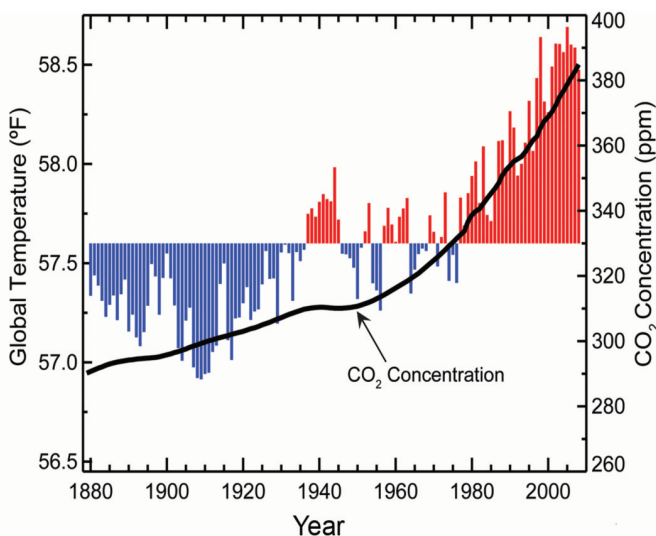


# Climate Change

Climate change is a defining issue of our time, causing society to rethink our relationship to and management of human and natural resources. Scientists in the College of the Environment are leading the way to better understand the climate system, the causes and impacts of climate change on natural and human systems, and how best to inform policies and management for mitigating and adapting to this new reality.



Records from land stations and ships indicate that the global mean surface temperature has warmed by about 0.9F since 1880. This warming is strongly attributed to human activities. (NOAA)



Climate change encompasses interactions among the atmosphere, oceans and land with consequences for humans and every other species on Earth. (photos.com)

## Understanding Climate Change

The build-up of carbon dioxide and other human-generated “greenhouse gases” in the atmosphere over the past century has led to accelerated changes in the Earth’s climate system. Thousands of studies have documented the increase of these gases, how this increase relates to the shifting climate over the past century, and the effects of climate change on plants and animals, landscapes and oceans, and people across the planet.

And yet, because the climate system involves interactions among numerous components at multiple scales in time and place, the changes that Earth’s climate will undergo over the coming centuries are difficult to predict. New approaches are needed to manage resources and adapt our human infrastructure—including food, water, housing, transportation systems and more—to the consequences of a changing climate.

## Addressing Climate Change at the College of the Environment

Researchers in the College work across disciplines to expand our knowledge of climate science, and to apply that knowledge to help communities adapt to the ecological, economic and social impacts. Working with industry, governments, non-profits and the public, we study systems across the globe from microscopic to macrocosmic scales to increase our understanding of the climate system and to be better able to anticipate impacts. We are at the forefront in training the next generation of scientists and managers to evaluate and devise solutions for the coming challenges.



## Advancing the Science

### Understanding the Climate System

Researchers are engaged in the study of all aspects of the climate system, from the response of clouds and rainfall to higher temperatures to changes in oxygen levels across large regions of the ocean. Scientists in Atmospheric Sciences, Earth and Space Sciences and Oceanography, often partnering with the Applied Physics Lab and the College of Engineering, model the atmosphere, water and land systems and their interactions. These models often require the use of “Big Data”—meaning large and complex datasets—and are used to inform regional to global predictions of climate change and to delineate human and natural drivers. Ocean-based stable isotopes, tree rings, and ice cores allow scientists to tease out the past patterns of climate dynamics. Researchers also observe our current climate using innovative instruments such as Argo ocean buoys, autonomous gliders, shipboard measurements of ocean carbon dioxide and microscopic algae, and satellite observations of sea level and sea surface temperature changes.

### Identifying the Implications

College scientists examine the effects of climate change on species, ecosystems and society in terms of both the impacts already taking place and those anticipated to occur, both here and around the world. Research emphases include projecting changes in species’ ranges and wildfire risk, identifying emergent threats to human health, and clarifying climate impacts on food production and water availability.

### Fostering New Leaders

College educators bring research to the classroom, empowering the scientists and managers of tomorrow to use it in their work today. A minor in climate is available to undergraduates from across campus, allowing them to engage with the complex and often controversial topics linked to climate change.

The UW Program on Climate Change (PCC) is an interdisciplinary initiative designed to foster both research and education around climate change and its effects. PCC has built a rigorous training environment for future scientists and policy-makers, and their Graduate Program and Graduate Certificate require not only a cross-disciplinary proficiency in the science

of climate change but also training in science communication.

For example, the Graduate Climate Conference, started in 2006 by PCC graduate students, is a venue for graduate students from across the world to network and think in increasingly interdisciplinary ways about their research.

### Building Strong Partnerships

To increase the capacity of our communities to adapt to short-term and long-term effects of climate change, strong partnerships that leverage climate science for decision-making are essential. The College of the Environment excels at collaborating with policy makers, resource managers, industry leaders and the public to link scientific research and understanding of climate change with management of our social, economic, and ecological systems. The Joint Institute for the Study of the Atmosphere and Ocean (JISAO) facilitates several such partnerships. It is home to the Office of the Washington State Climatologist, who serves as the State’s leading expert with regard to climate and weather information for state agencies and decision makers working on drought, floods, climate change, and other related issues.

The College is also home the Climate Impacts Group (CIG) which works at the intersection of climate science, public policy, and resource management. CIG is internationally recognized for its groundbreaking interdisciplinary research on the impacts of natural climate variability and global warming for the Pacific Northwest, and its work with planners and policymakers to incorporate this information into regional decision-making. Through research and direct interaction with stakeholders—including local, regional, state, federal and tribal agencies as well as the private and non-profit sectors—CIG works to create frameworks for identifying, assessing, and reducing climate risks to infrastructure, communities, and natural resources including hydropower, forests and fisheries.

For more information, contact the College of the Environment at: [coenv@uw.edu](mailto:coenv@uw.edu) or 206.685.5410

