

Climate Science and Climate Change Impacts

****Adaptation****: The process of adjusting to the impacts of climate change, in order to minimize harm or take advantage of potential opportunities. In the context of urban climate adaptation planning, this might involve modifying infrastructure, changing land use patterns, or implementing new policies and programs.

****Carbon Footprint****: The total amount of greenhouse gas emissions produced to support human activities, such as driving a car or heating a building. This is often expressed in terms of carbon dioxide equivalent (CO₂e), which takes into account the global warming potential of different greenhouse gases.

****Climate Change****: A long-term shift in the average weather patterns that have come to define local, regional, and global climates. This can include changes in temperature, precipitation, and wind patterns, as well as an increase in the frequency and intensity of extreme weather events, such as hurricanes and heatwaves.

****Climate Model****: A mathematical representation of the Earth's climate system, used to simulate the past, present, and future impacts of climate change. Climate models take into account a wide range of factors, including greenhouse gas emissions, solar radiation, and atmospheric and oceanic circulation patterns.

****Climate Projections****: The use of climate models to make predictions about future climate conditions, taking into account different scenarios for greenhouse gas emissions. These projections can help inform decisions about urban climate adaptation planning, by providing information about the potential impacts of climate change on cities and communities.

****Climate Resilience****: The ability of a system, community, or society to anticipate, prepare for, respond to, and recover from the impacts of climate change, in order to maintain essential functions and structures, and to adapt to changing climate conditions.

****Climate Variability****: The natural fluctuations in the Earth's climate system, which can result in changes in temperature, precipitation, and other weather patterns. Climate variability can be caused by a variety of factors, including changes in solar radiation, volcanic eruptions, and ocean currents.

****Disaster Risk Reduction****: The systematic approach to identifying, assessing, and reducing the risks associated with natural and human-induced hazards, in order to prevent or minimize the negative impacts of disasters.

****Extreme Weather Events****: The occurrence of weather events that are significantly outside the range of typical variability, and which can cause serious damage or disruption. Examples of extreme weather events include hurricanes, heatwaves, and blizzards.

****Fossil Fuels****: Fuels derived from the remains of ancient plants and animals, such as coal, oil, and natural gas. Burning fossil fuels releases large amounts of carbon dioxide and other greenhouse gases into the

atmosphere, contributing to climate change.

****Green Infrastructure****: The network of natural and semi-natural features, such as parks, green roofs, and wetlands, that provide a range of ecosystem services in urban areas. Green infrastructure can help reduce the impacts of climate change by providing shade, absorbing stormwater, and reducing the urban heat island effect.

****Greenhouse Gases****: Gases that trap heat in the Earth's atmosphere, contributing to the greenhouse effect and climate change. The most common greenhouse gases are carbon dioxide, methane, and nitrous oxide.

****Heat Island Effect****: The phenomenon in which urban areas experience higher temperatures than surrounding rural areas, due to the concentration of buildings, pavement, and other heat-absorbing surfaces. The heat island effect can be exacerbated by climate change, leading to increased energy consumption and health risks in urban areas.

****Mitigation****: The process of reducing greenhouse gas emissions, in order to slow or halt the progression of climate change. Mitigation strategies can include increasing energy efficiency, transitioning to renewable energy sources, and reducing deforestation and land degradation.

****Renewable Energy****: Energy derived from sources that are naturally replenished, such as wind, solar, and hydropower. Renewable energy sources can help reduce greenhouse gas emissions and dependence on fossil fuels.

****Sea Level Rise****: The gradual increase in the average global sea level, due to the melting of glaciers and ice sheets, as well as the thermal expansion of seawater. Sea level rise can pose significant risks to coastal communities, including increased flooding and erosion.

****Sustainability****: The ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability involves balancing economic, social, and environmental considerations, in order to create resilient and livable communities.

****Urban Heat Island****: See Heat Island Effect.

****Vulnerability****: The degree to which a system, community, or society is susceptible to the negative impacts of climate change, due to exposure, sensitivity, and adaptive capacity. Vulnerability assessments can help identify areas of concern and inform decisions about urban climate adaptation planning.

****Water Management****: The practices and policies used to manage the quantity, quality, and distribution of water resources in urban areas. Water management can help reduce the impacts of climate change by improving stormwater management, increasing water efficiency, and protecting water quality.

****Weather****: The short-term atmospheric conditions, such as temperature, precipitation, and wind, that occur in a particular place and time. Weather can be affected by a variety of factors, including climate change, and can have significant impacts on urban areas.

****Adaptive Capacity****: The ability of a system, community, or society to adapt to the impacts of climate change, by modifying behaviors, institutions, and infrastructure. Adaptive capacity is influenced by a variety of factors, including economic resources, social networks, and governance structures.

****Anthropogenic****: Relating to or resulting from the influence of human beings on the natural world. In the context of climate change, anthropogenic greenhouse gas emissions are those that are released as a result of human activities, such as burning fossil fuels and deforestation.

****Carbon Neutral****: A state in which the total greenhouse gas emissions produced by an individual, organization, or community are balanced by an equivalent amount of carbon dioxide removed from the atmosphere. This can be achieved through a variety of strategies, including increasing energy efficiency, transitioning to renewable energy sources, and implementing carbon offset programs.

****Climate Financing****: The provision of financial resources to support climate change mitigation and adaptation efforts, particularly in developing countries. Climate financing can come from a variety of sources, including national governments, multilateral development banks, and private sector investors.

****Climate Justice****: The principle that the impacts of climate change should be addressed in a way that is fair and equitable, taking into account the historical responsibility for greenhouse gas emissions and the disproportionate impacts on vulnerable populations.

****Climate Refugia****: Areas that are expected to experience relatively stable climate conditions in the face of climate change, and which may provide habitat for species that are unable to adapt to changing conditions elsewhere.

****Climate Sensitivity****: The degree to which the Earth's climate system responds to changes in greenhouse gas concentrations. Climate sensitivity is a key uncertainty in climate projections, and is the subject of ongoing research.

****Climate Variability and Change****: A term that encompasses both natural fluctuations in the Earth's climate system and human-induced climate change. Climate variability and change can have significant impacts on urban areas, including increased frequency and intensity of extreme weather events, sea level rise, and changes in temperature and precipitation patterns.

****Decarbonization****: The process of reducing or eliminating the use of fossil fuels, in order to reduce greenhouse gas emissions. Decarbonization strategies can include increasing energy efficiency, transitioning to renewable energy sources, and implementing carbon pricing mechanisms.

****Disaster Risk Management****: The systematic approach to reducing the risks associated with natural and human-induced hazards, in order to prevent or minimize the negative impacts of disasters. Disaster risk management involves a range of activities, including risk assessment, preparedness planning, and emergency response.

****Emissions Reduction Targets****: The specific goals or targets established by governments, organizations, and communities to reduce greenhouse gas emissions. Emissions reduction targets can be set at the

national, state, or local level, and can be expressed in terms of absolute emissions or emissions intensity.

****Energy Efficiency****: The use of less energy to perform the same task or function. Improving energy efficiency can help reduce greenhouse gas emissions, while also providing economic benefits in the form of lower energy costs.

****Extreme Weather and Climate Events****: A term that encompasses a wide range of weather and climate phenomena, including hurricanes, heatwaves, droughts, and floods, that are significant enough to cause serious damage or disruption. Extreme weather and climate events can be influenced by climate change, and can have significant impacts on urban areas.

****Greenhouse Gas Inventory****: A comprehensive accounting of the greenhouse gas emissions produced by an individual, organization,