

# B

---

## Glossary of Terms

---

**Ablation**

All processes by which snow and ice are lost from a glacier, floating ice, or snow cover.

**Acclimatization**

The physiological adaptation to climatic variations.

**Active Layer**

The top layer of soil in *permafrost* that is subjected to seasonal freezing and thawing.

**Adaptability**

See *adaptive capacity*.

**Adaptation**

Adjustment in natural or human systems in response to actual or expected climatic *stimuli* or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation:

- **Anticipatory Adaptation**—Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
- **Autonomous Adaptation**—Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
- **Planned Adaptation**—Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.
- **Private Adaptation**—Adaptation that is initiated and implemented by individuals, households or private companies. Private adaptation is usually in the actor's rational self-interest.
- **Public Adaptation**—Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.
- **Reactive Adaptation**—Adaptation that takes place after impacts of climate change have been observed.

See also *adaptation assessment*, *adaptation benefits*, *adaptation costs*, *adaptive capacity*, and *maladaptation*.

**Adaptation Assessment**

The practice of identifying options to adapt to climate change and evaluating them in terms of criteria such as availability, benefits, costs, effectiveness, efficiency, and feasibility.

**Adaptation Benefits**

The avoided damage costs or the accrued benefits following the adoption and implementation of *adaptation* measures.

**Adaptation Costs**

Costs of planning, preparing for, facilitating, and implementing *adaptation* measures, including transition costs.

**Adaptive Capacity**

The ability of a system to adjust to *climate change* (including *climate variability* and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.

**Aero-Allergens**

*Allergens* present in the air.

**Aerosols**

A collection of airborne solid or liquid particles, with a typical size between 0.01 and 10 mm that reside in the atmosphere for at least several hours. Aerosols may be of either natural or anthropogenic origin. Aerosols may influence climate in two ways: directly through scattering and absorbing radiation, and indirectly through acting as condensation nuclei for cloud formation or modifying the optical properties and lifetime of clouds.

**Afforestation**

Planting of new forests on lands that historically have not contained forests. For a discussion of the term *forest* and related terms such as *afforestation*, *reforestation*, and *deforestation*, see the *IPCC Special Report on Land Use, Land-Use Change, and Forestry* (IPCC, 2000).

**Aggregate Impacts**

Total impacts summed up across sectors and/or regions. The aggregation of impacts requires knowledge of (or assumptions about) the relative importance of impacts in different sectors and regions. Measures of aggregate impacts include, for example, the total number of people affected, change in net primary productivity, number of systems undergoing change, or total economic costs.

**Agronomy**

The branch of agriculture that deals with the theory and practice of field-crop production and the scientific management of soil.

**Alases**

Coalescing thaw depressions.

**Albedo**

The fraction of solar radiation reflected by a surface or object, often expressed as a percentage. Snow-covered surfaces have a high albedo; the albedo of soils ranges from high to low; vegetation-covered surfaces and oceans have a low albedo. The Earth's albedo varies mainly through varying cloudiness, snow, ice, leaf area, and land-cover changes.

**Algal Blooms**

A reproductive explosion of algae in a lake, river, or ocean.

**Alkalinity**

A measure of the capacity of water to neutralize acids.

**Allergens**

Antigenic substances capable of producing immediate-type hypersensitivity.

**Alpine**

The *biogeographic* zone made up of slopes above timberline and characterized by the presence of rosette-forming herbaceous plants and low shrubby slow-growing woody plants.

**Alternative Risk Transfer**

Capital-market alternatives to traditional insurance (e.g., catastrophe bonds).

**Anadromous Species**

A species of fish, such as salmon, that spawn in freshwater then migrate into the ocean to grow to maturity.

**Anaerobic**

Living, active, or occurring in the absence of free oxygen.

**Anoxia**

A deficiency of oxygen, especially of such severity as to result in permanent damage.

**Antarctic Bottomwater**

A type of water in the seas surrounding Antarctica with temperatures ranging from 0 to -0.8°C, salinities from 34.6 to 34.7 PSU, and a density near 27.88. This is the densest water in the free ocean.

**Antarctic Circumpolar Current**

A Southern Ocean current that flows around the entire globe driven by the circumpolar westerlies.

**Antarctic Intermediate Water**

Created through large-scale cooling and Ekman convergence in the Southern Ocean.

**Anthropogenic**

Resulting from or produced by human beings.

**AOGCM**

See *climate model*.

**Apex Consumers**

Organisms at the top of food chains; top predators.

**Aquaculture**

Breeding and rearing fish, shellfish, etc., or growing plants for food in special ponds.

**Aquifer**

Astratum of permeable rock that bears water. An unconfined aquifer is recharged directly by local rainfall, rivers, and lakes, and the rate of recharge will be influenced by the permeability of the overlying rocks and soils. A confined aquifer is characterized by an overlying bed that is impermeable and the local rainfall does not influence the aquifer.

**Arbovirus**

Any of various viruses transmitted by arthropods and including the causative agents of dengue fever, yellow fever, and some types of encephalitis.

**Arid Regions**

Ecosystems with <250 mm precipitation per year.

**Autotrophic**

Organisms independent of external sources of organic carbon (compounds) for provision of their own organic constituents, which they can manufacture entirely from inorganic material. Plants are autotrophic (photoautotrophs) using the energy of sunlight to produce organic carbon compounds from inorganic carbon and water in the process of *photosynthesis*.

**Baseflow**

Sustained flow in a river or stream that is primarily produced by groundwater runoff, delayed subsurface runoff, and/or lake outflow.

**Baseline/Reference**

The baseline (or reference) is any datum against which change is measured. It might be a “current baseline,” in which case it represents observable, present-day conditions. It might also be a “future baseline,” which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.

**Basin**

The drainage area of a stream, river, or lake.

**Benthic Organisms**

The *biota* living on, or very near, the bottom of the sea, river, or lake.

**Biodiversity**

The numbers and relative abundances of different genes (genetic diversity), species, and ecosystems (communities) in a particular area. See also *functional diversity*.

**Biodiversity Hot Spots**

Areas with high concentrations of *endemic* species facing extraordinary habitat destruction.

**Biofuels**

A fuel produced from dry organic matter or combustible oils produced by plants. Examples of biofuel include alcohol (from fermented sugar), black liquor from the paper manufacturing process, wood, and soybean oil.

**Biomass**

The total mass of living organisms in a given area or volume; recently dead plant material is often included as dead biomass.

