

NYC DEP Climate Change Module Glossary of Terms and Concepts

Adaption (*noun*) - Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.

Aerosol (*noun*) - A collection of tiny solid or liquid particles in the atmosphere that can come from natural sources (such as wildfires, dust storms, and volcanoes) or people's activities (such as burning fossil fuels). Some aerosols make the atmosphere warmer because they absorb energy. Others have a cooling effect because they reflect sunlight back to space. Aerosols also influence cloud formation.

Albedo (*noun*) - The fraction of radiation striking a surface that is reflected by that surface ([NOAA](#)).

Anthropocene (*noun*) - A proposed new geologic time period defined by humanity's role as a geological force that is capable of shaping the evolution of planet Earth.

Anthropogenic Climate Change (*noun*) - A significant change in the Earth's climate. The Earth is currently getting warmer because people are adding heat-trapping greenhouse gases to the atmosphere. The term "global warming" refers to warmer temperatures, while "climate change" refers to the broader set of changes that go along with warmer temperatures, including changes in weather patterns, the oceans, ice and snow, and ecosystems around the world ([US EPA](#)).

Aqueduct (*noun*) - A conduit, or structure, designed to carry water over a long distance, usually by gravity.

Atmosphere (*noun*) - A mixture of nitrogen, oxygen, carbon dioxide, and other gases that surrounds the Earth. The atmosphere is critical to supporting life on Earth ([US EPA](#)).

Bias (*noun*) - The systematic or persistent distortion of a measurement process which causes errors in one direction ([US EPA](#)).

Biodiversity (*noun*) - Biological diversity (or biodiversity) is the variety of life on Earth. It includes all living things, not just the plants and animals that are common or easily seen ([US National Park Service](#)).

Biogas (*noun*) - A type of biofuel that contains methane from landfills, animal waste, sewage, or other decomposing waste materials. Biogas can be burned to produce heat or electricity ([US EPA](#)).

Biosolids (*noun*) - The solid by-products of the wastewater treatment process that can be composted, applied to land or further processed for other beneficial uses.

By-product (*noun*) - Material, other than the principal product, generated as a consequence of an industrial process or as a breakdown product in a living system.

Carbon Cycle (*noun*) - Circulation of carbon atoms through the Earth's systems as a result of photosynthetic conversion of carbon dioxide into complex organic compounds by plants, which are consumed by other organisms, and return of the carbon to the atmosphere as carbon dioxide as a result of respiration, decay of organisms, and combustion of fossil fuels ([NOAA](#)).

Carbon Dioxide (*noun*) - A heavy, colorless greenhouse gas (CO₂) produced naturally from animal respiration and absorbed from plants during photosynthesis. It can be emitted during human activities such as burning fossil fuels.

Carbon Footprint (*noun*) - The total amount of greenhouse gases that are emitted into the atmosphere each year by a person, family, building, organization, or company. A person's carbon footprint includes greenhouse gas emissions from fuel that they burn directly, such as by heating a home or riding in a car. It also includes greenhouse gases that come from producing the goods or services that the person uses, including emissions from power plants that make electricity, factories that make products, and landfills where trash gets sent ([US EPA](#)).

Carbon Sequestration (*noun*) - The process of capturing and storing atmospheric carbon dioxide ([USGS](#)).

Catch Basin (*noun*) - Type of drain structure located next to the curb that collects stormwater runoff into the sewer system in order to decrease street flooding.

Chlorofluorocarbons (*noun*) - Synthetic compounds (CFCs) that have been linked to ozone depletion. Historically, CFCs were used as refrigerant and propellants in aerosol cans, but have now been phased out of production after the Montreal Protocol.

Climate (*noun*) - The long-term average of conditions in the atmosphere, ocean, and ice sheets and sea ice described by statistics, such as means and extremes ([NOAA](#)).

Climate Change (*noun*) - a significant and persistent change in the mean state of the climate or its variability. Climate change occurs in response to changes in some aspect of Earth's environment: these include regular changes in Earth's orbit about the sun, re-arrangement of continents through plate tectonic motions, or anthropogenic modification of the atmosphere ([NOAA](#)).

Climate Lag (*noun*) - The delay that occurs in climate change as a result of some factor that changes only very slowly. For example, the effects of releasing more carbon dioxide into the atmosphere occur gradually over time because it takes a long time for systems to respond to these changes ([US EPA](#)).

