

**climate:** The pattern of atmospheric conditions that typifies a geographic region over long periods of time (typically years, decades, centuries, or millennia).

**global climate change:** Systematic change in aspect of Earth's climate, such as temperature, precipitation, and storm intensity. Generally refers today to the current warming trend in global temperatures and the many associated climatic changes. (or climate change)

**global warming:** An increase in Earth's average surface temperature. The term is most frequently used in reference to the pronounced warming trend of recent decades. It is one aspect of global climate change and in turn drives other components of climate change.

**greenhouse gases:** A gas that absorbs infrared radiation released by Earth's surface and then warms the surface and troposphere by emitting energy, thus giving rise to the greenhouse effect. They include carbon dioxide, water vapor, ozone, nitrous oxide, halocarbon gases and methane.

**greenhouse effect:** The warming of Earth's surface and atmosphere (especially the troposphere) caused by the energy emitted by greenhouse gases.

**aerosols:** Very fine liquid droplets or solid particles aloft in the atmosphere.

**radiative forcing:** The amount of change in thermal energy that a factor (such as a greenhouse gas or an aerosol) causes in influencing Earth's temperature. Positive forcing warms Earth's surface, whereas negative forcing cools it.

**Milankovitch cycles:** One of three types of variations in Earth's rotation and orbit around the sun that result in slight changes in the relative amount of solar radiation reaching Earth's surface at different latitudes. As the cycles proceed, they change the way solar radiation is distributed over Earth's surface and contribute to changes in atmospheric heating and circulation that have triggered glaciations and other climate changes.

**paleoclimate:** Climate in the geologic past.

**proxy indicators:** A source of indirect evidence that serves as a proxy, or substitute, for direct measurement and that sheds light on past climate. Examples include data from ice cores, sediment cores, tree rings, packrat middens, and coral reefs.

**climate models:** A computer program that combines what is known about weather patterns, atmospheric circulation, atmospheric circulation, atmosphere-ocean interactions, and feedback mechanisms, to simulate climate processes.

**Intergovernmental Panel on Climate Change (IPCC):** An international panel of climate scientists and government officials established in 1988 by the United Nations Environment Programme and the World Meteorological Organization. The IPCC's mission is to assess and synthesize scientific research on global climate change and to offer guidance to the world's policymakers, primarily through periodic published reports.

**ocean acidification:** The process by which today's oceans are becoming more acidic (attaining lower pH) as a result of increased carbon dioxide concentrations in the atmosphere. Ocean acidification occurs as ocean water absorbs carbon dioxide from the air and forms carbonic acid. This impairs the ability of corals and other organisms to build exoskeletons of calcium carbonate, imperiling coral reefs and many organisms that depend on them.

**social cost of carbon:** An estimate of the total economic cost of damages resulting from the emission of carbon dioxide (from fossil fuel burning, deforestation, etc.,) and resulting global climate change, on a per-ton bases. Estimates vary widely, but the U.S. government currently uses as estimate of roughly \$40/ton CO<sub>2</sub>.

**mitigation:** The pursuit of strategies to lessen the severity of climate change, notably by reducing emissions of greenhouse gases.

**adaptation:** The pursuit of strategies to protect ourselves from the impacts of climate change.

**carbon capture and storage:** Technologies or approaches to remove carbon dioxide from emissions of per plants or other facilities, and sequester, or store, it (generally in liquid form) underground under pressure in locations where it will not seep out, in an effort to mitigate global climate change.

**cap-and-trade:** An emissions trading system in which government determines an acceptable level of pollution and then issues polluting parties permits to pollute. A company receives credit for amounts it does not emit and can then sell this credit to other companies.

**United Nations Framework Convention on Climate Change:** An international treaty signed in 1992 outlining a plan to reduce emissions of greenhouse gases. Gave rise to the Kyoto Protocol.

**Kyoto Protocol:** An international agreement drafter in 1997 that called for reducing, by 2012, emissions of six greenhouse gases to levels lower than their levels in 1990. It has been extended to 2020 until a replacement treaty can be reached. An outgrowth of the United Nations Framework Convention on Climate Change.

**carbon pricing:** The practice of putting a price on the emission of carbon dioxide, either through carbon trading or a carbon tax, as a means to address global climate change. It compensates the public for the external costs of fossil fuel use by shifting costs to emitters, and creates financial incentive to reduce emissions.

**carbon trading:** A form of emission trading that focuses on the emission of carbon dioxide. In a carbon trading market, emitters buy and sell permits to emit CO<sub>2</sub>. It is one approach to carbon pricing, and gives polluters a financial incentive to reduce emission sin order to address global climate change.

**carbon tax:** A type of green tax charged to entities that pollute by emitting carbon dioxide. It is one approach to carbon pricing, and gives polluters a financial incentive to reduce emissions in order to address global climate change.

**fee-and-dividend:** A carbon tax program in which proceeds from the tax are paid to consumers as a tax refund or “dividend.” This strategy seeks to prevent consumers from losing money if polluters pass their costs along to them.

**revenue-neutral carbon tax:** A type of fee-and-dividend program in which funds from the carbon tax that a government collects are disbursed to citizens in the form of payments or tax refunds. It is “revenue-neutral” because the government neither gains nor loses revenue in the end.

**carbon offsets:** A voluntary payment to another entity intended to enable that entity to reduce the greenhouse gas emission that one is unable or unwilling to reduce oneself. The payment thus offsets one’s own emissions.

**carbon-neutrality:** The state in which an individual, business, or institution emits no net carbon to the atmosphere. This may be achieved by reducing carbon emissions and/or employing carbon offset to offset emissions.

**geoengineering:** Any of a suite of proposed efforts to cool Earth's climate by removing carbon dioxide from the atmosphere or reflecting sunlight away from Earth's surface. Such ideas are controversial and are not nearly ready to implement.

**carbon footprint:** The cumulative amount of carbon, or carbon dioxide, that a person or institution emits, and is indirectly responsible for emitting into the atmosphere, contributing to global climate change.