**Biome**

A grouping of similar plant and animal communities into broad landscape units that occur under similar environmental conditions.

**Biosphere**

The part of the Earth system comprising all ecosystems and living organisms in the atmosphere, on land (terrestrial biosphere), or in the oceans (marine biosphere), including derived dead organic matter, such as litter, soil organic matter, and oceanic detritus.

**Biota**

All living organisms of an area; the flora and fauna considered as a unit.

**Bog**

A poorly drained area rich in accumulated plant material, frequently surrounding a body of open water and having a characteristic flora (such as sedges, heaths, and sphagnum).

**Boreal Forest**

Forests of pine, spruce, fir, and larch stretching from the east coast of Canada westward to Alaska and continuing from Siberia westward across the entire extent of Russia to the European Plain.

**Breakwater**

An offshore structure (such as a wall or jetty) that, by breaking the force of the wave, protects a harbor, anchorage, beach, or shore area.

**C<sub>3</sub> Plants**

Plants that produce a three-carbon compound during photosynthesis, including most trees and agricultural crops such as rice, wheat, soybeans, potatoes, and vegetables.

**C<sub>4</sub> Plants**

Plants that produce a four-carbon compound during photosynthesis (mainly of tropical origin), including grasses and the agriculturally important crops maize, sugar cane, millet, and sorghum.

**Carbon Cycle**

The term used to describe the flow of carbon (in various forms, e.g., as in carbon dioxide) through the atmosphere, ocean, terrestrial biosphere, and lithosphere.

**Carbon Dioxide (CO<sub>2</sub>)**

A naturally occurring gas, also a by-product of burning fossil fuels and *biomass*, as well as from land-use changes and other industrial processes. It is the principal *anthropogenic greenhouse gas* that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

**Carbon Dioxide Fertilization**

The enhancement of the growth of plants as a result of increased atmospheric *carbon dioxide* concentration. Depending on their mechanism of *photosynthesis*, certain types of plants are more sensitive to changes in atmospheric CO<sub>2</sub> concentration. In particular, *C<sub>3</sub> plants* generally show a larger response to CO<sub>2</sub> than *C<sub>4</sub> plants*.

**Carbon Flux**

Transfer of carbon from one carbon pool to another in units of measurement of mass per unit area and time (e.g., t C).

**Carrying Capacity**

The number of individuals in a population that the resources of a *habitat* can support.

**Catchment**

An area that collects and drains rainwater.

**Chagas'Disease**

A parasitic disease caused by the *Trypanosoma cruzi* and transmitted by triatomine bugs in the Americas, with two clinical periods: acute (fever, swelling of the spleen, edemas) and chronic (digestive syndrome, potentially fatal heart condition).

**Cholera**

An intestinal infection that results in frequent watery stools, cramping abdominal pain, and eventual collapse from dehydration.

**Climate**

Climate in a narrow sense is usually defined as the “average weather,” or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands of years. The classical period is 3 decades, as defined by the World Meteorological Organization (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

**Climate Change**

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the *United Nations Framework Convention on Climate Change (UNFCCC)*, which defines “climate change” as: “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” See also *climate variability*.

**Climate Model (Hierarchy)**

A numerical representation of the climate system based on the physical, chemical, and biological properties of its components, their interactions and feedback processes, and accounting for all or some of its known properties. The climate system can be represented by models of varying

complexity (i.e., for any one component or combination of components a hierarchy of models can be identified, differing in such aspects as the number of spatial dimensions; the extent to which physical, chemical, or biological processes are explicitly represented; or the level at which empirical parameterizations are involved. Coupled atmosphere/ocean/sea-ice General Circulation Models (AOGCMs) provide a comprehensive representation of the climate system. There is an evolution towards more complex models with active chemistry and biology. Climate models are applied, as a research tool, to study and simulate the climate, but also for operational purposes, including monthly, seasonal, and interannual climate predictions.

### **Climate Prediction**

A climate prediction or climate forecast is the result of an attempt to produce a most likely description or estimate of the actual evolution of the climate in the future (e.g., at seasonal, interannual, or long-term time scales. See also *climate projection* and *climate scenario*.

### **Climate Projection**

A projection of the response of the climate system to emission or concentration scenarios of *greenhouse gases* and *aerosols*, or *radiative forcing* scenarios, often based upon simulations by climate models. Climate projections are distinguished from *climate predictions* in order to emphasize that climate projections depend upon the emission/concentration/radiative forcing scenario used, which are based on assumptions, concerning, for example, future socioeconomic and technological developments that may or may not be realized and are therefore subject to substantial uncertainty.

### **Climate Scenario**

A plausible and often simplified representation of the future *climate*, based on an internally consistent set of climatological relationships, that has been constructed for explicit use in investigating the potential consequences of anthropogenic climate change, often serving as input to impact models. Climate projections often serve as the raw material for constructing climate scenarios, but climate scenarios usually require additional information such as about the observed current climate. A “climate change scenario” is the difference between a climate scenario and the current climate.

### **Climate System**

The climate system is the highly complex system consisting of five major components: the atmosphere, the hydrosphere, the *cryosphere*, the land surface, and the *biosphere*, and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations and human-induced forcings such as the changing composition of the atmosphere and *land use*.

### **Climate Variability**

Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence

of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability). See also *climate change*.

### **CO<sub>2</sub> Fertilization**

See *carbon dioxide fertilization*.

### **Communicable Disease**

An infectious disease caused by transmission of an infective biological agent (virus, bacterium, protozoan, or multicellular macroparasite).

### **Coping Range**

The variation in climatic *stimuli* that a system can absorb without producing significant impacts.

### **Coral Bleaching**

The paling in color of corals resulting from a loss of symbiotic algae. Bleaching occurs in response to physiological shock in response to abrupt changes in temperature, salinity, and turbidity.

### **Cordillera**

An individual mountain chain with closely connected, distinct summits. In South America, “cordillera” refers to an individual mountain range.

### **Cryosphere**

The component of the climate system consisting of all snow, ice, and *permafrost* on and beneath the surface of the earth and ocean.

### **Cryptosporidiosis**

An opportunistic infection caused by an intestinal parasite common in animals. Transmission occurs through ingestion of food or water contaminated with animal feces. The parasite causes severe chronic diarrhea, especially in people with HIV.