Climate Model (*noun*) - A series of calculations run on a computer that simulates how the atmosphere, oceans, land, living things, ice, and energy from the sun affect each other and the Earth's climate. Scientists use these models to study the Earth's climate and predict how it might respond to changing conditions, such as an increase in greenhouse gases in the atmosphere ([US EPA](#)).

Climate System (*noun*) - The matter, energy, and processes involved in interactions among Earth's atmosphere, hydrosphere, cryosphere, lithosphere, biosphere, and Earth-Sun interactions ([NOAA](#)).

Climate Variability (*noun*) - Natural changes in climate that fall within the normal range of extremes for a particular region, as measured by temperature, precipitation, and frequency of events. Drivers of climate variability include the El Niño Southern Oscillation and other phenomena ([NOAA](#)).

Combustion (*noun*) - The process of burning coal, oil, or natural gas to generate energy. This process releases by-products such as greenhouse gases.

Compost (*noun*) - Organic material that can be added to soil to help plants grow ([EPA](#)).

Conservation (*noun*) - Protection of natural resources for future generations through regulation of use.

Deforestation (*noun*) - Those practices or processes that result in the conversion of forested lands for non-forest uses. Deforestation contributes to increasing carbon dioxide concentrations for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that once removed carbon dioxide from the atmosphere in the process of photosynthesis are no longer present ([US EPA](#)).

Desertification (*noun*) - Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities ([US EPA](#)).

Divest (*verb*) - The opposite of investment. Removing stocks, bonds, or investments that are unethical or morally ambiguous.

Drought (*noun*) - A period of dryness, especially when prolonged, during which time there is very little or no precipitation.

Ecological Footprint (*noun*) - Measurement of a person's impact on the Earth based on their behavior and activities.

Ecosystem (*noun*) - The interactions between all living organisms and non-living things in a particular environment.

Ecosystem services (*noun*) - The benefits that humans receive from nature. These benefits underpin almost every aspect of human well-being, including our food and water, security, health, and economy ([US EPA](#)).

Emissions (*noun*) - The release of a substance (usually a gas) into the atmosphere ([US EPA](#)).

Energy (*noun*) - The ability to do work. Energy comes in many forms, such as heat, light, motion, and electricity. Most of the world's energy comes from burning fossil fuels to produce heat, which can then be converted into other forms of energy, such as motion (e.g., driving a car) or electricity ([US EPA](#)).

Eon (*noun*) - The largest subdivision of the geologic time. Eons are divided into eras which are divided into periods, epochs, and ages based on major events in Earth's history. The current eon is the Phanerozoic ([USGS](#)).

Epoch (*noun*) - A subdivision of the geologic timescale that is longer than an age but shorter than a period. The current epoch is the Holocene Epoch ([USGS](#)).

Equator (*noun*) - An imaginary line drawn around the middle of the Earth, dividing the planet into the Northern and Southern Hemispheres ([NASA](#)).

Equilibrium (*noun*) - A steady state condition. The amount of mass transferred in one direction is exactly balanced by the amount of mass transferred in the reverse direction.

Era (*noun*) - A subdivision of the geologic that divides an eon into smaller units of time. Eras are separated by large extinction periods. The current geologic era is the Cenozoic era ([USGS](#)).

Evaporation (*noun*) - The process by which water changes from a liquid to a gas or vapor. Evaporation is the primary pathway that water moves from the liquid state back into the water cycle as atmospheric water vapor ([USGS](#)).

Feasibility (*noun*) - The degree in which an action can be done.

Feedback Loop (*noun*) - The process through which a system is controlled, changed, or modulated in response to its own output. Positive feedback results in amplification of the system output; negative feedback reduces the output of a system ([NOAA](#)).

Filter (*verb*) – To pass or move through in order to separate out or remove substances from water, soil, or air.

Flood (*noun*) - An overflow of water, caused by either a large body of water or heavy rainfall, onto normally dry land.

Food Chain (*noun*) - Food chains show the relationships between producers, consumers, and decomposers ([US EPA](#)).

Food Web (*noun*) - Interconnected food chains representing a community of populations. Food webs have non-linear interactions which shows the complex flow of energy ([US EPA](#)).

Fossil Fuels (*noun*) - Energy sources such as petroleum, coal, or natural gas, which are derived from living matter that existed during a previous geologic time period ([NOAA](#)).

GIS (*noun*) - Geographic Information System. A computer-based graphics program that allows the superposition of plan-maps of thematic elements, such as roads, rivers, land use patterns, and the like to aid in local or regional planning activities ([NOAA](#)).

