2.12 Energy Balanced and Filled (EBAF)

The EBAF product provides monthly mean top-of-atmosphere (TOA) radiative fluxes constrained such that the 5-year average global net TOA flux is consistent with our best estimate of heat storage in the Earth-atmosphere system (~0.9 Wm^{-2}). CERES EBAF is primarily intended for studies that use Earth Radiation Budget (ERB) data for climate model evaluation, estimating the Earth's annual global mean energy budget, and in studies that infer meridional heat transports. The CERES EBAF dataset is a single file in netCDF format. It consists of monthly 1° regional, zonal, and global averages of TOA longwave (LW), shortwave (SW), and net (NET) fluxes under clear and all-sky conditions. It is derived from the *Terra* SRBAVG-GEO Edition2D_rev1 and SSF Edition2B_rev1 data products.

EBAF is an archival product produced from SRBAVG as a one-time process. There is a single file for the Terra record from March 2000 to October 2005. This product is written in netCDF and follows the Climate and Forecast (CF) dataset conventions set forth by the modeling community.

EBAF dataset contains monthly and climatological means on a regional, zonal, and global basis:
• Total-sky radiative fluxes at TOA (constrained so that the net flux equals the ocean heat storage term)
• Clear-sky radiative fluxes at TOA (constrained and filled for non-observed regions)

A complete listing of metadata and gridded science parameters for this data product can be found in Tables 4-9.

Level: 4
Frequency: 1 File
Portion of Atmosphere Covered: TOA

Time Interval Covered:
File: All Months and Climatology
Record: 68 Months

Portion of Globe Covered:
File: Zonal, Global, Regional
Record: 1-Deg Regions

Product Version:
Terra: Edition1A

EBAF Data Sets

Table 1. **Monthly Gridded Categories EBAF Tables 3-5.**

Number	Name	Description	No. of Records
1	1.0 Degree Regional	See Table 4	360x180x68
2	1.0 Degree Zonal	See Table 5	180x68
3	Global	See Table 6	68

Table 2. **Climatology Gridded Categories EBAF Tables 6-8.**

Number	Name	Description	Number of Records
4	1.0 Degree Regional	See Table 7	360x180x12
5	1.0 Degree Zonal	See Table 8	180x12
6	Global	See Table 9	12

Table 3. **List of Parameters used to Define Dimensions of Other Parameters**

Parameter Name	Data Type	Units	Range	No. of Records
Longitude	32-Bit Float	Degrees-East	-179.5 .. 179.5	360
Latitude	32-Bit Float	Degrees-North	-89.5 .. 89.5	180
Time	32-Bit Integer	Days Since 2000-3-1 00:00:0.0	ΔT = 0000-01-00 00:00:0.0	68
Climatology Time	32-Bit Integer	Days Since 2000-3-1 00:00:0.0	ΔT = 0000-01-00 00:00:0.0	12
Climatology Bounds	32-Bit Integer			12x2

Table 4. **List of the Monthly Data Sets contained in the 1.0 Degree Regional Parameters**

Monthly Data Sets contained in the 1.0 Degree Regional Parameters

Parameter Name	Data Type	Units	Range	No. of Records
SW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	360x180x68
LW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	360x180x68
Net All-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	360x180x68
SW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	360x180x68
LW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	360x180x68
Net Clear-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	360x180x68
SW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	360x180x68
LW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-200 .. 300	360x180x68
Net Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	360x180x68
SW All-Sky TOA Down (Incoming Solar)	32-Bit Float	W m^{-2}	0 .. 600	360x180x68

Table 5. **List of the Monthly Data Sets contained in the 1.0 Degree Zonal Parameters.**

Monthly Data Sets contained in the 1.0 Degree Zonal Parameters

Parameter Name	Data Type	Units	Range	No. of Records
Zonal SW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	180x68
Zonal LW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	180x68
Zonal Net All-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	180x68

Zonal SW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	180x68
Zonal LW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	180x68
Zonal Net Clear-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	180x68
Zonal SW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	180x68
Zonal LW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-200 .. 300	180x68
Zonal Net Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	180x68
Zonal SW All-Sky TOA Down (Incoming Solar)	32-Bit Float	W m^{-2}	0 .. 600	180x68

Table 6. **List of the Monthly Data Sets contained in the Global Parameters**

Monthly Data Sets contained in the Global Parameters

Parameter Name	Data Type	Units	Range	No. of Records
Global SW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	68
Global LW All-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	68
Global Net All-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	68
Global SW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 800	68
Global LW Clear-Sky TOA Up	32-Bit Float	W m^{-2}	0 .. 400	68
Global Net Clear-Sky TOA (Down=Positive)	32-Bit Float	W m^{-2}	-400 .. 400	68
Global SW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	68
Global LW Cloud Radiative Effect	32-Bit Float	W m^{-2}	-200 .. 300	68

Global Net Cloud Radiative Effect	32-Bit Float	W m^{-2}	-400 .. 400	68
Global SW All-Sky TOA Down (Incoming Solar)	32-Bit Float	W m^{-2}	0 .. 600	68

Table 7. **List of the Climatology Data Sets contained in the 1.0 Degree Regional Parameters**

Climatology Data Sets contined in the 1.0 Degree Regional Parameters

Parameter Name	Data Type	Units	Range	No. of Records
SW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	360x180x12
LW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	360x180x12
Net All-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	360x180x12
SW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	360x180x12
LW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	360x180x12
Net Clear-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	360x180x12
SW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	360x180x12
LW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-200 .. 300	360x180x12
Net Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	360x180x12
SW All-Sky TOA Down (Incoming Solar) 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 600	360x180x12

Table 8. **List of the Climatology Data Sets contained in the 1.0 Degree Zonal Parameters.**

Climatology Data Sets contained in the 1.0 Degree Zonal Parameters

Parameter Name	Data Type	Units	Range	No. of Records
Zonal SW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	180x12
Zonal LW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	180x12
Zonal Net All-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	180x12
Zonal SW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	180x12
Zonal LW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	180x12
Zonal Net Clear-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	180x12
Zonal SW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	180x12
Zonal LW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-200 .. 300	180x12
Zonal Net Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	180x12
Zonal SW All-Sky TOA Down (Incoming Solar) 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 600	180x12

Table 9. **List of the Climatology Data Sets contained in the Global Parameters**

Climatology Data Sets contained in the Global Parameters

Parameter Name	Data Type	Units	Range	No. of Records
Global SW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	12
Global LW All-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	12
Global Net All-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	12

Global SW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 800	12
Global LW Clear-Sky TOA Up 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 400	12
Global Net Clear-Sky TOA (Down=Positive) 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	12
Global SW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	12
Global LW Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-200 .. 300	12
Global Net Cloud Radiative Effect 5-Year Climatology	32-Bit Float	W m^{-2}	-400 .. 400	12
Global SW All-Sky TOA Down (Incoming Solar) 5-Year Climatology	32-Bit Float	W m^{-2}	0 .. 600	12

Total Region Records/File: **44,064,000**
Total Zonal Records/File: **122,400**
Total Global Records/File: **680**
Total 5-Year Region Records/File: **7,776,000**
Total 5-Year Zonal Records/File: **21,600**
Total 5-Year Global Records/File: **120**

Total Records/File: **51,984,800**
Total Bits/File: **1,663,513,600**
Total Bytes/File: **207,953,500**

EBAF Revision Record

The product Revision Record contains information pertaining to approved document changes. There are no revisions at this time.