### **Deepwater Formation**

Occurs when seawater freezes to form sea ice. The local release of salt and consequent increase in water density leads to the formation of saline coldwater that sinks to the ocean floor. See *Antarctic bottomwater*.

### **Deforestation**

Conversion of forest to non-forest. For a discussion of the term *forest* and related terms such as *afforestation*, *reforestation*, and *deforestation*, see the *IPCC Special Report on Land Use, Land-Use Change, and Forestry* (IPCC, 2000).

### **Dengue Fever**

An infectious viral disease spread by mosquitoes, often called breakbone fever because it is characterized by severe pain in joints and back. Subsequent infections of the virus may lead to dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS), which may be fatal.

**Desert**

An ecosystem with <100 mm precipitation per year.

**Desertification**

Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities. Further, the United Nations Convention to Combat Desertification (UNCCD) defines land degradation as a reduction or loss in arid, semi-arid, and dry sub-humid areas of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest, and woodlands resulting from land uses or from a process or combination of processes, including those arising from human activities and habitation patterns, such as: (i) soil erosion caused by wind and/or water; (ii) deterioration of the physical, chemical, and biological or economic properties of soil; and (iii) long-term loss of natural vegetation.

**Diatom**

A class of unicellular algae (*Bacillariophyceae*) that are widespread on soil surfaces and in freshwater and marine systems, especially cold waters of relatively low salinity. These have cell sizes ranging from 5 to 2000 µm.

**Disturbance Regime**

Frequency, intensity, and types of disturbances, such as fires, insect or pest outbreaks, floods, and *droughts*.

**Diurnal Temperature Range**

The difference between the maximum and minimum temperature during a day.

**Downscaling**

Reducing the scale of a model from a global to regional level.

**Drought**

The phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.

**Ecosystem**

A distinct system of interacting living organisms, together with their physical environment. The boundaries of what could be called an ecosystem are somewhat arbitrary, depending on the focus of interest or study. Thus the extent of an ecosystem may range from very small spatial scales to, ultimately, the entire Earth.

**Ecosystem Services**

Ecological processes or functions which have value to individuals or society

**Ecotone**

Transition area between adjacent ecological communities (e.g., between forests and grasslands), usually involving competition between organisms common to both.

**Edaphic**

Of or relating to the soil; factors inherent in the soil.

**Effective Rainfall**

The portion of the total rainfall that becomes available for plant growth.

**El Niño-Southern Oscillation (ENSO)**

El Niño, in its original sense, is a warmwater current that periodically flows along the coast of Ecuador and Peru, disrupting the local fishery. This oceanic event is associated with a fluctuation of the intertropical surface pressure pattern and circulation in the Indian and Pacific Oceans, called the *Southern Oscillation*. This coupled atmosphere-ocean phenomenon is collectively known as El Niño-Southern Oscillation. During an El Niño event, the prevailing trade winds weaken and the equatorial countercurrent strengthens, causing warm surface waters in the Indonesian area to flow eastward to overlie the cold waters of the Peru current. This event has great impact on the wind, sea surface temperature, and precipitation patterns in the tropical Pacific. It has climatic effects throughout the Pacific region and in many other parts of the world. The opposite of an El Niño event is called La Niña.

**Emission Scenario**

A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g., *greenhouse gases, aerosols*), based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socioeconomic development, technological change) and their key relationships. In 1992, the IPCC presented a set of emission scenarios that were used as a basis for the climate projections in the Second Assessment Report (IPCC, 1996). These emission scenarios are referred to as the IS92 scenarios. In the IPCC *Special Report on Emission Scenarios* (Nakicenovic *et al.*, 2000), new emission scenarios—the so-called SRES scenarios—were published.

**Endemic**

Restricted or peculiar to a locality or region. With regard to human health, endemic can refer to a disease or agent present or usually prevalent in a population or geographical area at all times.

**Endorheic Lake**

A lake with no outflow; also known as a closed lake.

**Enzootic**

A disease affecting the animals in an area. It corresponds to an *endemic* disease among humans.

**Epidemic**

Occurring suddenly in numbers clearly in excess of normal expectancy, said especially of infectious diseases but applied also to any disease, injury, or other health-related event occurring in such outbreaks.

**Erosion**

The process of removal and transport of soil and rock by weathering, mass wasting, and the action of streams, glaciers, waves, winds, and underground water.

**Eustatic Sea-Level Rise**

See *sea-level rise*.

**Eutrophication**

The process by which a body of water (often shallow) becomes (either naturally or by pollution) rich in dissolved nutrients with a seasonal deficiency in dissolved oxygen.

**Evaporation**

The process by which a liquid becomes a gas.

**Evapotranspiration**

The combined process of *evaporation* from the Earth's surface and *transpiration* from vegetation.

**Exoheic Lake**

A lake drained by outflowing rivers.

**Exotic Species**

See *introduced species*.

**Exposure**

The nature and degree to which a system is exposed to significant climatic variations.

**Exposure Unit**

An activity, group, region, or resource that is subjected to climatic *stimuli*.

**Externalities**

By-products of activities that affect the well-being of people or the environment, where those impacts are not reflected in market prices. The costs (or benefits) associated with externalities do not enter cost-accounting schemes.

**Extinction**

The complete disappearance of an entire species.

**Extirpation**

The disappearance of a species from part of its range; local extinction.

**Extreme Weather Event**

An event that is rare within its statistical reference distribution at a particular place. Definitions of "rare" vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile. By definition, the characteristics of what is called "extreme weather" may vary from place to place. An "extreme climate event" is an average of a number of weather events over a certain period of time, an average which is itself extreme (e.g., rainfall over a season).

**Extrinsic Incubation Period**

In blood-feeding anthropod vectors, the time between acquisition of the infectious blood meal and the time when the anthropod becomes capable of transmitting the agent. In the case of malaria, the life stages of the plasmodium parasite spent within the female mosquito vector (i.e., outside the human host).

**Feedback**

A process that triggers changes in a second process that in turn influences the original one; a positive feedback intensifies the original process, and a negative feedback reduces it.

**Fen**

Low land covered wholly or partly with water unless artificially drained.

**Fiber**

Wood, fuelwood (either woody or non-woody).

**Food Insecurity**

A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal, or transitory.

**Forecast**

See *climate prediction* and *climate projection*.

**Forest**

A vegetation type dominated by trees. Many definitions of the term *forest* are in use throughout the world, reflecting wide differences in biogeophysical conditions, social structure, and economics. For a discussion of the term *forest* and related terms such as *afforestation*, *reforestation*, and *deforestation*, see the IPCC *Special Report on Land Use, Land-Use Change, and Forestry* (IPCC, 2000).