Global Warming (*noun*) - The observed increase in average temperature near the Earth's surface and in the lowest layer of the atmosphere. In common usage, "global warming" often refers to the warming that has occurred as a result of increased emissions of greenhouse gases from human activities. Global warming is a type of climate change; it can also lead to other changes in climate conditions, such as changes in precipitation patterns ([NOAA](#)).

Grant (*noun*) - The transfer of anything of value from the Federal Government to a non-federal entity to carry out a public purpose authorized by US Law. Grants fund ideas and projects to provide public services, stimulate the economy, and benefit the general public.

Green Infrastructure (*noun*) - An engineered system that typically features soils, stones, and gardens to mimic the natural movement of water by collecting and managing stormwater runoff from streets, sidewalks, parking lots, and rooftops; examples include green roofs and rain gardens.

Greenhouse effect (*noun*) - Gases in the atmosphere such as carbon dioxide act like the roof of a greenhouse. During the day, the Sun shines through the atmosphere. Earth's surface warms up in the sunlight. At night, Earth's surface cools, releasing the heat back into the air. But some of the heat is trapped by the greenhouse gases in the atmosphere. That's what keeps our Earth a warm and cozy 59 degrees Fahrenheit, on average. This is similar to the process that keeps a greenhouse warm ([NASA](#)).

Greenhouse gas (*noun*) - Also sometimes known as "heat trapping gases," greenhouse gases are natural or manmade gases that trap heat in the atmosphere and contribute to the greenhouse effect. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxide, and fluorinated gases ([US EPA](#)).

Holocene (*noun*) - The Holocene is the current geological epoch. The epoch began after the last glacial retreat approximately 12,000 years ago. The Holocene includes all of human history. The climate during the Holocene has been impacted by human development ([USGS](#)).

Hurricane Sandy (*noun*) - The storm is considered the most destructive hurricane of the 2012 Hurricane Season costing \$70 billion in damages. A low-pressure storm formed in the central Caribbean on October 22, 2012. The storm intensified before hitting the New York City and the entire Tri-State area on October 28, 2012. The storm resulted in a large storm surge ([NOAA](#)).

Impervious/Impermeable (*adjective*) - Slowing or preventing fluid (e.g., water) from infiltrating into the soil, as under natural conditions prior to development.

Indirect Emissions (*noun*) - Emissions that occur as a result of the generation of energy used for an activity ([US EPA](#)).

Industrial Revolution (*noun*) - A period of time between the late 18th century and early 19th century in which there was rapid development in transportation, manufacturing, and communications. This period of time is often cited as the beginning of anthropogenic climate change due to the introduction of fossil fuels as power sources ([NPS](#)).

Infrastructure (*noun*) - The underlying foundation or basic framework of public works which provide services that are essential to facilitate the operations of a city, state, country, or region.

Inputs (*noun*) - Resources added to a system to obtain a desired output.

Intergovernmental Panel on Climate Change (*noun*) - The IPCC was established jointly by the United Nations Environment Programme and the World Meteorological Organization in 1988. The purpose of the IPCC is to assess information in the scientific and technical literature related to all significant components of the issue of climate change. The IPCC draws upon hundreds of the world's expert scientists as authors and thousands as expert reviewers. Leading experts on climate change and environmental, social, and economic sciences from some 60 nations have helped the IPCC to prepare periodic assessments of the scientific underpinnings for understanding global climate change and its consequences. With its capacity for reporting on climate change, its consequences, and the viability of adaptation and mitigation measures, the IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue ([UN IPCC](#)).

Invasive Species (*noun*) – Non-native species that can cause harm to the environment, the economy or human health ([NYS DEC](#)).

Land Change (*noun*) - A change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land use change may have an impact on the surface albedo, evapotranspiration, sources and sinks of greenhouse gases, or other properties of the climate system and may thus give rise to other impacts on climate, locally or globally ([UN IPCC](#)).

Land Use (*noun*) - Total arrangements, activities and inputs undertaken in a certain land cover type (a set of human actions). The term land use is also used in the sense of the social and economic purposes for which land is managed ([UN IPCC](#)).

Latitude (*noun*) - A measure of how far north or south a particular place is located on the Earth. Latitude is measured in degrees (°). The equator has a latitude of 0°. The North Pole's latitude is 90° north, and the South Pole's latitude is 90° south ([US EPA](#)).

Lifecycle (*noun*) - Compilation and evaluation of the inputs, outputs, and the potential environmental impacts of a product system throughout its life cycle. The comprehensive examination of a product or service's environmental aspects and potential impacts throughout its lifetime, including raw material extraction, transportation, manufacturing, use, and disposal ([US EPA](#)).

