



PRODUCT DEFINITION AND USERS' GUIDE (PUG)

APPENDIX X: ISO SERIES METADATA

FOR

**GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE
R SERIES (GOES-R) CORE GROUND SEGMENT**

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GOES-R SERIES CODE 417

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THESE ITEM(S) / DATA HAVE BEEN REVIEWED IN ACCORDANCE WITH THE INTERNATIONAL TRAFFIC IN ARMS REGULATIONS (ITAR), 22 CFR PART 120.11, AND THE EXPORT ADMINISTRATION REGULATIONS (EAR), 15 CFR 734(3)(b)(3), AND MAY BE RELEASED WITHOUT EXPORT RESTRICTIONS.

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APPENDIX X: ISO SERIES METADATA

FOR GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE R SERIES (GOES-R) CORE GROUND SEGMENT

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RECORD OF CHANGE

REVISION	DATE	DESCRIPTION
C	06 December 2013	Post-CDR Interim Release PTR-9218 Delivery_SE-16_Product Definition and Users' Guide (PUG) Release Update Rev C 1) Co-locate all ISO series metadata into a single document to improve usability of the PUG
C.1	05 December 2014	Post-CDR Interim Release Vol 1, Main: <ul style="list-style-type: none"> • Added FITS format section (SUVI) Vol 2, L0: <ul style="list-style-type: none"> • Minor editorial changes Vol 3, L1b: <ul style="list-style-type: none"> • Revised Space Weather and Solar instrument sections • Co-located Instrument Calibration Data with instrument section Vol 4, GRB: <ul style="list-style-type: none"> • Revised Space Weather and Solar instrument sections • Corrected APID list Vol 5, L2+: <ul style="list-style-type: none"> • Combined Volumes 5A and 5B • Added section for Latitude/Longitude grid (Radiation products) • Added Appendix for dynamic source data • Miscellaneous changes to CMI product Appendix X, ISO Series Metadata: <ul style="list-style-type: none"> • Revised L1b, L2+, Instrument Calibration Data sections PTR-12388 UMB_Delivery_SE-16_Product Definition and Users' Guide (PUG) Release Update Rev C.1 <ul style="list-style-type: none"> • Incorporates PTR-7028, PTR-7556, PTR-7557, PTR-7553, PTR-8055, PTR-8742, PTR-9027, PTR-9518, PTR-11701 • Combined Vol 5A and Vol 5B into a single volume • Rearranged major sections of the document (consolidated File Naming conventions, consolidated APID lists, etc.), for usability

13 May 2015

REVISION	DATE	DESCRIPTION
		<p>PTR-7028 Update Cumulative ERB/PCRB Changes in Next Rev of Document</p> <ul style="list-style-type: none"> • ERB: delete the Rainfall Rate Coefficient Algorithm • PCRB: change GLM Lightning Event Peak L1b/GRB update • PCRB: change Radiation Grid from ABI Grid to Latitude/Longitude <p>PTR-7556 Deferred Comments from Rev. B.2 Peer Review</p> <ul style="list-style-type: none"> • Incorporate comments deferred from Revision B.2 Peer Review <p>PTR-7753 SE-16: Updates to PUG Rev C for next Release</p> <ul style="list-style-type: none"> • Fixed MAG L1b OMAS/GRB/PD periodicity <p>PTR-8055 SE-16 PUG BCR # 127 + BCR #129 + BCR 124 + BCN_120 ATP for NcML/Product Definition for non-ABI Sensors + BCN_149, BCR 115 Update GLM L2 NcML + BCR 119 + BCR #127 and 129 (IPS and Product Set 1 NcML Corrections)</p> <ul style="list-style-type: none"> • BCR#127: incorporated IPS Product NcML corrections • BCR#129: incorporated IPS and Product Set 1 NcML corrections • BCR#124: changed SUVI, SEISS, MAG NcML • BCN_120: NcML/product definition for non-ABI instruments • BCN_149 / BCR#115: updated GLM L2+ NcML definition • BCR#119: changed SUVI GLM INR report design • ECP-9a: added aggregation criteria for Geomagnetic Field, Solar Flux: X-Ray products • BCR#212: incorporated Product Set 2 NcML corrections <p>PTR-8742 SE-16 PUG - Scheduled Science Instrument Products definitions</p> <ul style="list-style-type: none"> • Updated SUVI, EXIS, SEISS, MAG, GLM product definitions <p>PTR-9027 SE-16 PUG - Evaluate Customer Comments Against Rev B.2</p> <ul style="list-style-type: none"> • Incorporated customer comments not previously addressed in PUG Rev C

13 May 2015

REVISION	DATE	DESCRIPTION
		PTR-9518 SE-16 PUG, Evaluate Customer Comments from Rev C <ul style="list-style-type: none"> • Incorporated customer comments against PUG Rev C PTR-11701 SE-16 PUG - Update for BCR # 227, Non-ABI product Corrections <ul style="list-style-type: none"> • Incorporated non-ABI Product NcML corrections
D		PTR-7557 UMB_Delivery_SE-16_Product Definition and Users' Guide (PUG) Release Update Rev D <ul style="list-style-type: none"> • Incorporate customer comments against PUG Rev C.1 PTR-13600 <ul style="list-style-type: none"> • SE-16 PUG - Miscellaneous Corrections Appendix X <ul style="list-style-type: none"> • New content – L0 and GRB Info ISO Series Metadata Vol 2, L0 <ul style="list-style-type: none"> • Restructured to be consistent with other volumes Vol 3, L1b <ul style="list-style-type: none"> • New content – dynamic and semi-static processing parameters Vol 4, GRB <ul style="list-style-type: none"> • New content – GRB Information Vol 5, L2+ <ul style="list-style-type: none"> • New content – dynamic and semi-static processing parameters

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1.0 INTRODUCTION

1.1 Scope

The Product Definition and Users' Guide (PUG) document provides a product description and format users' guide for all data and products produced and made available to users by the Geostationary Operational Environmental Satellite R Series (GOES-R) Core Ground Segment (GS), developed under contract DG133E-09-CN-0094. This includes the Level 0 products, Level 1b products, GOES-R Rebroadcast (GRB), and Level 2+ products. This also includes ISO series metadata, instrument calibration data, and semi-static source data and algorithm packages.

This is an appendix to the PUG containing a detailed description of the ISO series metadata.

2.0 ISO SERIES METADATA OVERVIEW

GOES-R metadata is designed to serve two purposes:

- To support long-term archive and facilitate data discovery, evaluation, retrieval, use and reuse.
- To provide supplemental information for further processing, algorithm development, diagnostic and anomaly resolution and better understanding of each dataset.

For each Level 0, Level 1b, and Level 2+ product, ABI sample outlier data, instrument calibration data, and Level 1b and Level 2+ semi-static source data and algorithm packages, metadata is provided in an ISO-compliant XML product series (i.e., collection) level file. This metadata is in addition to the embedded native metadata existing in the GOES-R product and data files and is used to discover, display, exploit and further process the data. The ISO series metadata contains a set of "quasi-static" metadata elements that describe a collection of instances of a product or data. Their format, content, and citations to documents and points of contact are provided. Note that a complete ISO metadata record is produced by combining the series metadata with metadata in the product and data files using the ncISO functionality available at the NOAA Data Centers.

To present ISO Series Metadata in a readable format, each ISO xml file was transformed to text using a tool provided by NOAA National Geophysical Data Center (NGDC). The deeply nested xml format is flattened and includes only the specific fields containing metadata values. This presentation format provides links to the definitions of every ISO 19115 Universal Modeling Language (UML) class object and code list via a NOAA Enterprise Data Management (EDM) web site.

For example, given the following subset of ISO Series Metadata:

acquisitionInformation: ([MI AcquisitionInformation](#))

operation: ([MI Operation](#))

description: The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and provides ...

If the reader hovers their mouse over ([MI AcquisitionInformation](#)), presses Ctrl+Click and is connected to the Internet, the NOAA EDM web page for that ISO UML class will display:

MI AcquisitionInformation - NOAA Environment...

page discussion view source history

MI AcquisitionInformation

MI_AcquisitionInformation

1	instrument	0..*
2	operation	0..*
3	platform	0..*
4	acquisitionPlan	0..*
5	objective	0..*
6	acquisitionRequirement	0..*

Legend

- yellow: mandatory
- green: conditional
- blue: optional

ISO Legend

Possible Parent Elements

- ISO Acquisition Details
- Documentation Spirals#Acquisition_Information

AcquisitionDetails.png

Go to: Enterprise Metadata Management Architecture Home

Categories: ISO Explorer | 19115-2

Further and complete details are available on the web site by clicking keywords (such as “Operation”) on the page and subsequent pages:

MI Operation - NOAA Environmental Data Mana...

page discussion view source history

MI Operation

MI_Operation

1	description	0..1
2	citation	0..1
3	identifier	1
4	status	1
5	type	0..1
6	parentOperation	1
7	platform	0..*
8	objective	0..*
9	plan	0..1
10	significantEvent	0..*

Legend

- yellow: mandatory
- green: conditional
- blue: optional

ISO Legend

Possible Parent Elements

AcquisitionDetails.png

Go to: Enterprise Metadata Management

The filename conventions for ISO series metadata are located in paragraph 6.0, ISO Series Metadata Filename Conventions.

3.0 LEVEL 0 PRODUCT ISO SERIES METADATA

3.1 ABI Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 405cba30-aba1-11e3-a5e2-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier:
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI L0 Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2015-01-23
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2
Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L0-ISO-SERIES_c20150231137540.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Advanced Baseline Imager (ABI) Aggregated L0 Data Packets

alternateTitle: Data short name (DSN): ABI-L0

date:

identifier: (MD_Identifier)

authority: (CI_Citation)

title: gov.nesdis.noaa

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: ABI-L0
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: Advanced Baseline Imager (ABI) L0 data is comprised of unprocessed science data packets and telemetry packets. All science data and most telemetry data is sourced by the ABI instrument. L0 data includes select spacecraft telemetry in addition to instrument telemetry. ABI L0 data also includes orbit and attitude data and angular rate telemetry data (OAR), containing orbit ephemeris and satellite position.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode)
edition: Version 7.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: abi_space_packet_data
attributeType:
descriptor: GOES-R Advanced Baseline Imager (ABI) L0 CCSDS Space Packets
units:
scaleFactor:
offset:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:

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identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: Advanced Baseline Imager (ABI) front-end processing starts on the spacecraft where space packets are multiplexed placing multiple packets in each transfer frame. Forward error correction (FEC) coding (Low-Density Parity Check - LDPC) occurs and the packets are downlinked. The data is received, forward error correction decode is performed. In the event of an uncorrectable error the transfer frame is discarded. Error-free space packets are then extracted from the transfer frames. ABI science data arrives at the ground system from the spacecraft in a compressed format. The data is decompressed then packaged for delivery to external interfaces.
processor: (CI_ResponsibleParty)
organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the

HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage

operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

3.2 GLM Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f82fc080-a560-11e4-bcd8-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier:

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for GLM L0 Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2015-01-23
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2
Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_GLM-L0-ISO-SERIES_c20150231525370.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Geostationary Lightning Mapper (GLM) Aggregated L0 Data Packets

alternateTitle: Data short name (DSN): GLM-L0

date:

identifier: (MD_Identifier)

authority: (CI_Citation)

title: gov.nesdis.noaa

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GLM-L0

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: Geostationary Lightning Mapper (GLM) L0 data is comprised of unprocessed science data packets and telemetry packets. All science data and most telemetry data is sourced by the GLM instrument. L0 data includes select spacecraft telemetry in addition to instrument telemetry.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS >
SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR
COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T.
Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas,
C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: glm_space_packet_data

attributeType:

descriptor: GOES-R Geostationary Lightning Mapper (GLM) L0 CCSDS Space
Packets

units:

scaleFactor:

offset:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access
Data Units (CADUs) received with bit errors too numerous to be corrected by the Low
Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: Geostationary Lightning Mapper (GLM) front-end processing starts
on the spacecraft where space packets are multiplexed placing multiple packets in each
transfer frame. Forward error correction (FEC) coding (Low-Density Parity Check - LDPC)
occurs and the packets are downlinked. The data is received, forward error correction decode
is performed. In the event of an uncorrectable error the transfer frame is discarded. Error-free
space packets are then extracted from the transfer frames. GLM science data arrives at the
ground system from the spacecraft in a compressed format. The data is decompressed then
packaged for delivery to external interfaces.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition
Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code: GOES-16 GLM instrument_id (serial number)

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper is a single-channel, near-infrared optical transient detector that detects the momentary changes in an optical scene, indicating the presence of lightning. GLM measures total lightning activity continuously over the Americas and adjacent ocean regions with near uniform spatial resolution of approximately 10 km. GLM provides early predictions of intensifying storms and severe weather events. It also provides data for long-term climate studies. The instrument aids forecasting of weather events that could affect aviation safety and efficiency. GLM is unique both in how it operates and in the information it collects. While ground-based sensors only provide cloud-to-ground lightning coverage, GLM provides total lightning activity detection with both cloud-to-ground and cloud-to-cloud coverage. Also, ground-based systems can only provide coverage over land. GLM identifies growing, active and potentially destructive thunderstorms in areas over both land and oceans. The instrument collects information such

as the frequency and location of lightning events to detect the intensification of thunderstorms and tropical cyclones, which are often accompanied by increased lightning activity.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/glm.html>
date:
code: GOES-17 GLM instrument_id (serial number)

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper is a single-channel, near-infrared optical transient detector that detects the momentary changes in an optical scene, indicating the presence of lightning. GLM measures total lightning activity continuously over the Americas and adjacent ocean regions with near uniform spatial resolution of approximately 10 km. GLM provides early predictions of intensifying storms and severe weather events. It also provides data for long-term climate studies. The instrument aids forecasting of weather events that could affect aviation safety and efficiency. GLM is unique both in how it operates and in the information it collects. While ground-based sensors only provide cloud-to-ground lightning coverage, GLM provides total lightning activity detection with both cloud-to-ground and cloud-to-cloud coverage. Also, ground-based systems can only provide coverage over land. GLM identifies growing, active and potentially destructive thunderstorms in areas over both land and oceans. The instrument collects information such as the frequency and location of lightning events to detect the intensification of

thunderstorms and tropical cyclones, which are often accompanied by increased lightning activity.

3.3 SUVI Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 1a47ee90-a561-11e4-bcd8-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier:

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for SUVI L0 Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2015-01-23

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2

Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SUVI-L0-ISO-SERIES_c20150231513470.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Solar Ultraviolet Imager (SUVI) Aggregated L0 Data Packets

alternateTitle: Data short name (DSN): SUVI-L0

date:

identifier: (MD_Identifier)

authority: (CI_Citation)

title: gov.nesdis.noaa

date: (CI_Date)

date: 2014
dateType: (CI_DateTypeCode) revision
code: SUVI-L0
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: Solar Ultraviolet Imager (SUVI) L0 data is comprised of unprocessed science data packets and telemetry packets. All science data and most telemetry data is sourced by the SUVI instrument. L0 data includes select spacecraft telemetry in addition to instrument telemetry.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: suvi_space_packet_data
attributeType:
descriptor: GOES-R Solar Ultraviolet Imager (SUVI) L0 CCSDS Space Packets
units:
scaleFactor:
offset:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:

BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: Solar Ultraviolet Imager (SUVI) front-end processing starts on the spacecraft where space packets are multiplexed placing multiple packets in each transfer frame. Forward error correction (FEC) coding (Low-Density Parity Check - LDPC) occurs and the packets are downlinked. The data is received, forward error correction decode is performed. In the event of an uncorrectable error the transfer frame is discarded. Error-free space packets are then extracted from the transfer frames. SUVI science data arrives at the ground system from the spacecraft in a compressed format. The data is decompressed then packaged for delivery to external interfaces.
processor: (CI_ResponsibleParty)
organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the

HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/suvi.html>

date:

code: GOES-16 SUVI instrument_id (serial number)

type: Solar Ultraviolet Imager

description: The Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. SUVI observes and characterizes complex active regions of the Sun, solar flares, and the eruptions of solar filaments which may give rise to coronal mass ejections. Depending on the size and the trajectory of solar eruptions, the possible effects to near-Earth space and Earth's magnetosphere, referred to as space weather, can cause geomagnetic storms which disrupt power utilities, communication and navigation systems, and may cause radiation damage to orbiting satellites and the International Space Station. SUVI observations of solar flares and solar eruptions provide an early warning of possible impacts to Earth's space environment and enable better forecasting of potentially disruptive events on the ground.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/suvi.html>
date:
code: GOES-17 SUVI instrument_id (serial number)
type: Solar Ultraviolet Imager

description: The Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. SUVI observes and characterizes complex active regions of the Sun, solar flares, and the eruptions of solar filaments which may give rise to coronal mass ejections. Depending on the size and the trajectory of solar eruptions, the possible effects to near-Earth space and Earth's magnetosphere, referred to as space weather, can cause geomagnetic storms which disrupt power utilities, communication and navigation systems, and may cause radiation damage to orbiting satellites and the International Space Station. SUVI observations of solar flares and solar eruptions provide an early warning of possible impacts to Earth's space environment and enable better forecasting of potentially disruptive events on the ground.

3.4 EXIS Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 542948c0-a561-11e4-bcd8-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier:
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for EXIS L0 Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2015-01-23
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2

Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_EXIS-L0-ISO-SERIES_c20150231136450.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Extreme Ultraviolet and X-Ray Irradiance Sensors (EXIS)

Aggregated L0 Data Packets

alternateTitle: Data short name (DSN): EXIS-L0

date:

identifier: (MD_Identifier)

authority: (CI_Citation)

title: gov.nesdis.noaa

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: EXIS-L0

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Extreme Ultraviolet and X-ray Irradiance Sensors detect solar soft X-ray irradiance and solar extreme ultraviolet spectral irradiance in the 5-127 nm range. The X-Ray Sensor (XRS) monitors solar flares that can disrupt communications and degrade navigational accuracy, affecting satellites, astronauts, high latitude airline passengers, and power grid performance. The Extreme Ultraviolet (EUV) Sensor monitors solar variations that directly affect satellite drag/tracking and ionospheric changes, which impact communications and navigation operations. This information is critical to understanding the outer layers of the Earth's atmosphere. L0 data includes select spacecraft telemetry in addition to instrument telemetry.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS >
SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR
COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T.
Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas,
C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: exis_space_packet_data

attributeType:

descriptor: GOES-R EUV and X-Ray Irradiance Sensors (EXIS) L0 CCSDS Space
Packets

units:

scaleFactor:

offset:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access
Data Units (CADUs) received with bit errors too numerous to be corrected by the Low
Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: Extreme Ultraviolet and X-Ray Irradiance Sensors (EXIS) front-end
processing starts on the spacecraft where space packets are multiplexed placing multiple
packets in each transfer frame. Forward error correction (FEC) coding (Low-Density Parity
Check - LDPC) occurs and the packets are downlinked. The data is received, forward error
correction decode is performed. In the event of an uncorrectable error the transfer frame is
discarded. Error-free space packets are then extracted from the transfer frames. EXIS science
data arrives at the ground system from the spacecraft in a compressed format. The data is
decompressed then packaged for delivery to external interfaces.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition
Station, Chincoteague, VA)

role: (CI_RoleCode)

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode)
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code: GOES-16 EXIS instrument_id (serial number)

type: EUV and X-Ray Irradiance Sensors (EXIS)

description: The Extreme Ultraviolet and X-ray Irradiance Sensors detect solar soft X-ray irradiance and solar extreme ultraviolet spectral irradiance in the 5-127 nm range. The X-Ray Sensor (XRS) monitors solar flares that can disrupt communications and degrade navigational accuracy, affecting satellites, astronauts, high latitude airline passengers, and power grid performance. The Extreme Ultraviolet Sensor monitors solar variations that directly affect satellite drag/tracking and ionospheric changes, which impact communications and navigation operations. This information is critical to understanding the outer layers of the Earth's atmosphere. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code: GOES-17 EXIS instrument_id (serial number)

type: EUV and X-Ray Irradiance Sensors (EXIS)

description: The Extreme Ultraviolet and X-ray Irradiance Sensors detect solar soft X-ray irradiance and solar extreme ultraviolet spectral irradiance in the 5-127 nm range. The X-Ray Sensor (XRS) monitors solar flares that can disrupt communications and degrade navigational accuracy, affecting satellites, astronauts, high latitude airline passengers, and power grid performance. The Extreme Ultraviolet Sensor monitors solar variations that directly affect satellite drag/tracking and ionospheric changes, which impact communications and navigation operations. This information is critical to understanding the outer layers of the Earth's atmosphere. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array.

3.5 SEISS Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 85e0f200-a561-11e4-bcd8-0800200c9a66

language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier:
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for SEISS L0 Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2015-01-23
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_SEIS-L0-ISO-SERIES_c20150231535260.xml

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: GOES-R Space Environment In-Situ Suite (SEISS) Aggregated L0 Data Packets
alternateTitle: Data short name (DSN): SEIS-L0
date:
identifier: (MD_Identifier)
authority: (CI_Citation)
title: gov.nesdis.noaa
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: SEIS-L0
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD

postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: Space Environment In-Situ Suite (SEISS) L0 data is comprised of unprocessed science data packets and telemetry packets. All science data and most telemetry data is sourced by the SEISS instrument. L0 data includes select spacecraft telemetry in addition to instrument telemetry.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: seiss_space_packet_data
attributeType:
descriptor: GOES-R Space Environment In-Situ Suite (SEISS) L0 CCSDS Space
Packets
units:
scaleFactor:
offset:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access
Data Units (CADUs) received with bit errors too numerous to be corrected by the Low
Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: Space Environment In-Situ Suite (SEISS) front-end processing starts
on the spacecraft where space packets are multiplexed placing multiple packets in each
transfer frame. Forward error correction (FEC) coding (Low-Density Parity Check - LDPC)
occurs and the packets are downlinked. The data is received, forward error correction decode

is performed. In the event of an uncorrectable error the transfer frame is discarded. Error-free space packets are then extracted from the transfer frames. SEISS science data arrives at the ground system from the spacecraft in a compressed format. The data is decompressed then packaged for delivery to external interfaces.

processor: (CI_ResponsibleParty)
organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection

of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code: GOES-16 SEISS instrument_id (serial number)

type: Space Environment In-Situ Suite

description: The Space Environment In-Situ Suite is comprised of four sensors that will monitor proton, electron, and heavy ion fluxes at geosynchronous orbit. The information provided by SEISS is critical for assessing the electrostatic discharge (ESD) risk and radiation hazard to astronauts and satellites. In addition to hazard assessment, the information from SEISS can be used to warn of high flux events, mitigating any damage to radio communication. The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). Data from SEISS will drive solar radiation storm portion of NOAA space weather scales and other alerts and warnings and will improve energetic particle forecasts.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code: GOES-17 SEISS instrument_id (serial number)

type: Space Environment In-Situ Suite

description: The Space Environment In-Situ Suite is comprised of four sensors that will monitor proton, electron, and heavy ion fluxes at geosynchronous orbit. The information provided by SEISS is critical for assessing the electrostatic discharge (ESD) risk

and radiation hazard to astronauts and satellites. In addition to hazard assessment, the information from SEISS can be used to warn of high flux events, mitigating any damage to radio communication. The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). Data from SEISS will drive solar radiation storm portion of NOAA space weather scales and other alerts and warnings and will improve energetic particle forecasts.

3.6 Magnetometer Level 0 Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 389e80c0-a561-11e4-bcd8-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier:

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for MAG L0 Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2015-01-23

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2

Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_MAG-L0-ISO-SERIES_c20150231459560.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Magnetometer (MAG) Aggregated L0 Data Packets

alternateTitle: Data short name (DSN): MAG-L0
date:
identifier: (MD_Identifier)
authority: (CI_Citation)
title: gov.nesdis.noaa
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: MAG-L0
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: Magnetometer (MAG) L0 data is comprised of unprocessed science data packets and telemetry packets. All science data and most telemetry data is sourced by the MAG instrument. L0 data includes select spacecraft telemetry in addition to instrument telemetry.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite,
Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS >
SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR
COUNTS

type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-01-23
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mag_space_packet_data
attributeType:
descriptor: GOES-R Magnetometer (MAG) L0 CCSDS Space Packets
units:
scaleFactor:
offset:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: Magnetometer (MAG) front-end processing starts on the spacecraft where space packets are multiplexed placing multiple packets in each transfer frame. Forward error correction (FEC) coding (Low-Density Parity Check - LDPC) occurs and the packets are downlinked. The data is received, forward error correction decode is performed. In the event of an uncorrectable error the transfer frame is discarded. Error-free space packets are then extracted from the transfer frames. MAG science data arrives at the ground system from the spacecraft in a compressed format. The data is decompressed then packaged for delivery to external interfaces.
processor: (CI_ResponsibleParty)
organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L0

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager

(SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/mag.html>

date:

code: GOES-16 MAG instrument_id (serial number)

type: Magnetometer

description: The GOES-R Magnetometer provides measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products are an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast

Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/mag.html>
date:
code: GOES-17 MAG instrument_id (serial number)
type: Magnetometer

description: The GOES-R Magnetometer provides measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products are an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

4.0 LEVEL 1B PRODUCT AND DATA ISO SERIES METADATA

4.1 Level 1b Products

4.1.1 Radiances Product ISO Series Metadata

(MI_Metadata)
fileIdentifier: a70be540-c38b-11e0-962b-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 1b Radiances Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-14
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L1b-ISO-SERIES_c20142871334050.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 10848
resolution:
Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 10848
resolution:
Distance: 1 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 3000
resolution:
Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 5000
resolution:
Distance: 1 km at nadir

cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1000
 resolution:
 Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 1000
 resolution:
 Distance: 1 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; ABI Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 21696
 resolution:
 Distance: 0.5 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 21696
 resolution:
 Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channel 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 6000
 resolution:
 Distance: 0.5 km at nadir

axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 10000
resolution:
Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channel 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 2000
resolution:
Distance: 0.5 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 2000
resolution:
Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; ABI Channel 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 5424
resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 5424
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channels 4 and 6 - 16

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1500
resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 2500
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 4 and 6 - 16

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 500
resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; ABI Channels 4 and 6 - 16

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R ABI Level 1b Radiances Product

alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C01
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C02
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C03
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C04
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C05
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C06
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C07
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C08
alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C09
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alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C11
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alternateTitle: Data short name (DSN): ABI-L1b-RadM1-M3C13
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alternateTitle: Data short name (DSN): ABI-L1b-RadF-M4C14

alternateTitle: Data short name (DSN): ABI-L1b-RadF-M4C15

alternateTitle: Data short name (DSN): ABI-L1b-RadF-M4C16

date: (CI_Date)

date: 2014-10-14

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The ABI instrument samples the radiance of the Earth in sixteen spectral bands using several arrays of detectors in the instrument's focal plane. Single reflective band ABI L1b Radiance Products (channels 1 - 6 with wavelengths 0.47, 0.64, 0.865, 1.378, 1.61, 2.25 microns, respectively) are digital maps of outgoing radiance values at the top of the atmosphere for visible and near-IR bands. Single emissive band ABI L1b Radiance Products (channels 7 - 16 with wavelengths 3.9, 6.185, 6.95, 7.34, 8.5, 9.61, 10.35, 11.2, 12.3, 13.3 microns, respectively) are digital maps of outgoing radiance values at the top of the atmosphere for IR bands. Detector samples are compressed, packetized and down-linked to the ground station as Level 0 data for conversion to calibrated, geo-located pixels (Level 1b Radiance data). The detector samples are decompressed, radiometrically corrected, navigated and resampled onto an invariant output grid, referred to as the ABI fixed grid.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > VISIBLE RADIANCE
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > INFRARED RADIANCE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: toa_outgoing_radiance_per_unit_wavelength
keyword: toa_outgoing_radiance_per_unit_wavenumber
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: .5 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 1 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-14

endPosition: now
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -156.2995
 eastBoundLongitude: 6.2995
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: 141.7005
 eastBoundLongitude: -55.7005
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -153.1198
 eastBoundLongitude: -58.7853
 southBoundLatitude: 14.0097
 northBoundLatitude: 55.6790
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -132.6972
 eastBoundLongitude: -56.0418
 southBoundLatitude: 13.7412
 northBoundLatitude: 55.1071
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:

aName: Rad
attributeType:
descriptor: ABI L1b Radiances per pixel (channels 1 - 6)
units:
DerivedUnit:
identifier: mW m⁻² ster⁻¹ um⁻¹
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Rad
attributeType:
descriptor: ABI L1b Radiances per pixel (channels 7 - 16)
units:
DerivedUnit:
identifier: mW m⁻² sr⁻¹ (cm⁻¹)-1
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 1b Radiances data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Statisticals are provided for minimum, maximum, mean and standard deviation radiance value of valid pixels; counts of: missing pixels samples, pixels that exceed saturation limit, pixels below undersaturation limit, and pixels with each data quality flag value in the product image; and percent of uncorrectable L0 errors.
result:

report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: Raw data downlink is received by the Antenna system which processes the data through signal processing equipment to Intermediate Frequency. Forward error correction is performed. If FEC fails, those packets are dropped. Good packets are input to L0 processing. In L0 processing packets are uncompressed, extracted and byte-aligned (L1a). L1b processing extracts the L1a data, performs radiometric and geometric correction on the data to create L1b data.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
description: Advanced Baseline Imager (ABI) L1b data is a pixel array of resampled, radiometrically corrected, Earth located imagery with associated per-pixel quality flag array. End-products are unique to an ABI scene (Full Disk, CONUS or Mesoscale) and ABI channel (1 - 16).
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing Levels
role: (CI_RoleCode) publisher
code: L1b

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about

a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the next generation of geostationary weather satellites. The advanced spacecraft and instrument technology used on the GOES-R series will result in more timely and accurate forecasts and warnings. It will improve support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series is a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite will provide continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It will be the primary tool for the detection and tracking of hurricanes and severe weather and provide new and improved applications and products for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft will be 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite will be able to operate through periodic station-keeping and momentum adjust maneuvers, which will allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary

scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

4.1.2 Level 1b SUVI Solar Imagery: Extreme Ultraviolet Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f5816f57-fd6d-11e3-a3ac-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for Level 1b SUVI Solar Imagery: Extreme Ultraviolet Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-19

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SUVI-L1b-SUVI-ISO-SERIES_c20142921042240.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Level 1b SUVI Solar Imagery: Extreme Ultraviolet Product ISO Series Metadata

alternateTitle: Data short name (DSN): SUVI-L1b-Fe093

alternateTitle: Data short name (DSN): SUVI-L1b-Fe131

alternateTitle: Data short name (DSN): SUVI-L1b-Fe171

alternateTitle: Data short name (DSN): SUVI-L1b-Fe195

alternateTitle: Data short name (DSN): SUVI-L1b-Fe284

alternateTitle: Data short name (DSN): SUVI-L1b-He303

date: (CI_Date)

date: 2014-10-19

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: The Solar Ultraviolet Imager (SUVI) Level 1b Solar Imagery: X-Ray product contains an image of the Sun at one of six wavelengths with different exposure times, and metadata required for exploitation and higher level processing. This product also contains an array containing a quality flag for each pixel in the solar image.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
resourceFormat: (MD_Format)
name: FITS
version: 3.0
descriptiveKeywords: (MD_Keywords)
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR IMAGERY
keyword: ATMOSPHERE > ATMOSPHERIC RADIATION > SOLAR RADIATION
keyword: SPECTRAL/ENGINEERING > ULTRAVIOLET WAVELENGTHS > ULTRAVIOLET RADIANCE
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > CORONA
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > CORONA HOLES
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > CORONAL MASS EJECTIONS

keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR ACTIVE REGIONS
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR FLARES
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR PROMINENCES/SOLAR FILAMENTS
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR ULTRAVIOLET EMISSIONS
keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SUN SPOTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-19
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: RAD
attributeType:
descriptor: Level 1b SUVI Solar Imagery: Extreme Ultraviolet data
units:
DerivedUnit:
identifier: W m-2 sr-1
derivationUnitTerm: watt
derivationUnitTerm: meter

derivationUnitTerm: steradian

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF

attributeType:

descriptor: Level 1b SUVI Solar Imagery: Extreme Ultraviolet data quality flags

units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: SUVI is a solar imager capable of operation in the soft EUV to EUV wavelength range. It provides full-disk solar images at high cadence around the clock, except for brief periods during satellite eclipse. The operational goals of the SUVI are to image the solar emissions and temperatures within the EUV spectrum, to locate coronal holes for the forecasting of recurring geomagnetic activity, to locate solar flares for the forecasting of energetic particle events, to assess active region complexity for solar flare forecasting, and to determine the signatures of Coronal Mass Ejections (CME). The ground processing algorithm applies several correction and calibration processes in order to generate the photon fluxes for the final L1b product.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The Solar Ultraviolet Imager (SUVI) Level 1b Solar Imagery: X-Ray product contains an image of the Sun at one of six wavelengths with different exposure times, and metadata required for exploitation and higher level processing. This product also contains an array

containing a quality flag for each pixel in the solar image.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration

(NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/suvi.html>
date:
code: GOES-16 SUVI instrument_id (serial number)

type: Solar Ultraviolet Imager - SUVI
description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. The SUVI observes full disk solar images around the clock.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

13 May 2015

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/suvi.html>

date:

code: GOES-17 SUVI instrument_id (serial number)

type: Solar Ultraviolet Imager - SUVI

description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. The SUVI observes full disk solar images around the clock.