**Freshwater Lens**

Alenticular fresh groundwater body that underlies an oceanic island. It is underlain by saline water.

**Functional Diversity**

The number of functionally different organisms in an ecosystem (also referred to as "functional types" and "functional groups").

**General Circulation Model (GCM)**

See *climate model*.

**General Equilibrium Analysis**

An approach that considers simultaneously all the markets in an economy, allowing for feedback effects between individual markets.

**Geomorphic**

Pertaining to the form of the Earth or its surface features.

**Glacier**

A mass of land ice flowing downhill (by internal deformation and sliding at the base) and constrained by the surrounding topography (e.g., the sides of a valley or surrounding peaks); the bedrock topography is the major influence on the dynamics and surface slope of a glacier. A glacier is maintained by accumulation of snow at high altitudes, balanced by melting at low altitudes or discharge into the sea.

**Greenhouse Effect**

Greenhouse gases effectively absorb infrared radiation emitted by the Earth's surface, by the atmosphere itself due to the same gases, and by clouds. Atmospheric radiation is emitted to all sides, including downward to the Earth's surface. Thus greenhouse gases trap heat within the surface-troposphere system. This is called the "natural greenhouse effect." Atmospheric radiation is strongly coupled to the temperature of the level at which it is emitted. In the troposphere, the temperature generally decreases with height. Effectively, infrared radiation emitted to space originates from an altitude with a temperature of on average -19°C, in balance with the net incoming solar radiation, whereas the Earth's surface is kept at a much higher temperature of on average 14°C. An increase in the concentration of greenhouse gases leads to an increased infrared opacity of the atmosphere, and therefore to an effective radiation into space from a higher altitude at a lower temperature. This causes a radiative forcing, an imbalance that can only be compensated for by an increase of the temperature of the surface-troposphere system. This is called the "enhanced greenhouse effect."

**Greenhouse Gas**

Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the *greenhouse effect*. Water vapor ( $H_2O$ ), carbon dioxide ( $CO_2$ ), nitrous oxide ( $N_2O$ ), methane ( $CH_4$ ), and ozone ( $O_3$ ) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances which are dealt with under the Montreal Protocol. Beside  $CO_2$ ,  $N_2O$ , and  $CH_4$ , the *Kyoto Protocol* deals with the greenhouse gases sulfur hexafluoride ( $SF_6$ ), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

**Groin**

A low, narrow jetty, usually extending roughly perpendicular to the shoreline, designed to protect the shore from erosion by currents, tides, or waves, or to trap sand for the purpose of building up or making a beach.

**Gross Primary Production**

The amount of carbon fixed from the atmosphere through *photosynthesis*.

**Groundwater Recharge**

The process by which external water is added to the zone of saturation of an *aquifer*, either directly into a formation or indirectly by way of another formation.

**Habitat**

The particular environment or place where an organism or species tends to live; a more locally circumscribed portion of the total environment.

**Halocline**

A layer in the ocean in which the rate of salinity variation with depth is much larger than layers immediately above or below it.

**Hantavirus**

A virus in the family Bunyaviridae that causes a type of haemorrhagic fever. It is thought that humans catch the disease mainly from infected rodents, either through direct contact with the animals or by inhaling or ingesting dust that contains their dried urine.

**Heath**

Any of the various low-growing shrubby plants of open wastelands, usually growing on acidic, poorly drained soils.

**Heat Island**

An area within an urban area characterized by ambient temperatures higher than those of the surrounding area because of the absorption of solar energy by materials like asphalt.

**Herbaceous**

Flowering, non-woody plants.

**Heterotrophic Respiration**

The release of  $CO_2$  from decomposition of organic matter.

**Highland Malaria**

*Malaria* that occurs around the altitudinal limits of its distribution.

**Human Settlement**

A place or area occupied by settlers.

**Human System**

Any system in which human organizations play a major role. Often, but not always, the term is synonymous with "society" or "social system" (e.g., agricultural system, political system, technological system, economic system); all are human systems in the sense applied in the TAR.

**Hypolimnion**

The part of a lake below the *thermocline* made up of water that is stagnant and of essentially uniform temperature except during the period of overturn.

**Ice Cap**

A dome-shaped ice mass covering a highland area that is considerably smaller in extent than *ice sheets*.

**Ice Jam**

An accumulation of broken river or sea ice caught in a narrow channel.

**Ice Sheet**

A mass of land ice which is sufficiently deep to cover most of the underlying bedrock topography, so that its shape is mainly determined by its internal dynamics (the flow of the ice as it deforms internally and slides at its base). An ice sheet flows outwards from a high central plateau with a small average surface slope. The margins slope steeply, and the ice is discharged through fast-flowing ice streams or outlet glaciers, in some cases into the sea or into ice shelves floating on the sea. There are only two large ice sheets in the modern world—on Greenland and Antarctica, the Antarctic ice sheet being divided into east and west by the Transantarctic Mountains; during glacial periods there were others.

**Ice Shelf**

A floating *ice sheet* of considerable thickness attached to a coast (usually of great horizontal extent with a level or gently undulating surface); often a seaward extension of ice sheets.

**Immunosuppression**

Reduced functioning of an individual's immune system.

**(Climate) Impact Assessment**

The practice of identifying and evaluating the detrimental and beneficial consequences of climate change on natural and human systems.

**(Climate) Impacts**

Consequences of climate change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.

- **Potential Impacts**—All impacts that may occur given a projected change in climate, without considering adaptation.
- **Residual Impacts**—The impacts of climate change that would occur after adaptation.

See also *aggregate impacts*, *market impacts*, and *non-market impacts*.

**Indigenous Peoples**

People whose ancestors inhabited a place or a country when persons from another culture or ethnic background arrived on the scene and dominated them through conquest, settlement, or other means and who today live more in conformity with their own social, economic, and cultural customs and traditions than those of the country of which they now form a part (also referred to as “native,” “aboriginal,” or “tribal” peoples)

**Industrial Revolution**

A period of rapid industrial growth with far-reaching social and economic consequences, beginning in England during the second half of the 18th century and spreading to Europe and later to other countries including the United States. The industrial revolution marks the beginning of a strong increase in the use of fossil fuels and emission of in particular fossil carbon dioxide. In the TAR, the terms “pre-industrial” and “industrial” refer, somewhat arbitrarily, to the periods before and after 1750, respectively.