Longitude (*noun*) - A measure of how far east or west a particular place is located on the Earth relative to Greenwich, England. Longitude is measured in degrees (°) ([National Geographic](#)).

Methane (*noun*) - A colorless, potent greenhouse gas (CH₄) that occurs in nature as a product of certain human activities such as wastewater treatment and cattle raising.

Microclimate (*noun*) - Microclimate is the suite of climatic conditions measured in localized areas near the Earth's surface ([Science Direct](#)).

Mitigation (*noun*) - Human interventions to reduce the sources of greenhouse gases or enhance the sinks that remove them from the atmosphere ([NOAA](#)).

Montreal Protocol (*noun*) - The Montreal Protocol, finalized in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances such as CFCs. The Montreal Protocol has proven to be innovative and successful, and is the first treaty to achieve universal ratification by all countries in the world ([US EPA](#)).

Natural disaster (*noun*) - All types of severe weather, which have the potential to pose a significant threat to human health and safety, property, critical infrastructure, and homeland security. Natural disasters can lead to periods of insecurity, disruption, and economic loss ([US Department of Homeland Security](#)).

Negative Feedback Loop (*noun*) - Decrease the direct effects of the original process or self-regulating.

New York City Panel on Climate Change (NPCC) (*noun*) - A body of leading climate and social scientists and risk management experts, charged with advising the Mayor and the New York City Climate Change Adaptation Task Force on issues related to climate change and adaptation. It produced a set of climate projections specific to New York City. Created in January 2013, the panel provides up-to-date scientific information and analyses on climate risks for use in the Special Initiative for Rebuilding and Resiliency ([NPCC](#)).

Nitrous Oxide (*noun*) - A powerful greenhouse gas (N₂O) produced primarily from the use of commercial and organic fertilizers, fossil fuel combustion, and biomass burning.

Nonrenewable Resource (*noun*) - A natural resource that cannot be produced, regrown, or reused fast enough to keep up with how quickly it is used. Fossil fuels such as coal, oil, and natural gas, for example, take millions of years to develop naturally. Thus, their supply for people to use is considered nonrenewable ([US EPA](#)).

Ozone (*noun*) - A gas (O₃) that can be “good” or “bad” for health and the environment depending on where it's found in the atmosphere. Stratospheric ozone is “good” because it protects living things from

ultraviolet radiation from the sun. Ground-level ozone is “bad” because it can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma ([US EPA](#)).

Ozone Layer (*noun*) - A thin layer in the Stratosphere in which Ozone gas is in high concentration, about 15 to 30km from the Earth’s surface. The Ozone layer absorbs a portion of the ultraviolet rays and prevents much of the radiation from reaching the planet’s surface ([US EPA](#)).

Paris Climate Change Agreement (*noun*) – The Paris Climate Change Agreement, developed within the United Nations Framework Convention on Climate Change (UNFCCC), was created to reach a universal, legally binding agreement on international climate governance, applicable to all 195 nations. The Paris Agreement aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. The UN Convention of the Parties (COPs) are meetings that take place at least once a year to further the implementation of the UN Framework Convention on Climate Change. A notable convention was COP21 in which the Paris Climate Change Agreement was adopted ([UN](#)).

Permeable (*adjective*) – Something that allows substances (e.g., water) to pass through it.

Policy (*noun*) - A law, regulation, procedure, administrative action, incentive, or voluntary practice of governments and other institutions ([Center for Disease Control and Prevention](#)).

Politicization (*noun*) – The distortion of analysis by setting aside or otherwise failing to meet the standards of objectivity of information and judgement in order to support a specific political view or policy preference ([US Central Intelligence Agency](#)).

Precipitation (*noun*) - Any water that falls from the sky as part of the water cycle, whether it be rain, snow, hail, or sleet.

Reflection (*noun*) - The process whereby radiation (or other waves) incident upon a surface is directed back into the medium through which it traveled ([NOAA](#)).

Renewable Energy (*noun*) - Energy resources that are naturally replenishing such as biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action ([US EPA](#)).

Renewable Resource (*noun*) - Natural resource that can be produced, regrown, or reused fast enough to keep up with how quickly it is used. Wind, tides, and solar energy, for example, are in no danger of running out and can be consumed by people virtually forever. In contrast, fossil fuels such as coal take millions of years to develop naturally and are considered nonrenewable ([US EPA](#)).

