

Climate

Climate has an enormous impact on society, with wide-ranging effects on public safety and health, the economy, transportation, infrastructure, and agriculture. Geoscientists investigate our climate's past and present to better understand how it may change in the future.

Basics



Climate is the average of weather conditions over decades to centuries in a particular location.[1] Climate is influenced by many factors, including solar activity, ocean circulation, land cover, and greenhouse gases and aerosols in the atmosphere.[2,3,4,5]

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Frequently Asked Questions

What are El Niño and La Niña?

American Geosciences Institute

How is ocean acidification affecting sea life?

National Oceanic and Atmospheric Administration

What is ocean acidification?

National Oceanic and Atmospheric Administration

How does El Niño affect my area?

National Oceanic and Atmospheric Administration

What is the difference between weather and climate?

American Geosciences Institute

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Drought

Since 1980 the United States has experienced more than 24 major droughts, resulting in almost 3,000 deaths and economic impacts exceeding \$225 billion. All areas of the U.S. have some drought risk.



Energy

All of the energy we use comes from the Earth, its atmosphere, or the Sun. Some resources are mined or extracted, like coal, uranium, oil, and gas. Others, like wind, solar, tidal, biomass, and hydropower resources, are harnessed at the Earth's surface. Geoscientists play an essential role in developing energy resources and evaluating their environmental impacts.



Floods

Flooding is the most common and costliest natural hazard facing the United States. Each year, flooding causes billions of dollars in damages and dozens of deaths nationwide.



Water Availability

Water is constantly moving on the Earth between the atmosphere, ocean, rivers and streams, snowpacks and ice sheets, and underground. Water availability, both as surface water and groundwater, is essential for agriculture, human consumption, industry, and energy generation.



Water Quality

Water quality refers to whether water is suitable for a certain purpose, like drinking or irrigation. Both natural and man-made factors can affect water quality. Contaminants can include bacteria, metals, and man-made chemicals like pesticides or pharmaceutical drugs.



Weather Hazards

Weather hazards impact the entire country, with enormous effects on the economy and public safety. Since 1980, weather/climate disasters have cost the U.S. economy more than \$1.5 trillion. In an average year, the United States will be affected by six billion-dollar weather/climate disasters, but this number has increased in recent years: from 2013-2017 the average was 11.6 events.



Wildfires

Wildfires are causing more frequent and wider-ranging societal impacts, especially as residential communities continue to expand into wildland areas. Since 2000, there have been twelve wildfires in the United States that have each caused damages exceeding \$1 billion; cumulatively, these twelve wildfires have caused a total of \$44 billion in damages.

Maps & Visualizations



Interactive map of sea level rise impacts in Delaware

Delaware Department of Natural Resources and Environmental Control

The Delaware Sea Level Rise Inundation map shows how various extents of future sea level rise (0.5, 1.0, and 1.5 meters) would affect flooding in coastal Delaware. For each scenario, users can see the areas that would be flooded during an average higher tide (Mean Higher High Water). The map does...

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Remote Sensing Supports Emergency Management Response to Tornadoes

Remote sensing imagery is used by researchers at the University of Wisconsin–Madison to support recovery efforts after a tornado. Defining the Problem Following a tornado, first responders need maps of the width and location (swath) of the damage area. The biggest challenge when integrating remote...

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Responding to societal needs with 3D geology: An international perspective

Geological Survey Organizations (GSOs) have been helping society face economic and environmental challenges for over 150 years. The technological transformation of geoscience is presenting new opportunities for GSOs, and the wider geoscience community, to respond to the societal challenges of...

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