**Infectious Diseases**

Any disease that can be transmitted from one person to another. This may occur by direct physical contact, by common handling of an object that has picked up infective organisms, through a disease carrier, or by spread of infected droplets coughed or exhaled into the air.

**Infrastructure**

The basic equipment, utilities, productive enterprises, installations, and services essential for the development, operation, and growth of an organization, city, or nation.

**Insolvency**

Inability to meet financial obligations; bankruptcy.

**Integrated Assessment**

A method of analysis that combines results and models from the physical, biological, economic, and social sciences, and the interactions between these components, in a consistent framework to evaluate the status and the consequences of environmental change and the policy responses to it.

**Introduced Species**

A species occurring in an area outside its historically known natural range as a result of accidental dispersal by humans (also referred to as “exotic species” or “alien species”).

**Invasive Species**

An introduced species that invades natural habitats.

**Keystone Species**

A species that has a central servicing role affecting many other organisms and whose demise is likely to result in the loss of a number of species and lead to major changes in ecosystem function.

**Kyoto Protocol**

The Kyoto Protocol was adopted at the Third Session of the Conference of the Parties (COP) to the *UN Framework Convention on Climate Change* (UNFCCC) in 1997 in Kyoto, Japan. It contains legally binding commitments, in addition to those included in the UNFCCC. Countries included in Annex B of the Protocol (most OECD countries and EITs) agreed to reduce their anthropogenic GHG emissions ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$ , HFCs, PFCs, and  $\text{SF}_6$ ) by at least 5% below 1990 levels in the commitment period 2008 to 2012. The Kyoto Protocol has not yet entered into force (as of June 2001).

**La Niña**

See *El Niño-Southern Oscillation (ENSO)*.

**Land Use**

The total of arrangements, activities, and inputs undertaken in a certain land-cover type (a set of human actions). The social and economic purposes for which land is managed (e.g., grazing, timber extraction, conservation).

**Landslide**

A mass of material that has slipped downhill by gravity, often assisted by water when the material is saturated; rapid movement of a mass of soil, rock, or debris down a slope.

**Large-Scale Singularities**

Abrupt and dramatic changes in systems in response to smooth changes in driving forces. For example, a gradual increase in atmospheric greenhouse gas concentrations may lead to such large-scale singularities as slowdown or collapse of the thermohaline circulation or collapse of the West Antarctic Ice Sheet. The occurrence, magnitude, and timing of large-scale singularities are difficult to predict.

**Leaching**

The removal of soil elements or applied chemicals through percolation.

**Legume**

Plants that are able to fix nitrogen from the air through a symbiotic relationship with soil bacteria (e.g., peas, beans, alfalfa, clovers).

**Limnology**

Study of lakes and their *biota*.

**Littoral Zone**

A coastal region; the shore zone between high and low watermarks.

**Local Agenda 21**

Local Agenda 21s are the local plans for environment and development that each local authority is meant to develop through a consultative process with their populations, with particular attention paid to involving women and youth. Many local authorities have developed Local Agenda 21s through consultative processes as a means of reorienting their policies, plans, and operations towards the achievement of *sustainable development* goals. The term comes from Chapter 28 of Agenda 21—the document formally endorsed by all government representatives attending the UN Conference on Environment and Development (also known as the Earth Summit) in Rio de Janeiro in 1992.

**Maladaptation**

Any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead.

**Malaria**

Endemic or epidemic parasitic disease caused by species of the genus *Plasmodium* (protozoa) and transmitted by mosquitoes of the genus *Anopheles*; produces high fever attacks and systemic disorders, and kills approximately 2 million people every year.

**Market Impacts**

*Impacts* that are linked to market transactions and directly affect gross domestic product (GDP, a country's national accounts)—for example, changes in the supply and price of agricultural goods. See also *non-market impacts*.

**Mass Movement**

Applies to all unit movements of land material propelled and controlled by gravity.

**Meningitis**

Inflammation of the meninges (part of the covering of the brain).

**Metazoan**

An animal whose body consists of many cells. See also *protozoan*

**Microbial Loop**

Complex food web involving bacteria, single-celled animals and plants, viruses, and dissolved and particulate organic material. Dissolved and particulate material, released from organisms, is utilized by bacteria, which are grazed by protozoa which in turn are grazed by metazoa. Around 50% (often more) of primary production passes through the microbial loop rather than along the classical food chain of phytoplankton to herbivore.

**Microclimate**

Local climate at or near the Earth's surface. See also *climate*.

**Mitigation**

An anthropogenic intervention to reduce the *sources* or enhance the *sinks* of *greenhouse gases*.

**Mixed Layer**

The upper region of the ocean well-mixed by interaction with the overlying atmosphere.

**Monsoon**

Wind in the general atmospheric circulation typified by a seasonal persistent wind direction and by a pronounced change in direction from one season to the next.

**Montane**

The biogeographic zone made up of relatively moist, cool upland slopes below timberline and characterized by the presence of large evergreen trees as a dominant life form.

**Montreal Protocol**

The Montreal Protocol on Substances that Deplete the Ozone Layer was adopted in Montreal in 1987, and subsequently adjusted and amended in London (1990), Copenhagen (1992), Vienna (1995), Montreal (1997), and Beijing (1999). It controls the consumption and production of chlorine- and bromine-containing chemicals that destroy stratospheric ozone, such as CFCs, methyl chloroform, carbon tetrachloride, and many others.

**Morbidity**

Rate of occurrence of disease or other health disorder within a population, taking account of the age-specific morbidity rates. Health outcomes include chronic disease incidence/prevalence, rates of hospitalization, primary care consultations, disability-days (i.e., days when absent from work), and prevalence of symptoms.

**Morphology**

The form and structure of an organism or any of its parts.

**Mortality**

Rate of occurrence of death within a population within a specified time period; calculation of mortality takes account of age-specific death rates, and can thus yield measures of life expectancy and the extent of premature death.

**Nanoplankton**

*Phytoplankton* whose lengths range from 10-50  $\mu\text{m}$ .

**Net Biome Production (NBP)**

Net gain or loss of carbon from a region. NBP is equal to *Net Ecosystem Production* minus the carbon lost due to a disturbance (e.g., a forest fire or a forest harvest).

