

# Appendix 1

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## Acronyms

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<b>ACA</b>	Arid Central Asia	<b>Ca</b>	calcium
<b>ACIA</b>	Arctic Climate Impact Assessment	<b>CAM</b>	Crassulacean Acid Metabolism
<b>AEDI</b>	Accumulated Effective Drought Index	<b>CAM3.1</b>	Community Atmosphere Model version 3
<b>AF</b>	airborne fraction	<b>CCA</b>	canonical correspondence analysis
<b>ALT</b>	active layer thickness	<b>CCN</b>	Cloud condensation nuclei
<b>AMO</b>	Atlantic Multidecadal Oscillation	<b>CEDI</b>	Corrected Effective Drought Index
<b>AMSR</b>	Advanced Microwave Scanning Radiometer	<b>CEMs</b>	climate envelope models
<b>A/N</b>	ammonium/nitrate	<b>CERES</b>	Clouds and the Earth's Radiant Energy System
<b>AOGCM</b>	Atmosphere-Ocean General Circulation Model	<b>CEVSA</b>	Carbon Exchanges in the Vegetation-Soil-Atmosphere System
<b>AOT</b>	aerosol optical thickness	<b>CFC</b>	chlorofluorocarbons
<b>ASI</b>	aeolian sand influx	<b>CGCM</b>	Coupled General Circulation Models
<b>ATLAS</b>	Airborne Thermal and Land Applications Sensor	<b>CH<sub>2</sub>CII</b>	iodocarbon chloroiodomethane
<b>ATZ</b>	accumulated temperature zone	<b>CH<sub>3</sub>C<sub>1</sub></b>	methyl chloride
<b>AVHRR</b>	Advanced Very High Resolution Radiometer	<b>CH<sub>4</sub></b>	methane
<b>Ba</b>	barium	<b>CH<sub>2</sub>I<sub>2</sub></b>	diiodomethane
<b>BAI</b>	basal area increment	<b>CHD</b>	coronary heart disease
<b>BioCON</b>	Biodiversity, Carbon Dioxide, and Nitrogen Effects on Ecosystem Functioning	<b>CLEH</b>	climate-linked epidemic hypothesis
<b>BP</b>	before present	<b>CMIP3</b>	Coupled Model Intercomparison Project Phase 3
<b>BTv</b>	bluetongue virus	<b>CO<sub>2</sub></b>	carbon dioxide
<b>BVOC</b>	biogenic volatile organic compound	<b>C/P</b>	carbon/phosphorus
<b>C4MIP</b>	Coupled Carbon Cycle Climate Model Intercomparison Project	<b>CRF</b>	cosmic ray flux
		<b>CS<sub>2</sub></b>	carbon disulfide
		<b>CSR</b>	cloud system-resolving models
		<b>CVD</b>	cardiovascular disease
		<b>DACP</b>	Dark Ages cold period

