

GLOSSARY**Aerosols**

tiny particles suspended in the air

Adjusted

refers to time series data that have been “homogenized” to remove time dependent biases; owing to uncertainties inherent in data bias removal, the term “adjusted” is often used instead of “corrected”

Albedo

the fraction of incident light that is reflected from a surface

Anthropogenic

human-induced

Black carbon

soot particles primarily from fossil fuel burning

Climate sensitivity

the equilibrium change in global-average surface air temperature following a change in radiative forcing; in current usage, this term generally refers to the warming that would result if atmospheric carbon dioxide concentrations were to double from their pre-industrial levels

Contrails

condensation trails from aircraft

Convection

motions in a fluid or the air that are predominantly vertical and driven by buoyancy forces; a principal means of vertical energy transfer

Diurnal

occurring daily; varying within the course of a day

Dewpoint

temperature at which water vapor condenses into liquid water temperature when cooled at constant pressure

Error

the difference between an estimated or observed value and the true value

Forcing

a natural or human-induced factor that influences climate

Greenhouse gases

gases including water vapor, carbon dioxide, methane, nitrous oxide, and halocarbons that trap infrared heat, warming the air near the surface and in the lower levels of the atmosphere

Homogenization

Removing changes in time series data that might have arisen for non-climatic reasons

Internal variability

natural cycles and variations in climate

Temperature inversion

a condition in which the air temperature increases with height, in contrast to the more common situation in which temperature decreases with altitude

Isothermal

constant temperature; often refers to a temperature profile meaning constant temperature with height

Lapse rate

the rate at which temperature decreases with increasing elevation

Latent heat

the heat required to change the phase of a substance, *e.g.*, solid to vapor (sublimation), liquid to vapor (vaporization), or solid to liquid (melting); the temperature does not change during these processes. Heat is released for the reverse processes, *e.g.*, vapor to solid (frost), liquid to solid (freezing), or vapor to liquid (condensation)

Metadata

supplemental records used to interpret measurements, such as how and where measurements were collected and processed

Parameterization

a mathematical representation of a process that cannot be explicitly resolved in a climate model

Radiosonde

a balloon carrying a thermometer or other sensing device that takes measurements in the atmosphere and transmits them by radio to a data recorder on the surface

Reanalysis

a mathematically blended record that incorporates a variety of observational data sets (with adjustments) in an assimilation model

Reference networks

a small subset of sites consisting of multiple instruments that independently measure the same variable which if well coordinated could provide full characterization of instrument errors and biases, significantly reducing uncertainty in observed climate change

Relative humidity

the percentage of water vapor in the air relative to what is required for saturation to occur at a given temperature

Sensible heat

heat that can be measured by a thermometer

Specific humidity

the amount of water vapor in the air in units of kilograms of water vapor per kilogram of air

Trend

a systematic change over time

Uncertainty

a term used to describe the range of possible values around a best estimate, sometimes expressed in terms of probability or likelihood (see Preface Figure 1 and discussion in Appendix A)

ACRONYMS

20CEN	climate model simulation of the 20th century
AGCM	Atmospheric General Circulation Model
AIRS	Atmospheric InfraRed Sounder
AMIP	Atmospheric Model Intercomparison Project
AMSU	Advanced Microwave Sounding Unit
AOGCM	Atmosphere-Ocean General Circulation Model
AR4	IPCC Fourth Assessment Report
ARL	Air Resources Laboratory
ATMS	Advanced Technology Microwave Sounder
ATSR	Along-Track Scanning Radiometer
AVHRR	Advanced Very High Resolution Radiometer
CCSM	Community Climate System Model
CCSP	Climate Change Science Program
CDR	Climate Data Record
CFCs	chlorofluorocarbons
CGCM	Coupled Atmosphere-Ocean General Circulation Model
CH₄	Methane
C.I.	Confidence Interval
CLIVAR	Climate Variability and Prediction
CMIP	Coupled Model Intercomparison Project
CMIS	Conical scanning Microwave Imager/Sounder
CO₂	Carbon Dioxide
COADS	Comprehensive Ocean-Atmosphere Data Set
COWL	Cold Ocean Warm Land
CrIS	Cross-track Infrared Sounder
CRN	Climate Reference Network
CRU	Climate Research Unit
DOE	Department of Energy
EBM	Energy Balance Model
ECMWF	European Centre for Medium-range Weather Forecasts
EMIC	Earth System Models of Intermediate Complexity
ENSO	El Niño-Southern Oscillation
EOF	Empirical Orthogonal Function
ERA	ECMWF Re-Analysis
ERSST	Extended Reconstruction Sea Surface Temperature
GAW	Global Atmospheric Watch
GCM	General Circulation Model
GCOS	Global Climate Observing System
GCSM	Global Climate System Model
GEOSS	Global Earth Observation System of Systems