**Net Ecosystem Production (NEP)**

Net gain or loss of carbon from an ecosystem. NEP is equal to *Net Primary Production* minus the carbon lost through heterotrophic respiration.

**Net Primary Production (NPP)**

The increase in plant biomass or carbon of a unit of a landscape. NPP is equal to *Gross Primary Production* minus carbon lost through autotrophic respiration.

**Nitrogen Oxides ( $\text{NO}_x$ )**

Any of several oxides of nitrogen.

**Non-Linearity**

A process is called “non-linear” when there is no simple proportional relation between cause and effect.

**Non-Market Impacts**

*Impacts* that affect ecosystems or human welfare, but that are not directly linked to market transactions—for example, an increased risk of premature death. See also *market impacts*.

**Non-Point-Source Pollution**

Pollution from sources that cannot be defined as discrete points, such as areas of crop production, timber, surface mining, disposal of refuse, and construction. See also *point-source pollution*.

**No Regrets Policy**

One that would generate net social benefits whether or not there is *anthropogenic* climate change.

**North Atlantic Oscillation (NAO)**

The North Atlantic Oscillation consists of opposing variations of barometric pressure near Iceland and near the Azores. It is the dominant mode of winter climate variability in the North Atlantic region ranging from central North America to Europe.

**Obligate Species**

Species restricted to one particularly characteristic mode of life.

**Ocean Conveyor Belt**

The theoretical route by which water circulates around the entire global ocean, driven by wind and the *thermohaline circulation*.

**Ocean Ventilation**

Downwelling of water from near the surface to the deep ocean. See also *deepwater formation*.

**Oligotrophic**

Relatively unproductive areas of the sea, lakes, and rivers with low nutrient content. See also *eutrophic*.

**Opportunity Costs**

The cost of an economic activity forgone by the choice of another activity.

**Orography**

The study of the physical geography of mountains and mountain systems.

**Ozone**

Ozone, the triatomic form of oxygen ( $\text{O}_3$ ), is a gaseous atmospheric constituent. In the troposphere, it is created both naturally and by photochemical reactions involving gases resulting from human activities (*photochemical smog*). In high concentrations, tropospheric ozone can be harmful to a wide-range of living organisms. Tropospheric ozone acts as a *greenhouse gas*. In the stratosphere, ozone is created by the interaction between solar ultraviolet radiation and molecular oxygen ( $\text{O}_2$ ). Stratospheric ozone plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric ozone, due to chemical reactions that may be enhanced by *climate change*, results in an increased ground-level flux of *ultraviolet (UV-) B radiation*. See also *Montreal Protocol*.

**Particulates**

Very small solid exhaust particles emitted during the combustion of fossil and biomass fuels. Particulates may consist of a wide variety of substances. Of greatest concern for health are particulates of less than or equal to 10 nm in diameter, usually designated as PM<sub>10</sub>.

**Peat**

Unconsolidated soil material consisting largely of partially decomposed organic matter accumulated under conditions of excess moisture or other conditions that decrease decomposition rates.

**Pelagic**

Of, relating to, or living or occurring in the open sea.

**Permafrost**

Perennially frozen ground that occurs wherever the temperature remains below 0°C for several years.

**Phenology**

The study of natural phenomena that recur periodically (e.g., blooming, migrating) and their relation to climate and seasonal changes.

**Photic Zone**

The upper waters of lakes, rivers, and sea sufficiently illuminated for *photosynthesis* to occur.

**Photochemical Smog**

A mix of photochemical oxidant air pollutants produced by the reaction of sunlight with primary air pollutants, especially hydrocarbons.

**Photosynthate**

The product of *photosynthesis*.

**Photosynthesis**

The process by which plants take carbon dioxide from the air (or bicarbonate in water) to build carbohydrates, releasing oxygen in the process. There are several pathways of photosynthesis with different responses to atmospheric CO<sub>2</sub> concentrations. See also *CO<sub>2</sub> fertilization*, *C<sub>3</sub> plants*, and *C<sub>4</sub> plants*.

**Physiographic**

Of, relating to, or employing a description of nature or natural phenomena.

**Phytophagous Insects**

Insects that feed on plants.

**Phytoplankton**

The plant forms of *plankton* (e.g., *diatoms*). Phytoplankton are the dominant plants in the sea, and are the base of the entire marine food web. These single-celled organisms are the principal agents for photosynthetic carbon fixation in the ocean. See also *zooplankton*.

**Plankton**

Aquatic organisms that drift or swim weakly. See also *phytoplankton* and *zooplankton*.

**Point-Source Pollution**

Pollution resulting from any confined, discrete source, such as a pipe, ditch, tunnel, well, container, concentrated animal-feeding operation, or floating craft. See also *non-point-source pollution*.

**Polynyas**

Areas of open water in pack ice or sea ice.

**Pool**

See *reservoir*.

**Potential Production**

Estimated production of a crop under conditions when nutrients and water are available at optimum levels for plant growth and development; other conditions such as day length, temperature, soil characteristics, etc., determined by site characteristics.

**Pre-Industrial**

See *Industrial Revolution*.

**Primary Energy**

Energy embodied in natural resources (e.g., coal, crude oil, sunlight, uranium) that has not undergone any *anthropogenic* conversion or transformation.

**Producer Surplus**

Returns beyond the cost of production that provide compensation for owners of skills or assets that are scarce (e.g., agriculturally productive land).

**Projection (Generic)**

A projection is a potential future evolution of a quality or set of quantities, often computed with the aid of a model. Projections are distinguished from predictions in order to emphasize that projections involve assumptions—concerning, for example, future socioeconomic and technological developments that may or may not be realized—and are therefore subject to substantial uncertainty. See also *climate projection* and *climate prediction*.

**Protozoan**

A single-celled animal.

**Radiative Forcing**

Radiative forcing is the change in the net vertical irradiance [expressed in Watts per square meter (Wm<sup>-2</sup>)] at the tropopause due to an internal change or a change in the external forcing of the climate system, such as a change in the concentration of CO<sub>2</sub> or the output of the Sun. Usually radiative forcing is computed after allowing for stratospheric temperatures to readjust to radiative equilibrium, but with all tropospheric properties held fixed at their unperturbed values.

**Rangeland**

Unimproved grasslands, shrublands, savannas, and tundra.

**Reference Scenario**

See *baseline/reference*.