4.1.3 Solar Flux: Extreme Ultraviolet Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f7087580-e5a8-11e3-ac10-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for EXIS Level 1b Solar Flux: Extreme Ultraviolet Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_EXIS-L1b-SFEU-ISO-SERIES_c20142741128040.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: EXIS Level 1b Solar Flux: Extreme Ultraviolet Product ISO Series Metadata

alternateTitle: Data short name (DSN): EXIS-L1b-SFEU

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: The Extreme Ultraviolet (EUV) solar flux product consists of a solar irradiance spectrum covering the wavelength range from 5 nm to 127 nm. The Extreme Ultraviolet Sensor and X-ray Irradiance Sensors (EXIS) instrument does not directly measure the entire spectrum over this wavelength range. Instead, the ground processing algorithm computes the solar spectrum using a proxy model based on the set of measurements obtained from the XRS-A channel (0.05-0.4 nm), the XRS-B channel (0.1-0.8 nm) and the three channels from the EUV sensor. The ground processing algorithm will produce this spectrum with a spectral resolution of 5 nm over the entire wavelength range with one 10 nm exception being the 117 - 127 nm wavelength bin.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SPECTRAL/ENGINEERING > ULTRAVIOLET WAVELENGTHS > ULTRAVIOLET FLUX

keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR IRRADIANCE

keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR ULTRAVIOLET EMISSIONS

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
 temporalElement: (EX_TemporalExtent)
 extent:
 TimePeriod:
 beginPosition: 2014-10-01
 endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: irradianceSpectrum
 attributeType:
 descriptor: irradiance spectrum for wavelengths between 5 and 127 nm calculated using a proxy model based on inputs from XRS A and B channels, and EUVS A, B, and C channels
 units:
 DerivedUnit:
 identifier: W m-2 nm-1
 derivationUnitTerm: watt
 derivationUnitTerm: meter

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
 level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
 nameOfMeasure: percent_uncorrectable_L0_errors
 evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
 result: (DQ_QuantitativeResult)
 valueUnit:
 BaseUnit:
 identifier: percent
 unitsSystem:
 value:
 lineage: (LI_Lineage)
 processStep: (LE_ProcessStep)
 description: The ground processing algorithm (GPA) converts the raw data from all of the photodiodes for both XRS channels from digital numbers into electrical current using the integration time and the total diode gain factor, composed of the pre-flight temperature calibration value, the in-flight temporal calibration factor, and the gain linearity factor. The GPA calculates and removes the dark diode current, caused by the radiation background, the thermal contribution from the diode

material and the temperature-dependent electrical offset from the measured current. The GPA sums the four currents for the solar maximum quadrant diode set. The GPA converts the solar minimum and the solar maximum currents to irradiance values using the instrument responsivity and the field-of-view correction generated from the EXIS Solar Position Sensor (SPS) pointing data and determines the primary irradiance for each channel based on a calibration threshold value. The GPA computes the 1-AU correction factor to the X-Ray fluxes to support the generation of higher-level products at a later time. The GPA also has a requirement to calculate the XRS ratio, XRS-A and XRS-B primary irradiances for use in the EUV solar flux end product processing.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The Extreme Ultraviolet (EUV) solar flux product consists of a solar irradiance spectrum covering the wavelength range from 5 nm to 127 nm. The Extreme Ultraviolet Sensor and X-ray Irradiance Sensors (EXIS) instrument does not directly measure the entire spectrum over this wavelength range. Instead, the ground processing algorithm computes the solar spectrum using a proxy model based on the set of measurements obtained from the XRS-A channel (0.05-0.4 nm), the XRS-B channel (0.1-0.8 nm) and the three channels from the EUV sensor. The ground processing algorithm will produce this spectrum with a spectral resolution of 5 nm over the entire wavelength range.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle

from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code: GOES-16 EXIS serial number

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code: GOES-17 EXIS serial number

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

4.1.4 Solar Flux: X-Ray Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f7087581-e5a8-11e3-ac10-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for EXIS Level 1b Solar Flux: X-Ray Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-01
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_EXIS-L1b-SFXR-ISO-SERIES_c20142741131270.xml

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: EXIS Level 1b Solar Flux: X-Ray Product ISO Series Metadata
alternateTitle: Data short name (DSN): EXIS-L1b-SFXR
date: (CI_Date)
date: 2014-10-01
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: The solar flux X-Ray product consists of two irradiance measurements within the X-Ray spectrum of the Sun. The algorithm generates this product using XRS measurements of the solar flux in two channels: XRS-A covering 0.05-0.4 nm and XRS-B covering 0.1-0.8 nm. In order to span the full dynamic range of the X-Ray radiation over the approximate 11-year solar cycle, each channel of the XRS uses both a solar minimum photodiode and a solar maximum quadrant photodiode set. The solar minimum diode performs well during periods of low solar activity, but can saturate during high solar activity. The set of quadrant photodiodes provides good coverage of the X-Ray solar flux during high activity and flares, but may bottom-out during low activity. In addition, the individual

signals in the quadrant provide a means for estimating the location of flares on the solar disk. The product data will contain a flag to indicate whether the solar minimum or solar maximum photodiodes correspond to the primary irradiance measurement for each channel. The X-Ray solar flux product also includes a set of quality flags to assess the state and health of the instrument, product metadata indicating the measurement details and quality of the product data, and intermediate data required for the generation of higher-level products.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SPECTRAL/ENGINEERING > X-RAY > X-RAY FLUX

keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR IRRADIANCE

keyword: SUN-EARTH INTERACTIONS > SOLAR ACTIVITY > SOLAR X-RAY

EMISSIONS

keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > X-RAY FLUX

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

language: eng

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) geoscientificInformation

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:
beginPosition: 2014-10-01
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: irradiance_xrsa1
attributeType:
descriptor: irradiance at wavelengths between 0.05 and 0.4 nm calculated from XRS-A solar minimum channel (photodiode)
units:
DerivedUnit:
identifier: W m-2
derivationUnitTerm: watt
derivationUnitTerm: meter
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: irradiance_xrsa2
attributeType:
descriptor: irradiance at wavelengths between 0.05 and 0.4 nm calculated from XRS-A solar maximum channel (quadrant photodiode)
units:
DerivedUnit:
identifier: W m-2
derivationUnitTerm: watt
derivationUnitTerm: meter
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: irradiance_xrsb1
attributeType:
descriptor: irradiance at wavelengths between 0.1 and 0.8 nm calculated from XRS-B solar minimum channel (photodiode)
units:
DerivedUnit:
identifier: W m-2
derivationUnitTerm: watt
derivationUnitTerm: meter
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: irradiance_xrsb2
attributeType:

descriptor: irradiance at wavelengths between 0.1 and 0.8 nm calculated from XRS-B solar maximum channel (quadrant photodiode)

units:

DerivedUnit:

identifier: W m⁻²

derivationUnitTerm: watt

derivationUnitTerm: meter

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The ground processing algorithm (GPA) converts the raw data from all of the photodiodes for both XRS channels from digital numbers into electrical current using the integration time and the total diode gain factor, composed of the pre-flight temperature calibration value, the in-flight temporal calibration factor, and the gain linearity factor. The GPA calculates and removes the dark diode current, caused by the radiation background, the thermal contribution from the diode material and the temperature-dependent electrical offset from the measured current. The GPA sums the four currents for the solar maximum quadrant diode set. The GPA converts the solar minimum and the solar maximum currents to irradiance values using the instrument responsivity and the field-of-view correction generated from the EXIS Solar Position Sensor (SPS) pointing data and determines the primary irradiance for each channel based on a calibration threshold value. The GPA computes the 1-AU correction factor to the X-Ray fluxes to support the generation of higher-level products at a later time. The GPA also has a requirement to calculate the XRS ratio, XRS-A and XRS-B primary irradiances for use in the EUV solar flux end product processing.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The solar flux X-Ray product consists of two irradiance measurements within the X-Ray spectrum of the Sun. The algorithm generates this product using XRS measurements of the solar flux in two channels: XRS-A covering 0.05-0.4 nm and XRS-B covering 0.1-0.8 nm. In order to span the full dynamic range of the X-Ray radiation over the approximate 11-

year solar cycle, each channel of the XRS uses both a solar minimum photodiode and a solar maximum quadrant photodiode set. The solar minimum diode performs well during periods of low solar activity, but can saturate during high solar activity. The set of quadrant photodiodes provides good coverage of the X-Ray solar flux during high activity and flares, but may bottom-out during low activity. In addition, the individual signals in the quadrant provide a means for estimating the location of flares on the solar disk. The product data will contain a flag to indicate whether the solar minimum or solar maximum photodiodes correspond to the primary irradiance measurement for each channel. The X-Ray solar flux product also includes a set of quality flags to assess the state and health of the instrument, product metadata indicating the measurement details and quality of the product data, and intermediate data required for the generation of higher-level products.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

contactResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow

for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/exis.html>
date:
code: GOES-16 EXIS serial number

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI),

Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code: GOES-17 EXIS serial number

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

4.1.5 Energetic Heavy Ions Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f7087582-e5a8-11e3-ac10-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for SEISS Level 1b Energetic Heavy Ions Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SEIS-L1b-EHIS-ISO-SERIES_c20142741139080.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R SEISS Level 1b Energetic Heavy Ions Product ISO Series Metadata

alternateTitle: Data short name (DSN): SEIS-L1b-EHIS

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The GOES-R L1b Energetic Heavy Ions Product consists of heavy ion differential fluxes derived from in situ measurements of heavy ion count rates. Differential fluxes are produced for Hydrogen (H), Helium (He), Carbon-Nitrogen-Oxygen (CNO) mass group, Neon-Sulfur (Ne-S) mass group, Chlorine-Nickel (Cl-Ni) mass group, and Beryllium to Copper (Be-Cu) 26 elements group. For each mass and element group, the fluxes are produced for five energy bands, and one angular zone. The 5 energy bands are evenly spaced logarithmically spanning from 10 to 200 MeV/nucleon for H and He. The energy range for ions heavier than He is species-dependent and normalized such that, when focused into a beam and directed into a block of silicon, it corresponds to the same stopping range as He. The one angular zone has a central, anti-earthward look-angle (-Z direction in spacecraft body-reference-frame coordinates), and a 60 degree field-of-view. The product also contains processing and data quality metadata, satellite state and location information, and data required for the generation of level 2 products.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

13 May 2015

country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE
DYNAMICS > ELECTRIC FIELDS/ELECTRIC CURRENTS
keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE
DYNAMICS > ION CHEMISTRY/IONIZATION
keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX >
HEAVY NUCLEI FLUX
keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX >
ION FLUX
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M.
Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M.
Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-01
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: H5MinuteDifferentialFluxes
attributeType:

descriptor: Hydrogen (H) differential flux for each energy band

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: megaelectron

derivationUnitTerm: volt

derivationUnitTerm: nucleon

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: He5MinuteDifferentialFluxes

attributeType:

descriptor: Helium (He) differential flux for each energy band

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: megaelectron

derivationUnitTerm: volt

derivationUnitTerm: nucleon

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: CNO5MinuteDifferentialFluxes

attributeType:

descriptor: Carbon-Nitrogen-Oxygen (CNO) mass group differential flux for each energy

band

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: megaelectron

derivationUnitTerm: volt

derivationUnitTerm: nucleon

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: NeS5MinuteDifferentialFluxes

attributeType:

descriptor: Neon-Sulfur (Ne-S) mass group differential flux for each energy band

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: megaelectron
derivationUnitTerm: volt
derivationUnitTerm: nucleon

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: ClNi5MinuteDifferentialFluxes

attributeType:

descriptor: Chlorine-Nickel (Cl-Ni) mass group differential flux for each energy band

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: megaelectron

derivationUnitTerm: volt

derivationUnitTerm: nucleon

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: BeCu5MinuteDifferentialFluxes

attributeType:

descriptor: Beryllium to Copper (Be-Cu) differential flux for each element's energy bands

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 (MeV nuc-1)-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: megaelectron

derivationUnitTerm: volt

derivationUnitTerm: nucleon

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: SEISS EHIS L1b Calibration Algorithm (SECA) uses the EHIS data to produce heavy ion differential fluxes in the energy range from 10 to 200 MeV/nucleon. Differential fluxes are produced for Hydrogen (H), Helium (He), the C-N-O group, the Ne-S group and the Fe group. For each mass group, the fluxes are produced for five energy bands, and one angular zone. The 5 energy bands are evenly spaced logarithmically and range from 10 to 200 MeV/nuc (for H and He). The energy range for ions heavier than He is species-dependent and corresponds to the same stopping range (in Si) as He. The one angular zone has a central look-angle which is anti-earthward (-Z direction), and has a 60 degree field-of-view.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The GOES-R Energetic Heavy Ions L1b Space and Solar End-Product consists of fluxes of heavy ions derived from in situ measurements of heavy ion count rates. These measurements are retrieved from the Energetic Heavy Ion Sensor (EHIS) which is one of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS) to produce heavy ion differential fluxes in the energy range from 10 to 200 MeV/nucleon. Differential fluxes are produced for Hydrogen (H), Helium (He), the C-N-O group, the Ne-S group and the Fe group. For each mass group, the fluxes are produced for five energy bands, and one angular zone. The 5 energy bands are evenly spaced logarithmically and range from 10 to 200 MeV/nuc (for H and He). The energy range for ions heavier than He is species-dependent and corresponds to the same stopping range (in Si) as He. The one angular zone has a central look-angle which is anti-earthward (-Z direction), and has a 60 degree field-of-view.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position

Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/seiss.html>
date:
code: GOES-16 SEISS EHS serial number

type: SEISS Energetic Heavy Ion Sensor (EHS)
description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/seiss.html>
date:
code: GOES-17 SEISS EHS serial number

type: SEISS Energetic Heavy Ion Sensor (EHS)
description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within

Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

4.1.6 Magnetospheric Electrons and Protons: Low Energy Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f7087583-e5a8-11e3-ac10-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for SEISS Level 1b Magnetospheric Electrons and Protons: Low Energy Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SEIS-L1b-MPSL-ISO-SERIES_c20142741143150.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R SEISS Level 1b Magnetospheric Electrons and Protons: Low Energy Product ISO Series Metadata

alternateTitle: Data short name (DSN): SEIS-L1b-MPSL

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: The GOES-R Low Energy Magnetospheric Electrons and Protons L1b Space and Solar End-Product consists of fluxes of relatively low energy electrons and ions derived from in situ measurements of electron and ion count rates. These measurements are retrieved from the Magnetospheric Particle Sensor Low (MPS-LO) sensor which is one of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS). The MPS-LO fluxes are reported for two species (electrons and ions), 15 energy bands and 14 angular zones.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > ELECTRIC FIELDS/ELECTRIC CURRENTS

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > ION CHEMISTRY/IONIZATION

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > SOLAR WIND

keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > ELECTRON FLUX

keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > ION FLUX

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

language: eng

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) geoscientificInformation

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:

beginPosition: 2014-10-01

endPosition: now

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DiffElectronFluxes

attributeType:

descriptor: differential electron flux at specific energy bands for each zone's primary electron data channels

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 keV-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: kiloelectron

derivationUnitTerm: volt

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DiffIonFluxes

attributeType:

descriptor: differential ion flux at specific energy bands for each zone's primary ion data channels

units:

DerivedUnit:

identifier: cm-2 sr-1 s-1 keV-1

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: second

derivationUnitTerm: kiloelectron
derivationUnitTerm: volt

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_LO_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The SEISS MPS-LO L1b Calibration Algorithm (SMLCA) produces the MPS-LO electron and ion fluxes. The MPS-LO raw count rates are first corrected for the dead-time effect using a simple formula. For the out-of-band contamination correction, MPS-LO employs two shielded background channels. Only high-energy particles can penetrate the shielding and be counted in these background channels. These high-energy particles are assumed to also be contaminating the open-aperture channels. Counts from the background channels are first scaled by background removal coefficients, and then subtracted from the dead-time-corrected, open-aperture channel count rates to remove contamination. Finally, the dead-time corrected, and contamination-free count rates are normalized by the geometrical factor and energy band pass value to obtain directional-differential fluxes.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The GOES-R Low Energy Magnetospheric Electrons and Protons L1b Space and Solar End-Product consists of fluxes of relatively low energy electrons and ions derived from in situ measurements of electron and ion count rates. These measurements are retrieved from the Magnetospheric Particle Sensor Low (MPS-LO) sensor which is one of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS). The MPS-LO fluxes are reported for two species (electrons and ions), 15 energy bands and 14 angular zones.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L1b

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:
status: (MD_ProgressCode) onGoing
parentOperation:
platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)
description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the

in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code: GOES-16 SEISS MPS_Lo serial number

type: Magnetospheric Particle Sensor – Low Energy Range (MPS-Lo)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code: GOES-17 SEISS MPS_Lo serial number

type: SEISS Magnetospheric Particle Sensor – Low Energy Range (MPS-Lo)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

4.1.7 Magnetospheric Electrons and Protons: Medium and High Energy Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f7087584-e5a8-11e3-ac10-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for SEISS Level 1b Magnetospheric Electrons and Protons: Medium and High Energy Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SEIS-L1b-MPSH-ISO-SERIES_c20142741141010.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R SEISS Level 1b Magnetospheric Electrons and Protons: Medium and High Energy Product ISO Series Metadata

alternateTitle: Data short name (DSN): SEIS-L1b-MPSH

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: The GOES-R Magnetospheric Electrons and Protons: Medium and High Energy Product consists of fluxes of medium and high energy electrons and protons derived from in situ measurements of electron and proton count rates. Differential and integral electron fluxes are reported at eleven energy bands in five angular zones. Ten of the energy bands are evenly spaced logarithmically spanning from 50 keV to 4 MeV with differential electron flux being reported. The eleventh energy band collects electrons with energies greater than 2 MeV with electron integral flux being reported. In addition, differential proton fluxes are reported at eleven energy bands in the same five angular zones. The eleven proton energy bands are evenly spaced logarithmically and range from 80 keV to 12 MeV. Collectively, the five angular zones, each with a 30 degree field-of-view, span a total angular range of 170 degrees in the Y-Z arranged north to south with the central zone having an anti-earthward look-angle and are parallel to the minus Z-axis (in spacecraft body-reference-frame coordinates). With respect to the earth, the zones are arranged from north to south with the central zone pointing anti-earthward. In addition, the product contains ionizing radiation doses in two energy ranges, 50 keV to 1 MeV and 1 MeV to 10 MeV, obtained from a pair of Low and High Linear Energy Transfer dosimeters, respectively. The product also contains processing and data quality metadata, satellite state and location information, and data required for the generation of level 2 products.

pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > ELECTRIC FIELDS/ELECTRIC CURRENTS
keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > ELECTRON FLUX
keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > PROTON FLUX
keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE PROPERTIES > ENERGY DEPOSITION
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-01
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DiffElectronFluxes
attributeType:
descriptor: differential electron flux at specific energy bands for each telescope's ten primary data channels
units:

DerivedUnit:
identifier: cm-2 sr-1 s-1 keV-1
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: kiloelectron
derivationUnitTerm: volt
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: IntgElectronFluxes
attributeType:
descriptor: integral electron flux at energy band > 2000 keV for each telescope's primary data channel E11
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: second
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DiffProtonFluxes
attributeType:
descriptor: differential proton flux at specific energy bands for each telescope's eleven primary data channels
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1 keV-1
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: kiloelectron
derivationUnitTerm: volt

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:

value:**lineage:** (LI_Lineage)**processStep:** (LE_ProcessStep)

description: The SEISS MPS-HI L1b Calibration Algorithm (SMHCA) produces the MPS-HI electron and proton fluxes. The MPS-HI raw count rates are first corrected for the dead-time effect using a simple formula. The proton count rates are assumed to be free from out-of-band contamination, based on pre-flight ground calibration activities. For the electron out-of-band contamination correction, the SMHCA will use data from the SEISS SGPS-X sensor unit (in particular, from Telescope 3) to correct the highest energy channels. Finally, the dead-time corrected, and contamination-free count rates for both protons and electrons are normalized by geometrical factors to obtain differential fluxes for the differential channels, and integral fluxes for the integral channels.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor**processor:** (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor**output:** (LE_Source)

description: The GOES-R Medium and High Energy Magnetospheric Electrons and Protons L1b Space and Solar End-Product consists of fluxes of medium and high energy electrons and protons derived from in situ measurements of electron and proton count rates. These measurements are retrieved from the Magnetospheric Particle Sensor High (MPS-HI) sensor which is one of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS). The MPS-HI electron fluxes are reported for eleven energy bands and five angular zones. Ten of the energy bands are evenly spaced logarithmically and range from 50 keV to 4 MeV. Differential fluxes are reported for these bands. The eleventh energy channel collects electrons with energies greater than 2 MeV. Integral flux is reported for this channel. The MPS-HI proton fluxes are also reported for eleven energy bands and five angular zones. However, all eleven of the proton energy bands are evenly spaced logarithmically and range from 80 keV to 12 MeV (i.e. there is no integral channel for the protons). Differential fluxes are reported for all eleven proton channels.

processedLevel: (MD_Identifier)**authority:** (CI_Citation)**title:** NOAA Processing Levels**date:** (CI_Date)**date:** 2013-11**dateType:** (CI_DateTypeCode) revision**citedResponsibleParty:** (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)**onlineResource:** (CI_OnlineResource)**linkage:** https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels[ng Levels](#)**role:** (CI_RoleCode) publisher**code:** L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position

Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/seiss.html>
date:
code: GOES-16 SEISS MPS_Hi serial number

type: Magnetospheric Particle Sensor – High Energy Range (MPS-Hi)
description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/seiss.html>
date:
code: GOES-17 SEISS MPS_Hi serial number

type: Magnetospheric Particle Sensor – High Energy Range (MPS-Hi)
description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within

Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

4.1.8 Solar and Galactic Protons Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 67e28dc8-4a39-11e4-9e35-164230d1df67

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for SEISS Level 1b Solar and Galactic Protons

Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SEIS-L1b-SGPS-ISO-SERIES_c20142741147300.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R SEISS Level 1b Solar and Galactic Protons Product ISO Series Metadata

alternateTitle: Data short name (DSN): SEIS-L1b-SGPS

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The GOES-R Solar and Galactic Protons L1b Space and Solar End-Product consists of fluxes of very high energy protons derived from in situ measurements of proton count rates. These measurements are retrieved from the two Solar and Galactic Proton Sensor (SGPS) sensor units, which are two of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS). SGPS data is measured by two sensor units: SGPS-X and SGPS+X. One sensor unit faces east, while the other faces west. Their respective positions reverse upon execution, by the spacecraft, of the yaw flip maneuver. There are three telescopes on each of the sensor units. The three telescopes all have the same central look direction. Proton fluxes are produced for every primary energy band of each of the three telescopes for each sensor unit. Each telescope has a unique number of energy bands spanning a unique energy range. For each sensor unit, there are a total of 13 primary, differential energy bands spanning 1 to 500 MeV, and one primary, integral channel for > 500 MeV particles. Differential proton fluxes are produced from the 13 primary, differential channels. An integral proton flux is produced from the one primary, integral channel.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > ELECTRIC FIELDS/ELECTRIC CURRENTS

keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > ALPHA PARTICLE FLUX

keyword: SUN-EARTH INTERACTIONS > SOLAR ENERGETIC PARTICLE FLUX > PROTON FLUX

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-01
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: T1_DifferentialProtonFluxes
attributeType:
descriptor: differential proton flux at specific energy bands for telescope 1's primary proton data channels on each of the two sensor units
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1 keV-1
derivationUnitTerm: centimeter
derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: kiloelectron
derivationUnitTerm: volt
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: T2_DifferentialProtonFluxes
attributeType:
descriptor: differential proton flux at specific energy bands for telescope 2's primary proton data channels on each of the two sensor units
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1 keV-1
derivationUnitTerm: centimeter

derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: kiloelectron
derivationUnitTerm: volt
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: T3_DifferentialProtonFluxes
attributeType:
descriptor: differential proton flux at specific energy bands for telescope 3's primary proton data channels on each of the two sensor units
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1 keV-1
derivationUnitTerm: centimeter
derivationUnitTerm: steradian
derivationUnitTerm: second
derivationUnitTerm: kiloelectron
derivationUnitTerm: volt
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: T3P11_IntegralProtonFlux
attributeType:
descriptor: integral proton flux at energy band > 500 MeV for telescope 3's primary integral data channel P11 on each of the two sensor units
units:
DerivedUnit:
identifier: cm-2 sr-1 s-1
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: second

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)

description: The SEISS SGPS L1b Calibration Algorithm (SSCA) CSU produces proton fluxes for protons possessing the high energies indicative of their solar or galactic origins. SGPS data is measured by two sensor units: SGPS-X and SGPS+X. One sensor unit faces east, while the other faces west. Their respective positions reverse upon execution, by the spacecraft, of the yaw flip maneuver. The SEISS SGPS L1b Calibration Algorithm (SSCA) produces the SGPS proton fluxes. Events (charged particles hitting a set of detectors) are not counted during those times when the instrument's processor is occupied with other tasks. This time interval, when events are not being counted, is known as "dead" time. The overall effect of having a dead time limitation is that the measured count rate is lower than the true count rate. Another instrumental limitation is that the measured count rate can be contaminated by charged particles of the wrong species, and/or having an energy outside of the desired energy range, and/or arriving at the detector from outside of the desired FOV. Collectively, this is known as "out-of-band" contamination. The SSCA will correct for these instrumental limitations.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

description: The GOES-R Solar and Galactic Protons L1b Space and Solar End-Product consists of fluxes of very high energy protons derived from in situ measurements of proton count rates. These measurements are retrieved from the two Solar and Galactic Proton Sensor (SGPS) sensor units, which are two of the 5 scientific sensor units comprising the GOES-R Space Environment In Situ Suite (SEISS). SGPS data is measured by two sensor units: SGPS-X and SGPS+X. One sensor unit faces east, while the other faces west. Their respective positions reverse upon execution, by the spacecraft, of the yaw flip maneuver. There are three telescopes on each of the sensor units. The three telescopes all have the same central look direction. Proton fluxes are produced for every primary energy band of each of the three telescopes for each sensor unit. Each telescope has a unique number of energy bands spanning a unique energy range. For each sensor unit, there are a total of 13 primary, differential energy bands spanning 1 to 500 MeV, and one primary, integral channel for > 500 MeV particles. Differential proton fluxes are produced from the 13 primary, differential channels. An integral proton flux is produced from the one primary, integral channel.