Representative Concentration Pathway (*noun*) – Greenhouse gas concentration projection/trajectory that describes different climate futures depending on how much greenhouse gases are emitted in the future ([UN IPCC](#)).

Reservoir (*noun*) – A natural or artificial place where water is collected and stored for use.

Resiliency (*noun*) - The ability to withstand or swiftly recover from changing conditions as a result of preparation and adaptation measures.

Resource Recovery (*noun*) – The recovery of material or energy from solid waste.

Runoff (*noun*) - The part of the precipitation, snow melt, or irrigation water that does not percolate into the ground resulting in uncontrolled surface streams and rivers.

Sea Level Rise (*noun*) - The upward trend in average sea level height ([NASA](#)).

Sewers (*noun*) - A system of underground pipes that collect and deliver wastewater to treatment facilities or nearby waterways.

Sludge (*noun*) - The organic solids, such as food, feces, and paper fibers, in wastewater that are settled out and removed during the wastewater treatment process.

Solar Energy (*noun*) - Energy from the sun, which can be converted into other forms of energy such as heat or electricity ([US EPA](#)).

Stakeholder (*noun*) - An individual or group involved or affected by a course of action.

Stewardship (*noun*) - Taking personal responsibility to help protect your environment.

Stormwater (*noun*) - Precipitation that does not percolate into the ground or evaporate, but flows overland instead.

Sustainability (*noun*) - The balance between social, economic, and environmental factors.

Systems Thinking (*noun*) - The understanding of a system by examining the linkages and interactions between the components that comprise the entirety of that defined system.

Thermal Expansion (*noun*) - The increase in volume of a material as it gets warmer. For example, water expands as it is heated, causing each drop of water to increase in size. In the ocean, thermal expansion is one cause of rising sea level ([US EPA](#)).

Tipping Point (*noun*) - When Earth's climate abruptly moves between relatively stable states ([NASA](#)).

Troposphere (*noun*) - The layer of the atmosphere from the Earth's surface up to the tropopause, characterized by decreasing temperature with height (except, perhaps, in thin layers), vertical wind motion, appreciable water vapor content, and sensible weather (clouds, rain, etc.) ([NOAA](#)).

UN Framework Convention on Climate Change (*noun*) - The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention enjoys near universal membership, with 189 countries having ratified. Under the Convention, governments: 1) gather and share information on greenhouse gas emissions, national policies and best practices; 2) launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; 3) cooperate in preparing for adaptation to the impacts of climate change. The Convention entered into force on March 21, 1994 ([UNFCCC](#)).

United Nations (*noun*) – An international organization founded in 1945 and made up of 193 Member States. The UN can take action on the issues confronting humanity in the 21st century, such as peace and

security, climate change, sustainable development, human rights, disarmament, terrorism, humanitarian and health emergencies, gender equality, governance, and food production ([UN](#)).

Urban Heat Island Effect (*noun*) - A regional elevation in air temperature that represents the difference between air temperatures in urban versus rural areas. The annual mean temperature of a city with 1 million people or more can be 1.8-5.4°F (1-3°C) warmer than its surroundings.

Vulnerability (*noun*) - The degree to which physical, biological, and socio-economic systems are susceptible to and unable to cope with adverse impacts of climate change ([NOAA](#)).

Wastewater (*noun*) - Used water mixed with solid waste from homes, schools, and businesses that flows to a treatment plant.

Wastewater Resource Recovery Facility (*noun*) - Facilities designed to treat used water and stormwater before being discharged into receiving waterbodies. These facilities turn its byproducts into beneficial use by recovering energy, nutrients, water, and materials in their operations.

Water Cycle (*noun*) - The stages of water as it travels from the ocean to the atmosphere to the land and back again through processes such as precipitation, evaporation, and condensation.

Water Vapor (*noun*) - The most abundant greenhouse gas in the Earth's atmosphere. While not directly potent, water vapor still plays a role in climate change. As the Earth's atmosphere warms, water vapor increases, which in-turn, increases the amount of clouds in the atmosphere and total precipitation.

Watershed (*noun*) – An area of land where all water drains into the same region, such as a lake, river, or reservoir.

Weather (*noun*) - The specific conditions of the atmosphere at a particular place and time, measured in terms of variables that include temperature, precipitation, cloudiness, humidity, air pressure, and wind ([NOAA](#)).

Weather Forecast (*noun*) - A prediction about the specific atmospheric conditions expected for a location in the short-term future (hours to days) ([NOAA](#)).