GFDL	Geophysical Fluid Dynamics Laboratory	NPOESS	National Polar-orbiting Operational Environmental Satellite System
GHCN	Global Historical Climatology Network	NRC	National Research Council
GHG	Greenhouse Gas	NSF	National Science Foundation
GHRSSST-PP	GODAE High-Resolution SST Pilot Project	NWP	Numerical Weather Prediction
GISS	Goddard Institute for Space Studies	O₃	Ozone
GODAE	Global Ocean Data Assimilation Experiment	OGCM	Ocean General Circulation Model
GPS	Global Positioning System	PCM	Parallel Climate Model
GSN	GCOS Surface Network	PDO	Pacific Decadal Oscillation
GUAN	GCOS Upper Air Network	QBO	Quasi-Biennial Oscillation
HadCM	Hadley Centre Climate Model	RATPAC	Radiosonde Atmospheric Temperature Products for Assessing Climate
HadRT	Hadley Centre Radiosonde Temperatures	RSS	Remote Sensing Systems
hPa	hectoPascals, a measure of pressure	SAM	Southern Hemisphere Annual Mode
HIRS	High-resolution Infrared Radiation Sounder	SCAMS	SCanning Microwave Spectrometer
IASI	Infrared Atmospheric Sounding Interferometer	SH	Southern Hemisphere
ICOADS	International Comprehensive Ocean-Atmosphere Data Set	SO₄	Sulfate
IGRA	Integrated Global Radiosonde Archive	SSM/I	Special Sensor Microwave/Imager
IPCC	Intergovernmental Panel on Climate Change	SSMIS	Special Sensor Microwave Imager/Sounder
IR	Infrared Radiation	SST	Sea Surface Temperature
ITCZ	Inter Tropical Convergence Zone	SSU	Stratospheric Sounding Unit
LBNL	Lawrence Berkeley National Laboratory	TAO	Tropical Atmosphere Ocean
LECT	Local Equator Crossing Time	TEAP	Technology and Economic Assessment Panel
LKS	Lanzante, Klein, Seidel	TIROS	Television InfraRed Observation Satellite
LLNL	Lawrence Livermore National Laboratory	TLT	Temperature of the Lower Troposphere
LOSU	Level of Scientific Understanding	TOGA	Tropical Ocean Global Atmosphere
LULC	Land Use/Land Cover	TOVS	TIROS Operational Vertical Sounder
MAT	Marine Air Temperatures	TRMM	Tropical Rainfall Measuring Mission
MIT	Massachusetts Institute of Technology	UAH	University of Alabama in Huntsville
MSU	Microwave Sounding Unit	UMd	University of Maryland
NAM	Northern Hemisphere Annual Mode	USHCN	United States Historical Climatology Network
NAO	North Atlantic Oscillation	UTC	Coordinated Universal Time
NASA	National Aeronautics and Space Administration	UW	University of Washington - Seattle
NCAR	National Center for Atmospheric Research	WMO	World Meteorological Organization
NCDC	National Climatic Data Center		
NCEP	National Centers for Environmental Prediction		
NEMS	Nimbus E Microwave Spectrometer		
NESDIS	National Environmental Satellite, Data, and Information Service		
NH	Northern Hemisphere		
NMAT	Night Marine Air Temperatures		
N₂O	Nitrous Oxide		
NOAA	National Oceanic and Atmospheric Administration		

CHAPTER I REFERENCES

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APPENDIX A REFERENCES

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Contact Information

Global Change Research Information Office
c/o Climate Change Science Program Office
1717 Pennsylvania Avenue, NW
Suite 250
Washington, DC 20006
202-223-6262 (voice)
202-223-3065 (fax)

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U.S. Climate Change Science Program
1717 Pennsylvania Avenue, NW • Suite 250 • Washington, D.C. 20006 USA
1-202-223-6262 (voice) • 1-202-223-3065 (fax)
<http://www.climatechange.gov>