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration
 (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN)

broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code: GOES-16 SEISS SGPS serial numbers

type: Solar and Galactic Proton Sensor - SGPS

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code: GOES-17 SEISS SGPS serial numbers

type: Solar and Galactic Proton Sensor - SGPS

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a

complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

4.1.9 Geomagnetic Field Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f5816f50-fd6d-11e3-a3ac-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for Magnetometer Level 1b Geomagnetic Field

Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_MAG-L1b-GEOF-ISO-SERIES_c20142741136440.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Magnetometer Level 1b Geomagnetic Field Product ISO Series Metadata

alternateTitle: Data short name (DSN): MAG-L1b-GEOF

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and

Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Geomagnetic Field product consists of the estimated ambient magnetic field in four coordinate reference frames, Earth Polar Normal, J2000 Earth-Centered Inertial, and the spacecraft's Body Reference Frame and Attitude Control Reference Frame. The product also includes the compensated (calibrated and misalignment corrected) magnetic field in the native reference frame for both the inboard and outboard magnetometers. Furthermore, the product includes inboard and outboard magnetometer status flags, processing and data quality metadata, satellite state and location information, and data required for the generation of level 2 products.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > MAGNETIC FIELDS/MAGNETIC CURRENTS

keyword: SUN-EARTH INTERACTIONS > IONOSPHERE/MAGNETOSPHERE DYNAMICS > MAGNETIC STORMS

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-01
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: IB_Data
attributeType:
descriptor: Compensated InBoard magnetometer data (x, y, z)
units:
DerivedUnit:
identifier: nT
derivationUnitTerm: tesla
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: OB_Data
attributeType:
descriptor: Compensated OutBoard magnetometer data (x, y, z)
units:
DerivedUnit:
identifier: nT
derivationUnitTerm:
derivationUnitTerm:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The ground processing algorithm (GPA) for the magnetometer is required to convert the instrument raw data in scaled nanotesla (nT) to the three orthogonal components of the geomagnetic field in units of nT. The MAG L1b Algorithm applies calibration parameters to magnetometer data, performs the gradiometer calculations, and outputs the measured ambient magnetic field.

processor: (CI_ResponsibleParty)

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)

role: (CI_RoleCode) processor

processor: (CI_ResponsibleParty)

organisationName: RBU (Remote Backup Unit, Fairmont, WV)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: [https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA Processing Levels](https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels)

role: (CI_RoleCode) publisher

code: L1b

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect

public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/mag.html>

date:

code: GOES-16 MAG serial number

type: Magnetometer

description: The GOES-R Magnetometer provides measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in

research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products will be an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/mag.html>

date:

code: GOES-17 MAG serial number

type: Magnetometer

description: The GOES-R Magnetometer will provide measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products will be an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

4.2 Level 1b Data

4.2.1 GRB Information ISO Series Metadata

(MI_Metadata)

fileIdentifier: d60ed140-3a8a-11e3-aa6e-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for GRB Information Packets Dataset
Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data,
and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-19

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2

Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_GRB-INFO-ISO-SERIES_c20150281420200.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R GRB Information Dataset

alternateTitle: Data short name (DSN): GRB-INFO-ACQ

alternateTitle: Data short name (DSN): GRB-INFO-GLMP

alternateTitle: Data short name (DSN): GRB-INFO-NPRF

alternateTitle: Data short name (DSN): GRB-INFO-SCH

alternateTitle: Data short name (DSN): GRB-INFO-STAT

alternateTitle: Data short name (DSN): GRB-INFO-SUVP

date: (CI_Date)

date: 2015-02-03

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)
title: gov.nesdis.noaa
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GRB-INFO-*

citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: GRB information (GRB-INFO) provides data related to the operations, health and performance of the GOES-R series flight and ground system, and includes the following types of information: Satellite acquisition data; Mission schedule; Flight system status, ABI Image Navigation and Registration (INR) performance data, GLM INR performance data, SUVI INR performance data, and Operator message. Each of these types of GRB INFO exists as xml documents in separate CCSDS Space Packets.

pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

resourceFormat: (MD_Format)
name: netCDF
version: 4

descriptiveKeywords: (MD_Keywords)
keyword: GRB INFO
keyword: GRB INFO PACKETS
keyword: GRB Information Packets
keyword: GOES Rebroadcast
type:

thesaurusName:
descriptiveKeywords: (MD_Keywords)
keyword: GOES > Geostationary Operational Environmental Satellites
keyword: GOES-R > Geostationary Operational Environmental Satellite R
type:
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodeau
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode)
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2015-02-03
endPosition: now

contentInfo: (MD_CoverageDescription)
attributeDescription:
RecordType: GRB-INFO-ACQ
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: GRB INFO State, Position, and Velocity Vectors
attributeType:
descriptor: Satellite Acquisition Data contains the latitude and longitude of the satellite sub-point at 30 minute intervals. This data is used by ground terminals to acquire and lock on the GRB RF downlink signal. Nominally, the satellite acquisition data is updated daily, and spans the subsequent seven day period. The frequency of update and time-span associated with the satellite acquisition data may change. Note that the more time that has passed since the generation of the satellite acquisition data, the greater the error in the

satellite's predicted location.

contentInfo: (MD_CoverageDescription)

attributeDescription:

RecordType: GRB-INFO-SCH

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: GRB INFO Schedule and Operations

attributeType:

descriptor: Mission Schedule contains a tailored set of scheduled operations and maintenance tasks that affect the ability of the GOES-R system to produce products, or the quality of the products. These tasks typically involve commanding the spacecraft or an instrument to perform an operation. The scheduled time frame associated with each task is included. This data indirectly provides GRB users with notification that product degradation and delivery interruptions will be occurring in the hours and days ahead due to planned satellite maintenance activities. Nominally, the mission schedule is updated daily, and spans the subsequent seven day period. The frequency of update and time-span associated with the mission schedule may change.

contentInfo: (MD_CoverageDescription)

attributeDescription:

RecordType: GRB-INFO-STAT

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: GRB INFO Health and Status

attributeType:

descriptor: Flight System Status contains a configurable set of parameters, and their values and status that summarize the health and performance of the flight system. Parameters associated with the (1) communications, (2) command and data handling, (3) guidance, navigation, and control, (4) electrical power, (5) propulsion, (6) mechanical, (7) thermal control, or (8) instrument satellite subsystems, or aggregates thereof may be included. Nominally, the flight system status is updated daily. The frequency of update associated with the flight system status may change.

contentInfo: (MD_CoverageDescription)

attributeDescription:

RecordType: GRB-INFO-NPRF

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: GRB INFO ABI INR Performance

attributeType:

descriptor: ABI INR Performance Data contains statistics that summarize the ABI image navigation and registration (INR) performance associated with the GOES-R system. In addition to monitoring INR performance of the ABI and overarching GOES-R system, this data is used by GRB users to assess the mapping accuracy of ABI Level 1b and Level 2+ product data. These statistics are calculated using ABI Level 1b Radiances product images and landmarks. The image to map and within frame statistics derived using landmarks are available for those ABI bands that can see the earth's surface (i.e., ABI bands 1-3, 5-7, 11, and 13-16). The statistics are aggregates, specifically 3-sigma values (i.e., sum of mean value and three times the standard deviation), using measurements taken from individual images over a configurable sliding time window. Nominally, this sliding time window is set to 24 hours with the ABI INR performance data being updated daily. The sliding time window and frequency of update associated with the ABI INR performance data may change. As a result, if the sliding time window is configured to minutes up to several hours, and the ABI INR performance data is updated at a similar frequency, it is possible that at certain times during the day, no statistics are reported for the reflective bands (i.e., ABI bands 1-6) due to their inability to operate effectively at night.

contentInfo: (MD_CoverageDescription)

attributeDescription:

RecordType: GRB-INFO-GLMP

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: GRB INFO GLM INR Performance

attributeType:

descriptor: GLM INR Performance Data contains statistics that summarize the GLM INR performance associated with the GOES-R system. In addition to monitoring INR performance of the GLM and overarching GOES-R system, this data is used by GRB users to assess the mapping accuracy of the GLM Level 2+ Lightning Detection product data. These statistics are calculated using a background image observed by the GLM and downlinked periodically and landmarks. The statistics are aggregates, specifically 3-sigma values (i.e., sum of mean value and three times the standard deviation), using measurements taken from individual images over a configurable sliding time window. Nominally, this sliding time window is set to 24 hours, and the GLM INR performance data is updated daily. The sliding time window and frequency of update associated with the GLM INR performance data may change. As a result, if the sliding time window is configured to minutes up to several hours, and the GLM INR performance data is updated at a similar frequency, it is possible that at certain times during the day, no statistics are reported because of the inability of the GLM to

generate satisfactory background images at night.

contentInfo: (MD_CoverageDescription)

attributeDescription:

RecordType: GRB-INFO-SUVP

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: GRB INFO SUVI INR Performance

attributeType:

descriptor: SUVI INR Performance Data contains statistics that summarize the SUVI INR performance associated with the GOES-R system. In addition to monitoring INR performance of the SUVI and overarching GOES-R system, this data is used by GRB users to assess the mapping accuracy of Level 1b SUVI Solar Imagery: EUV product data. These statistics are calculated using metadata fields in the SUVI Level 1b product that contain the location of the sun's center, which are based on information received from the Guide Telescope, and the SUVI Level 1b one second exposure 195.1 angstrom solar image, which is best for locating the edge of the solar disk. The statistics are aggregates using measurements taken from individual images over a configurable fixed time window. Nominally, this fixed time window is set to 24 hours (TBR) with the SUVI INR performance data being updated daily. The fixed time window and frequency of update associated with the SUVI INR performance data may change.

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode)

maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and

Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code:

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code:

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 8 km continuously day and night over the Americas and adjacent ocean regions. The GLM provides early indication of storm intensification and severe weather events, improved tornado warning lead time, and data for long-term climate variability studies. The GLM provides information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/suvi.html>

date:

code:

type: Solar Ultraviolet Imager - SUVI

description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. By observing the Sun, SUVI will be able to compile full disk solar images around the clock.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System will acquire and disseminate environmental data from a near-equatorial Earth orbit at geostationary altitude. This includes the Earth's

surface and atmosphere, solar activity, and geosynchronous space environment. The major functions of the GOES-R System are to support the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) support terrestrial and oceanographic Data Collection Platforms (DCPs), (2) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (3) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code:

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. ABI will be able to view the Earth with 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. It will provide three times more spectral information, four times the spatial resolution, and more than five times faster temporal coverage than the current system. Forecasters will be able to use the higher resolution images to track the development of storms in their early stages. The GOES-R ABI will be used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). It is designed to observe the western hemisphere in various time intervals at 0.5, 1, and 2 km spatial resolutions in visible, near-infrared (IR), and IR wavelengths, respectively. The ABI has two main scan modes. The continuous full disk mode will provide uninterrupted scans of the full disk every 5 minutes, while the flex mode will concurrently allow full disk imagery every 15 minutes, the continental US every 5 minutes, and a mesoscale region as often as every 30 seconds. It is expected that two mesoscale regions will be scanned, resulting in a 1 minute cadence for those sectors. The ABI will be calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI will be accurate to 1K (1 σ) at 300K.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code:

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient

detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 10 km continuously day and night over the Americas and adjacent ocean regions. The GLM will provide early indication of storm intensification and severe weather events, improved tornado warning lead time of up to 20 minutes or more, and data for long-term climate variability studies. The GLM will provide information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/suvi.html>

date:

code:

type: Solar Ultraviolet Imager - SUVI

description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. By observing the Sun, SUVI will be able to compile full disk solar images around the clock.

4.2.2 Sample Outlier Data ISO Series Metadata

(MI_Metadata)

fileIdentifier: 21798500-3a7a-11e3-aa6e-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Sample Outlier Data File Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2013-10-28

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_SOF-ISO-SERIES_c20142911635590.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Sample Outlier Data File

alternateTitle: Data short name (DSN): ABI-L1b-SOF

date: (CI_Date)

date: 2014-10-18

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: An outlier is an ABI fixed grid pixel in a specific band whose ABI L1b radiance value is outside of the product's measurement range because some of its constituent detector samples have radiance values indicating over-saturation. An ABI Sample Outlier Data file is a netCDF-4 file created for each ABI Radiances product image containing at least one outlier. A separate file created for each band, and in the case of band 2, a separate file is created for each of the five data paths. The band 2 data paths provide a partitioning of the high data volume associated with its 0.000014 radian horizontal spatial resolution to support concurrent processing in the instrument and ground system. An ABI Sample Outlier Data File contains resampled outlier radiance values, their corresponding Data Quality Flag, and the ABI fixed grid location of the resampled outlier. It also contains the source sample data received from the ABI, an ABI image chip (4 x 4 samples) for each resampled outlier pixel, along with a Data Quality Flag and the ABI fixed grid location for each of the 16 samples. This file is used to assess the impact of resampling saturated samples on product quality.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > VISIBLE RADIANCE
keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR COUNTS
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > INFRARED RADIANCE
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > SENSOR COUNTS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: OutlierPixel
attributeType:

descriptor: Resampled pixel radiance value (channels 1 - 6)

units:

DerivedUnit:

identifier: mW m⁻² ster⁻¹ um⁻¹

derivationUnitTerm: watt

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: micron

scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: OutlierPixel

attributeType:

descriptor: ABI L1b Radiances per pixel (channels 7 - 16)

units:

DerivedUnit:

identifier: mW m⁻² sr⁻¹ (cm⁻¹)-1

derivationUnitTerm: watt

derivationUnitTerm: steradian

derivationUnitTerm: meter

scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: OutlierSamples

attributeType:

descriptor: The samples - 4x4 pixels - contributing to OutlierPixel. At least one is an outlier (channels 1 - 6)

units:

DerivedUnit:

identifier: mW m⁻² ster⁻¹ um⁻¹

derivationUnitTerm: watt

derivationUnitTerm: meter

derivationUnitTerm: steradian

derivationUnitTerm: micron

scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: OutlierSamples
attributeType:
descriptor: The samples - 4x4 pixels - contributing to OutlierPixel. At least one is an outlier
(channels 7 - 16)
units:
DerivedUnit:
identifier: mW m-2 sr-1 (cm-1)-1
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: OutlierPixelDQF
attributeType:
descriptor: resampled outlier pixel data quality flag per pixel
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: OutlierSampleDQFs
attributeType:
descriptor: outlier sample radiance value data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)

level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start and end time of the scene in seconds since J2000 epoch (2000-01-01 12:00:00).
result:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: An outlier is an ABI fixed grid pixel in a specific band whose ABI L1b radiance value is outside of the product's measurement range because some of its constituent detector samples have radiance values indicating over-saturation. An ABI Sample Outlier Data file is a netCDF-4 file created for each ABI Radiances product image containing at least one outlier.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at WCDAS (Wallops Command and Data Acquisition Station, Chincoteague, VA)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L1b

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability

improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System will acquire and disseminate environmental data from a near-equatorial Earth orbit at geostationary altitude. This includes the Earth's surface and atmosphere, solar activity, and geosynchronous space environment. The major functions of the GOES-R System are to support the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) support terrestrial and oceanographic Data Collection Platforms (DCPs), (2) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (3) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. ABI will be able to view the Earth with 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. It will provide three times more spectral information, four times the spatial resolution, and more than five times faster temporal coverage than the current system. Forecasters will be able to use

the higher resolution images to track the development of storms in their early stages. The GOES-R ABI will be used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). It is designed to observe the western hemisphere in various time intervals at 0.5, 1, and 2 km spatial resolutions in visible, near-infrared (IR), and IR wavelengths, respectively. The ABI has two main scan modes. The continuous full disk mode will provide uninterrupted scans of the full disk every 5 minutes, while the flex mode will concurrently allow full disk imagery every 15 minutes, the continental US every 5 minutes, and a mesoscale region as often as every 30 seconds. It is expected that two mesoscale regions will be scanned, resulting in a 1 minute cadence for those sectors. The ABI will be calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI will be accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System will acquire and disseminate environmental data from a near-equatorial Earth orbit at geostationary altitude. This includes the Earth's surface and atmosphere, solar activity, and geosynchronous space environment. The major functions of the GOES-R System are to support the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) support terrestrial and oceanographic Data Collection Platforms (DCPs), (2) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (3) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. ABI will be able to view the Earth with 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. It will provide three times more spectral information, four times the spatial resolution, and more than five times faster temporal coverage than the current system. Forecasters will be able to use the higher resolution images to track the development of storms in their early stages. The GOES-R ABI will be used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). It is designed to observe the western hemisphere in various time intervals at 0.5, 1, and 2 km spatial resolutions in visible, near-infrared (IR), and IR wavelengths, respectively. The ABI has two main scan modes. The continuous full disk mode will provide uninterrupted scans of the full disk every 5 minutes, while the flex mode will concurrently allow full disk imagery every 15 minutes, the continental US every 5 minutes, and a

mesoscale region as often as every 30 seconds. It is expected that two mesoscale regions will be scanned, resulting in a 1 minute cadence for those sectors. The ABI will be calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI will be accurate to 1K (1 σ) at 300K.

4.2.3 Instrument Calibration Data

(MI_Metadata)

fileIdentifier: fbd4e2a0-3749-11e3-aa6e-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for GOES-R Instrument Calibration Data Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-18

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_CAL-ISO-SERIES_c20142911617240.xml

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GOES-R Instrument Calibration Data

alternateTitle: Data short name (DSN): SAT-INST-CAL-EPH

alternateTitle: Data short name (DSN): ABI-INST-CAL-ENG

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C01

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C02-1

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C02-2

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C02-3

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C02-4

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C02-5

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C03

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C04

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C05

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C06

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C07

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C08

alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C09
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C10
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C11
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C12
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C13
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C14
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C15
alternateTitle: Data short name (DSN): ABI-INST-CAL-M2C16
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alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C02-1
alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C02-2
alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C02-3
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alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C06
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alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C12
alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C13
alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C14
alternateTitle: Data short name (DSN): ABI-INST-CAL-LUN-M3C15
alternateTitle: Data short name (DSN): EXIS-INST-CAL-ENG
alternateTitle: Data short name (DSN): GLM-INST-CAL-ENG
alternateTitle: Data short name (DSN): GLM-INST-CAL-BACK
alternateTitle: Data short name (DSN): SEIS-INST-CAL-ENG
alternateTitle: Data short name (DSN): SUVI-INST-CAL-ENG
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-93
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-131
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-171
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-195
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-284
alternateTitle: Data short name (DSN): SUVI-INST-CAL-IMG-303
alternateTitle: Data short name (DSN): SUVI-INST-CAL-DARK
alternateTitle: Data short name (DSN): MAG-INST-CAL-ENG
alternateTitle: Data short name (DSN): MAG-INST-CAL-MAN

date: (CI_Date)

date: 2014-10-18

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 3: Level 1b Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator

abstract: The Instrument Calibration Data product contains the data needed to evaluate, monitor, and trend sensor performance. ABI instrument calibration data contains engineering data (hourly generation), calibration data by timeline ID, and lunar data for each channel 1 - 16. This includes component temperatures, noise (NEDR - Noise Equivalent Delta Radiance, NEDT - Noise Equivalent Delta Temperature), calibration coefficients, blackbody counts, space view counts, Radiometric Platinum Resistance Thermometer (PRT) counts, Lunar scan, star catalog scan data, solar calibration target counts, and time and ephemeris data. Information for other instruments to be added.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: SPECTRAL/ENGINEERING > VISIBLE WAVELENGTHS > SENSOR COUNTS

keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > SENSOR COUNTS

keyword: SPECTRAL/ENGINEERING > PLATFORM CHARACTERISTICS > ORBITAL CHARACTERISTICS

keyword: SPECTRAL/ENGINEERING > PLATFORM CHARACTERISTICS > ATTITUDE CHARACTERISTICS

keyword: SPECTRAL/ENGINEERING > SENSOR CHARACTERISTICS

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2013

dateType: (CI_DateTypeCode) revision

edition: Version 8.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodeau

role: (CI_RoleCode) author
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) geoscientificInformation
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ehis_relative_hcr_priority_counts
attributeType:
descriptor: difference between Priority 3 (Hydrogen) and Priority 1 (Heavy Ions) measured hardware coincident count rate for non-prime and prime condition. value should always be positive
units:
DerivedUnit:
identifier: count (3 s)-1
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ehis_hcr_priority_count_rate
attributeType:
descriptor: measured hardware coincident count rate for the three EHIS priority categories in non-prime and prime conditions
units:
DerivedUnit:
identifier: count (3 s)-1
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ehis_relative_pec_counts
attributeType:

descriptor: percent of pulse height analysis event counts that are valid for the three EHS priority categories

units:

DerivedUnit:

identifier: percent

derivationUnitTerm: percent

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: ehis_dead_time_corrections

attributeType:

descriptor: energetic heavy ions count rate multiplicative dead-time correction factor for EHS

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: ehis_rear-entry_contamination_corrections

attributeType:

descriptor: rear-entry multiplicative contamination correction factor for each of the three EHS priority categories

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: mps-hi_electron_singles_channel_count_rate

attributeType:

descriptor: measured electron singles channel count rate for each MPS-HI electron telescopes' logical detectors

units:

DerivedUnit:

identifier: count s-1

derivationUnitTerm: count

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: mps-hi_proton_singles_channel_count_rate

attributeType:

descriptor: measured proton singles channel count rate for each MPS-HI proton telescopes' logical detectors

units:

DerivedUnit:
identifier: count s-1
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-hi_electron_dead_time_corrections
attributeType:
descriptor: electron count rate dead-time correction factor in divisor form for each MPS-HI
electron telescope
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-hi_proton_dead_time_corrections
attributeType:
descriptor: proton count rate dead-time correction factor in divisor form for each MPS-HI
proton telescope
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-lo_electron_background_channel_count_rate
attributeType:
descriptor: average electron background channel count rate for each MPS-LO sensor head
units:
DerivedUnit:
identifier: count s-1
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-lo_ion_background_channel_count_rate
attributeType:
descriptor: average ion background channel count rate for each MPS-LO sensor head
units:
DerivedUnit:
identifier: count s-1
derivationUnitTerm: count
scaleFactor:
offset:

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-lo_electron_dead_time_corrections
attributeType:
descriptor: electron count rate dead-time correction factor in divisor form for each MPS-LO angular zone's energy bands
units:
scaleFactor:
offset:

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: mps-lo_ion_dead_time_corrections
attributeType:
descriptor: ion count rate dead-time correction factor in divisor form for each MPS-LO angular zone's energy bands
units:
scaleFactor:
offset:

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sgps-x_singles_channel_count_rate
attributeType:
descriptor: measured singles channel count rate for each SGPS-X telescope's detectors
units:
DerivedUnit:
identifier: count s-1
derivationUnitTerm: count
scaleFactor:
offset:

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sgps+x_singles_channel_count_rate
attributeType:
descriptor: measured singles channel count rate for each SGPS+X telescope's detectors
units:
DerivedUnit:
identifier: count s-1
derivationUnitTerm: count
scaleFactor:
offset:

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sgps-x_proton_dead_time_corrections
attributeType:

descriptor: proton count rate dead-time correction factor in divisor form for each SGPS-X telescope

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: sgps+x_proton_dead_time_corrections

attributeType:

descriptor: proton count rate dead-time correction factor in divisor form for each SGPS+X telescope

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: SEISS Instrument Calibration Data

definition: (EHIS) The EHIS data consists of the HCR priority count rate, which is the measured hardware coincident count rate for the three EHIS priority categories in both non-prime and prime conditions (i.e., Non-Prime_P1, Non-Prime_P2, Non-Prime_P3, Prime_P1, Prime_P2, and Prime_P3). The relative PEC counts are the percent of pulse height analysis event counts that are valid for the three EHIS priority categories, P1-Heavy_Ions, P2-Helium, and P3-Hydrogen. The dead-time corrections data represent the energetic heavy ions count rate multiplicative dead-time correction factor for EHIS. Finally, the rear-entry contamination corrections represent the rear-entry multiplicative contamination correction factor for each of the three EHIS priority categories. (SGPS) The SGPS data consists of the SGPS-X singles channel count rate, the SGPS+X singles channel count rate, the SGPS-X proton dead time corrections, and the SGPS+X proton dead time corrections. The data structures representing SGPS-X and SGPS+X singles channel count rates are both dependent upon the three SGPS telescopes, the three SGPS detectors, and the number of time samples. Both the SGPS-X dead time correction data and the SGPS+X dead time correction data are dependent on the number of SGPS telescopes, as well as the number of time samples. (MPS-Hi) The MPS-Hi data consists of the electron singles channel count, the proton singles channel count, the electron dead-time correction and the proton dead-time correction. The electron and proton singles channel counts are a function of the five MPS-HI telescopes, the four MPS-HI electron detectors, and the number of time samples. The MPS-HI electron and proton dead-time corrections are both a function of the number of MPS-HI telescopes and time samples. (MPS-Lo) The MPS-LO data consists of: the average electron background channel count rate for each of the two (R and L) sensor heads; the average ion background channel count rate for each of the two sensor heads; the electron count rate dead-time correction factor (in divisor form) for each MPS-LO angular zone; and the ion count rate dead-time correction factor (in divisor form) for each MPS-LO angular zone. The electron and ion background channel count rates are array structures sized according to the two MPS-LO sensor heads, and the time samples. The dead-time correction data are sized according to the sixteen MPS-LO angular zones, fifteen MPS-LO energy steps, and the time samples.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: SU_Telemetry
 attributeType:
descriptor: EXIS instrument telemetry item value
units:
scaleFactor:
offset:
rangeElementDescription: (MI_RangeElementDescription)
 name: EXIS Instrument Calibration Engineering
 definition: EXIS telemetry data
 rangeElement:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: mag_dqf
 attributeType:
descriptor: magnetometer data quality flags
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: ib_mag_status
 attributeType:
descriptor: inbound magnetometer status flags
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: ob_mag_status
 attributeType:
descriptor: outbound magnetometer status flags
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: ib_mag_x_coord, ib_mag_y_coord, ib_mag_z_coord

attributeType:
descriptor: inboard magnetometer raw x, y and z measurements
units:
DerivedUnit:
identifier: count
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ob_mag_x_coord, ob_mag_y_coord, ob_mag_z_coord
attributeType:
descriptor: outboard magnetometer raw x, y and z measurements
units:
DerivedUnit:
identifier: count
derivationUnitTerm: count
scaleFactor:
offset:
rangeElementDescription: (MI_RangeElementDescription)
name: MAG Instrument Calibration Data
definition: The Magnetometer calibration data represents the level 0 instrument inboard and outboard measurement data, and corresponding status information, for a time period of one second collected during a calibration maneuver. This information consists of magnetometer data quality flags, inboard and outboard status flags, and inboard and outboard raw sensor measurements in x,y,z coordinates. The time of the Magnetometer observation is provided, expressed in seconds since the J2000 epoch starting from 1 January 2000 at 12:00:00. Each instance of the Magnetometer data quality flag indicates whether the 10 samples of the raw x,y,x inboard and outboard data are of good quality or is a missing value. The data quality flag is a vector that consists of 10 elements, in which each element has a unique flag value. In addition, the MAG Instrument Calibration Data file includes an inboard magnetometer status flag and an outboard magnetometer status flag, in which each such status flag is a 10 element vector.
rangeElement:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: SU_Telemetry
attributeType:
descriptor: MAG instrument telemetry item value
units:
scaleFactor:
offset:
rangeElementDescription: (MI_RangeElementDescription)

name: MAG Instrument Calibration Engineering
definition: MAG telemetry data
rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: filterwheel1_position

attributeType:

descriptor: forward filter wheel setting

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: filterwheel2_position

attributeType:

descriptor: aft filter wheel setting

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: readout_side

attributeType:

descriptor: flags indicating the CCD readout configuration

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: image

attributeType:

descriptor: SUVI miscellaneous calibration frame data (in digital numbers)

units:

DerivedUnit:

identifier: count

derivationUnitTerm: count

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF

attributeType:

descriptor: SUVI miscellaneous calibration frame data quality flags

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: SUVI Instrument Frame Calibration Data

definition: The SUVI miscellaneous calibration frame product is intended to represent data obtained during the calibration activities concerning CCD flat fields, light transfer measurements, visible light images, EXIS cross calibration, and focus checks. CCD flat fields are obtained bi-annually. Light transfer measurements are obtained quarterly and during eclipses. Visible light images are obtained at least daily, as are EXIS cross calibration measurements. Finally, the focus check is performed annually, at a minimum. These on-orbit calibration operations can be accomplished during normal operations using designated calibration slots in the four minute SUVI imaging sequence. The start time of the calibration frame product is expressed in seconds since 1 January 2000 at 12:00 UTC. The SUVI miscellaneous calibration frame product provides information concerning the wavelength of the image frame, expressed in units of Angstroms. Information is also included that describes the active position of each of the two filter wheels. The readout configuration of the CCD is provided. Finally, a raw data downlink CCSDS APID variable is included indicating that the SUVI miscellaneous calibration frame has been received. The calibration data file consists of an image array and an array of data quality flags (DQF). The image and DQF arrays are sized such that the extent is 1292 rows by 1330 columns. The data in the image array is expressed in terms of units of digital numbers (i.e., counts) and is of type short, with a valid range of 0 to 16383. The data quality flag is represented by an array in which each element is a byte data type.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: image

attributeType:

descriptor: SUVI dark frame calibration data (in digital numbers)

units:

DerivedUnit:

identifier: count

derivationUnitTerm: count

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF

attributeType:

descriptor: SUVI dark frame calibration data quality flags

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: SUVI Instrument Dark Frame Calibration Data

definition: The SUVI dark frame calibration product is intended to measure the inherent bias and noise in the camera electronics, and to map permanently bad (i.e. hot) pixels. Such frames are taken as a standard exposure with the camera shutter closed. Ideally, a median dark frame is created for each exposure every four hours. The start time of the calibration frame product is expressed in seconds since 1 January 2000 at 12:00 UTC. The SUVI miscellaneous calibration frame product provides information concerning the readout configuration of the CCD. A raw data downlink CCSDS APID variable is included which indicates that the SUVI miscellaneous calibration frame has been received. The dark frame calibration data file consists of an image array and an array of data quality flags (DQF). The image and DQF arrays are sized such that the extent is 1292 rows by 1330 columns. The data in the image array is expressed in terms of units of digital numbers (i.e., counts). It is of type short, with a valid range of 0 to 16383. The data quality flag is represented by an array in which each element is a byte data type.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: SU_Telemetry

attributeType:

descriptor: SUVI instrument telemetry item value

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: SUVI Instrument Calibration Engineering

definition: SUVI telemetry data

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: ict

attributeType:

descriptor: internal calibration target data digital numbers for emissive bands

units:

DerivedUnit:
identifier: count
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ict_nedn
attributeType:
descriptor: internal calibration target calculated noise equivalent change in radiance (NEdN)
for detectors of emissive bands over single calibration sampling period
units:
DerivedUnit:
identifier: mW m-2 sr-1 (cm-1)-1
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: ict_nedt
attributeType:
descriptor: internal calibration target calculated noise equivalent differential temperature
(NEdT) for detectors of emissive bands over single calibration sampling period
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sct
attributeType:
descriptor: solar calibration target data digital numbers for reflective bands
units:
DerivedUnit:
identifier: count
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sct_nedn

attributeType:
descriptor: solar calibration target calculated noise equivalent change in radiance (NEdN) for detectors of reflective bands over single calibration sampling period
units:
DerivedUnit:
identifier: W m⁻² sr⁻¹ um⁻¹
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: sct_signal_to_noise
attributeType:
descriptor: solar calibration target calculated signal to noise ratio for detectors of reflective bands over single calibration sampling period calibration sampling period
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: spacelook
attributeType:
descriptor: space look calibration data digital numbers for reflective and emissive bands calibration sampling period
units:
DerivedUnit:
identifier: count
derivationUnitTerm: count
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: spacelook_nedn
attributeType:
descriptor: space look calibration calculated noise equivalent change in radiance (NEdN) for detectors of reflective and emissive bands over single calibration sampling period
units:
DerivedUnit:
identifier: W m⁻² sr⁻¹ um⁻¹ for reflective bands, mW m⁻² sr⁻¹ (cm⁻¹)⁻¹ for emissive bands
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:

MemberName:
aName: spacelook_nedt
attributeType:
descriptor: space look calibration calculated noise equivalent differential temperature (NEdT) for detectors of emissive bands over single calibration sampling period over single calibration sampling period
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: starlook
attributeType:
descriptor: calibrated star look radiance for detectors over single calibration sampling period for applicable bands calibration sampling period over single calibration sampling period
units:
DerivedUnit:
identifier: W m⁻² sr⁻¹ um⁻¹
derivationUnitTerm: watt
derivationUnitTerm: meter
derivationUnitTerm: steradian
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: starlook_dqf
attributeType:
descriptor: calibrated detector star look radiance data quality flags for applicable bands period over single calibration sampling period
units:
scaleFactor:
offset:
rangeElementDescription: (MI_RangeElementDescription)
name: ABI Instrument Calibration Data
definition: The ABI instrument calibration product files contain data representative of the ABI Internal Calibration Target (ICT), Solar Calibration Target (SCT) and Space Look Target. There are two types of Space Look target. There is the Space Look associated with the beginning of a Mode 3 and a Mode 4 timeline. Data from these observations are used in conjunction with the ICT observations to compute the gain coefficient of each detector of an ABI emissive band. There is also an SCT Space Look, which is essentially just a longer duration Space Look obtained at the time of the SCT observation to facilitate the computation of reflective band gain coefficients. The product data contain information on the ICT, SCT and Space Look, both in terms of the discrete measurement values, as well as in terms of the statistical metrics derived from them. The ICT statistical data are min, max, mean and standard deviation of the ICT detector samples for each detector of the ABI

emissive channel of interest. Similarly, the SCT data contain min, max, mean and standard deviation of the SCT detector data for each detector of the ABI reflective channel of interest. ICT data are collected at the very beginning of the ABI Mode 3 timeline and the ABI Mode 4 timeline. This is followed by a Space Look observation. Such pairs of observations, taking into account the ABI scan mirror radiometric properties obtained at these times, leads to the computation of detector gain coefficient values. The remaining Space Look observations during a Mode 3 or Mode 4 sequence always precede a swath scan of the Earth. The ABI cal data products include the raw ICT counts, and the associated statistical metrics (min, max, mean, standard deviation). In addition, metrics quantifying detector sensitivity are included in the form of ICT NEdN values, and ICT NEdT values for each detector. SCT data are collected during the ABI diagnostic mode. Such observations occur daily or weekly in the very beginning of the GOES-R mission, gradually tapering off in frequency to several times per year as the end of mission life of GOES-R approaches. Each SCT observation is accompanied by an SCT Space Look, an extended duration version of the Space Look observation obtained during normal mode operations. The ABI cal data products include the raw SCT counts, and the associated statistical metrics (min, max, mean, standard deviation). In addition, metrics quantifying detector sensitivity are included in the form of SCT SNR values, and SCT NEdN values for each detector. Space Look data are provided for the ABI channel of interest. In normal mode operation, a Space Look observation takes place at the beginning of an ABI Mode 3 and Mode 4 observation in conjunction with the ICT observation. Subsequent Space Look observations are collected at the beginning of each Full Disk scan of the Earth. Along with the raw Space Look data, the ABI calibration files contain associated statistical metrics in the form of min, max, mean and standard deviation per detector for the ABI channel of interest. In addition, metrics quantifying detector sensitivity are provided in the form of Space Look NEdN and Space Look NEdT, where the latter metric is associated with emissive bands, only. Star look data are collected for ABI reflective channels during Mode 3 and Mode 4 operations. Nominally, six star scene observations are obtained during each such mode. There are a total of seven ABI star scene ID types. Star scene ID values of 4 through 9 represent one star scene for each reflective channel. Star scene ID 10 is reserved for a star scene observation associated with an emissive channel. The star look data is represented in the calibration product file in terms of calibrated radiances, data quality flags, and computed gain coefficients.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: radiance

attributeType:

descriptor: lunar scan calibrated sample radiance values

units:

DerivedUnit:

identifier: W m⁻² sr⁻¹ um⁻¹ for reflective bands, mW m⁻² sr⁻¹ (cm⁻¹)-1 for emissive

bands

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: radiance_dqf

attributeType:

descriptor: lunar scan calibrated sample radiance value data quality flags

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: ABI Instrument Calibration Lunar Scan

definition: Lunar scan data is an off-earth mesoscale scene, and collected as part of an ABI mode 3 timeline when the Moon is in the field of regard of the ABI instrument. The apparent size of the Moon in the field of regard of the ABI subtends a size suitable for coverage using the ABI mesoscale scene type consisting of two swaths. This data is collected for all ABI bands. Lunar scan data samples are radiometrically calibrated. The Moon's surface is scanned for calibration purposes only. Separate files are created for each band and each occurrence of an ABI Mode 3 timeline, which corresponds to fifteen minutes. In the case of band 2, five different files are created, one for each of the data paths. The band 2 data paths provide a partitioning of the high data volume associated with its 0.000014 radian horizontal spatial resolution to support concurrent processing in the instrument and ground system.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: SU_Telemetry

attributeType:

descriptor: ABI instrument telemetry item value

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: ABI Instrument Calibration Engineering

definition: ABI telemetry data

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: image

attributeType:

descriptor: GLM native background image (in digital numbers)

units:

DerivedUnit:

identifier: count

derivationUnitTerm: count

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: image_dqf

attributeType:

descriptor: GLM native background image data quality flags

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: GLM Instrument Calibration

definition: The GLM generates a background image periodically, interleaved with the detection of events in support of detecting false events, and instrument calibration. A background image is a scene composed of the background from all detector elements in the focal plane.

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: SU_Telemetry

attributeType:

descriptor: GLM instrument telemetry item value

units:

scaleFactor:

offset:

rangeElementDescription: (MI_RangeElementDescription)

name: GLM Instrument Calibration Engineering

definition: GLM telemetry data

rangeElement:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: attitudeTimes

attributeType:
descriptor: time of the attitude observation (Q0, Q1, Q2, and Q3) in seconds since J2000 epoch (2000-01-01 12:00:00)
units:
DerivedUnit:
identifier: seconds since 2000-01-01 12:00:00
derivationUnitTerm: second
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: orbitTimes
attributeType:
descriptor: time of the orbit observation (x, y, z, theta_x, theta_y, theta_z) in seconds since J2000 epoch (2000-01-01 12:00:00)
units:
DerivedUnit:
identifier: seconds since 2000-01-01 12:00:00
derivationUnitTerm: second
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: x
attributeType:
descriptor: x-position of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km
derivationUnitTerm: meter
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: y
attributeType:
descriptor: y-position of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km
derivationUnitTerm: meter
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:

aName: z
attributeType:
descriptor: z-position of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km
derivationUnitTerm: meter
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: theta-x
attributeType:
descriptor: x-velocity of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km s-1
derivationUnitTerm: meter
derivationUnitTerm: second
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: theta-y
attributeType:
descriptor: y-velocity of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km s-1
derivationUnitTerm: meter
derivationUnitTerm: second
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: theta-z
attributeType:
descriptor: z-velocity of the spacecraft in the J2000 inertial reference frame
units:
DerivedUnit:
identifier: km s-1
derivationUnitTerm: meter
derivationUnitTerm: second
scaleFactor:
offset:
dimension: (MD_Band)

sequenceIdentifier:
MemberName:
aName: Q0
attributeType:
descriptor: $Q0 = \cos(\phi / 2)$. ϕ is the angle between the J2000 reference and body frame of reference
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Q1
attributeType:
descriptor: $Q1 = e1 * \sin(\phi / 2)$. ϕ is the angle between the J2000 reference and body frame of reference. $e1$ is a component of the unit rotation vector u in either frame
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Q2
attributeType:
descriptor: $Q2 = e2 * \sin(\phi / 2)$. ϕ is the angle between the J2000 reference and body frame of reference. $e2$ is a component of the unit rotation vector u in either frame
units:
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Q3
attributeType:
descriptor: $Q3 = e3 * \sin(\phi / 2)$. ϕ is the angle between the J2000 reference and body frame of reference. $e3$ is a component of the unit rotation vector u in either frame
units:
scaleFactor:
offset:
rangeElementDescription: (MI_RangeElementDescription)
name: Satellite Instrument Calibration Ephemeris
definition: Satellite ephemeris data
rangeElement:

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)**operation:** (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)**authority:** (CI_Citation)**title:** <http://science.nasa.gov/missions/goes-r/>**date:****code:****status:** (MD_ProgressCode) onGoing**parentOperation:****platform:** (MI_Platform)**identifier:** (MD_Identifier)**authority:** (CI_Citation)**title:** <http://www.goes-r.gov>**date:****code:** GOES-R-S-T

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)**identifier:** (MD_Identifier)**authority:** (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code:

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/exis.html>

date:

code:

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code:

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 8 km continuously day and night over the Americas and adjacent ocean regions. The GLM provides early indication of storm intensification and severe weather events, improved tornado warning lead time, and data for long-term climate variability studies. The GLM provides information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/mag.html>

date:

code:

type: Magnetometer

description: The GOES-R Magnetometer provides measurements of the space

environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products will be an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code:

type: SEISS Energetic Heavy Ion Sensor (EHIS)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code:

type: Magnetospheric Particle Sensor – High Energy Range (MPS-Hi)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code:

type: Magnetospheric Particle Sensor – Low Energy Range (MPS-Lo)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar

and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/seiss.html>
date:
code:

type: Solar and Galactic Proton Sensor - SGPS

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/suvi.html>
date:
code:

type: Solar Ultraviolet Imager - SUVI

description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. By observing the Sun, SUVI will be able to compile full disk solar images around the clock.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code:

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/exis.html>
date:
code:

type: Extreme Ultraviolet and X-ray Irradiance Sensors (EXIS)

description: The EXIS contains two primary sensors, the Extreme Ultraviolet Sensor (EUVS) and the X-Ray Sensor (XRS), which will help scientists monitor activity on the Sun. EXIS will reside on the Sun Pointing Platform mounted in the yoke of the solar array. The instrument also includes the Sun Positioning Sensor (SPS).

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/glm.html>
date:
code:

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 8 km continuously day and night over the Americas and adjacent ocean regions. The GLM provides early indication of storm intensification and severe weather events, improved tornado warning lead time, and data for long-term climate variability studies. The GLM provides information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/mag.html>
date:

code:**type:** Magnetometer

description: The GOES-R Magnetometer provides measurements of the space environment magnetic field that controls charged particle dynamics in the outer region of the magnetosphere. These particles can be dangerous to spacecraft and human spaceflight. The geomagnetic field measurements are important for providing alerts and warnings to many customers, including satellite operators and power utilities. GOES Magnetometer data are also important in research, being among the most widely used spacecraft data by the national and international research community. The GOES-R Magnetometer products will be an integral part of the National Oceanic and Atmospheric Administration (NOAA) space weather operations, providing information on the general level of geomagnetic activity and permitting detection of sudden magnetic storms. In addition, measurements will be used to validate large-scale space environment models that are used in operations. The MAG requirements are similar to the tri-axial fluxgates that have previously flown. GOES-R requires measurements of three components of the geomagnetic field with a resolution of 0.016 nT and response frequency of 2.5 Hz.

instrument: (MI_Instrument)**identifier:** (MD_Identifier)**authority:** (CI_Citation)**title:** <http://www.goes-r.gov/spacesegment/seiss.html>**date:****code:****type:** SEISS Energetic Heavy Ion Sensor (EHIS)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)**identifier:** (MD_Identifier)**authority:** (CI_Citation)**title:** <http://www.goes-r.gov/spacesegment/seiss.html>**date:****code:****type:** Magnetospheric Particle Sensor – High Energy Range (MPS-Hi)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)**identifier:** (MD_Identifier)**authority:** (CI_Citation)**title:** <http://www.goes-r.gov/spacesegment/seiss.html>**date:****code:**

type: Magnetospheric Particle Sensor – Low Energy Range (MPS-Lo)

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/seiss.html>

date:

code:

type: Solar and Galactic Proton Sensor - SGPS

description: The SEISS instrument suite consists of: the Energetic Heavy Ion Sensor (EHIS), the Magnetospheric Particle Sensors - High and Low (MPS-HI and MPS-LO), and the Solar and Galactic Proton Sensor (SGPS). The instrument suite also includes the Data Processing Unit (DPU). The EHIS is responsible for measuring heavy ion fluxes in the magnetosphere to provide a complete picture of the energetic particles surrounding Earth. This includes particles trapped within Earth's magnetosphere and particles arriving directly from the sun and cosmic rays which have been accelerated by electromagnetic fields in space.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/suvi.html>

date:

code:

type: Solar Ultraviolet Imager - SUVI

description: The GOES-R Solar Ultraviolet Imager is a telescope that monitors the Sun in the extreme ultraviolet wavelength range. By observing the Sun, SUVI will be able to compile full disk solar images around the clock.

4.2.4 Level 1b Semi-Static Source Data ISO Series Metadata

*** *This paragraph will be supplied in PUG version D.* ***

4.2.5 Level 1b Algorithm Packages

*** *This paragraph will be supplied in PUG version D.* ***

5.0 LEVEL 2+ PRODUCT AND DATA ISO SERIES METADATA

5.1 Level 2+ Products

5.1.1 Cloud and Moisture Imagery Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 8c9e8150-3692-11e3-aa6e-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

13 May 2015

parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud and Moisture Imagery
Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and
Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-17
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for
imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-CMIP-ISO-SERIES_c20142900716560.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 10848
resolution:
Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 10848
resolution:
Distance: 1 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 3000
resolution:
Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column

13 May 2015

dimensionSize: 5000
resolution:
 Distance: 1 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1000
 resolution:
 Distance: 1 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 1000
 resolution:
 Distance: 1 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; Channels 1, 3, 5

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 21696
 resolution:
 Distance: 0.5 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 21696
 resolution:
 Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk; ABI Channel 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 6000
resolution:
 Distance: 0.5 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 10000
 resolution:
 Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 2000
 resolution:
 Distance: 0.5 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2000
 resolution:
 Distance: 0.5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; Channel 2

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 5424
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 5424
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk; ABI Channels 4 and 6 - 16

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS; ABI Channels 4 and 6 - 16

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale; Channels 4 and 6 - 16

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R

satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Cloud and Moisture Imagery Product

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C01

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C02

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C03

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C04

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C05

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C06

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C07

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C08

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C09

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C10

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C11

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C12

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C13

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alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C15

alternateTitle: Data short name (DSN): ABI-L2-CMIPM1-M3C16

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alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C04
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C05
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C06
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C07
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C08
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C09
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M3C10
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alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C02
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C03
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C04
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C05
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C06
alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C07
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alternateTitle: Data short name (DSN): ABI-L2-CMIPF-M4C16
alternateTitle: Data short name (DSN): ABI-L2-MCMIPC-M3
alternateTitle: Data short name (DSN): ABI-L2-MCMIPC-M4
alternateTitle: Data short name (DSN): ABI-L2-MCMIPF-M3
alternateTitle: Data short name (DSN): ABI-L2-MCMIPF-M4

date: (CI_Date)

date: 2014-10-17

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud and Moisture Imagery product contains one or more Earth-view images with pixel values identifying “brightness values” that are scaled to support visual analysis. The product includes data quality information that provides an assessment of the cloud and moisture imagery data values for onearth pixels. Cloud and Moisture Imagery product files are generated for each of the sixteen ABI reflective bands (channels 1 - 6 with wavelengths 0.47, 0.64, 0.865, 1.378, 1.61, 2.25 microns respectively) and emissive bands (channels 7 - 16 with wavelengths 3.9, 6.185, 6.95, 7.34, 8.5, 9.61, 10.35, 11.2, 12.3, 13.3 microns respectively). In addition, there is a multi-band product file where the imagery at all bands is included. The imagery value for the reflective bands, ABI bands 1 through 6, is a dimensionless “reflectance factor” quantity that is normalized by the solar zenith angle. These bands support the characterization of clouds, vegetation, snow/ice, and aerosols. The imagery value for the emissive bands, ABI bands 7 through 16, is the brightness temperature at the Top-Of-Atmosphere (TOA) in Kelvin. These bands supports the characterization of the surface, clouds, water vapor, ozone, volcanic ash and dust based on emissive properties.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC RADIATION > REFLECTANCE
keyword: SPECTRAL/ENGINEERING > INFRARED WAVELENGTHS > BRIGHTNESS
TEMPERATURE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: toa_lambertian_equivalent_albedo_multiplied_by_cosine_solar_zenith_angle
keyword: toa_brightness_temperature
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: .5 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 1 km at nadir
spatialResolution: (MD_Resolution)
distance:

Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
 temporalElement: (EX_TemporalExtent)
 extent:
 TimePeriod:
 beginPosition: 2014-10-17
 endPosition: now
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -156.2995
 eastBoundLongitude: 6.2995
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: 141.7005
 eastBoundLongitude: -55.7005
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -153.1198
 eastBoundLongitude: -58.7853
 southBoundLatitude: 14.0097
 northBoundLatitude: 55.6790
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -132.6972
 eastBoundLongitude: -56.0418
 southBoundLatitude: 13.7412
 northBoundLatitude: 55.1071
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)

code: Mesoscale

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: CMI

attributeType:

descriptor: ABI Cloud and Moisture Imagery reflectance factor (channels 1 - 6)

units:

scaleFactor:

offset:

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: CMI

attributeType:

descriptor: ABI Cloud and Moisture Imagery brightness temperature at top of atmosphere
(channels 7 - 16)

units:

DerivedUnit:

identifier: k

derivationUnitTerm: kelvin

scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF

attributeType:

descriptor: ABI Level 2+ Cloud and Moisture Imagery Product data quality flags

units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Solar radiance and irradiance values that vary as a function of the Earth-Sun distance and planck constants used for cloud and moisture imagery correction; Number of geolocated

pixels; Number of good and conditionally usable pixels; Number of cloud and moisture imagery pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the cloud and moisture imagery values in the product image. The cloud and moisture imagery outlier count and minimum, maximum, mean, and standard deviation values are calculated using good and conditionally usable quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Cloud and Moisture product is generated by the GOES-R ABI Cloud and Moisture Imagery ground processing algorithm. Production of the reflective bands depends on the solar radiance at the Earth-Sun distance at the time of observation, and the solar zenith angle. The inverse of the solar radiance is represented by the "kappa0" variable in the product file. The dynamic range of the reflectance factor and brightness temperature output is not constrained by the algorithm but it is compared to the expected measurement range for each band based on the ABI's dynamic range.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode)

output: (LE_Source)

description: Advanced Baseline Imager (ABI) L2 Cloud and Moisture Imagery data are digital maps of clouds, moisture, and atmospheric windows, through which land and water are observed, from radiances for the visible, near-IR, and IR bands with associated per-pixel quality flag array. End-products are unique to an ABI scene (Full Disk, CONUS or Mesoscale) and ABI channel (1 - 16).

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a collection of datasets of a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:
status: (MD_ProgressCode) ongoing
parentOperation:
platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data

Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.2 Clear Sky Mask Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: b015d6f0-b002-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Clear Sky Mask Product

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-14

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-ACM-ISO-SERIES_c20142871645080.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1500

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 2500

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 500

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.
 code: goes_projection
 codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
 title: ABI Level 2+ Clear Sky Mask Product
 alternateTitle: Data short name (DSN): ABI-L2-ACMM1-M3
 alternateTitle: Data short name (DSN): ABI-L2-ACMM2-M3
 alternateTitle: Data short name (DSN): ABI-L2-ACMC-M3
 alternateTitle: Data short name (DSN): ABI-L2-ACMC-M4
 alternateTitle: Data short name (DSN): ABI-L2-ACMF-M3
 alternateTitle: Data short name (DSN): ABI-L2-ACMF-M4
 date: (CI_Date)
 date: 2014-10-14
 dateType: (CI_DateTypeCode) creation
 identifier: (MD_Identifier)
 authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) revision
 code: GOES-R Document Control Number: 7035538
 citedResponsibleParty: (CI_ResponsibleParty)
 organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Clear Sky Mask product contains an image in the form of a binary cloud mask that identifies pixels within a coverage region as clear or cloudy. The production of the clear sky mask is an important step in the processing of many other GOES-R Level 2+ products that use the information generated in the production of the clear sky mask to determine the presence of cloud. The product includes data quality information for the binary cloud mask data values for on-earth pixels. The binary cloud mask value is a dimensionless quantity. The Clear Sky Mask product image is provided at 2 km resolution on the ABI fixed grid for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced for geolocated source data to local zenith angles of 90 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > CLOUD AMOUNT/FREQUENCY

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: cloud_binary_mask

type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-14
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: BCM
attributeType:
descriptor: The Binary Cloud Mask (BCM) defines the detection of a cloud with a value of 1 for the mask otherwise the value of the mask is 0 for clear
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) qualityInformation
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Clear Sky Mask data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of pixels and percentages of the intermediate 4-level cloud mask image having clear, probably clear, cloudy, and probably cloudy classifications; Applicable ABI emissive

band-specific brightness temperature differences minimum, maximum, mean, and standard deviation values between those observed and modeled for all and clear sky conditions. These statistics are calculated using good quality pixels to a local zenith angle of 70 degrees. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Clear Sky Mask product is generated by the GOES-R ABI Cloud Mask ground processing algorithm. The Cloud Mask algorithm is an important component of the GOES-R Level 2+ Algorithm Precedence Network, as the output of the algorithm is used in the generation of the GOES-R Cloud, Aerosol, Sounding, Land, Ocean, Radiation, and Wind products. The Clear Sky Mask product algorithm identifies clear, probably clear, cloudy, and probably cloudy conditions based on spectral, spatial, and temporal tests. The algorithm compares ABI emissive band data with processed clear sky and cloudy sky model data derived from the Community Radiative Transfer Model (CRTM).

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS

Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.3 Cloud Top Phase Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 1f205b40-afd3-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Top Phase Product

Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-14

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-CTP-ISO-SERIES_c20142871707320.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 5424
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 5424
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Cloud Top Phase Product

alternateTitle: Data short name (DSN): ABI-L2-ACTPM1-M3

alternateTitle: Data short name (DSN): ABI-L2-ACTPM2-M3

alternateTitle: Data short name (DSN): ABI-L2-ACTPC-M3

alternateTitle: Data short name (DSN): ABI-L2-ACTPC-M4

alternateTitle: Data short name (DSN): ABI-L2-ACTPF-M3

alternateTitle: Data short name (DSN): ABI-L2-ACTPF-M4

date: (CI_Date)

date: 2014-10-14

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud Top Phase product contains an image with pixel values identifying the presence of cloud in four phase categories. The categories, which are consistent with heritage NOAA and NASA cloud products, include: Warm liquid water: liquid water cloud with an opaque cloud temperature greater than 273 degrees K; Supercooled liquid water: liquid water topped cloud with an opaque cloud temperature less than 273 degrees K; Mixed phase clouds: high probability of containing both liquid water and ice near cloud top; Ice phase clouds: all ice topped clouds. The Cloud Top Phase product image data variable also has categories for clear sky and unknown phases. A pixel is classified as having an unknown phase when the retrieval has failed because of missing or bad input data. The product includes data quality information that provides an assessment of the the cloud top phase data values for on-earth pixels. The cloud top phase value is a dimensionless quantity which is provided at 2 km resolution on the ABI fixed grid for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced for geolocated source data to local zenith angles of 90 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > CLOUD LIQUID WATER/ICE

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: cloud_phase_category

type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-14
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Phase
attributeType:
descriptor: ABI Level 2+ Cloud Top Phase
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Cloud Top Phase data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Percentage of pixels in each of the phase category; Number of cloudy pixels in the image. These statistics are calculated using geolocated pixels. The percentages of pixels assigned to each DQF value are also included in the product.
result:

report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Cloud Top Phase product is generated by the GOES-R ABI Cloud Type ground processing algorithm. The algorithm determines the cloud top phase for pixels identified as cloudy, probably cloudy, and probably clear in the intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Clear sky is determined using clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position

Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)
type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)
type: Advanced Baseline Imager
description: The Advanced Baseline Imager is the primary instrument on GOES-R for

imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.4 Cloud Top Height Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 4571d650-b00c-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Top Height Product
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-14
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-ACHA-ISO-SERIES_c20142871454090.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 1086
resolution:
 Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 300
 resolution:
 Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 250
 resolution:
 Distance: 4 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 250
 resolution:
 Distance: 4 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: GOES-R Product Definition and Users Guide (PUG)

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Cloud Top Height Product

alternateTitle: Data short name (DSN): ABI-L2-ACHAM1-M3

alternateTitle: Data short name (DSN): ABI-L2-ACHAM2-M3

alternateTitle: Data short name (DSN): ABI-L2-ACHAC-M3

alternateTitle: Data short name (DSN): ABI-L2-ACHAC-M4

alternateTitle: Data short name (DSN): ABI-L2-ACHAF-M3

alternateTitle: Data short name (DSN): ABI-L2-ACHAF-M4

date: (CI_Date)

date: 2014-10-14

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud Top Height product contains an image with pixel values identifying the geopotential height at the top of a cloud layer. The product is generated in combination with the Cloud Top Temperature and Cloud Top Pressure products by the same algorithm. The product includes data quality information that provides an assessment of the cloud top height data values for on-earth pixels. The units of measure for the cloud top height value is meters. The Cloud Top

Pressure product image is produced on the ABI fixed grid (at 10 km for Full Disk and CONUS coverage regions and at 4km for Mesoscale) under the following conditions: Cloudy; Geolocated source data to local zenith angles of 70 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > CLOUD HEIGHT

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: geopotential_height_at_cloud_top

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted.