<b>DGGE</b>	denaturing gradient gel electrophoresis	<b>HKO</b>	Hong Kong Observatory of China
<b>DIC</b>	dissolved inorganic carbon	<b>HSP</b>	heat-shock protein
<b>DOC</b>	dissolved organic carbon	<b>IHD</b>	ischemic heart disease
<b>DSE</b>	dark septate root endophytic	<b>IMAR</b>	Inner Mongolia Autonomous Region
<b>DSF</b>	dust storm frequency	<b>IMP</b>	Internal Multidecadal Pattern
<b>DTR</b>	diurnal temperature range	<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>EDI</b>	Effective Drought Index	<b>IPCC 2007-I</b>	Intergovernmental Panel on Climate Change — Group 1 Contribution
<b>EESC</b>	effective stratospheric chlorine concentrations	<b>IPCC 2007-II</b>	Intergovernmental Panel on Climate Change — Group II Contribution
<b>ENP</b>	eastern North Pacific	<b>IPCC 2007-II</b>	Intergovernmental Panel on Climate Change — Group III Contribution
<b>ENSO</b>	El Nino-Southern Oscillation	<b>IPCC-FAR</b>	Intergovernmental Panel on Climate Change — First Assessment Report
<b>EOS</b>	Earth Observing System	<b>IPCC-SAR</b>	Intergovernmental Panel on Climate Change — Second Assessment Report
<b>EROWI</b>	energy return on water invested	<b>IPCC-TAR</b>	Intergovernmental Panel on Climate Change — Third Assessment Report
<b>ET</b>	evapotranspiration	<b>IPCC-AR4</b>	Intergovernmental Panel on Climate Change — Fourth Assessment Report
<b>ETCW</b>	early twentieth-century warming	<b>IRD</b>	ice rafted debris
<b>EWUE</b>	ecosystem water use efficiency	<b>ISA</b>	impervious surface area
<b>FACE</b>	Free-air CO <sub>2</sub> Enrichment	<b>ITCZ</b>	Intertropical Convergence Zone
<b>FAO</b>	Food and Agricultural Organization	<b>iWUE</b>	intrinsic water-use efficiency
<b>FTA</b>	Fast Track Assessment	<b>JTWC</b>	Joint Typhoon Warning Center
<b>GCE</b>	Goddard Cumulus Ensemble	<b>LADS</b>	Laser Airborne Depth Sounder
<b>GCM</b>	General Circulation Models	<b>LAI</b>	leaf area index
<b>GCR</b>	galactic cosmic rays	<b>LDC</b>	least developed countries
<b>GCTE</b>	Global Change and Terrestrial Ecosystems	<b>LDD</b>	long-distance dispersal
<b>GDH</b>	growing degree hours	<b>LIA</b>	Little Ice Age
<b>GDP</b>	Gross Domestic Product	<b>LIG</b>	Last Interglacial
<b>GHG</b>	green house gas(es)	<b>LST</b>	land surface temperature
<b>GIA</b>	Glacial Isostatic Adjustment	<b>LT</b>	lower-tropospheric
<b>GIMMS</b>	Global Inventory Modeling and Mapping Studies	<b>LTM</b>	long-term mean standardization
<b>GISS-AOM</b>	Goddard Institute of Space Studies-Atmosphere Ocean Model	<b>LULC</b>	land use and land cover
<b>gr</b>	gram(s)	<b>m</b>	meter
<b>GRACE</b>	Gravity Recovery and Climate Experiment	<b>MCA</b>	Medieval Climate Anomaly
<b>GS</b>	glucosinolate		
<b>GTTA</b>	Global Tropospheric Temperature Anomalies		

