

Glossary

Anthropogenic

human-induced

Attribution

attribution of causes of climate change is the process of establishing the most likely causes for a detected change with some defined level of confidence

Baroclinic

a baroclinic atmosphere is one for which the density depends on both the temperature and the pressure

Barotropic

a barotropic atmosphere is one in which the density depends only on the pressure, so that isobaric surfaces (surfaces of constant pressure) are also surfaces of constant density

Biodiversity

the number of different species of plants or animals in a given area

Best track

a smoothed path representing the movement of a tropical cyclone over its lifetime. The 'best-track' coordinates and information are based on a post-storm assessment of all the storm advisories

Cold surge

an equatorward penetration of cold air

Cold wave

cold spells of 4 days in duration with mean temperature falling below the threshold for a 1 in 10 year recurrence interval

Cyclogenesis

the development of a cyclone

Cyclone

a storm system that rotates around a center of low atmospheric pressure

Tropical cyclone

a cyclone usually originating in the tropics, with a warm central core

Extratropical cyclone

a cyclone originating in the mid or high latitudes, with a cold central core. Larger in scale than a tropical cyclone and with less central intensity

Diurnal temperature range

the difference between maximum and minimum temperature over a period of 24 hours

Ecosystem

an interconnected, dynamic community of animals, plants, bacteria, insects and other organisms and non-organic components. An ecosystem exists at any scale – a pond, a continent, the Earth

El Nino-Southern Oscillation

the waxing and waning every 2-7 years of El Niño and La Niña ocean temperature cycles along with the related atmospheric pressure component of the Southern Oscillation. The primary centers of ENSO variability are in the tropical Pacific, but ENSO effects can be felt across much of the globe

Forcing

a natural or human-induced factor that influences climate

Frost Day

a day on which there is frost recorded in a specified location

Frost-free Season

the length of the season between the last frost of the spring and the first frost in the fall

Heat wave

warm spells of 4 days in duration with mean temperature exceeding the threshold for a 1 in 10 year recurrence interval

Hindcast

using a model to simulate events in the past in order to test a model against observed reality

Hydrometeorology

the area of meteorology specifically concerned with water and precipitation

Inhomogeneity

a break or interruption in an otherwise homogeneous record. For example, moving a weather station from the center of a city to the suburbs will create an inhomogeneity in the climate record

Modes of variability

variability in the climate system with identifiable characteristics, regional patterns and often oscillatory behavior. For example ENSO is a mode of variability, as is the Pacific Decadal Oscillation (PDO)

Monsoon

a seasonal change in wind direction (driven by changes in temperature), often accompanied by a seasonal precipitation maximum

Nor'easter

a storm occurring off the east coast of North America, with winds blowing from a northeasterly direction onto the coast. Usually occurs in winter

Power Dissipation Index

a measure of the intensity of tropical cyclones that integrates wind speed, storm size and duration

Rawinsonde

an instrument carried on weather balloons to measure wind speeds through the upper atmosphere

Reanalysis

retrospective (not in real time) analysis based on data from forecast models, yielding a more complete grid of data points for more features of climate than is currently possible from actual observations

Return Period

the average length of time separating events of a similar magnitude. Eg. A 100-year flood event will happen roughly once every 100 years

Saffir-Simpson Scale

a hurricane intensity scale which categorizes hurricanes on a scale of 1 to 5 according to the storm's wind speed, barometric pressure, storm surge and damage potential

Stratosphere

the highly stratified region of the atmosphere above the troposphere extending from about 10 km (ranging from 9 km in high latitudes to 16 km in the tropics on average) to about 50 km

Synoptic-scale

referring to weather systems that are a few hundred miles-to-continent size. E.g. High and low pressure systems

Teleconnection

a relationship between weather or climate events in separated areas of the globe. E.g. An El Niño in the Pacific can lead to heat waves in North America

Troposphere

the lowest part of the atmosphere from the surface to about 10 km in altitude in mid-latitudes (ranging from 9 km in high latitudes to 16 km in the tropics on average) where

clouds and “weather” phenomena occur, in the troposphere, temperatures generally decrease with height

Walker Circulation

an east-west air circulation confined to equatorial regions of the Pacific Ocean and driven principally by the oceanic temperature gradient

Definitions for the SRES scenarios

A1. The A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies. Major underlying themes are convergence among regions, capacity building and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income.