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: 10 km at nadir

spatialResolution: (MD_Resolution)

distance:

Distance: 4 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
 temporalElement: (EX_TemporalExtent)
 extent:
 TimePeriod:
 beginPosition: 2014-10-14
 endPosition: now
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -156.2995
 eastBoundLongitude: 6.2995
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: 141.7005
 eastBoundLongitude: -55.7005
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -153.1198
 eastBoundLongitude: -58.7853
 southBoundLatitude: 14.0097
 northBoundLatitude: 55.6790
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -132.6972
 eastBoundLongitude: -56.0418
 southBoundLatitude: 13.7412
 northBoundLatitude: 55.1071
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)

code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: HT
attributeType:
descriptor: ABI Level 2+ Cloud Top Height
units:
DerivedUnit:
identifier: m
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Cloud Top Height Product data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of cloudy or probably cloud pixels that qualify for the algorithm retrieval; Number of cloud top height pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the cloud top height values in the product image. These statistics are calculated using good quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)

valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Cloud Top Temperature, Cloud Top Pressure, and Cloud Top Height products are generated by the GOES-R ABI Cloud Top Height ground processing algorithm. The Cloud Top Height algorithm is an important component of the GOES-R ground processing precedence chain as the output of the algorithm is used in the generation of other ABI Level 2+ products. The algorithm retrieves a state vector composed of cloud top temperature, channel 14 emissivity, and band 15/14 beta ratio. It is retrieved using an optimal estimation technique. Cloud top pressure and height are then derived from cloud top temperature. The channel 14 emissivity and band 15/14 beta ratio are output as intermediate products. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. Cloudy conditions are determined using cloudy and probably cloudy pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. The Cloud Top Height algorithm operates on 2 km resolution pixels, generating intermediate temperature, pressure, and height products at this resolution, but the delivered Cloud Top Height and Pressure products are aggregated to 4 km or 10 km as needed to satisfy end user product resolution requirements.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN)

broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.5 Cloud Top Pressure Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: aa36b140-b00d-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Top Pressure Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-15

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-CTP-ISO-SERIES_c20142881356170.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1086

resolution:

Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 300
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication
otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.
code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)

title: ABI Level 2+ Cloud Top Pressure Product
alternateTitle: Data short name (DSN): ABI-L2-CTPC-M3
alternateTitle: Data short name (DSN): ABI-L2-CTPC-M4
alternateTitle: Data short name (DSN): ABI-L2-CTPF-M3
alternateTitle: Data short name (DSN): ABI-L2-CTPF-M4
date: (CI_Date)
date: 2014-10-15
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: The Cloud Top Pressure product contains an image with pixel values identifying the atmospheric pressure at the top of a cloud layer. The product is generated in combination with the Cloud Top Height and Cloud Top Temperature products by the same algorithm. The product includes data quality information that provides an assessment of the cloud top height data values for on-earth pixels. The units of measure for the cloud top pressure value is hectopascals. The Cloud Top Pressure product image is produced on the ABI fixed grid (at 10 km for Full Disk and CONUS coverage regions) under the following conditions: Cloudy; Geolocated source data to local zenith angles of 70 degrees for both daytime and nighttime conditions.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF

version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > CLOUDS > CLOUD TOP PRESSURE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: air_pressure_at_cloud_top
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 10 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-15
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: PRES
attributeType:
descriptor: ABI Level 2+ Cloud Top Pressure
units:
DerivedUnit:
identifier: hPa
derivationUnitTerm: pascal
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:

MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Cloud Top Pressure data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of cloudy or probably cloud pixels that qualify for the algorithm retrieval; Number of cloud top pressure pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the cloud top pressure values in the product image. These statistics are calculated using good quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Cloud Top Temperature, Cloud Top Pressure, and Cloud Top Height products are generated by the GOES-R ABI Cloud Top Height ground processing algorithm. The Cloud Top Height algorithm is an important component of the GOES-R ground processing precedence chain as the output of the algorithm is used in the generation of other ABI Level 2+ products. The algorithm retrieves a state vector composed of cloud top temperature, channel 14 emissivity, and band 15/14 beta ratio. It is retrieved using an optimal estimation technique. Cloud top pressure and height are then derived from cloud top temperature. The channel 14 emissivity and band 15/14 beta ratio are output as intermediate products. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. Cloudy conditions are

determined using cloudy and probably cloudy pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. The Cloud Top Height algorithm operates on 2 km resolution pixels, generating intermediate temperature, pressure, and height products at this resolution, but the delivered Cloud Top Height and Pressure products are aggregated to 4 km or 10 km as needed to satisfy end user product resolution requirements.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow

for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)
identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.6 Cloud Top Temperature Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 8c98eff0-afda-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Top Temperature Product

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-14

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-ACHT-ISO-SERIES_c20142871508100.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 500

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 500

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

13 May 2015

checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: GOES-R Product Definition and Users Guide (PUG)
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)
title: ABI Level 2+ Cloud Top Temperature Product
alternateTitle: Data short name (DSN): ABI-L2-ACHTM1-M3
alternateTitle: Data short name (DSN): ABI-L2-ACHTM2-M3
alternateTitle: Data short name (DSN): ABI-L2-ACHTF-M3
alternateTitle: Data short name (DSN): ABI-L2-ACHTF-M4
date: (CI_Date)
date: 2014-10-14
dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud Top Temperature product contains an image with pixel values identifying the atmospheric temperature at the top of a cloud layer. The product is generated in combination with the Cloud Top Height and Cloud Top Pressure products by the same algorithm. The product includes data quality information that provides an assessment of the cloud top height data values for on-earth pixels. The units of measure for the cloud top temperature value is kelvin. The Cloud Top Temperature product image is produced on the ABI fixed grid at 2 km resolution for Full Disk and Mesoscale coverage regions. Product data is produced under the following conditions: cloudy; Geolocated source data to local zenith angles of 70 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > CLOUD TOP TEMPERATURE

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: air_temperature_at_cloud_top

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted.

classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-14
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: TEMP
attributeType:
descriptor: ABI Level 2+ Cloud Top Temperature
units:
DerivedUnit:
identifier: k

derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Cloud Top Temperature data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of cloudy or probably cloud pixels that qualify for the algorithm retrieval; Number of cloud top temperature pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the cloud top temperature values in the product image. These statistics are calculated using good quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Cloud Top Temperature, Cloud Top Pressure, and Cloud Top Height products are generated by the GOES-R ABI Cloud Top Height ground processing algorithm. The Cloud Top Height algorithm is an important component of the GOES-R ground processing precedence chain as the output of the algorithm is used in the generation of other ABI Level 2+ products. The algorithm retrieves a state vector composed of cloud top temperature, channel 14 emissivity, and band 15/14 beta ratio. It is retrieved using an optimal estimation technique. Cloud top pressure and height are then derived from cloud top temperature. The channel 14 emissivity and band 15/14 beta ratio are output as intermediate products. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. Cloudy conditions are determined using cloudy and probably cloudy pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. The Cloud Top Height algorithm operates on 2 km resolution pixels, generating intermediate temperature, pressure, and height products at this resolution, but the delivered Cloud Top Height and Pressure products are aggregated to 4 km or 10 km as needed to satisfy end user product resolution requirements.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability

improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km.

Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.7 Cloud Optical Depth ISO Series Metadata

13 May 2015

(MI_Metadata)

fileIdentifier: 49b3d350-afec-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Optical Depth Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2015-09-09

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-COD-ISO-SERIES_c20142900746150.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 2712

resolution:

Distance: 4 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 2712

resolution:

Distance: 4 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1500

resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 2500
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Cloud Optical Depth Product
alternateTitle: Data short name (DSN): ABI-L2-CODC-M3
alternateTitle: Data short name (DSN): ABI-L2-CODC-M34
alternateTitle: Data short name (DSN): ABI-L2-CODF-M3
alternateTitle: Data short name (DSN): ABI-L2-CODF-M4
date: (CI_Date)
date: 2014-10-17
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and

Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud Optical Depth product contains an image with pixel values identifying the measure of the extinction due to condensed water or ice clouds at a wavelength of 0.64 um. Separate algorithms are used for daytime, solar zenith angle to 82 degrees, and nighttime, solar zenith angle greater than 82 degrees, conditions. The product is generated in combination with the Cloud Particle Size product by the same algorithms. The product includes data quality information that identifies whether the daytime or nighttime algorithm generated the pixel, and provides an assessment of the cloud optical depth data values for on-earth pixels. The cloud optical depth value is a dimensionless quantity. The Cloud Optical Depth product image is produced on the ABI fixed grid at 4 km resolution for Full Disk and 2 km resolution for CONUS coverage regions. Product data is produced under the following conditions for the daytime algorithm: Cloudy; Geolocated source data to local zenith angles of 65 degrees and to solar zenith angles of 82 degrees. Product data generated by the nighttime algorithm is produced under the following conditions: Cloudy; Geolocated source data to local zenith angles of 70 degrees and solar zenith angles between 82 and 180 degrees. The cloud optical depth values reported range from 0 to 160. The sensitivity of the product to high optical depths is limited for nighttime conditions to the nighttime maximum threshold, which is an optical depth value of 16. Cloud Optical Depth product data is identified as degraded in the terminator region, which is a solar zenith angle between 65 and 82 degrees for the daytime algorithm, and 82 and 90 degrees for the nighttime algorithm.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > CLOUD OPTICAL DEPTH/THICKNESS

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: atmosphere_optical_thickness_due_to_cloud
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 4 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-17
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005

eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: COD
attributeType:
descriptor: ABI L2+ Cloud Optical Depth at 640 nm
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI L2+ Cloud Optical Depth data quality flags
units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of good or degraded cloud optical depth pixels for both day and night; Percentage of daytime, nighttime, and twilight pixels in the product image (solar zenith angles 0 to 65, 90 to 180, and 65 to 90 degrees, respectively); Number of cloud optical depth pixels whose values are outside the required measurement range for both the daytime (1 to 50) and nighttime (1 to 8) algorithms; Minimum, maximum, mean, and standard deviation of the cloud optical depth values in the product image for both the daytime and nighttime algorithms. The daytime and nighttime statistics are calculated using pixels to a daytime solar zenith angle of 82 degrees, except for the percent day, night, and twilight statistics that are based on more restrictive day, night, and twilight solar zenith angle ranges. Percentage of daytime, nighttime, and twilight pixels in the image are calculated using geolocated pixels. The other statistics are calculated using good and degraded pixels to a local zenith angle of 65 degrees. The statistics for the image are not restricted to the measurement range specified in the performance requirements. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Cloud Optical Depth and Cloud Particle Size products are generated by the GOES-R ABI Cloud Microphysical and Optical Properties (COMP) ground processing algorithms for daytime and nighttime. The daytime algorithm employs a physical retrieval based on theoretically computed lookup tables while the nighttime retrieval employs the Community Radiative Transfer Model (CRTM) calculations in an iterative physical retrieval that seeks to minimize the difference between the compute TOA brightness temperature and the observations. The algorithm processes the data pixel-by-pixel, choosing to use the daytime or nighttime approach based on the solar zenith angle

threshold value of 82 degrees. The two approaches use different criteria to identify candidate cloudy pixels. The daytime algorithm processes pixels that are identified as cloudy or probably cloudy in the intermediate 4-level cloud mask. In addition to the the intermediate 4-level cloud mask, the nighttime algorithm processes pixels based on the intermediate cloud type product data that is generated by the Cloud Type algorithm. The nighttime processing occurs for any pixel that is identified as cloudy, probably cloudy, or probably clear in the intermediate 4-level cloud mask. However, because the nighttime retrieval requires cloud top temperature product data as input, which is generated only for cloudy, and probably cloud pixels, the nighttime cloud optical depth and particle size are flagged as invalid for pixels identified anywhere the cloud top temperature is invalid. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. The daytime algorithm is limited to local zenith angles below a threshold of 65 degrees. The nighttime algorithm produces degraded quality product data beyond the local zenith angle limit. However, because of the dependency on cloud top temperature, a valid product is restricted to the local zenith angle range for the Cloud Top Temperature product of 70 degrees. The product is generated for all solar zenith angles but is flagged as degraded in the twilight region where the solar zenith angle is between 65 and 82 degrees for the daytime algorithm, and between 82 and 90 degrees for the nighttime algorithm. The Cloud Optical and Microphysical Properties algorithm operates on 2 km pixels, generating an intermediate product at this resolution, but the delivered Cloud Optical Depth product is aggregated to 4 km for the Full Disk coverage region.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle

from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The

ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.8 Cloud Particle Size Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 964f0910-afe1-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Cloud Particle Size Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-15

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-CPS-ISO-SERIES_c20142881343200.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 1500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
 authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this.

The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Cloud Particle Size Product

alternateTitle: Data short name (DSN): ABI-L2-CPSM1-M3

alternateTitle: Data short name (DSN): ABI-L2-CPSM2-M3

alternateTitle: Data short name (DSN): ABI-L2-CPSC-M3

alternateTitle: Data short name (DSN): ABI-L2-CPSC-M4

alternateTitle: Data short name (DSN): ABI-L2-CPSF-M3

alternateTitle: Data short name (DSN): ABI-L2-CPSF-M4

date: (CI_Date)

date: 2014-10-15

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Cloud Particle Size product contains an image with pixel values identifying a measure of the effective radius of the particles in a single cloud layer. It is defined by the ratio of the third and second moment of the particle size distribution. Separate algorithms are used for daytime, solar zenith angle to 82 degrees, and nighttime, solar zenith angle greater than 82 degrees, conditions. The product is generated in combination with the Cloud Optical Depth product by the same algorithms. The product includes data quality information that identifies whether the daytime or nighttime algorithm generated the pixel, and provides an assessment of the cloud particle size data values for on-earth pixels. The units of measure for the cloud particle size value is microns. Product data is produced under the following conditions for the daytime algorithm: Cloudy; Geolocated source data to local zenith angles of 65 degrees and to solar zenith angles of 82 degrees. Product data generated by the nighttime algorithm is produced under the following conditions: Cloudy; Geolocated source data to local zenith angles of 70 degrees and solar zenith angles between 82 and 180 degrees. The cloud particle size values reported range from 0 to 100 um. However, the size range depends on day/night conditions and the liquid/ice water phase. Cloud Particle Size product data is identified as

degraded in the terminator region, which is a solar zenith angle between 65 and 82 degrees for the daytime algorithm, and 82 and 90 degrees for the nighttime algorithm. The measurement range for Cloud Particle Size is determined by the model parameterization used in the algorithm retrieval. For daytime retrievals, the effective radius is determined by the lookup table bounds, 100.4 to 102.0, corresponding to 2.51 to 100 um, for both liquid and ice clouds. For nighttime retrievals, the effective radiance is determined by the range of particle size models considered: 2 to 32 um for water clouds, and; 2.62 to 78.15 um for ice clouds where the retrieval of particle size diameter is related to the effective radius by a quadratic equation.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > CLOUDS > DROPLET CONCENTRATION/SIZE

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: effective_radius_of_cloud_condensed_water_particles_at_cloud_top

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted.

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)
distance:
 Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
 temporalElement: (EX_TemporalExtent)
 extent:
 TimePeriod:
 beginPosition: 2014-10-15
 endPosition: now
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -156.2995
 eastBoundLongitude: 6.2995
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: 141.7005
 eastBoundLongitude: -55.7005
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -153.1198
 eastBoundLongitude: -58.7853
 southBoundLatitude: 14.0097
 northBoundLatitude: 55.6790
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -132.6972
 eastBoundLongitude: -56.0418
 southBoundLatitude: 13.7412
 northBoundLatitude: 55.1071
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: PSD
attributeType:
descriptor: ABI L2+ Cloud Particle Size
units:
DerivedUnit:
identifier: micron
derivationUnitTerm: micron
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) qualityInformation
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Cloud Particle Size data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of good or degraded cloud particle size pixels for both day and night; Percentage of daytime, nighttime, and twilight pixels in the product image (solar zenith angles 0 to 65, 90 to 180, and 65 to 90 degrees, respectively); Number of cloud particle size pixels whose values are outside the required measurement range for both the daytime and nighttime algorithms (liquid: 2 to 32 um; ice 2 to 50 um); Minimum, maximum, mean, and standard deviation of the cloud particle size values in the product image for both the daytime and nighttime algorithms. The daytime and nighttime statistics are calculated using pixels to a daytime solar zenith angle of 82 degrees, except for the percent day, night, and twilight statistics that are based on more restrictive day, night, and twilight solar zenith angle ranges. Percentage of of daytime, nighttime, and twilight pixels in the image are calculated using geolocated pixels. The other statistics are calculated using good and degraded pixels to a local zenith angle of 65 degrees. The statistics for the image are not restricted to

the measurement range specified in the performance requirements. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Cloud Optical Depth and Cloud Particle Size products are generated by the GOES-R ABI Cloud Microphysical and Optical Properties (COMP) ground processing algorithms for daytime and nighttime. The daytime algorithm employs a physical retrieval based on theoretically computed lookup tables while the nighttime retrieval employs the Community Radiative Transfer Model (CRTM) calculations in an iterative physical retrieval that seeks to minimize the difference between the compute TOA brightness temperature and the observations. The algorithm processes the data pixel-by-pixel, choosing to use the daytime or nighttime approach based on the solar zenith angle threshold value of 82 degrees. The two approaches use different criteria to identify candidate cloudy pixels. The daytime algorithm processes pixels that are identified as cloudy or probably cloudy in the intermediate 4-level cloud mask. In addition to the the intermediate 4-level cloud mask, the nighttime algorithm processes pixels based on the intermediate cloud type product data that is generated by the Cloud Type algorithm. The nighttime processing occurs for any pixel that is identified as cloudy, probably cloudy, or probably clear in the intermediate 4-level cloud mask. However, because the nighttime retrieval requires cloud top temperature product data as input, which is generated only for cloudy, and probably cloud pixels, the nighttime cloud optical depth and particle size are flagged as invalid for pixels identified anywhere the cloud top temperature is invalid. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. The daytime algorithm is limited to local zenith angles below a threshold of 65 degrees. The nighttime algorithm produces degraded quality product data beyond the local zenith angle limit. However, because of the dependency on cloud top temperature, a valid product is restricted to the local zenith angle range for the Cloud Top Temperature product of 70 degrees. The product is generated for all solar zenith angles but is flagged as degraded in the twilight region where the solar zenith angle is between 65 and 82 degrees for the daytime algorithm, and between 82 and 90 degrees for the nighttime algorithm. The Cloud Optical and Microphysical Properties algorithm operates on 2 km

pixels, generating an intermediate product at this resolution, but the delivered Cloud Optical Depth product is aggregated to 4 km for the Full Disk coverage region.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.9 Aerosol Detection Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 258cad90-af4b-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Aerosol Detection Product

Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-15

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-ADP-ISO-SERIES_c20142881252180.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1500
resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Aerosol Detection Product

alternateTitle: Data short name (DSN): ABI-L2-ADPM1-M3

alternateTitle: Data short name (DSN): ABI-L2-ADPM2-M3

alternateTitle: Data short name (DSN): ABI-L2-ADPC-M3

alternateTitle: Data short name (DSN): ABI-L2-ADPC-M4

alternateTitle: Data short name (DSN): ABI-L2-ADPF-M3

alternateTitle: Data short name (DSN): ABI-L2-ADPF-M4

date: (CI_Date)

date: 2014-10-15

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Aerosol Detection product contains three images in the form of binary masks that identify the presence of aerosols, dust, and smoke. The aerosol mask indicates the presence of either smoke or dust. The dust and smoke masks indicate the presence of dust and smoke, respectively. Because the presence of smoke and dust are independently derived, a given pixel can be identified with both dust and smoke. The product includes data quality information for on-earth pixels. The binary aerosol, dust, and smoke mask values are dimensionless quantities. The Aerosol Detection product images are produced on the ABI fixed grid at 2 km resolution for Full Disk, CONUS and Mesoscale coverage regions. Product data is produced under the following conditions: Clear sky; Snow-free; Geolocated source data to local zenith angles of 90 degrees and to solar zenith angles of 87 degrees.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > AEROSOLS > DUST/ASH/SMOKE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: aerosol_binary_mask
keyword: smoke_binary_mask
keyword: dust_binary_mask
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-15
endPosition: now

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: aerosol_binary_mask

attributeType:
descriptor: Flag to signal the absence/presence of aerosols in each pixel
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: smoke_binary_mask
attributeType:
descriptor: Flag to signal the absence/presence of smoke in each pixel
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: dust_binary_mask
attributeType:
descriptor: Flag to signal the absence/presence of dust in each pixel
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Aerosol Detection data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: ABI L2+ Aerosol Detection data quality flags; Number of pixels where geolocated source data is available to a local zenith angle of 60 degrees; Number of pixels where geolocated source data is available to a solar zenith angle of 60 degrees; Number of pixels that qualified for the smoke and dust retrievals; Number of pixels where each of smoke and dust are detected. Of the number of pixel statistics, the first in the list is calculated using geolocated pixels to a solar zenith angle of 87 degrees. The second statistic in the list is calculated using geolocated pixels to a local zenith angle of 90 degrees. The last two statistics in the list are calculated using good retrieved detection pixels to a local zenith angle of 90 degrees and a solar zenith angle of 87 degrees. The percentages of pixels assigned to each retrieval quality value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Aerosol Detection product is generated by the GOES-R ABI Aerosol Detection ground processing algorithm. The algorithm applies threshold tests to ABI reflectance bands and thermal bands over land and ocean backgrounds to obtain results. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Snow-free is determined using snow-free pixels indicated in the most recent intermediate binary snow mask generated by the Snow Cover algorithm.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:
status: (MD_ProgressCode) onGoing
parentOperation:
platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between

earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.10 Aerosol Optical Depth Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 6aae4020-af4e-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Aerosol Optical Depth Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-15

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-AOD-ISO-SERIES_c20142881323140.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1500

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 2500

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: CONUS

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Aerosol Optical Depth Product

alternateTitle: Data short name (DSN): ABI-L2-AODC-M3

alternateTitle: Data short name (DSN): ABI-L2-AODC-M4

alternateTitle: Data short name (DSN): ABI-L2-AODF-M3

alternateTitle: Data short name (DSN): ABI-L2-AODF-M4

date: (CI_Date)

date: 2014-10-15

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Aerosol Optical Depth product contains an image with pixel values identifying a measure of the extinction due to atmospheric aerosols at a wavelength of 550 nm over land and ocean. The product includes data quality information that provides an assessment of the quality of the algorithm retrievals for on-earth pixels. The aerosol optical depth value is a dimensionless quantity. The Aerosol Optical Depth product image is produced on the ABI fixed grid at 2 km resolution for Full Disk and CONUS coverage regions. Product data is produced under the following conditions: Clear sky; snow-free; Geolocated source data to local zenith angles of 90 degrees, to solar zenith angles of 90 degrees, and sunglint angles greater than 40 degrees when over the ocean.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and

Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > AEROSOLS > AEROSOL OPTICAL DEPTH/THICKNESS

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: atmosphere_absorption_optical_thickness_due_to_ambient_aerosol

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted.

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: 2 km at nadir

language: eng; USA

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:

beginPosition: 2014-10-15

endPosition: now
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -156.2995
 eastBoundLongitude: 6.2995
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: Full Disk - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: 141.7005
 eastBoundLongitude: -55.7005
 southBoundLatitude: -81.3282
 northBoundLatitude: 81.3282
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-East
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -153.1198
 eastBoundLongitude: -58.7853
 southBoundLatitude: 14.0097
 northBoundLatitude: 55.6790
extent: (EX_Extent)
 geographicElement: (EX_GeographicDescription)
 geographicIdentifier: (MD_Identifier)
 code: CONUS - GOES-West
 geographicElement: (EX_GeographicBoundingBox)
 westBoundLongitude: -132.6972
 eastBoundLongitude: -56.0418
 southBoundLatitude: 13.7412
 northBoundLatitude: 55.1071

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: AOD
 attributeType:
 descriptor: ABI Level 2+ Aerosol Optical Depth at 550 nm
units:

scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
contentType: (MD_CoverageContentTypeCode) qualityInformation
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Aerosol Optical Depth data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Percentage of each of good and bad aerosol optical depth pixels over land and over ocean for the eighteen, 10 degree latitude bands in the product image; Number of aerosol optical depth pixels whose values are outside the required measurement range over land and over ocean; Minimum, maximum, mean, and standard deviation of the aerosol optical depth values in the 550 nm image over land and over ocean for the eighteen, 10 degree latitude bands in the product image; Minimum, maximum, mean, and standard deviation of the aerosol optical depth values in the images at ABI reflective band wavelengths associated with source level 1b data used by the algorithm over land and over ocean for the eighteen, 10 degree latitude bands in the product image; Minimum, maximum, mean, and standard deviation of the surface reflectivity values at the ABI reflective band wavelengths associated with source level 1b data used by the algorithm over land and over ocean for the eighteen, 10 degree latitude bands in the product image; Number of attempted retrievals over land and over ocean for the eighteen, 10 degree latitude bands; Number of attempted retrievals over land and over ocean within the local zenith angle performance specification limit of 60 degrees for the eighteen, 10 degree latitude bands. These statistics are calculated using geolocated pixels to a solar zenith angle of 80 degrees, which is associated with good quality pixels. These statistics are calculated using geolocated pixels to a local zenith angle of 90 degrees, except for the number of attempted retrievals over land and over ocean within the local zenith angle performance specification limit of 60 degrees. The percentages of pixels assigned to each retrieval quality value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent

unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Aerosol Optical Depth product is generated by the GOES-R ABI Aerosol Optical Depth ground processing algorithm. The algorithm determines ABI reflectance measurements using physical retrievals that utilize a lookup table of TOA reflectance that is pre-calculated from the Community Radiative Transfer Model (CRTM). The physical retrievals are performed separately over land and ocean. The algorithm computes the optical thickness of aerosols at wavelengths that depend on the surface type. ABI bands 1, 2, and 6 with central wavelengths of 0.47, 0.64, and 2.25 um are used for land retrievals over dark vegetated surfaces. ABI bands 2, 3, 5, and 6 with central wavelengths of 0.64, 0.865, 1.61, and 2.25 um are used for ocean retrievals. The aerosol type is evaluated based on the selection of an aerosol model from four prescribed land aerosol models, generic, dust, smoke, and urban, or for a pair of fine and coarse marine aerosol modes selected from four prescribed fine modes and five prescribed coarse modes. The suspended matter is derived from the computed aerosol optical depth. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Snow-free is determined using snow-free pixels indicated in the most recent intermediate binary snow mask generated by the Snow Cover algorithm. The latitude band statistics, whose extents are a function of the the ABI's fixed grid field of regard and latitude, use the CF metadata conventions hybrid grid mapping that includes both the grid_mapping for the "geostationary" and "latitude_longitude" projections.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processi

[ng Levels](#)

role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data

Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:
code: GOES-17 ABI instrument_id (serial number)
type: Advanced Baseline Imager
description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.11 Volcanic Ash: Detection and Height Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 0c7acd60-b012-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Volcanic Ash: Detection and Height Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-18
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-VAA-ISO-SERIES_c20142911141150.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 5424

resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 5424
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Volcanic Ash: Detection and Height Product
alternateTitle: Data short name (DSN): ABI-L2-VAAF-M3
alternateTitle: Data short name (DSN): ABI-L2-VAAF-M4
date: (CI_Date)
date: 2014-10-18
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Volcanic Ash: Detection and Height product contains two images with pixel values identifying volcanic ash cloud height and volcanic ash mass loading. The ash cloud top height is the geopotential height of the ash cloud top. The ash mass loading is the mass of volcanic ash per unit of area. The product includes two types of data quality information. One type of data quality indicator describes the quality of the volcanic ash detection, providing an assessment of the presence of volcanic ash for on-earth pixels including an indication of good or degraded quality, or invalid pixels, and the confidence in the detection of volcanic ash existing in single and multiple layers. The second type of data quality indicator provides information about the quality and ash characteristics of the retrieval for on-earth pixels, identifying failure conditions, cloud top temperature, cloud emissivity, and absorbed optical depth ratio retrieval quality, and the volcanic ash particle size. The units of measure for the ash cloud top height value is meters. The units of measure for the ash mass loading value is metric tons (tonnes) per square kilometer. The Volcanic Ash: Detection and Height product images are produced on the ABI fixed grid at 2 km resolution for the Full Disk coverage region. Product data is produced for geolocated source data to local zenith angles of 90 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > AEROSOLS > DUST/ASH/SMOKE

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M.

Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: volcanic_ash_cloud_height
keyword: volcanic_ash_mass
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

contentInfo: (MI_CoverageDescription)
attributeDescription:

13 May 2015

RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: VAH
attributeType:
descriptor: ABI Level 2+ Volcanic Ash: Ash Cloud Height
units:
DerivedUnit:
identifier: m
derivationUnitTerm: meter
scaleFactor:
offset:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: VAML
attributeType:
descriptor: ABI Level 2+ Volcanic Ash: Ash Mass Loading
units:
DerivedUnit:
identifier: t km-2
derivationUnitTerm: tonne
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DET_DQF
attributeType:
descriptor: ABI Level 2+ Volcanic Ash data detection quality flags
units:
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: RET_DQF
attributeType:
descriptor: ABI L2+ Volcanic Ash data retrieval quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)

level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Total volcanic ash mass loading in image; Number of volcanic ash cloud top height and volcanic ash mass loading pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the values in the volcanic ash cloud top height and volcanic ash mass loading product images. Number of attempted retrievals is calculated using geolocated pixels where the retrieval is successful or failed. The other statistics are calculated using geolocated pixels where the retrieval is successful to a local zenith angle of 80 degrees. The percentages of pixels assigned to each flag value for the data detection and retrieval quality information are also included in the product.

result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Volcanic Ash: Detection and Height product is generated by the GOES-R ABI Volcanic Ash: Detection and Height ground processing algorithm. Volcanic ash cloud top height and mass loading are determined by retrieving ash cloud effective temperature, 11 micron cloud emissivity, and the 12/11 micron effective absorption optical depth ratio (β -ratio). The algorithm uses a physical retrieval utilizing an in-line radiative transfer model to compute clear sky TOA radiances, clear sky transmittance and radiance profiles, and black cloud radiance profiles. The algorithm is optimized by first detecting volcanic ash, and then performing the volcanic ash cloud top height and mass loading retrievals satisfying an ash confidence level threshold. The algorithm identifies volcanic ash confidence levels for both single and multiple layer cloud conditions. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor

output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:
status: (MD_ProgressCode) onGoing
parentOperation:
platform: (MI_Platform)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS

Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.12 Legacy Vertical Temperature Profile Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 52291390-afe9-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Legacy Vertical Temperature Profile Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-17
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-LVTP-ISO-SERIES_c20142901125210.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 300
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 100

resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 100
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Legacy Vertical Temperature Profile Product
alternateTitle: Data short name (DSN): ABI-L2-LVTPM1-M3
alternateTitle: Data short name (DSN): ABI-L2-LVTPM2-M3
alternateTitle: Data short name (DSN): ABI-L2-LVTPC-M3
alternateTitle: Data short name (DSN): ABI-L2-LVTPC-M4
alternateTitle: Data short name (DSN): ABI-L2-LVTPF-M3
alternateTitle: Data short name (DSN): ABI-L2-LVTPF-M4
date: (CI_Date)

date: 2014-10-17
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Legacy Vertical Temperature Profile product contains a three-dimensional image with pixel values identifying the air temperature at 101 standard pressure levels. The units of measure for the total precipitable water value is kelvin. The product includes three types of data quality information. One describes the overall quality of the data pixels, providing an assessment of the derived stability indices data values for on-earth pixels. The second provides information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions. The third provides information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels. The Derived Stability Indices product images are produced on the ABI fixed grid at 10 km resolution for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced under the following conditions: Clear sky; Geolocated source data to local zenith angles of 80 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF
version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > ATMOSPHERIC TEMPERATURE > TEMPERATURE PROFILES

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: air_temperature

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: 10 km at nadir

language: eng; USA

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:

beginPosition: 2014-10-17

endPosition: now

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: Full Disk - GOES-East

geographicElement: (EX_GeographicBoundingBox)

westBoundLongitude: -156.2995

eastBoundLongitude: 6.2995

southBoundLatitude: -81.3282

northBoundLatitude: 81.3282

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: Full Disk - GOES-West

geographicElement: (EX_GeographicBoundingBox)

westBoundLongitude: 141.7005

eastBoundLongitude: -55.7005

southBoundLatitude: -81.3282

northBoundLatitude: 81.3282

extent: (EX_Extent)

geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)

code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: LVT
attributeType:
descriptor: ABI Level 2+ Legacy Vertical Temperature Profile provides air temperature at
101 pressure levels in the atmosphere
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Overall
attributeType:
descriptor: overall quality of the data pixels, providing an assessment of the vertical
temperature profile data values for on-earth pixels

units:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF_Retrieval

attributeType:

descriptor: information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions

units:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF_SkinTemp

attributeType:

descriptor: information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels

units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) series

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Number of legacy vertical temperature profile data values outside the required measurement range. Note that the count is constrained to no more than one per horizontal grid point; Applicable ABI emissive band-specific brightness temperature differences mean and standard deviation values between those observed and modeled. These statistics are calculated using valid pixels based on the local zenith angle threshold of 80 degrees and the latitude threshold of 70 degrees north and south. The percentages of pixels assigned to each flag value for the three types of data quality information are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Legacy Vertical Temperature Profile, Legacy Vertical Moisture Profile, Total Precipitable Water, and Derived Stability Indices products are generated by the GOES-R ABI Legacy Atmospheric Profiles ground processing algorithm. The algorithm uses processed NWP model profile data as the first guess and employs a regression retrieval followed by an iterative physical retrieval that utilizes the ground system implementation of the Community Radiative Transfer Model (CRTM) to derive the final product data. The temperature and moisture profiles contain values at 101 standard pressure levels, of which only 54 temperature and 35 moisture pressure levels are actually populated in the retrieval. The 54 temperature levels are from approximately 103 hPa to approximately 1014 hPa. The 35 moisture levels are from 300 hPa to approximately 1014 hPa. The regression retrieval is applied for coverage regions corresponding to local zenith angles to 80 degrees but the physical retrieval is limited to local zenith angles to 67 degrees. The product is generated for 5 x 5 fields of regard from 2 km pixel inputs where the percentage of clear pixels satisfies a 20 percent threshold. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Total precipitable water from the surface to 300 hPa is derived from the retrieved moisture profile. In addition, the five atmospheric stability indices, CAPE, K-index, Lifted Index, Showalter Index, and Total Totals Index, are derived from the retrieved moisture and temperature profiles. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS

Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.13 Legacy Vertical Moisture Profile Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: d5ed67b0-afe6-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Legacy Vertical Moisture Profile Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-17

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-LVMP-ISO-SERIES_c20142901106420.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 300
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 100
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 100
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Legacy Vertical Moisture Profile Product

alternateTitle: Data short name (DSN): ABI-L2-LVMPPM1-M3

alternateTitle: Data short name (DSN): ABI-L2-LVMPPM2-M3

alternateTitle: Data short name (DSN): ABI-L2-LVMPC-M3

alternateTitle: Data short name (DSN): ABI-L2-LVMPC-M4

alternateTitle: Data short name (DSN): ABI-L2-LVMPPF-M3

alternateTitle: Data short name (DSN): ABI-L2-LVMPPF-M4

date: (CI_Date)

date: 2014-10-17

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Legacy Vertical Moisture Profile product contains a three-dimensional image with pixel values identifying the water vapor at 101 standard pressure levels. The product includes three types of data quality information. One describes the overall quality of the data pixels, providing an assessment of the legacy vertical temperature profile data values for on-earth pixels. The second provides information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions. The third provides information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels. The units of measure for the vertical temperature value is percent. The Legacy Vertical Moisture Profile product image is generated on the ABI fixed grid at 10 km resolution for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced under the following conditions: Clear sky; Geolocated source data to local zenith angles of 80 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > ATMOSPHERIC WATER VAPOR > WATER VAPOR
PROFILES

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: relative_humidity

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 10 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-17
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West

geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: LVM
attributeType:
descriptor: ABI Level 2+ Legacy Vertical Moisture Profile provides relative humidity at 101 pressure levels in the atmosphere
units:
DerivedUnit:
identifier: percent
derivationUnitTerm: percent
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Overall
attributeType:
descriptor: overall quality of the data pixels, providing an assessment of the vertical moisture profile data values for on-earth pixels
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Retrieval

attributeType:
descriptor: information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_SkinTemp
attributeType:
descriptor: information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: mean difference and standard deviation of calculated vs observed brightness temperature by channel; percent of pixels for each data quality flag value
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Legacy Vertical Temperature Profile, Legacy Vertical Moisture Profile,

Total Precipitable Water, and Derived Stability Indices products are generated by the GOES-R ABI Legacy Atmospheric Profiles ground processing algorithm. The algorithm uses processed NWP model profile data as the first guess and employs a regression retrieval followed by an iterative physical retrieval that utilizes the ground system implementation of the Community Radiative Transfer Model (CRTM) to derive the final product data. The temperature and moisture profiles contain values at 101 standard pressure levels, of which only 54 temperature and 35 moisture pressure levels are actually populated in the retrieval. The 54 temperature levels are from approximately 103 hPa to approximately 1014 hPa. The 35 moisture levels are from 300 hPa to approximately 1014 hPa. The regression retrieval is applied for coverage regions corresponding to local zenith angles to 80 degrees but the physical retrieval is limited to local zenith angles to 67 degrees. The product is generated for 5 x 5 fields of regard from 2 km pixel inputs where the percentage of clear pixels satisfies a 20 percent threshold. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Total precipitable water from the surface to 300 hPa is derived from the retrieved moisture profile. In addition, the five atmospheric stability indices, CAPE, K-index, Lifted Index, Showalter Index, and Total Totals Index, are derived from the retrieved moisture and temperature profiles. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R

series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for

imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The

ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.14 Total Precipitable Water Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 42511480-afef-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Total Precipitable Water Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-17

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-TPW-ISO-SERIES_c20142901211060.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1086

resolution:

Distance: 10 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 1086

resolution:

Distance: 10 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 300
 resolution:
 Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 100
 resolution:
 Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 100
 resolution:
 Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this.

The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Total Precipitable Water Product

alternateTitle: Data short name (DSN): ABI-L2-TPWM1-M3

alternateTitle: Data short name (DSN): ABI-L2-TPWM2-M3

alternateTitle: Data short name (DSN): ABI-L2-TPWC-M3

alternateTitle: Data short name (DSN): ABI-L2-TPWC-M4

alternateTitle: Data short name (DSN): ABI-L2-TPWF-M3

alternateTitle: Data short name (DSN): ABI-L2-TPWF-M4

date: (CI_Date)

date: 2014-10-17

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Total Precipitable Water product contains an image with pixel values identifying the integrated column water vapor amount from the surface to a height corresponding to an atmospheric pressure of 300 hPa. The units of measure for the total precipitable water value is millimeters. The product includes three types of data quality information. One describes the overall quality of the data pixels, providing an assessment of the derived stability indices data values for on-earth pixels. The second provides information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions. The third provides information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels. The Derived Stability Indices product images are produced on the ABI fixed grid at 10 km resolution for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced under the following conditions: Clear sky; Geolocated source data to local zenith angles of 80 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and

Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > ATMOSPHERIC WATER VAPOR > PRECIPITABLE

WATER

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M.

Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M.

Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: lwe_thickness_of_atmosphere_mass_content_of_water_vapor

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: 10 km at nadir

language: eng; USA

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)

extent:

TimePeriod:
beginPosition: 2014-10-17
endPosition: now

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)

sequenceIdentifier:
MemberName:
aName: TPW
attributeType:
descriptor: Total Precipitable Water
units:
DerivedUnit:
identifier: mm
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Overall
attributeType:
descriptor: overall quality of the data pixels, providing an assessment of the total precipitable water data values for on-earth pixels
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Retrieval
attributeType:
descriptor: information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_SkinTemp
attributeType:
descriptor: information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels

units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Number of total precipitable water pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the total precipitable water values in the product image; Applicable ABI emissive band-specific brightness temperature differences mean and standard deviation values between those observed and modeled. These statistics are calculated using valid pixels based on the local zenith angle threshold of 80 degrees and the latitude threshold of 70 degrees north and south. The percentages of pixels assigned to each flag value for the three types of data quality information are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Legacy Vertical Temperature Profile, Legacy Vertical Moisture Profile, Total Precipitable Water, and Derived Stability Indices products are generated by the GOES-R ABI Legacy Atmospheric Profiles ground processing algorithm. The algorithm uses processed NWP model profile data as the first guess and employs a regression retrieval followed by an iterative physical retrieval that utilizes the ground system implementation of the Community Radiative Transfer Model (CRTM) to derive the final product data. The temperature and moisture profiles contain values at 101 standard pressure levels, of which only 54 temperature and 35 moisture pressure levels are actually populated in the retrieval. The 54 temperature levels are from approximately 103 hPa to approximately 1014 hPa. The 35 moisture levels are from 300 hPa to approximately 1014 hPa. The regression retrieval is applied for coverage regions corresponding to local zenith angles to 80

degrees but the physical retrieval is limited to local zenith angles to 67 degrees. The product is generated for 5 x 5 fields of regard from 2 km pixel inputs where the percentage of clear pixels satisfies a 20 percent threshold. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Total precipitable water from the surface to 300 hPa is derived from the retrieved moisture profile. In addition, the five atmospheric stability indices, CAPE, K-index, Lifted Index, Showalter Index, and Total Totals Index, are derived from the retrieved moisture and temperature profiles. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection

and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The

ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager
description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.15 Derived Stability Indices Product ISO Series Metadata

(MI_Metadata)
fileIdentifier: 158fae30-affd-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Derived Stability Indices Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-17
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-DSI-ISO-SERIES_c20142901037480.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 300
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 500
resolution:

Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 100
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 100
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: GOES-R Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication
otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.
code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Derived Stability Indices Product
alternateTitle: Data short name (DSN): ABI-L2-DSIM1-M3
alternateTitle: Data short name (DSN): ABI-L2-DSIM2-M3
alternateTitle: Data short name (DSN): ABI-L2-DSIC-M3
alternateTitle: Data short name (DSN): ABI-L2-DSIC-M4

alternateTitle: Data short name (DSN): ABI-L2-DSIF-M3

alternateTitle: Data short name (DSN): ABI-L2-DSIF-M4

date: (CI_Date)

date: 2014-10-17

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Derived Stability Indices product contains images for five stability indices with pixel values that are indicators of atmospheric instability associated with convection and potential thunderstorm activity. 1) Convective(ly) Available Potential Energy (CAPE): A measure of atmospheric stability calculated by integrating the positive temperature difference between the surrounding atmosphere and a parcel of air lifted adiabatically from the surface to its equilibrium level. It exists under conditions of potential instability, and measures the potential energy per unit mass that would be released by the unstable parcel if it were able to convect upwards to equilibrium. Units of measure are joules per kilogram. 2) Lifted Index: The temperature difference between a parcel of air lifted adiabatically from the surface to a finishing air pressure of 500 hPa in the troposphere and the ambient air temperature at the finishing air pressure in the troposphere. The air parcel is "lifted" by moving the air parcel from the surface to the Lifting Condensation Level (dry adiabatically) and then from the Lifting Condensation Level to the finishing air pressure (wet adiabatically). Units of measure are kelvin. 3) K-Index: A measure of atmospheric stability indicating the potential of severe convection. The index is the difference in air temperature between 850 and 500 hPa, the dew point temperature at 850 hPa, and the difference between the air temperature and the dew point temperature at 700 hPa. Units of measure are kelvin. 4) Showalter Index: A measure of atmospheric stability indicating the convective and thunderstorm potential. The index is the temperature difference between a parcel of air lifted from 850 to 500 hPa (wet adiabatically) and the ambient air temperature at 500 hPa. Units of measure are kelvin. 5) Total Totals Index: A measure of atmospheric stability indicating the likelihood of severe convection. The index is derived from the difference in air temperature between 850 and 500 hPa (the vertical totals) and the difference between the dew point temperature at 850 hPa and the air temperature at 500 hPa (the cross totals). The index is the sum of the vertical and cross totals. Units of measure are kelvin. The product includes three types of data quality information. One describes the overall quality of the data pixels, providing an assessment of the derived stability indices data values for on-earth pixels. The second provides

information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions. The third provides information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels. The Derived Stability Indices product images are produced on the ABI fixed grid at 10 km resolution for Full Disk, CONUS, and Mesoscale coverage regions. Product data is produced under the following conditions: Clear sky; Geolocated source data to local zenith angles of 80 degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: ATMOSPHERE > ATMOSPHERIC TEMPERATURE > ATMOSPHERIC STABILITY

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: temperature_difference_between_ambient_air_and_air_lifted_adiabatically_from_the_surface

keyword: atmosphere_convective_available_potential_energy_wrt_surface

keyword: atmosphere_stability_k_index

keyword: atmosphere_stability_showalter_index

keyword: atmosphere_stability_total_totals_index

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 10 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-17
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)

westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: LI
attributeType:
descriptor: Derived Stability Indices: Lifted Index
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: CAPE
attributeType:
descriptor: ABI Level 2+ Derived Stability Indices: CAPE (Convective(ly) Available
Potential Energy)
units:
DerivedUnit:
identifier: J kg-1
derivationUnitTerm: joule
derivationUnitTerm: gram
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement

13 May 2015

dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: TT
attributeType:
descriptor: ABI Level 2+ Derived Stability Indices: Total Totals Index
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: SI
attributeType:
descriptor: ABI Level 2+ Derived Stability Indices: Showalter Index
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: KI
attributeType:
descriptor: ABI Level 2+ Derived Stability Indices: K-Index
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:

RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Overall
attributeType:
descriptor: overall quality of the data pixels, providing an assessment of the derived stability indices data values for on-earth pixels
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_Retrieval
attributeType:
descriptor: information about the quality of the physical retrieval for on-earth pixels, identifying failure conditions
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF_SkinTemp
attributeType:
descriptor: information about the quality of the first guess skin temperature for on-earth pixels, identifying temperature threshold failure conditions for on-earth pixels
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Number of CAPE, Lifted Index, K-Index, Showalter Index, and Total Totals Index pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the values in the CAPE, Lifted Index, K-Index, Showalter Index, and Total Totals Index product images; Applicable ABI emissive band-specific brightness temperature differences mean and standard deviation values between those observed and modeled. These statistics are calculated using valid pixels based on the local zenith

angle threshold of 80 degrees and the latitude threshold of 70 degrees north and south. The percentages of pixels assigned to each flag value for the three types of data quality information are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Legacy Vertical Temperature Profile, Legacy Vertical Moisture Profile, Total Precipitable Water, and Derived Stability Indices products are generated by the GOES-R ABI Legacy Atmospheric Profiles ground processing algorithm. The algorithm uses processed NWP model profile data as the first guess and employs a regression retrieval followed by an iterative physical retrieval that utilizes the ground system implementation of the Community Radiative Transfer Model (CRTM) to derive the final product data. The temperature and moisture profiles contain values at 101 standard pressure levels, of which only 54 temperature and 35 moisture pressure levels are actually populated in the retrieval. The 54 temperature levels are from approximately 103 hPa to approximately 1014 hPa. The 35 moisture levels are from 300 hPa to approximately 1014 hPa. The regression retrieval is applied for coverage regions corresponding to local zenith angles to 80 degrees but the physical retrieval is limited to local zenith angles to 67 degrees. The product is generated for 5 x 5 fields of regard from 2 km pixel inputs where the percentage of clear pixels satisfies a 20 percent threshold. Clear sky is determined using clear and probably clear pixels indicated in the temporally coincident intermediate 4-level cloud mask generated by the Cloud Mask algorithm. Total precipitable water from the surface to 300 hPa is derived from the retrieved moisture profile. In addition, the five atmospheric stability indices, CAPE, K-index, Lifted Index, Showalter Index, and Total Totals Index, are derived from the retrieved moisture and temperature profiles. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
(NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:
status: (MD_ProgressCode) onGoing
parentOperation:
platform: (MI_Platform)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS

Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.16 Rainfall Rate (Quantitative Precipitation Estimate) Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 3a3268a0-b006-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Rainfall Rate (Quantitative Precipitation Estimate) Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator
dateStamp: 2014-10-18
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-RRQPE-ISO-SERIES_c20142910615110.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 5424
resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 5424
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication
otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.
code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: Advanced Baseline Imager (ABI) Level 2+ Rainfall Rate (Quantitative Precipitation Estimate) Product
alternateTitle: Data short name (DSN): ABI-L2-RRQPEF-M3
alternateTitle: Data short name (DSN): ABI-L2-RRQPEF-M4
date: (CI_Date)

date: 2014-10-18
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: The Rainfall Rate Quantitative Precipitation Estimate (QPE) product contains an image with pixel values identifying the rainfall rate. The product includes data quality information that provides an assessment of the rainfall rate data values for on-earth pixels. The units of measure for the rainfall rate value is millimeters per hour. The Rainfall Rate (QPE) product image is produced on the ABI fixed grid at 2 km resolution for the Full Disk coverage region. Product data is produced for geolocated source data to local zenith angles of 90 degrees for both daytime and nighttime conditions.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > PRECIPITATION > PRECIPITATION RATE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)

date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: rainfall_rate
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282

northBoundLatitude: 81.3282

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) physicalMeasurement

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: RRQPE

attributeType:

descriptor: ABI Level 2+ Rainfall Rate (Quantitative Prediction Estimate)

units:

DerivedUnit:

identifier: mm h-1

derivationUnitTerm: meter

derivationUnitTerm: hour

scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)

attributeDescription:

RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification

dimension: (MD_Band)

sequenceIdentifier:

MemberName:

aName: DQF

attributeType:

descriptor: ABI Level 2+ Rainfall Rate (Quantitative Prediction Estimate) data quality flags

units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of pixels where retrieval is successful; Number of pixels with rain; Total rainfall rate in product image; Number of rainfall rate pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the rainfall rate values in the product image. These statistics are calculated using good quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:

lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Rainfall Rate (QPE) product is generated by the GOES-R ABI Rainfall Rate (QPE) ground processing algorithm. Rainfall rate is obtained using a two-step process that involves the detection of pixels where rain is occurring and the retrieval of rainfall rate for those pixels. The algorithm includes eight linear and eight non-linear predictors based on brightness temperatures measured in five emissive ABI bands 8, 10, 11, 14, and 15 with central wavelengths of 6.185, 7.34, 8.5, 11.2, and 12.3 um, respectively. As a result of the spectral range of the ABI instrument not being capable of penetrating optically thick clouds where precipitation is occurring, the algorithm uses retrieval coefficients that are established based on a statistical correlation of the observed cloud top brightness temperatures with rainfall occurrence and rate as detected by sources capable of penetrating optically thick clouds, such as microwave observations. The retrieval coefficients used by the algorithm are managed as Level 2+ processing parameters (i.e. semi-static data) in the ground system.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN)

broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.17 Derived Motion Winds Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: aee58cd0-f85-11e1-a21f-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Derived Motion Winds Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-19

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-DMW-ISO-SERIES_c20142920549280.xml

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R DMW products use the latitude_longitude CF grid mapping. The coordinates for the global latitude/longitude grid are latitude and longitude. In two-dimensional map space, the x-axis is at the equator, and the y-axis is at the prime (Greenwich) meridian. By convention, degrees north and degrees east are used for latitude and longitude, respectively.

code: latitude_longitude

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Derived Motion Winds Product

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C02

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C07

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVM1-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C09

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C10

alternateTitle: Data short name (DSN): ABI-L2-DMWM1-M3C14

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C02

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C07

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVM2-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C09

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C10

alternateTitle: Data short name (DSN): ABI-L2-DMWM2-M3C14

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C02

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C07

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVC-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C09

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C10

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M3C14

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C02

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C07

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVC-M4C08

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C09

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C10

alternateTitle: Data short name (DSN): ABI-L2-DMWC-M4C14

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C02

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C07

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVF-M3C08

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C09

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C10

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M3C14

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C02

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C07

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C08

alternateTitle: Data short name (DSN): ABI-L2-DMWVF-M4C08

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C09

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C10

alternateTitle: Data short name (DSN): ABI-L2-DMWF-M4C14

date: (CI_Date)

date: 2014-10-19

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Derived Motion Winds product contains a list of wind vectors identifying their location, wind speed, wind direction, air pressure and temperature, and local zenith angle. The product includes data quality information for each wind vector. The product name includes the word "derived" because the wind vectors are derived by tracking environmental features, specifically clouds and clear sky water vapor over multiple ABI observations. The type of feature tracked varies as a function of the ABI band. Derived Motion Wind product files are generated for the ABI reflective and emissive band that are used to track features. The units of measure for the wind vector quantities are meters per second for wind speed; degrees for wind direction; hectopascals for wind pressure; kelvin for air temperature. Product data is produced for geolocated source data to local zenith angles of 90 degrees. The Derived Motion Winds product is produced using ABI Full Disk, CONUS, and Mesoscale coverage region observations.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)
name: netCDF
version: 4

descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC WINDS
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)
keyword: wind_speed
keyword: wind_to_direction
keyword: air_pressure
keyword: air_temperature
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted.
classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) vector
spatialResolution: (MD_Resolution)
distance:
Distance: 10 km

language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-19
endPosition: now

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995

eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: wind_direction
attributeType:
descriptor: wind vector's wind to direction measured positive clockwise from due north
units:
DerivedUnit:
identifier: degree
derivationUnitTerm: degree

scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: wind_speed
 attributeType:
descriptor: wind vector's wind speed
units:
 DerivedUnit:
 identifier: m s-1
 derivationUnitTerm: meter
 derivationUnitTerm: second
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: pressure
 attributeType:
descriptor: wind vector's air pressure
units:
 DerivedUnit:
 identifier: hPa
 derivationUnitTerm: pascal
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: temperature
 attributeType:
descriptor: wind vector's air temperature
units:

DerivedUnit:
identifier: k
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) qualityInformation
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Derived Motion Winds data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) series
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Time between successive ABI images used to derive wind vectors, and ABI band-specific geospatial criteria for finding and tracking features; Start, midpoint, and end time of the wind vectors in the product, which corresponds to the middle Level 1b product image observation period; Number of vectors' wind speeds whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the vector's wind speed values in the product file; Number of wind vectors in each of three atmospheric layers, and the minimum, maximum, mean, and standard deviation of the constituent wind vectors' cloud top pressure values. These statistics are calculated using good quality wind vectors. The percentages of pixels assigned to each DQF value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Derived Motion Winds product is generated by the GOES-R ABI Derived Motion Winds ground processing algorithm. Wind speed and direction are determined by tracking environmental features, specifically cloud edges and clear sky moisture gradients, over a time series composed of three ABI observations. Two displacement vectors are produced for the two time adjacent observation pairs, and then averaged. The time associated with wind vectors in a Derived Motion Winds product file is the acquisition time associated with the middle observation. The algorithm performs several consistency checks on the derived wind information including a comparison with the NWP wind forecast to establish a confidence level for the wind vector and an estimate of its wind speed error. For each ABI band, algorithm processing occurs independently and separate product files are generated. The configuration of each retrieval is band dependent and is determined by the target type (clear sky water vapor or cloud), target box size, search window size (i.e. lag size), temporal spacing between image pairs, and the application of nested tracking of target sub-regions. This configuration information is included in the product metadata. Product files include data for each attempted wind retrieval. It is possible that one or more wind vectors in a product file have one or more null values in its data elements, which is indicated with the applicable variables' fill values. When operating in ABI mode 3, there will be a delay in the production of mesoscale Derived Motion Wind product files when the ABI is commanded to observe a new mesoscale region. This is because the algorithm requires three successive product images. The amount of delay is approximately twice the required time between successive images, which is band-specific and managed as a parameter in the Level 2+ semi-static source data. The time between successive images value is included in the product.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels

[ng Levels](#)

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position

Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for

imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.18 Hurricane Intensity Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: a70be540-c38b-11e0-962b-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Hurricane Intensity Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-19

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-HIE-ISO-SERIES_c20142920656460.xml

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R HIE products use the latitude_longitude CF grid mapping. The coordinates for the global latitude/longitude grid are latitude

and longitude. In two-dimensional map space, the x-axis is at the equator, and the y-axis is at the prime (Greenwich) meridian. By convention, degrees north and degrees east are used for latitude and longitude, respectively.

code: latitude_longitude

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Hurricane Intensity Product

alternateTitle: Data short name (DSN): ABI-L2-HIEF-M3

alternateTitle: Data short name (DSN): ABI-L2-HIEF-M4

date: (CI_Date)

date: 2014-10-19

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Hurricane Intensity product contains information about tropical cyclones along their trajectories from the time they are identified to the current time. Tropical cyclone information provided in the product includes its identity, location, maximum wind speed, Dvorak tropical cyclone current intensity number, detailed wind shear, cloud, and eye characteristics, strengthening and weakening state information, and the start, midpoint, and end observation time of the source ABI product image. Data quality information is not included in the product. A hurricane intensity product file is produced for each tropical cyclone. The units of measure for the maximum sustained wind speed value is meters per second. The advanced Dvorak technique tropical cyclone current and tropical intensity numbers are dimensionless quantities. The Hurricane Intensity product is produced using ABI Full Disk coverage region observations. Product data is produced when a tropical cyclone is in the ABI's field of regard for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC PHENOMENA > HURRICANES
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: dvorak_tropical_cyclone_current_intensity_number
keyword: tropical_cyclone_maximum_sustained_wind_speed
keyword: dvorak_tropical_number
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v27
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) vector
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-19
endPosition: now

13 May 2015

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: wind_speed
attributeType:
descriptor: ABI Level 2+ Hurricane Intensity: tropical cyclone's maximum sustained wind
speed
units:
DerivedUnit:
identifier: m s-1
derivationUnitTerm: meter
derivationUnitTerm: second
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: CI_number
attributeType:
descriptor: ABI Level 2+ Hurricane Intensity: advanced Dvorak technique tropical cyclone
current intensity number (CI#)

13 May 2015

units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: final_T_number
attributeType:
descriptor: ABI Level 2+ Hurricane Intensity: advanced Dvorak technique final tropical
number (T#)
units:
scaleFactor:
offset:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) series
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Observation time: J2000 epoch (seconds since 2000-01-01
12:00:00) mid-point between the start and end image scan in seconds associated with tropical cyclone
intensity estimate; Observation time bounds: start and end time of each image scan associated with
tropical cyclone intensity estimates over time; Cloud temperature annular average: cloud top
temperature in cloud region annulus centered at storm center; Eye temperature standard deviation:
standard deviation of brightness temperature values in eye region.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units
(CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check
Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Hurricane Intensity product is generated by the GOES-R ABI Hurricane Intensity ground processing algorithm. The algorithm, which is the Advanced Dvorak Technique, is used to derive a set of Dvorak Tropical numbers and a Current Intensity number that map directly to a maximum sustained one minute wind speed using a set of pre-determined statistical relationships. The algorithm determines the intensity of a tropical cyclone by matching observed brightness temperature patterns in the current processed ABI Full Disk level 1b band 13 image with a central wavelength of 10.35 um to a set of pre-defined tropical cyclone structures. From this correlation, the center and scene type of the tropical cyclone are determined. The Tropical and Current Intensity numbers are determined based on the recent trend of strengthening or weakening, and pre-defined intensity variation thresholds that vary as a function of time.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: [https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA Processing Levels](https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels)

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect

public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages.