## Acronyms

<b>MISR</b>	multi-angle imaging spectroradiometer	<b>PETM</b>	Paleocene-Eocene Thermal Maximum
<b>MJO</b>	Madden-Julian Oscillation	<b>ppb</b>	parts per billion
<b>MOC</b>	meridional overturning circulation	<b>PPB</b>	purple phototrophic bacteria
<b>MODIS</b>	moderate-resolution imaging spectroradiometer	<b>ppm</b>	parts per million
<b>MPI</b>	maximum potential intensity	<b>PR</b>	Precipitation Radar
<b>MSU</b>	Microwave Sounding Unit	<b>Ps</b>	solid precipitation
<b>MWP</b>	Medieval Warm Period	<b>RATPAC</b>	Radiosonde Atmospheric Temperature Products for Assessing Climate
<b>MXD</b>	maximum latewood density	<b>RCM</b>	regional climate model
<b>N<sub>2</sub>O</b>	nitrous oxide	<b>RCS</b>	regional curve standardization
<b>NAO</b>	North Atlantic Oscillation	<b>RERCA</b>	recent rate of carbon accumulation
<b>NAOI</b>	North Atlantic Oscillation Index	<b>Rg</b>	solar irradiance
<b>NAS</b>	National Academy of Sciences	<b>RKC</b>	red king crab ( <i>Paralithodes camtschaticus</i> )
<b>NC</b>	neutron count	<b>RMF</b>	root mass fraction
<b>NCEP</b>	National Center for Environmental Prediction	<b>RMSE</b>	root mean square of errors
<b>NDVI</b>	Normalized Difference Vegetation Index	<b>ROS</b>	reactive oxygen species
<b>NEE</b>	net ecosystem CO <sub>2</sub> exchange	<b>RSMC</b>	Regional Specialized Meteorological Center
<b>NHL</b>	Northern High Latitude	<b>SAM</b>	Southern Hemisphere Annular Mode
<b>NIO</b>	North Indian Ocean	<b>SAMS</b>	South American Monsoon System
<b>NIPCC</b>	Nongovernmental International Panel on Climate Change	<b>SAT</b>	surface air temperature
<b>NMHC</b>	non-methane hydrocarbon	<b>SCM</b>	single-column models
<b>NPP</b>	net primary production	<b>SCSMEX</b>	South China Sea Monsoon Experiment
<b>Nr</b>	reactive nitrogen	<b>SDS</b>	sudden death syndrome
<b>NSC</b>	nonstructural carbohydrates	<b>SET</b>	surface elevation table
<b>nss-SO<sub>4</sub><sup>2-</sup></b>	non-sea-salt sulfate	<b>SLP</b>	sea-level pressure
<b>NWAUS</b>	northwest Australia	<b>SLR</b>	sea-level rise
<b>O<sub>3</sub></b>	ozone	<b>SMB</b>	surface mass balance
<b>OECD</b>	Organization for Economic Cooperation and Development	<b>SMBR</b>	Sierra de Manantlan Biosphere Reserve
<b>OTC</b>	open-top chambers	<b>SN</b>	sunspot number
<b>P</b>	precipitation	<b>SO</b>	Southern Ocean
<b>PALSEA</b>	Paleo Sea Level Working Group	<b>SOC</b>	soil organic carbon
<b>PDI</b>	power dissipation index	<b>SOI</b>	Southern Oscillation Index
<b>PDMT</b>	present-day surface mass trend	<b>SOM</b>	soil organic matter
<b>PDSI</b>	Palmer Drought Severity Index	<b>SoyFACE</b>	soybean free-air CO <sub>2</sub> -enrichment
<b>PeECE</b>	Pelagic Ecosystem CO <sub>2</sub> Enrichment	<b>SR</b>	Scaling Ratio
		<b>SN/SSN</b>	sunspot number
		<b>SST</b>	sea surface temperatures

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<b>STI</b>	Shanghai Typhoon Institute	<b>UHI</b>	urban heat island
<b>STD</b>	standardization	<b>UNEP</b>	United Nations Environment Program
<b>SWS</b>	sea water salinity	<b>UV</b>	ultraviolet
<b>TBAR</b>	thiobarbituric acid reactive substances	<b>WAIS</b>	West Antarctic Ice Sheet
<b>TC</b>	tropical cyclones	<b>WCRP</b>	World Climate Research Program
<b>TEM</b>	Terrestrial Ecosystem Model	<b>WEG</b>	western English Channel
<b>Tmax</b>	maximum temperature	<b>WG</b>	Wendell Gyre
<b>Tmin</b>	minimum temperature	<b>WNP</b>	Western North Pacific
<b>TMI</b>	Tropical Rainfall Measuring Mission Microwave Imager	<b>XUAR</b>	Xinjiang Uygur Autonomous Region
<b>TN</b>	total nitrogen	<b>XRD</b>	X-ray diffraction
<b>TOA</b>	top of the atmosphere	 	
<b>TRMM</b>	Tropical Rainfall Measuring Mission	<b>YAEDI</b>	Year-Accumulated Effective Drought Index
<b>TWE</b>	Thermal Wind Equation		