

Climate Change Terminology

Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or benefit from opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

Adaptive Capacity: Organization and public capacity to change in response to, and in expectation of, the impact of climate hazards

Anthropogenic emissions: greenhouse gas emissions and aerosols released from human activities such as fossil fuel-based energy sources, the built environment and land use change.

Climate: the average weather conditions of a region over a long period of time. Or more rigorously, the statistical description in terms of the mean and variability of relevant quantities over a period of time. The standard period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant attributes are most often surface climate variables such as temperature, precipitation and wind.

Climate hazard: the potential occurrence of a climate change driven event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. Climate change amplifies the intensity, frequency and variability of climate hazards.

Calgary's key climate hazards: Extreme temperatures, multi-year drought, short duration-high intensity storms, changes in seasonality, river flooding, severe storms, winter storms, and wildfire.

Climate-related impacts: the consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including climate-related events or long-term trends), exposure, and vulnerability. Impacts generally refer to effects on built, natural and human systems including lives; livelihoods; health and well-being; ecosystems and species; economic, social and cultural assets; services (including ecosystem services); and infrastructure. Impacts may be referred to as consequences or outcomes, and can be adverse or beneficial.

Examples of climate-related impacts: water supply shortage due to multi-year drought, health impacts from poor air quality due to wildfire smoke, and increased basement flood damages due to intense summer storms.

Climate-related risk: the potential for adverse consequences where something of value is at stake and where the occurrence and degree of an outcome is uncertain. In the context of the assessment of climate impacts, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard, or of adaptation or mitigation responses to such a hazard, on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure. Risk results from the interaction of vulnerability (of the affected system), its exposure over time (to the hazard), as well as the (climate-related) hazard and the likelihood of its occurrence.

Climate system: a complex system consisting of five major components: the atmosphere, hydrosphere, cryosphere, lithosphere and biosphere and the interactions between them. The climate system evolves over time under the influence of internal dynamics and external forcings.

Climate variables: a physical, or atmospheric variable or a group of linked variables that critically contributes to the characterization of the Earth's climate.



Examples of climate variables: air temperature, precipitation, air pressure, wind speed, and water vapour (humidity).

Cooling degree days: are equal to the number of degrees Celsius a given day's mean temperature is above 18°C. For example, if the daily mean temperature is 21°C, the CDD value for that day is equal to 3°C. If the daily mean temperature is below 18°C, the CDD value for that day is zero.

Consequence: is the effect, result or outcome of an acute or long-term event. Consequence is determined by the magnitude of system(s) impacts. It includes the following factors: duration of impact, frequency of impact, vulnerability, which is determined by sensitivity and response capacity, and exposure within the system(s), direct & indirect costs (monetary & non-monetary).

Coping Capacity: Organization and public capacity to manage the impact of climate hazards (disaster recovery)

CO₂e: Carbon dioxide equivalent (CO₂e) is a standard unit for expressing the impact of each different greenhouse gas in terms of the amount of CO₂ that would create the same amount of warming. Standard ratios are used to convert various gases into equivalent amounts of CO₂ based on the global warming potential of each gas. The global warming potential describes the warming impact of a gas relative to CO₂ over a set period – generally 100 years.

Exposure: exposure reflects the presence of something of human value (within a built, natural or human system) in a place and/or setting that could be impacted by a hazard. (*i.e.* people, livelihoods, ecosystems, environmental functions, services, resources, infrastructure, or economic, social, or cultural assets). [2]

External forcings: refers to a driving agent outside of the climate system that causes a change within the climate system.

Examples: changes to the radiative output of the sun, volcanic eruptions, anthropogenic changes to atmospheric composition (emissions) and land use change. [1]

Frequency: the temporal distribution of a repeating event or occurrence.

Greenhouse Gases: a gas that absorbs and emits radiant energy within the thermal infrared range. The primary greenhouse gases in Earth's atmosphere are water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃).

Intensity: the measurable force of a property or quantity per unit area.

Likelihood: is the probability of the event and/or trend occurring. In climate change risk assessment, the likelihood is attributed to the hazard, the probability of a climate-related event and/or trend occurring due to climate change.

Parts per millions (ppm): a measure of the concentration of a particular component (*i.e.* carbon dioxide) in a mixed solution, such as air.

Representative Concentration Pathways (RCP): scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases (GHGs) and aerosols and chemically active gases, as well as land use/land cover. The word representative signifies that each RCP provides only one of many possible scenarios. The term pathway emphasizes that not only the long-term concentration levels are of interest, but also the trajectory taken over time to reach that outcome.

Response Capacity: incorporates both coping and adaptive capacity to manage and reduce the impact of climate hazards.



Sensitivity: the degree of adverse impacts, influenced by system assets' condition, asset interdependencies, and human-infrastructure coupling

Vulnerability: the degree to which a system may be adversely affected; vulnerability encompasses a variety of concepts including sensitivity or susceptibility to harm and system response capacity.

Weather: the short-term changes in the condition of the atmosphere, over days to months

Source: <https://www.ipcc.ch/sr15/chapter/glossary/>

IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press