The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.19 Fire (Hot Spot Characterization) Product ISO Series Metadata

13 May 2015

(MI_Metadata)

fileIdentifier: b015d6f0-b002-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Fire (Hot Spot Characterization)

Product Collection

contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-17

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-FDC-ISO-SERIES_c20142901242300.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 1500

resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 2500
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Fire (Hot Spot Characterization) Product
alternateTitle: Data short name (DSN): ABI-L2-FDCC-M3
alternateTitle: Data short name (DSN): ABI-L2-FDCC-M4
alternateTitle: Data short name (DSN): ABI-L2-FDCF-M3
alternateTitle: Data short name (DSN): ABI-L2-FDCF-M4
date: (CI_Date)
date: 2014-10-17
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and

Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Fire (HSC) product contains four images, one in the form of a fire mask, and the other three with pixel values identifying fire temperature, fire area, and fire radiative power. Pixel values in the fire mask image identify a fire category and diagnostic information associated with algorithm execution. The six fire categories include: Good quality or temporally filtered good quality fire pixel; Saturated fire pixel or temporally filtered saturated fire pixel; Cloud contaminated or temporally filtered cloud contaminated fire pixel; High probability or temporally filtered high probability fire pixel; Medium probability or temporally filtered high probability fire pixel; Low probability or temporally filtered high probability fire. Temporally filtered fire pixels are those resulting from fire pixels that are in close proximity in both space and time. The product includes data quality information that provides an assessment of fire detection for on-earth pixels. The units of measure for the Fire (HSC) product quantities are for Mask: dimensionless; for Temperature: kelvin; for Area: square kilometers; for Radiative Power: megawatts. The Fire (HSC) product image is produced on the ABI fixed grid at 2 km resolution for Full Disk and CONUS coverage regions. Product data is produced under the following conditions: Existence of land; Geolocated source data to local zenith angles of 80 degrees, solar zenith angles between 10 and 180 degrees, and sunglint angles greater than 10 degrees.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: HUMAN DIMENSIONS > NATURAL HAZARDS > FIRES

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: fire_area
keyword: fire_temperature
keyword: fire_radiative_power
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-17
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282

northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Mask
attributeType:
descriptor: ABI Level 2+ Fire (Hot Spot Characterization): Fire Mask
units:
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Area
attributeType:
descriptor: ABI Level 2+ Fire (Hot Spot Characterization): Fire Area
units:
DerivedUnit:
identifier: km2
derivationUnitTerm: meter
scaleFactor:

offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Temp
attributeType:
descriptor: ABI Level 2+ Fire (Hot Spot Characterization): Fire Temperature
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: Power
attributeType:
descriptor: ABI Level 2+ Fire (Hot Spot Characterization): Fire Power
units:
DerivedUnit:
identifier: MW
derivationUnitTerm: watt
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Fire (Hot Spot Characterization) data quality flags
units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) series

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of pixels with fire detected, but fire temperature, area and radiative power not reported; Number of pixels with fire temperature and area reported, but radiative power not reported; Number of pixels with fire temperature, area, and radiative power reported; Number of fire temperature, fire area, and fire radiative power pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the values in the fire temperature, fire area, and fire radiative power product images. The fire pixel count statistics are calculated using good quality fire pixels where the fire mask for these pixels indicate at least medium probability of fire. The fire temperature, fire area, and fire radiative power minimum, maximum, mean and standard deviation statistics are calculated using good quality fire pixels where the fire mask for these pixels indicate definite fire. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Fire product is generated by the GOES-R ABI Land Fire ground processing algorithm. The Fire algorithm is a dynamic multispectral thresholding algorithm that uses the differences in sensitivity to high temperature subpixel anomalies of ABI bands 7 and 14, with central wavelengths of 3.9 and 11.2 um, respectively. The algorithm consists of a series of screening tests, threshold tests, and calculations that are applied to each pixel. Estimates of subpixel fire area, temperature, and power are computed based on a screening. Additionally, subsequent analysis can introduce additional fire pixels in the fire mask for which fire properties are not derived from the source ABI data. Pixels in the product images with out of range values are assigned the minimum or maximum value in the valid range. Reflectance for band 2 and brightness temperature for band 15 are

used in cloud tests but are not required to detect fires. The algorithm maintains “time of last fire” intermediate data for each pixel that is used and updated for each execution of the algorithm.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.20 Land Surface (Skin) Temperature Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f22c3310-b00a-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Land Surface Temperature Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-18
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-LST-ISO-SERIES_c20142910601230.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 1086
resolution:
Distance: 10 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1500
resolution:
Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 2500
resolution:
Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.
 code: goes_projection
 codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
 title: ABI Level 2+ Land Surface Temperature Product
 alternateTitle: Data short name (DSN): ABI-L2-LSTM1-M3
 alternateTitle: Data short name (DSN): ABI-L2-LSTM2-M3
 alternateTitle: Data short name (DSN): ABI-L2-LSTC-M3
 alternateTitle: Data short name (DSN): ABI-L2-LSTC-M4
 alternateTitle: Data short name (DSN): ABI-L2-LSTF-M3
 alternateTitle: Data short name (DSN): ABI-L2-LSTF-M4
 date: (CI_Date)
 date: 2014-10-18
 dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: The Land Surface (Skin) Temperature product contains an image with pixel values identifying the instantaneous land surface skin temperature or surface radiometric temperature. Measured from the perspective of the satellite, the product is limited to clear conditions over land and represents the effective land temperature over an isothermal mixed pixel. The product includes data quality information that provides an assessment of the quality of the algorithm retrievals for on-earth pixels. The units of measure for the land surface (skin) temperature value is kelvin. The Land Surface (Skin) Temperature product image is produced on the ABI fixed grid at 10 km resolution for Full Disk and 2 km resolution for CONUS and Mesoscale coverage regions. Product data is produced under the following conditions: Existence of land; Clear sky; Geolocated source data to local zenith angles of 85 degrees for both daytime and nighttime conditions.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: LAND SURFACE > LAND TEMPERATURE > LAND SURFACE TEMPERATURE
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: surface_temperature
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 10 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)

code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: LST
attributeType:
descriptor: ABI Level 2+ Land Surface Temperature
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Land Surface Temperature data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of good retrievals; Number of good retrievals where valid land surface (skin) temperature data is determined. Number of land surface (skin) temperature pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the land surface (skin) temperature values in the product image. These statistics are calculated using pixels with good retrievals and a local zenith angle to 85 degrees. The percentages of pixels assigned to each retrieval quality value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Land Surface Temperature product is generated by the GOES-R ABI Land Surface Temperature ground processing algorithm. This product is generated using a regression algorithm based on ABI brightness temperatures and brightness temperature differences for ABI window bands 14 and 15 with central wavelengths of 11.2 and 12.3 um, respectively and on Level 2+ processing parameters containing surface emissivity data. The algorithm applies difference regression

coefficients for dry or moist atmospheric conditions as determined from the Total Precipitable Water product or the NWP total precipitable water dynamic processed ancillary data. The 10 km resolution Total Precipitable Water product is upscaled to 2 km using nearest neighbor to support the retrieval. The Land Surface Temperature algorithm operates on 2 km resolution pixels and generates products at this resolution for CONUS and Mesoscale coverage regions, and aggregates the retrieved land surface temperatures to 10 km resolution for the Full Disk coverage region.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The

satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:
code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:
code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/abi.html>
date:
code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.21 Snow Cover Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: e7ce8b20-b00a-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Fractional Snow Cover Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-17

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-FSC-ISO-SERIES_c20142901609480.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 1500
resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 2500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 500
 resolution:
 Distance: 2 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for geo-referencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: ABI Level 2+ Fractional Snow Cover Product

alternateTitle: Data short name (DSN): ABI-L2-FSCM1-M3

alternateTitle: Data short name (DSN): ABI-L2-FSCM2-M3

alternateTitle: Data short name (DSN): ABI-L2-FSCC-M3

alternateTitle: Data short name (DSN): ABI-L2-FSCC-M4

alternateTitle: Data short name (DSN): ABI-L2-FSCF-M3

alternateTitle: Data short name (DSN): ABI-L2-FSCF-M4

date: (CI_Date)

date: 2014-10-17

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Snow Cover product contains an image with pixel values identifying the fraction of their areas covered by snow. The product includes data quality information that provides an assessment of the snow cover data values for on-earth pixels. The units of measure for the snow cover value is percent. The Snow Cover product image is produced on the ABI fixed grid at 2 km resolution for Full Disk, CONUS and Mesoscale coverage regions. Product data is produced under the following conditions: Existence of land; Clear sky; Geolocated source data to local zenith angles of 90 degrees and solar zenith angles of 90 degrees.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

13 May 2015

country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: CRYOSPHERE > SNOW/ICE > SNOW COVER
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: surface_snow_area_fraction
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 2 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-17
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995

eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.1198
eastBoundLongitude: -58.7853
southBoundLatitude: 14.0097
northBoundLatitude: 55.6790
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.6972
eastBoundLongitude: -56.0418
southBoundLatitude: 13.7412
northBoundLatitude: 55.1071
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: FSC
attributeType:
descriptor: ABI Level 2+ Snow Cover, which contains fraction of pixel covered by snow
units:
DerivedUnit:
identifier: percent
derivationUnitTerm: percent

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scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Snow Cover data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) dataset
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of snow cover pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the snow cover values in the product image; Minimum, maximum, mean, and standard deviation of the root mean square difference between the observed surface bidirectional reflectance values in ABI reflective bands 1, 2, 3, 5 and 6 with central wavelengths of 0.47, 0.64, 0.865, 1.61, and 2.25 um, and the corresponding modeled values derived from a multiple endmember mixing model values in the product image. These statistics are calculated using good quality pixels. The percentages of pixels assigned to each DQF value are also included in the product.

result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:

value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Snow Cover product is generated by the GOES-R ABI Snow Cover ground processing algorithm. The algorithm relies on atmospherically-corrected surface reflectances derived as part of the determination of the surface albedo and does not use ABI Level 1b data inputs directly. The product is generated using spectral mixture analysis with a look-up table containing spectral reflectances of individual surfaces calculated from a radiative transfer model, and also a physical retrieval utilizing a spectral library lookup table to account for the dependency of reflectance on snow grain size, and local and solar zenith angles. The algorithm maintains an endmember memory file that contains two values per pixel indicating the endmember identifiers of the last modeled endmembers. Types of endmembers are land surface materials such as snow, vegetation, and rock, and are characterized using unique reflectance spectra based on modeled and field measurements. The endmemory memory file is re-initialized daily.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: [https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA Processing Levels](https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels)
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect

public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages.

The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.22 Sea Surface (Skin) Temperature Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: d70be540-c38a-11e0-962b-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Sea Surface (Skin) Temperature

Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-18

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-SST-ISO-SERIES_c20142911133250.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) column

dimensionSize: 5424

resolution:

Distance: 2 km at nadir

cellGeometry: (MD_CellGeometryCode) area

transformationParameterAvailability: true

checkPointAvailability: false

pointInPixel: (MD_PixelOrientationCode) upperLeft

transformationDimensionDescription: Full Disk

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R ABI level 1b and level 2+ products are on the ABI fixed grid. The ABI fixed grid defines the location of each data point to allow for georeferencing. The ABI fixed grid is a projection that is mathematically based on the idealized location of the GOES-R satellite. The ABI fixed grid allows the data points in every product from a GOES-R satellite at a particular longitude in geostationary orbit generated over time to be at the same location on the earth. All of the dynamics associated with an orbiting satellite are removed to accomplish this. The fixed grid is rectified to a GRS80 geoid viewed from the idealized geostationary position.

code: goes_projection

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: Advanced Baseline Imager (ABI) Level 2+ Sea Surface (Skin) Temperature Product

alternateTitle: Data short name (DSN): ABI-L2-SSTF-M3

alternateTitle: Data short name (DSN): ABI-L2-SSTF-M4

date: (CI_Date)

date: 2014-10-18

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Sea Surface (Skin) Temperature product contains an image with pixel values identifying the variations in temperature of the top 10 um of the sea surface. These values are calibrated to the bulk temperature at a depth of 1 m associated with in situ temperature measurements. On average, the pixel values represent the bulk sea surface temperature, but horizontal spatial variations in the product image reveal features associated with the sea surface skin temperature. The product includes data quality information that provides an assessment of the sea surface (skin) temperature data values for on-earth pixels. The units of measure for the sea surface (skin) temperature value is kelvin. The Sea Surface (Skin) Temperature product image is produced on the ABI fixed grid at 2 km resolution for the Full Disk coverage region. Product data is produced under the following conditions: Existence of sea; Geolocated source data to local zenith angles of 90

degrees for both daytime and nighttime conditions.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF

version: 4

descriptiveKeywords: (MD_Keywords)

keyword: OCEANS > OCEAN TEMPERATURE > SEA SURFACE TEMPERATURE

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: NASA Global Change Master Directory (GCMD) Earth Science Keywords

date: (CI_Date)

date: 2012-10

dateType: (CI_DateTypeCode) revision

edition: Version 7.0.0.0.0

citedResponsibleParty: (CI_ResponsibleParty)

individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea

role: (CI_RoleCode) author

descriptiveKeywords: (MD_Keywords)

keyword: sea_surface_skin_temperature

type: (MD_KeywordTypeCode) theme

thesaurusName: (CI_Citation)

title: CF Standard Name Table v25

date: (CI_Date)

date: 2013-07-05

dateType: (CI_DateTypeCode) revision

resourceConstraints: (MD_SecurityConstraints)

useLimitation: Unrestricted

classification: (MD_ClassificationCode) unclassified

spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid

spatialResolution: (MD_Resolution)

distance:

Distance: 2 km at nadir

language: eng; USA

characterSet: (MD_CharacterSetCode) utf8

topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere

extent: (EX_Extent)

temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.2995
eastBoundLongitude: 6.2995
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.7005
eastBoundLongitude: -55.7005
southBoundLatitude: -81.3282
northBoundLatitude: 81.3282

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: SST
attributeType:
descriptor: ABI Level 2+ Sea Surface (Skin) Temperature
units:
DerivedUnit:
identifier: K
derivationUnitTerm: kelvin
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:

descriptor: ABI Level 2+ Sea Surface (Skin) Temperature data quality flags
units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of good quality sea surface (skin) temperature pixels; Number of degraded and severely degraded quality sea surface (skin) temperature pixels; Number of unprocessed on-earth pixels in the sea surface (skin) temperature image; Number of day, night, and twilight sea surface (skin) temperature pixels; Number of sea surface (skin) temperature pixels whose values are outside the required measurement range; Minimum, maximum, mean, and standard deviation of the land surface (skin) temperature values in the product image; Minimum, maximum, mean, and standard deviation of the difference in the observed and modeled brightness temperature for ABI band 7 with central wavelength of 3.9 um used during the nighttime only generation of the sea surface (skin) temperature data; Minimum, maximum, mean, and standard deviation of the difference in the observed and modeled brightness temperature for ABI bands 14 and 15 with central wavelengths of 11.2 and 12.3 um used during the daytime and nighttime generation of the sea surface (skin) temperature data. The number of good quality, day, night, twilight, and outlier statistics are calculated using geolocated sea pixels to a local zenith angle of 67 degrees. The degraded count statistics are calculated using geolocated sea pixels to a local zenith angle of 90 degrees. The sea surface (skin) temperature and brightness temperature difference statistics are calculated using good quality pixels to a local zenith angle of 67 degrees. The percentages of pixels assigned to each DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_GRB_errors

evaluationMethodDescription: percent data lost due to uncorrectable GRB errors

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Sea Surface (Skin) Temperature product is generated by the GOES-R ABI Sea Surface (Skin) Temperature ground processing algorithm. This product is retrieved using a hybrid regression algorithm that incorporates observed brightness temperatures, clear sky brightness temperatures computed based on the Community Radiative Transfer Model (CRTM), and the Reynolds sea surface temperature. Regression coefficients are defined for daytime and for nighttime conditions. This algorithm can also be configured to execute in a standard regression configuration that does not rely on the CRTM inputs. An attribute of the primary data variable in the product file, "algorithm_type", indicates the specific algorithm used. Both algorithms employ a multiband approach, relying on brightness temperature in ABI bands 7, 14, and 15 with central wavelengths 3.9, 11.2, and 12.3 um for nighttime, and ABI bands 14 and 15 for daytime. Pixels in the product image with out-of-range values are assigned the minimum or maximum value in the valid range. The product is a composite, making use of multiple ABI Full Disk observations collected over a one hour period at fifteen minute intervals. The algorithm applies the hybrid regression for all ocean pixels regardless of cloud cover.

processor: (CI_ResponsibleParty)

organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)

role: (CI_RoleCode) processor

output: (LE_Source)

processedLevel: (MD_Identifier)

authority: (CI_Citation)

title: NOAA Processing Levels

date: (CI_Date)

date: 2013-11

dateType: (CI_DateTypeCode) revision

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)

contactInfo: (CI_Contact)

onlineResource: (CI_OnlineResource)

linkage: [https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA Processing Levels](https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels)

role: (CI_RoleCode) publisher

code: L2

metadataMaintenance: (MD_MaintenanceInformation)

maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded

maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)

operation: (MI_Operation)

description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect

public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages.

The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.23 Downward Shortwave Radiation: Surface Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: de00d810-b013-11e1-afa6-0800200c9a66
language: eng
characterSet: (MD_CharacterSetCode) utf8
parentIdentifier: n/a
hierarchyLevel: (MD_ScopeCode) series
hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Downward Shortwave Radiation:
Surface Product Collection
contact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and
Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
dateStamp: 2014-10-18
metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for
imagery and gridded data
metadataStandardVersion: ISO 19115-2:2009(E)
dataSetURI: OR_ABI-L2-DSR-ISO-SERIES_c20142911829410.xml

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 326
resolution:
Distance: 50 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 326
resolution:
Distance: 50 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 378

resolution:
Distance: 25 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 167
resolution:
Distance: 25 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) row
dimensionSize: 565
resolution:
Distance: 5 km at nadir
axisDimensionProperties: (MD_Dimension)
dimensionName: (MD_DimensionNameTypeCode) column
dimensionSize: 888
resolution:
Distance: 5 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Mesoscale

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) publication
otherCitationDetails: The data points on GOES-R Radiation products use the latitude_longitude CF grid mapping. The coordinates for the global latitude/longitude grid are latitude and longitude. In two-dimensional map space, the x-axis is at the equator, and the y-axis is at the prime (Greenwich) meridian. By convention, degrees north and degrees east are used for latitude and longitude, respectively.
code: latitude_longitude
codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
title: ABI Level 2+ Downward Shortwave Radiation: Surface Product

alternateTitle: Data short name (DSN): ABI-L2-DSRM1-M3
alternateTitle: Data short name (DSN): ABI-L2-DSRM2-M3
alternateTitle: Data short name (DSN): ABI-L2-DSRC-M3
alternateTitle: Data short name (DSN): ABI-L2-DSRC-M4
alternateTitle: Data short name (DSN): ABI-L2-DSRF-M3
alternateTitle: Data short name (DSN): ABI-L2-DSRF-M4
date: (CI_Date)
date: 2014-10-18
dateType: (CI_DateTypeCode) creation
identifier: (MD_Identifier)
authority: (CI_Citation)
title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products
date: (CI_Date)
date: 2014
dateType: (CI_DateTypeCode) revision
code: GOES-R Document Control Number: 7035538
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
abstract: The Downward Shortwave Radiation: Surface product contains an image with pixel values identifying the instantaneous total shortwave irradiance (flux) received at the Earth's surface integrated over the 0.2 to 4.0 um wavelength bandpass. It includes contributions from direct solar radiation attenuated by the atmosphere and from diffuse radiation associated with scattering within the atmosphere. The product includes data quality information that provides an assessment of the downward shortwave radiation: surface data values for on-earth pixels. The units of measure for the downward shortwave radiation: surface value is watts per square meter. The Downward Shortwave Radiation: Surface product image is produced on a global latitude/longitude grid at 0.5 degree resolution for Full Disk, 0.25 degree resolution for CONUS, and 0.05 degree resolution for Mesoscale coverage regions. Product data is produced for geolocated source data to local zenith angles of 90 degrees and solar zenith angles to 90 degrees.
pointOfContact: (CI_ResponsibleParty)
organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce
contactInfo: (CI_Contact)
address: (CI_Address)
deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor
city: Silver Spring
administrativeArea: MD
postalCode: 20910
country: USA

electronicMailAddress: GOES-R@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC RADIATION > SHORTWAVE
RADIATION
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M.
Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M.
Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: surface_downwelling_shortwave_flux_in_air
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 50 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 25 km at nadir
spatialResolution: (MD_Resolution)
distance:
Distance: 5 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.50
eastBoundLongitude: 6.50
southBoundLatitude: -81.50
northBoundLatitude: 81.50

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.50
eastBoundLongitude: -55.50
southBoundLatitude: -81.50
northBoundLatitude: 81.50

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.25
eastBoundLongitude: -58.75
southBoundLatitude: 14.00
northBoundLatitude: 55.75

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.75
eastBoundLongitude: -56.00
southBoundLatitude: 13.50
northBoundLatitude: 55.25

extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Mesoscale

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DSR

attributeType:
descriptor: ABI Level 2+ Downward Shortwave Radiation: Surface
units:
DerivedUnit:
identifier: W m-2
derivationUnitTerm: watt
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: DQF
attributeType:
descriptor: ABI Level 2+ Downward Shortwave Radiation: Surface data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
level: (MD_ScopeCode) series
report: (DQ_QuantitativeAttributeAccuracy)
nameOfMeasure: Product summary statistics
evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Number of attempted retrievals to local zenith angle of 70 degrees; Number of downward shortwave radiation: surface pixels whose values are outside the required measurement range; Cloud fraction in product image; Minimum, maximum, mean, and standard deviation of the solar zenith angle values for the product image's pixels; Minimum, maximum, mean, and standard deviation of the downward shortwave radiation: surface values in the product image. The attempted retrieval count, cloud fraction, and solar zenith angle statistics are calculated using geolocated pixels to a solar zenith angle of 90 degrees. The downward shortwave radiation: surface outlier count and other statistics are calculated using good quality pixels to a local zenith angle to 70 degrees and solar zenith angle to 70 degrees. The percentages of pixels assigned to each DQF value are also included in the product.
result:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_L0_errors
evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:

value:
report: (DQ_CompletenessOmission)
nameOfMeasure: percent_uncorrectable_GRB_errors
evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
result: (DQ_QuantitativeResult)
valueUnit:
BaseUnit:
identifier: percent
unitsSystem:
value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
description: The Downward Shortwave Radiation: Surface product is generated by the GOES-R ABI Downward Shortwave Radiation: Surface and Reflected Shortwave Radiation: TOA ground processing algorithm. Depending on the availability of inputs, the algorithm performs either a direct or indirect retrieval of broadband transmittance and reflectance over four scene types: clear sky over no snow/ice; clear sky over snow/ice; water cloud, and; ice cloud. The direct retrieval is primary method. Computed atmospheric transmittance and reflectance are used to derive the shortwave fluxes at the surface and TOA. The direct retrieval path uses ABI products to estimate fluxes from Level 2 processing parameter lookup tables whose values are based on a forward radiative transfer model. When inputs needed for the direct retrieval path are not available, the algorithm uses the indirect retrieval path, invoking a multistep inversion scheme. The indirect retrieval path includes the calculation of a clear-sky snow/ice-free composite TOA albedo derived from the ABI reflectance observations over the previous 29 days. Both retrieval paths rely on primary inputs at 2 km resolution that are averaged over each scene type on the output global latitude/longitude grid. Grid cells within the product extent not represented by a direct mapping between the ABI fixed grid and the global latitude/longitude grid are assigned values based on the nearest neighbor. The coverage region included in the Full Disk and CONUS radiation products is the minimum bounding rectangle within the global latitude/longitude grid. In the case of the mesoscale coverage region, the radiation product data structure dimensions are fixed and based on its maximum latitude/longitude extent on the ABI Full Disk. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range.
processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration
 (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processi

[ng Levels](#)

role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://science.nasa.gov/missions/goes-r/>
date:

code:
status: (MD_ProgressCode) onGoing

parentOperation:
platform: (MI_Platform)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov>
date:

code: GOES-East (G16)
description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection

products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.24 Reflected Shortwave Radiation: Top-Of-Atmosphere Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: 02f5ddc0-b008-11e1-afa6-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for ABI Level 2+ Reflected Shortwave Radiation: Top-Of-Atmosphere Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-18

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_ABI-L2-RSR-ISO-SERIES_c20142911843070.xml

spatialRepresentationInfo: (MD_Georectified)

numberOfDimensions: 2

axisDimensionProperties: (MD_Dimension)

dimensionName: (MD_DimensionNameTypeCode) row

dimensionSize: 652
resolution:
 Distance: 25 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 652
 resolution:
 Distance: 25 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: Full Disk

spatialRepresentationInfo: (MD_Georectified)
numberOfDimensions: 2
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) row
 dimensionSize: 167
 resolution:
 Distance: 25 km at nadir
axisDimensionProperties: (MD_Dimension)
 dimensionName: (MD_DimensionNameTypeCode) column
 dimensionSize: 378
 resolution:
 Distance: 25 km at nadir
cellGeometry: (MD_CellGeometryCode) area
transformationParameterAvailability: true
checkPointAvailability: false
pointInPixel: (MD_PixelOrientationCode) upperLeft
transformationDimensionDescription: CONUS

referenceSystemInfo: (MD_ReferenceSystem)
referenceSystemIdentifier: (RS_Identifier)
authority: (CI_Citation)
 title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products
 date: (CI_Date)
 date: 2014
 dateType: (CI_DateTypeCode) publication
 otherCitationDetails: The data points on GOES-R Radiation products use the latitude_longitude CF grid mapping. This grid mapping defines the canonical 2D geographical coordinate system based upon latitude and longitude coordinates on a spherical Earth. It is included so that the figure of the Earth can be described.
 code: latitude_longitude
 codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)
citation: (CI_Citation)
 title: ABI Level 2+ Reflected Shortwave Radiation: Top-Of-Atmosphere Product

alternateTitle: Data short name (DSN): ABI-L2-DSRC-M3

alternateTitle: Data short name (DSN): ABI-L2-DSRC-M4

alternateTitle: Data short name (DSN): ABI-L2-DSRF-M3

alternateTitle: Data short name (DSN): ABI-L2-DSRF-M4

date: (CI_Date)

date: 2014-10-18

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2 Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Reflected Shortwave Radiation: TOA product contains an image with pixel values identifying the instantaneous total shortwave irradiance (flux) emerging at the Earth's TOA integrated over the 0.2 to 4.0 um wavelength bandpass. It includes contributions from the solar radiation reflected upward by the Earth's surface and that scattered by the atmosphere. The product includes data quality information that provides an assessment of the reflected shortwave radiation: TOA data values for on-earth pixels. The units of measure for the reflected shortwave radiation: TOA value is watts per square meter. The Reflected Shortwave Radiation: TOA product image is produced on a global latitude/longitude grid at 0.25 degree resolution for Full Disk and CONUS coverage regions. Product data is produced for geolocated source data to local zenith angles of 90 degrees and solar zenith angles to 90 degrees.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

resourceFormat: (MD_Format)

name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC RADIATION > SHORTWAVE RADIATION
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C. Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: toa_outgoing_shortwave_flux
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 25 km at nadir
language: eng; USA
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-18
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -156.50
eastBoundLongitude: 6.50
southBoundLatitude: -81.50
northBoundLatitude: 81.50

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extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: 141.50
eastBoundLongitude: -55.50
southBoundLatitude: -81.50
northBoundLatitude: 81.50
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -153.25
eastBoundLongitude: -58.75
southBoundLatitude: 14.00
northBoundLatitude: 55.75
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: CONUS - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -132.75
eastBoundLongitude: -56.00
southBoundLatitude: 13.50
northBoundLatitude: 55.25