**Reforestation**

Planting of *forests* on lands that have previously contained forests but that have been converted to some other use. For a discussion of the term *forest* and related terms such as *afforestation*, *reforestation*, and *deforestation*, see the IPCC *Special Report on Land Use, Land-Use Change, and Forestry* (IPCC, 2000).

**Regeneration**

The renewal of a stand of trees through either natural means (seeded onsite or adjacent stands or deposited by wind, birds, or animals) or artificial means (by planting seedlings or direct seeding).

**Reinsurance**

The transfer of a portion of primary insurance risks to a secondary tier of insurers (reinsurers); essentially “insurance for insurers.”

**Reservoir**

A component of the climate system, other than the atmosphere, that has the capacity to store, accumulate, or release a substance of concern (e.g., carbon, a *greenhouse gas*, or precursor). Oceans, soils, and *forests* are examples of reservoirs of carbon. “Pool” is an equivalent term (note that the definition of pool often includes the atmosphere). The absolute quantity of substances of concern held within a reservoir at a specified time is called the “stock.” The term also means an artificial or natural storage place for water, such as a lake, pond, or *aquifer*, from which the water may be withdrawn for such purposes as irrigation, water supply, or irrigation.

**Reservoir Host**

Any animal, plant, soil, or inanimate matter in which a pathogen normally lives and multiplies, and on which it depends primarily for survival (e.g., foxes are a reservoir for rabies). Reservoir hosts may be asymptomatic.

**Resilience**

Amount of change a system can undergo without changing state.

**Respiration**

The process whereby living organisms convert organic matter to carbon dioxide, releasing energy and consuming oxygen.

**Riparian**

Relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater.

**Runoff**

That part of precipitation that does not evaporate. In some countries, runoff implies *surface runoff* only.

**Salinization**

The accumulation of salts in soils.

**Saltwater Intrusion/Encroachment**

Displacement of fresh surface water or groundwater by the advance of saltwater due to its greater density, usually in coastal and estuarine areas.

**Scenario (Generic)**

A plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections, but are often based on additional information from other sources, sometimes combined with a “narrative storyline.” See also *climate scenario* and *emissions scenario*.

**Sea-Level Rise**

An increase in the mean level of the ocean. Eustatic sea-level rise is a change in global average sea level brought about by an alteration to the volume of the world ocean. Relative sea-level rise occurs where there is a net increase in the level of the ocean relative to local land movements. Climate modelers largely concentrate on estimating eustatic sea-level change. Impact researchers focus on relative sea-level change.

**Seawall**

A human-made wall or embankment along a shore to prevent wave erosion.

**Semi-Arid Regions**

Ecosystems that have >250 mm precipitation per year, but are not highly productive; usually classified as rangelands.

**Sensitivity**

Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate-related *stimuli*. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to *sea level rise*).

**Sequestration**

The process of increasing the carbon content of a carbon pool other than the atmosphere.

**Silt**

Unconsolidated or loose sedimentary material whose constituent rock particles are finer than grains of sand and larger than clay particles.

**Silviculture**

Development and care of forests.

**Sink**

Any process, activity, or mechanism that removes a *greenhouse gas*, an *aerosol*, or a precursor of a greenhouse gas or aerosol from the atmosphere.

**Snowpacks**

A seasonal accumulation of slow-melting snow.

**Soil Carbon Pool**

Refers to the relevant carbon in the soil. It includes various forms of soil organic carbon (humus) and inorganic soil carbon and charcoal. It excludes soil biomass (e.g., roots, bulbs, etc.) as well as the soil fauna (animals).

**Source**

Any process, activity, or mechanism that releases a *greenhouse gas*, an *aerosol*, or a precursor of a greenhouse gas or aerosol into the atmosphere.

**Southern Oscillation**

A large-scale atmospheric and hydrographic fluctuation centered in the equatorial Pacific Ocean, exhibiting a pressure anomaly, alternatively high over the Indian Ocean and high over the South Pacific. Its period is slightly variable, averaging 2.33 years. The variation in pressure is accompanied by variations in wind strengths, ocean currents, sea-surface temperatures, and precipitation in the surrounding areas.

**Stakeholders**

Person or entity holding grants, concessions, or any other type of value that would be affected by a particular action or policy.

**Stimuli (Climate-Related)**

All the elements of climate change, including mean climate characteristics, climate variability, and the frequency and magnitude of extremes.

**Stochastic Events**

Events involving a random variable, chance, or probability.

**Stock**

See *reservoir*.

**Stratosphere**

Highly stratified region of 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.

**Streamflow**

Water within a river channel, usually expressed in  $\text{m}^3 \text{ sec}^{-1}$ .

**Sub-Antarctic Mode Water (SAMW)**

A type of water in the Sub-Antarctic Zone of the Southern Ocean. The SAMW is the deep surface layer of water with uniform temperature and salinity created by convective processes in the winter. It can be identified by a temperature of around  $-1.8^\circ\text{C}$  and a salinity of around 34.4 PSU, and is separated from the overlying surface water by a halocline at around 50 m in the summer. Although it is not considered to be a water mass, it contributes to the Central Water of the Southern Hemisphere, and is additionally responsible for the formation of Antarctic Intermediate Water in the eastern part of the South Pacific Ocean. It is also known as Winter Water.

**Submergence**

A rise in the water level in relation to the land, so that areas of formerly dry land become inundated; it results either from a sinking of the land or from a rise of the water level.

**Subsidence**

The sudden sinking or gradual downward settling of the Earth's surface with little or no horizontal motion.

**Succession**

Transition in the composition of plant communities following disturbance.

**Surface Runoff**

The water that travels over the soil surface to the nearest surface stream; *runoff* of a drainage basin that has not passed beneath the surface since precipitation.

**Sustainable Development**

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Synoptic**

Relating to or displaying atmospheric and weather conditions as they exist simultaneously over a broad area.

**Taiga**

Coniferous forests of northern North America and Eurasia.

**Thermal Erosion**

The erosion of ice-rich permafrost by the combined thermal and mechanical action of moving water.

**Thermal Expansion**

In connection with *sea-level rise*, this refers to the increase in volume (and decrease in density) that results from warming water. A warming of the ocean leads to an expansion of the ocean volume and hence an increase in sea level.

**Thermocline**

The region in the world's ocean, typically at a depth of 1 km, where temperature decreases rapidly with depth and which marks the boundary between the surface and the ocean.

