

## Climate Research at the University of Michigan

University of Michigan faculty have significant climate-related research interests, with expertise spread across a myriad schools and colleges, departments, centers, and institutes. Below is a brief summary of climate-related faculty efforts at the university.

### College of Engineering

#### [Chemical Engineering](#)

Faculty focus on problems associated with burning fossil fuels, reducing emissions, and creating more efficient solutions to moving and storing energy from renewable sources. Others explore new ways to make batteries and solar cells more efficient and powerful.

#### [Civil and Environmental Engineering](#)

Research includes understanding the origins of climate change-related emissions and contaminants, and methods to control them. Faculty create new, more efficient ways to store energy, and advance the state of renewable technologies.

#### [Climate and Space Sciences](#)

Faculty focus on modeling to understand and predict climate change and associated impacts, including sea level rise, temperature increase, glacial melt, and changes in extreme events.

#### [Electrical Engineering](#)

Faculty study optimizing energy systems and the efficient integration of wind systems. Faculty employ new materials and technologies in hybrid or electric vehicle charging stations, including battery storage in vehicles.

#### [Mechanical Engineering](#)

Faculty focus on renewable energy, specifically optimizing electric and hybrid vehicle technology to create more efficient engines and reduce their carbon footprint.

### College of Literature, Science, and the Arts

#### [Biological Station](#)

Leveraging the station's 125 year environmental records provides the best high-resolution picture of climate change-induced changes in North America, focused on how climate change is altering natural and managed ecosystems, and how these alterations are in turn affecting the capacity of ecosystems to sustain biodiversity, the economy, and the quality of human life.

### [Earth and Environmental Sciences](#)

Faculty study soils, stratigraphy, and fossils to explore the history of our climate from 500 million years ago, and use this information to determine the rate of climate change over time and guide climate change modeling in the present.

### [Ecology and Evolutionary Biology](#)

Faculty study the impact of climate change on plant and animal species around the world, such as where and how well species can grow and adapt to warmer water and air temperatures. Other faculty focus on plants and animal dynamics to help predict agricultural and ecological instability issues.

## **Ford School of Public Policy**

Ford School faculty focus on science policy and public policy issues related to energy and climate change. Some faculty focus on environmental economics, including how different energy markets (such as electricity, natural gas, shale gas, carbon markets) contribute to environmental problems and respond to regulations. Other faculty focus on political and governance issues including global environmental governance, cross-border and cross-media transfer of pollutants, and intergovernmental cooperation in federal grant and regulatory programs. Other faculty explore the social psychology of sustainable behaviors, trends in public and policymaker opinion related to climate change, and how multiple dimensions of environmental change connect to human populations.

## **Law School**

Law faculty focus on natural resource law, including environmental policy and regulation. They address policy adherence to reduce pollution, and policies that promote green energy, by setting quotas for corporations, states, and countries.

## **School of Natural Resources and Environment**

Faculty focus on climate issues ranging from ecosystem impacts of climate change to policies related to adaptation. They explore climate related changes in terrestrial and water systems, such as impacts on native and invasive species, as well as local to international policies related to mitigation trade-offs and adaptation strategies. The School is also home for the [Cooperative Institute for Limnology and Ecosystems Research](#) and the [Michigan Sea Grant College Program](#) that focus on Great Lakes and Michigan climate issues, respectively.

## **Taubman College of Architecture and Urban Planning**

Architecture faculty explore new technologies to improve the infrastructure and populations within cities. New sustainable technologies allow buildings to heat and cool more efficiently, generate their own electricity, or provide a localized carbon sink. Urban Planning faculty study climate-related issues such as water level rise and the impact on land use policy and planning. Faculty are examining community resiliency, including how addressing runoff and implementing green

infrastructure best practices may result in reduced risk to climate-induced flooding. Others are investigating how rooftop solar panels help conserve energy and reduce the use of fossil fuels.

## **University-wide Institutes**

### [Energy Institute](#)

The Institute supports faculty working on reducing scientific and technical barriers to creating new breakthrough energy storage and technology, such as considering biofuels, hydrogen production to address the need for electricity, housing, manufacturing and transportation.

### [Graham Sustainability Institute](#)

The Institute's [Water](#) and [Climate](#) Centers and [Integrated Assessment](#) program support natural and social science research and assessments, integrating scientists and policy makers across a range of climate -related issues, including impacts on communities and cities, natural habitats, nutrient over enrichment, lake level variations, alternative energy sources, and increased storms and flooding.

### [Transportation Research Institute](#)

Faculty focus on increasing fuel economy by developing tires for automobiles with less rolling resistance, intelligent transportation systems to increase safety, and by tracking and reporting fuel efficiency trends.