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: RSR
attributeType:
descriptor: ABI Level 2+ Reflected Shortwave Radiation: TOA
units:
DerivedUnit:
identifier: W m-2
derivationUnitTerm: watt
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable

contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: DQF
 attributeType:
descriptor: ABI Level 2+ Reflected Shortwave Radiation: TOA data quality flags
units:

dataQualityInfo: (DQ_DataQuality)
scope: (DQ_Scope)
 level: (MD_ScopeCode) series
report: (DQ_QuantitativeAttributeAccuracy)
 nameOfMeasure: Product summary statistics
 evaluationMethodDescription: Start, midpoint, and end time of the product image observation period; Number of attempted retrievals; Number of attempted retrievals to local zenith angle of 70 degrees; Number of reflected shortwave radiation: TOA pixels whose values are outside the required measurement range; Cloud fraction in product image; Minimum, maximum, mean, and standard deviation of the solar zenith angle values for the product image's pixels; Minimum, maximum, mean, and standard deviation of the reflected shortwave radiation: TOA values in the product image. The attempted retrieval count, cloud fraction, and solar zenith angle statistics are calculated using geolocated pixels to a solar zenith angle of 90 degrees. The downward shortwave radiation: surface outlier count and other statistics are calculated using good quality pixels to a local zenith angle to 70 degrees and solar zenith angle to 70 degrees. The percentages of pixels assigned to each DQF value are also included in the product.
 result:
 report: (DQ_CompletenessOmission)
 nameOfMeasure: percent_uncorrectable_L0_errors
 evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.
 result: (DQ_QuantitativeResult)
 valueUnit:
 BaseUnit:
 identifier: percent
 unitsSystem:
 value:
report: (DQ_CompletenessOmission)
 nameOfMeasure: percent_uncorrectable_GRB_errors
 evaluationMethodDescription: percent data lost due to uncorrectable GRB errors
 result: (DQ_QuantitativeResult)
 valueUnit:
 BaseUnit:
 identifier: percent
 unitsSystem:
 value:
lineage: (LI_Lineage)
processStep: (LE_ProcessStep)
 description: The Reflected Shortwave Radiation: TOA product is generated by the GOES-

R ABI Downward Shortwave Radiation: Surface and Reflected Shortwave Radiation: TOA ground processing algorithm. Depending on the availability of inputs, the algorithm performs either a “direct” or “indirect” retrieval of broadband transmittance and reflectance over four scene types: clear sky over no snow/ice; clear sky over snow/ice; water cloud, and; ice cloud. The “direct” retrieval is primary method. Computed atmospheric transmittance and reflectance are used to derive the shortwave fluxes at the surface and TOA. The “direct” retrieval path uses ABI products to estimate fluxes from Level 2 processing parameter lookup tables whose values are based on a forward radiative transfer model. When inputs needed for the “direct” retrieval path are not available, the algorithm uses the “indirect” retrieval path, invoking a multistep inversion scheme. The “indirect” retrieval path includes the calculation of a clear-sky snow/ice-free composite TOA albedo derived from the ABI reflectance observations over the previous 29 days. Both retrieval paths rely on primary inputs at 2 km resolution that are averaged over each scene type on the output global latitude/longitude grid. Grid cells within the product extent not represented by a direct mapping between the ABI fixed grid and the global latitude/longitude grid are assigned values based on the nearest neighbor. The coverage region included in the Full Disk and CONUS radiation products is the minimum bounding rectangle within the global latitude/longitude grid. In the case of the mesoscale coverage region, the radiation product data structure dimensions are fixed and based on its maximum latitude/longitude extent on the ABI Full Disk. Pixels in the product image with out of range values are assigned the minimum or maximum value in the valid range.

processor: (CI_ResponsibleParty)
organisationName: NESDIS/OSPO at NSOF (NOAA Satellite Operations Facility, Suitland, MD)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: ISO Series metadata contain quasi-static general information about a collection of datasets of a particular product that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle

from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-16 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/abi.html>

date:

code: GOES-17 ABI instrument_id (serial number)

type: Advanced Baseline Imager

description: The Advanced Baseline Imager is the primary instrument on GOES-R for imaging Earth's weather, climate, and environment. The ABI observes the Earth at 16 different spectral bands, including two visible channels, four near-infrared channels, and ten infrared channels. The products generated from ABI observations provides spatial resolutions between 0.5 and 2.0 km. Forecasters use these high resolution images to track the development of storms in their early stages. The GOES-R ABI is used for a wide range of applications related to weather, oceans, land, climate, and hazards (fires, volcanoes, hurricanes, and storms that spawn tornados). The ABI has two primary scan modes. The continuous full disk mode provide uninterrupted scans of the full disk every 5 minutes, while the flex mode concurrently allows full disk imagery every 15 minutes, the continental US every 5 minutes, and two interleaved mesoscale regions with each viewed every 60 seconds. The

ABI is calibrated to an accuracy of 3% (1 σ) radiance for visible and near-infrared wavelengths. For infrared channels, the ABI is accurate to 1K (1 σ) at 300K.

5.1.25 Surface Albedo Product

The current ground system baseline does not produce the Surface Albedo product.

5.1.26 Lightning Detection Product ISO Series Metadata

(MI_Metadata)

fileIdentifier: f5816f53-fd6d-11e3-a3ac-0800200c9a66

language: eng

characterSet: (MD_CharacterSetCode) utf8

parentIdentifier: n/a

hierarchyLevel: (MD_ScopeCode) series

hierarchyLevelName: ISO Series Metadata for GLM Level 2+ Lightning Detection Product Collection

contact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: GOES-R@noaa.gov

role: (CI_RoleCode) originator

dateStamp: 2014-10-01

metadataStandardName: ISO 19115-2 Geographic Information - Metadata Part 2 Extensions for imagery and gridded data

metadataStandardVersion: ISO 19115-2:2009(E)

dataSetURI: OR_GLM-L2-LCFA-ISO-SERIES_c20142741134100.xml

referenceSystemInfo: (MD_ReferenceSystem)

referenceSystemIdentifier: (RS_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) publication

otherCitationDetails: The data points on GOES-R GLM products use the latitude_longitude CF grid mapping. This grid mapping defines the canonical 2D geographical coordinate system based upon latitude and longitude coordinates on a spherical Earth. It is included so that the figure of the Earth can be described.

code: latitude_longitude

codeSpace: <http://cfconventions.org/latest.html>

identificationInfo: (MD_DataIdentification)

citation: (CI_Citation)

title: GLM Level 2+ Lightning Detection Product

alternateTitle: Data short name (DSN): GLM-L2-LCFA

date: (CI_Date)

date: 2014-10-01

dateType: (CI_DateTypeCode) creation

identifier: (MD_Identifier)

authority: (CI_Citation)

title: Product Definition and Users Guide (PUG) Volume 5: Level 2+ Products

date: (CI_Date)

date: 2014

dateType: (CI_DateTypeCode) revision

code: GOES-R Document Control Number: 7035538

citedResponsibleParty: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD

postalCode: 20910

country: USA

electronicMailAddress: goes-r@noaa.gov

role: (CI_RoleCode) originator

abstract: The Lightning Detection product contains a list of lightning flashes, and their constituent groups and events. The definition of and relationship among flashes, groups, and events are governed by the following spatial and temporal characteristics: An event represents the signal detected from the cloud top associated with a lightning emission in an individual sensor pixel for a 2 ms integration period; A group represents the events detected in adjacent sensor pixels for the same integration period as an event; A flash represents a series of measurements constrained by temporal and spatial extent thresholds that are associated with one or more groups. The parent, child relationship among specific flashes, groups, and events is stored in the product. Data for each flash includes an energy-weighted centroid latitude, longitude location, time span of occurrence, amount of radiant energy, and coverage area. Data for each group includes an energy-weighted centroid latitude, longitude location, mean time of occurrence, amount of radiant energy, and coverage area. Data for each event includes a latitude, longitude location, time of occurrence, and amount of radiant energy. The product includes data quality information for each flash and group. A Lightning Detection product file contains a set of flashes, and its constituent groups and events for a 20 second period. The units of measure for the flash, group, and event radiant energy values is joules. The units of measure for the flash and group coverage areas is square kilometers.

pointOfContact: (CI_ResponsibleParty)

organisationName: DOC/NOAA/NESDIS > National Environmental Satellite, Data, and Information Services, NOAA, U.S. Department of Commerce

contactInfo: (CI_Contact)

address: (CI_Address)

deliveryPoint: 1335 East-West Highway, SSMC1, 8th Floor

city: Silver Spring

administrativeArea: MD
postalCode: 20910
country: USA
electronicMailAddress: goes-r@noaa.gov
role: (CI_RoleCode) originator
resourceFormat: (MD_Format)
name: netCDF
version: 4
descriptiveKeywords: (MD_Keywords)
keyword: ATMOSPHERE > ATMOSPHERIC ELECTRICITY > LIGHTNING
keyword: ATMOSPHERE > ATMOSPHERIC PHENOMENA > LIGHTNING
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: NASA Global Change Master Directory (GCMD) Earth Science Keywords
date: (CI_Date)
date: 2012-10
dateType: (CI_DateTypeCode) revision
edition: Version 7.0.0.0.0
citedResponsibleParty: (CI_ResponsibleParty)
individualName: Olsen, L.M., G. Major, K. Shein, J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman, R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas, C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo, R. Bilodea
role: (CI_RoleCode) author
descriptiveKeywords: (MD_Keywords)
keyword: lightning_radiant_energy
type: (MD_KeywordTypeCode) theme
thesaurusName: (CI_Citation)
title: CF Standard Name Table v25
date: (CI_Date)
date: 2013-07-05
dateType: (CI_DateTypeCode) revision
resourceConstraints: (MD_SecurityConstraints)
useLimitation: Unrestricted
classification: (MD_ClassificationCode) unclassified
spatialRepresentationType: (MD_SpatialRepresentationTypeCode) grid
spatialResolution: (MD_Resolution)
distance:
Distance: 8 km
language: eng; USA
characterSet: (MD_CharacterSetCode) utf8
topicCategory: (MD_TopicCategoryCode) climatologyMeteorologyAtmosphere
extent: (EX_Extent)
temporalElement: (EX_TemporalExtent)
extent:
TimePeriod:
beginPosition: 2014-10-01
endPosition: now
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)

geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-East
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -141.56
eastBoundLongitude: -8.44
southBoundLatitude: -66.56
northBoundLatitude: 66.56
extent: (EX_Extent)
geographicElement: (EX_GeographicDescription)
geographicIdentifier: (MD_Identifier)
code: Full Disk - GOES-West
geographicElement: (EX_GeographicBoundingBox)
westBoundLongitude: -203.56
eastBoundLongitude: -70.44
southBoundLatitude: -66.56
northBoundLatitude: 66.56

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: event_time_offset
attributeType:
descriptor: GLM Level 2+ Lightning Detection: event's time of occurrence
units:
DerivedUnit:
identifier: milliseconds since start time of product
derivationUnitTerm: second
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: event_energy
attributeType:
descriptor: GLM Level 2+ Lightning Detection: event radiant energy
units:
DerivedUnit:
identifier: J
derivationUnitTerm: joule

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scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: group_time_offset
 attributeType:
 descriptor: GLM Level 2+ Lightning Detection: mean time of group's constituent events'
times of occurrence
 units:
 DerivedUnit:
 identifier: milliseconds since start time of product
 derivationUnitTerm: second
 scaleFactor:
 offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: group_energy
 attributeType:
 descriptor: GLM Level 2+ Lightning Detection: group radiant energy
 units:
 DerivedUnit:
 identifier: J
 derivationUnitTerm: joule
 scaleFactor:
 offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: group_area
 attributeType:
 descriptor: GLM Level 2+ Lightning Detection: group area coverage (pixels containing at
least one constituent event only)

units:
DerivedUnit:
 identifier: km2
 derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: flash_time_offset_of_first_event
 attributeType:
descriptor: GLM Level 2+ Lightning Detection: time of occurrence of first constituent event
in flash
units:
DerivedUnit:
 identifier: milliseconds since start time of product
 derivationUnitTerm: second
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
 MemberName:
 aName: flash_time_offset_of_last_event
 attributeType:
descriptor: GLM Level 2+ Lightning Detection: time of occurrence of last constituent event
in flash
units:
DerivedUnit:
 identifier: milliseconds since start time of product
 derivationUnitTerm: second
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
 RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:

MemberName:
aName: flash_energy
attributeType:
descriptor: GLM Level 2+ Lightning Detection: flash radiant energy
units:
DerivedUnit:
identifier: J
derivationUnitTerm: joule
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) physicalMeasurement
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: flash_area
attributeType:
descriptor: GLM Level 2+ Lightning Detection: flash area coverage (pixels containing at least one constituent event only)
units:
DerivedUnit:
identifier: km2
derivationUnitTerm: meter
scaleFactor:
offset:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: group_quality_flag
attributeType:
descriptor: GLM Level 2+ Lightning Detection: group data quality flags
units:

contentInfo: (MI_CoverageDescription)
attributeDescription:
RecordType: variable
contentType: (MD_CoverageContentTypeCode) thematicClassification
dimension: (MD_Band)
sequenceIdentifier:
MemberName:
aName: flash_quality_flag

attributeType:
descriptor: GLM Level 2+ Lightning Detection: flash data quality flags
units:

dataQualityInfo: (DQ_DataQuality)

scope: (DQ_Scope)

level: (MD_ScopeCode) dataset

report: (DQ_QuantitativeAttributeAccuracy)

nameOfMeasure: Product summary statistics

evaluationMethodDescription: Approximate start and end time of the observation period; Number of flashes, groups, and events; Satellite yaw flip configuration. The percentages of pixels assigned to each flash and group DQF value are also included in the product.

result:

report: (DQ_CompletenessOmission)

nameOfMeasure: percent_uncorrectable_L0_errors

evaluationMethodDescription: Percentage of Raw Data CCSDS Channel Access Data Units (CADUs) received with bit errors too numerous to be corrected by the Low Density Parity Check Forward Error Correction coding.

result: (DQ_QuantitativeResult)

valueUnit:

BaseUnit:

identifier: percent

unitsSystem:

value:

lineage: (LI_Lineage)

processStep: (LE_ProcessStep)

description: The Lightning Detection product is generated by the sequential execution of Level 0, Level 1b and Level 2+ ground processing algorithms. The Level 2+ algorithm is the GOES-R GLM Lightning Cluster-Filter algorithm. The Level 0 algorithm decompresses and extracts events and GLM background image data from the CCSDS packets. The GLM instrument detects areas of potential lightning by capturing optical images of the Earth in its field of view, and identifying potential lightning events based on transient emissions from the tops of cloud. GLM Level 1b algorithm ground processing filters false lightning events using spatial and temporal thresholds and tracking tests. Each event remaining after filtering is radiometrically corrected, navigated to latitude, longitude coordinates, and time-tagged. The time-tag is corrected for light propagation time from cloud to satellite. The Level 2+ Lightning Detection algorithm clusters the events into groups and flashes based on spatial and temporal threshold parameters. Events, groups, and flashes are related in a tree-like structure with each flash made up of a unique set of groups and each group made up of a unique set of events. For each group and flash, the centroid location is its optically-weighted position, the energy is the sum of its events' energies, and its area is the sum of the areas covered by its events' pixels. Flashes from cloud-to-ground lightning and intra-cloud lightning are not distinguished. The wavelength of the radiant energy sensed by the instrument is from 776.87 to 777.87 nm at half the maximum of the spectral response function. The Level 1b and Level 2+ processing algorithms are executed at a cadence of once per second. The flashes for which processing has completed are included in the 20 second products. This means that event, group, time stamp values may be prior to the 20 second period associated with the particular product instance. These algorithms are designed subject to requirements for the maximum event, group, and flash rates to ensure that ground system processing operates at the data rate for lightning in the sensor's field of view.

processor: (CI_ResponsibleParty)

13 May 2015

organisationName: WCDAS (Wallops Command and Data Acquisition Station, Wallops Island, VA), RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
processor: (CI_ResponsibleParty)
organisationName: RBU (Remote Backup Unit, Fairmont, WV)
role: (CI_RoleCode) processor
output: (LE_Source)
processedLevel: (MD_Identifier)
authority: (CI_Citation)
title: NOAA Processing Levels
date: (CI_Date)
date: 2013-11
dateType: (CI_DateTypeCode) revision
citedResponsibleParty: (CI_ResponsibleParty)
organisationName: National Oceanographic and Atmospheric Administration (NOAA) National Geophysical Data Center (NGDC)
contactInfo: (CI_Contact)
onlineResource: (CI_OnlineResource)
linkage: https://www.ngdc.noaa.gov/wiki/index.php?title=NOAA_Processing_Levels
role: (CI_RoleCode) publisher
code: L2

metadataMaintenance: (MD_MaintenanceInformation)
maintenanceAndUpdateFrequency: (MD_MaintenanceFrequencyCode) asNeeded
maintenanceNote: GOES-R ISO Series metadata contain quasi-static general information about a product line that changes infrequently

acquisitionInformation: (MI_AcquisitionInformation)
operation: (MI_Operation)
description: The Geostationary Operational Environmental Satellite-R Series (GOES-R) is the United States Government geostationary weather satellite series having an operational life-cycle from 2016 to the 2030s. The advanced spacecraft and instrument technology used on the GOES-R series result in more timely and accurate forecasts and warnings than previous generations, including the capability to image its near hemispherical field of view in five minutes. The sixteen imaging channels supporting product resolutions between 0.5 and 2.0 km, and lightning detection capability improves support for the detection and observations of meteorological phenomena that directly affect public safety, protection of property, and ultimately, economic health and development. The GOES-R series was a collaborative development and acquisition effort between the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). The GOES-R satellite provides continuous imagery and atmospheric measurements of Earth's Western Hemisphere and space weather monitoring. It is the primary tool for the detection and tracking of hurricanes and severe weather and is a key enabler for fulfilling NOAA's goals of Water and Weather, Climate, Commerce, and Ecosystem. The GOES-R spacecraft is 3-axis stabilized and designed for 10 years of on-orbit operation preceded by up to 5 years of on-orbit storage. The satellite operates through periodic station-keeping and momentum transfer maneuvers, which allow for near-continuous instrument observations.

identifier: (MD_Identifier)
authority: (CI_Citation)

title: <http://science.nasa.gov/missions/goes-r/>

date:

code:

status: (MD_ProgressCode) onGoing

parentOperation:

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-East (G16)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI), Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov/spacesegment/glm.html>

date:

code: GOES-16 GLM serial number

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 8 km continuously day and night over the Americas and adjacent ocean regions. The GLM provides early indication of storm intensification and severe weather events, improved tornado warning lead time, and data for long-term climate variability studies. The GLM provides information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

platform: (MI_Platform)

identifier: (MD_Identifier)

authority: (CI_Citation)

title: <http://www.goes-r.gov>

date:

code: GOES-West (G17)

description: The GOES-R System acquires and disseminates environmental data from geostationary orbit. The system observes the Earth's surface and atmosphere, solar activity, and the in-situ space environment. The major functions of the GOES-R System are to support, process, and distribute the data from its instruments, specifically the Advanced Baseline Imager (ABI),

Geostationary Lightning Mapper (GLM), Solar Ultraviolet Imager (SUVI), EUVS and XRS Irradiance Sensors (EXIS), Space Environment In-Situ Suite (SEISS) and Magnetometer. Other functions of the GOES-R System are to: (1) rebroadcast Level 1b and Level 2+ lightning detection products generated by the GOES-R System (GRB), (2) support terrestrial and oceanographic Data Collection Platforms (DCPs), (3) relay High Rate Information Transmission (HRIT) data between earth terminals and relay the Emergency Managers Weather Information Network (EMWIN) broadcast on the HRIT/EMWIN link, and (4) provide rapid detection of distress messages from the Search and Rescue (SAR) Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs). The GOES operational constellation provides coverage operationally from two locations, one at 75° West longitude and the second at 137° West longitude.

instrument: (MI_Instrument)
identifier: (MD_Identifier)
authority: (CI_Citation)
title: <http://www.goes-r.gov/spacesegment/glm.html>
date:
code: GOES-17 GLM serial number

type: Geostationary Lightning Mapper

description: The Geostationary Lightning Mapper (GLM) is an optical transient detector and imager operating in the near-IR that maps total lightning (in-cloud and cloud-to-ground) activity with near uniform spatial resolution of approximately 8 km continuously day and night over the Americas and adjacent ocean regions. The GLM provides early indication of storm intensification and severe weather events, improved tornado warning lead time, and data for long-term climate variability studies. The GLM provides information to identify growing, active, and potentially destructive thunderstorms over land as well as ocean areas.

5.2 Level 2+ Data

5.2.1 Level 2+ Semi-Static Source Data

*** *This paragraph will be supplied in PUG version D.* ***

5.2.2 Level 2+ Algorithm Packages

*** *This paragraph will be supplied in PUG version D.* ***

6.0 ISO SERIES METADATA FILENAME CONVENTIONS

The main volume of the PUG contains a summary level description of the filename conventions used for all GOES-R product and data files. This appendix contains the detailed filename conventions for Level 0, 1b, and 2+ product and data ISO series metadata.

As discussed in the main volume of the PUG, filenames consist of a set of string fields delimited by an underscore or a period that are concatenated together. The content and format of several of the filename string fields are common across more than one of the ISO series metadata product and data filenames. Refer to Table 6.0-1, Common Filename String Fields.

Table 6.0-1 Common Filename String Fields

Common String Field	Description	Values and Meanings
Creation Date & Time	Date & time the file is created.	“cYYYYDDDDHHMMSS” Notes:

		<ul style="list-style-type: none"> ➤ YYYY = year: e.g. 2015 ➤ DDD = day of year: 001-366 ➤ HH = UTC hour of day: 00-23 ➤ MM = minute of hour: 00-59 ➤ SS = second of minute: 00-59 (60 indicates leap second and third "s" is tenth of second)
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Table 6.0-2, Appendix A Filename Convention Paragraphs for Specific ISO Series Metadata Types, identifies the subordinate paragraph where ISO series metadata are defined for GOES-R products and data. In addition, example filenames are included in the subordinate paragraphs.

Table 6.0-2 Appendix A Filename Convention Paragraphs for Specific ISO Series Metadata Types

Level 1b Product or Data Types	Appendix A Paragraph
Level 0 Products	Paragraph 6.1
Level 1b Products and Data, and GRB Information	Paragraph 6.2
Level 2+ Products and Data	Paragraph 6.3

6.1 Level 0 Products

Level 0 product ISO series metadata filenames are assembled using filename string fields as follows:

<DSN>_Version.<File Extension>

Different ISO series metadata files have unique DSNs. Refer to Table 6.1, Level 0 ISO Series Metadata DSNs.

Table 6.1 Level 0 ISO Series Metadata DSNs

Type of Level 1b Product or Data	ISO Series Metadata DSN	Specific Product
Level 0 Product	OR_ABI-L0-ISO-SERIES	ABI Level 0 Product
	OR_GLM-L0-ISO-SERIES	GLM Level 0 Product
	OR_SUVI-L0-ISO-SERIES	SUVI Level 0 Product
	OR_EXIS-L0-ISO-SERIES	EXIS Level 0 Product
	OR_SEISS-L0-ISO-SERIES	SEISS Level 0 Product
	OR_MAG-L0-ISO-SERIES	Magnetometer Level 0 Product

The file extension for ISO series metadata files is ".xml".

The filename for the third major version, second minor revision to SEISS Level 0 ISO series metadata is: "SEISS-L0-ISO-SERIES_v0302.xml"

6.2 Level 1b Products and Data

Level 1b ISO series metadata filenames are assembled using filename string fields as follows:

<DSN>_<Creation Date & Time>.<File Extension>

The relationship between different ISO series metadata files and the other GOES-R Level 1b products and data files varies as a function of the type of product or data. The relationship between Level 1b product and data files is as follows:

- Each Level 1b product is associated with a unique ISO series metadata file.
- All of the types of GRB information data files are associated with a unique ISO series metadata file.
- ABI sample outlier data file is associated with a unique ISO series metadata file.
- All of the types of instrument calibration data files are associated with a shared, but unique ISO series metadata file.
- All of the types of Level 1b semi-static source data are associated with a shared, but unique ISO series metadata file.
- All of the types of Level 1b algorithm package files are associated with a shared, but unique ISO series metadata file.

Different ISO series metadata files have unique DSNs. Refer to Table 6.2, Level 1b ISO Series Metadata DSNs.

Table 6.2 Level 1b ISO Series Metadata DSNs

Type of Level 1b Product or Data	ISO Series Metadata DSN	Specific Product
Level 1b Product	OR_ABI-L1b-Rad-ISO-SERIES	Radiances
	OR_SUVI-L1b-SUVI-ISO-SERIES	Solar Imagery: X-Ray
	OR_EXIS-L1b-SF XR-ISO-SERIES	Solar Flux: X-Ray
	OR_EXIS-L1b-SFEU-ISO-SERIES	Solar Flux: EUV
	OR_SEIS-L1b-EHIS-ISO-SERIES	Energetic Heavy Ions
	OR_SEIS-L1b-MPSL-ISO-SERIES	Magnetospheric Electrons and Protons: Low Energy
	OR_SEIS-L1b-MPSH-ISO-SERIES	Magnetospheric Electrons and Protons: Medium and High Energy
	OR_SEIS-L1b-SGPS-ISO-SERIES	Solar and Galactic Protons
GRB Information	OR_GRB-INFO-ISO-SERIES	
ABI Sample Outlier Data	OR_SOF-ISO-SERIES	
Instrument Calibration Data	OR_CAL-ISO-SERIES	
Level 1b Semi-Static Source Data	OR_PARM-L1b-ISO-SERIES	
Level 1b Algorithm Packages	OR_ALG-L1b-ISO-SERIES	

The file extension for ISO series metadata files is “.xml”.

The filename for the instrument calibration data ISO series metadata file created at 1:00 PM UTC on January 4, 2015 is:

“CAL-ISO-SERIES_c20140041300000.xml”

6.3 Level 2+ Products and Data

Level 2+ ISO series metadata filenames are assembled using filename string fields as follows:

<DSN>_Version.<File Extension>

The relationship between different ISO series metadata files and the other GOES-R Level 1b products and data files varies as a function of the type of product or data. The relationship between Level 1b product and data files is as follows:

- Each Level 2+ product is associated with a unique ISO series metadata file.
- All of the types of Level 2+ semi-static source data are associated with a shared, but unique ISO series metadata file.
- All of the types of Level 2+ algorithm package files are associated with a shared, but unique ISO series metadata file.

Different ISO series metadata files have unique DSNs. Refer to Table 6.3, Level 2+ ISO Series Metadata DSNs.

Table 6.3 Level 2+ ISO Series Metadata DSNs

Type of Level 2+ Product or Data	ISO Series Metadata DSN	Specific Product
Level 2+ Product	OR_ABI-L2-ACHA-ISO-SERIES	Cloud Top Height
	OR_ABI-L2-ACHT-ISO-SERIES	Cloud Top Temperature
	OR_ABI-L2-ACM-ISO-SERIES	Clear Sky Masks
	OR_ABI-L2-ACTP-ISO-SERIES	Cloud Top Phase
	OR_ABI-L2-ADP-ISO-SERIES	Aerosol Detection
	OR_ABI-L2-AOD-ISO-SERIES	Aerosol Optical Depth
	OR_ABI-L2-CMIP-ISO-SERIES	Cloud & Moisture Imagery
	OR_ABI-L2-COD-ISO-SERIES	Cloud Optical Depth
	OR_ABI-L2-CPS-ISO-SERIES	Cloud Particle Size Distribution
	OR_ABI-L2-CTP-ISO-SERIES	Cloud Top Pressure
	OR_ABI-L2-DMW-ISO-SERIES	Derived Motion Winds
	OR_ABI-L2-DSI-ISO-SERIES	Derived Stability Indices
	OR_ABI-L2-DSR-ISO-SERIES	Downward Shortwave Radiation: Surface
	OR_ABI-L2-FDC-ISO-SERIES	Fire / Hot Spot Characterization
	OR_ABI-L2-FSC-ISO-SERIES	Snow Cover
	OR_ABI-L2-HIE-ISO-SERIES	Hurricane Intensity
	OR_ABI-L2-LST-ISO-SERIES	Land Surface (Skin) Temperature
	OR_ABI-L2-LVTP-ISO-SERIES	Legacy Vertical Moisture Profile
	OR_ABI-L2-RRQPE-ISO-SERIES	Rainfall Rate/QPE
	OR_ABI-L2-RSR-ISO-SERIES	Reflected Shortwave Radiation: TOA
	OR_ABI-L2-SST-ISO-SERIES	Sea Surface (Skin) Temperature
	OR_ABI-L2-TPW-ISO-SERIES	Total Precipitable Water
	OR_ABI-L2-VAA-ISO-SERIES	Volcanic Ash: Detection & Height
OR_GLM-L2-LCFA-ISO-SERIES	Lightning Detection	
Level 2+ Semi-Static Source Data	OR_PARM-L2-ISO-SERIES	
Level 2+ Algorithm Packages	OR_ALG-L2-ISO-SERIES	

The file extension for ISO series metadata files is “.xml”, indicating XML files.

The filename for the Total Precipitable Water ISO series metadata file created at 5:05 PM UTC on January 7, 2017 is:

“ABI-L2-TPW-ISO-SERIES_c20170071705000.xml”