**Thermohaline Circulation**

Large-scale density-driven circulation in the ocean, caused by differences in temperature and salinity. In the North Atlantic, the thermohaline circulation consists of warm surface water flowing northward and cold deepwater flowing southward, resulting in a net poleward transport of heat. The surface water sinks in highly restricted sinking regions located in high latitudes.

**Thermokarst**

Irregular, hummocky topography in frozen ground caused by melting of ice.

**Timberline**

The upper limit of tree growth in mountains or high latitudes.

**Transpiration**

The emission of water vapor from the surfaces of leaves or other plant parts.

**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.

**Tsunami**

A large tidal wave produced by a submarine earthquake, landslide, or volcanic eruption.

**Tundra**

A treeless, level, or gently undulating plain characteristic of arctic and subarctic regions.

**Ultraviolet (UV)-B Radiation**

Solar radiation within a wavelength range of 280–320 nm, the greater part of which is absorbed by *stratospheric ozone*. Enhanced UV-B radiation suppresses the immune system and can have other adverse effects on living organisms.

**Uncertainty**

An expression of the degree to which a value (e.g., the future state of the climate system) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined concepts or terminology, or uncertain projections of human behavior. Uncertainty can therefore be represented by quantitative measures (e.g., a range of values calculated by various models) or by qualitative statements (e.g., reflecting the judgment of a team of experts).

**Undernutrition**

The result of food intake that is insufficient to meet dietary energy requirements continuously, poor absorption, and/or poor biological use of nutrients consumed.

**Unique and Threatened Systems**

Entities that are confined to a relatively narrow geographical range but can affect other, often larger entities beyond their range; narrow geographical range points to sensitivity to environmental variables, including climate, and therefore attests to potential vulnerability to *climate change*.

**United Nations Framework Convention****on Climate Change (UNFCCC)**

The Convention was adopted on 9 May 1992, in New York, and signed at the 1992 Earth Summit in Rio de Janeiro by more than 150 countries and the European Community. Its ultimate objective is the “stabilization of greenhouse gas

concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” It contains commitments for all Parties. Under the Convention, Parties included in Annex I aim to return greenhouse gas emissions not controlled by the Montreal Protocol to 1990 levels by the year 2000. The Convention entered in force in March 1994. See also *Kyoto Protocol*.

**Ungulate**

Ahoofed, typically herbivorous, quadruped mammal (such as a ruminant, swine, camel, hippopotamus, horse, rhinoceros, or elephant).

**Upwelling**

Transport of deeper water to the surface, usually caused by horizontal movements of surface water.

**Urbanization**

The conversion of land from a natural state or managed natural state (such as agriculture) to cities; a process driven by net rural-to-urban migration through which an increasing percentage of the population in any nation or region come to live in settlements that are defined as “urban centers.”

**Vector**

An organism, such as an insect, that transmits a pathogen from one host to another. See also *vector-borne diseases* and *vectorial capacity*.

**Vector-Borne Diseases**

Disease that is transmitted between hosts by a *vector* organism (such as a mosquito or tick—for example, malaria, dengue fever, and leishmaniasis).

**Vectorial Capacity**

Quantitative term used in the study of the transmission dynamics of malaria to express the average number of potentially infective bites of all vectors feeding upon one host in one day, or the number of new inoculations with a vector-borne disease transmitted by one vector species from one infective host in one day.

**Vernalization**

The act or process of hastening the flowering and fruiting of plants by treating seeds, bulbs, or seedlings so as to induce a shortening of the vegetative period.

**Vulnerability**

The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

**Water Consumption**

Amount of extracted water irretrievably lost at a given territory during its use (evaporation and goods production). Water consumption is equal to water withdrawal minus return flow.

**Water Stress**

A country is water stressed if the available freshwater supply relative to *water withdrawals* acts as an important constraint on development. Withdrawals exceeding 20% of renewable water supply has been used as an indicator of water stress.

**Water Withdrawal**

Amount of water extracted from water bodies.

**Water Use Efficiency**

Carbon gain in photosynthesis per unit water lost in evapotranspiration. It can be expressed on a short-term basis as the ratio of photosynthetic carbon gain per unit transpirational water loss, or on a seasonal basis as the ratio of *net primary production* or agricultural yield to the amount of available water.

**Sources**

- IPCC**, 1996: *Climate Change 1995: The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change* [Houghton, J.T., L.G. Meira Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskell (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 572 pp.
- IPCC**, 1998: *The Regional Impacts of Climate Change: An Assessment of Vulnerability. A Special Report of IPCC Working Group II* [Watson, R.T., M.C. Zinyowera, and R.H. Moss (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 517 pp.
- IPCC**, 2000: *Land Use, Land-Use Change, and Forestry. A Special Report of the IPCC* [Watson, R.T., I.R. Noble, B. Bolin, N.H. Ravindranath, D.J. Verardo, and D.J. Dokken (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 377 pp.
- Jackson, J.** (ed.), 1997: *Glossary of Geology*. American Geological Institute, Alexandria, Virginia.
- Moss, R.H.** and S.H. Schneider, 2000: Uncertainties in the IPCC TAR: recommendations to lead authors for more consistent assessment and reporting. In: *Guidance Papers on the Cross Cutting Issues of the Third Assessment Report of the IPCC* [Pachauri, R., K. Tanaka, and T. Taniguchi (eds.)]. Intergovernmental Panel on Climate Change, Geneva, Switzerland, pp. 33–51. Available online at <http://www.gispri.or.jp>.

**Xeric**

Requiring only a small amount of moisture.

**Zoonosis**

The transmission of a disease from an animal or nonhuman species to humans. The natural reservoir is a nonhuman animal.

**Zooplankton**

The animal forms of *plankton*. They consume *phytoplankton* or other zooplankton. See also *phytoplankton*.

**Nakicenovic, N.**, J. Alcamo, G. Davis, B. de Vries, J. Fenmann, S. Gaffin, K. Gregory, A. Grübler, T.Y. Jung, T. Kram, E.L. La Rovere, L. Michaelis, S. Mori, T. Morita, W. Pepper, H. Pitcher, L. Price, K. Raihi, A. Roehrl, H.-H. Rogner, A. Sankovski, M. Schlesinger, P. Shukla, S. Smith, R. Swart, S. van Rooijen, N. Victor, and Z. Dadi, 2000: *Emissions Scenarios. A Special Report of Working Group III of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 599 pp.

**United Nations Environment Programme**, 1995: *Global Biodiversity Assessment* [Heywood, V.H. and R.T. Watson (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1140 pp.