The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end use technologies).

A2. The A2 storyline and scenario family describes a very heterogeneous world. The underlying theme is self reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily regionally oriented and per capita economic growth and technological change more fragmented and slower than other storylines.

B1. The B1 storyline and scenario family describes a convergent world with the same global population, that peaks in mid-century and declines thereafter, as in the A1 storyline, but with rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives.

B2. The B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels.

Acronyms

| | |
|-----------------------|---|
| AMM | Atlantic Multidecadal Mode |
| AO | Arctic Oscillation |
| AOGCM | Atmosphere-Ocean (coupled) Global Climate Model |
| AMO | Atlantic Multidecadal Oscillation |
| BMRC | Australian Bureau of Meteorology |
| CAI | Cyclone Activity Index |
| CAPE | Convective Available Potential Energy |
| CO₂ | Carbon dioxide |
| CPS | Convective Precipitating Storm |
| CH₄ | Methane |
| CMIP2+ | Coupled Model Intercomparison Project (2 nd phase) |
| DTR | Diurnal Temperature Range |
| ECMWF | European Center for Medium Range Weather Forecasts |
| ECWS | East Coast Winter Storm |
| ENSO | El Nino-Southern Oscillation |
| ERA-40 | 40-year ECMWF Re-Analysis project |
| ERS | European Remote Sensing Satellite |
| ETC | Extra-tropical Cyclone |
| FEMA | Federal Emergency Management Agency |
| FRZA | Frequency of days with freezing rain |
| GCM | Global Climate Model or General Circulation Model |
| GCOS | Global Climate Observing System |
| GEV | Generalized Extreme Value |
| GFDL | NOAA's Geophysical Fluid Dynamics Laboratory |
| GHG | Greenhouse House Gases |
| GPD | Generalized Pareto Distribution |
| HURDAT | Atlantic Hurricane Database |
| IPCC | Intergovernmental Panel on Climate Change |
| IPCC FAR | IPCC First Assessment Report (published in 1996) |
| IPCC TAR | IPCC Third Assessment Report (published in 2001) |
| IPCC AR4 | IPCC Fourth Assessment report (due to be published in 2007) |
| IPCC WGII | IPCC Working Group II |
| ITCZ | Intertropical Convergence Zone |
| JMA | Japanese Meteorological Agency |
| JTWC | U.S. Navy's Joint Typhoon Warning Center |
| MPI | Maximum Potential Intensity |
| MCC | Mesoscale Convective Complexes |
| MEI | Multivariate ENSO Index |
| MJO | Madden-Julian Oscillation |
| MSLP | Mean Sea Level Pressure |
| NAM | Northern Annular Mode |
| NAO | North Atlantic Oscillation |
| NCAR | National Center for Atmospheric Research |
| NCDC | NOAA's National Climatic Data Center |

| | |
|--------------|---|
| NCEP | NOAA's National Center for Environmental Prediction |
| NDBC | NOAA's National Data Buoy Center |
| NHC | NOAA's National Hurricane Center |
| NOAA | National Oceanic and Atmospheric Administration |
| NRL | Naval Research Laboratory |
| NTR | Non-Tide Residuals |
| NWS | NOAA's National Weather Service |
| ONI | Oceanic El Nino Index |
| PCMDI | Program for Climate Model Diagnosis and Intercomparison |
| PDI | Power Dissipation Index |
| PDO | Pacific Decadal Oscillation |
| PDSI | Palmer Drought Severity Index |
| PNA | Pacific North American index |
| SRES | IPCC Special Report on Emission Scenarios |
| SSM/I | Special Sensor Microwave/Imager |
| SST | Sea Surface Temperature |
| TC | Tropical Cyclone |
| USDA | United States Department of Agriculture |
| WMO | World Meteorological Organization |
| ZR | Days with freezing rain |