Department of Geography, Environment, and Spatial Sciences
MICHIGAN STATE UNIVERSITY

SPRING 2025

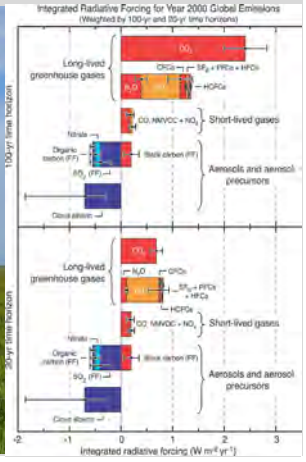
TAKE ACTION, UNDERSTAND THE SCIENCE, & LEAD THE CHANGE!

DESCRIPTION

Global climate change and its impacts on nature and humanity represent the most urgent challenge for communities worldwide. This seminar is designed to familiarize students with the physical foundations of climate change and variability, its direct and indirect impacts on ecosystems and societies, and the actions necessary for adaptation and mitigation. Students are encouraged to lead discussions on key topics. This seminar class will feature guest lectures from national leaders involved in IPCC, the U.S. Global Change Research Program, the National Academy of Sciences, and other networks advancing awareness, education, and science. A field trip to the Kellogg Biological Station in April will offer firsthand experience with local ecosystem experiments, observational stations, and key findings. Reading materials will be drawn from the literature and jointly selected by both students and the instructor, ensuring alignments with students' interests while encompassing both classical texts and the latest developments in the field.

MAJOR TOPICS

Climate & Changes ● Climate Literacy ● Extreme Weather ● Rising Sea Levels ● Ocean Acidification ● Biodiversity Loss ● Agriculture ● Human Health ● Ecosystem Regulations ● Urbanization ● Earth System Models ● Carbon Sequestration ● Greenhouse Gasses ● Global Warming Potentials ● Land Surface Phenology ● Renewable Energy ● IPCC ● US Climate Change ● Adaptation & Mitigation ● Carbon Monitoring ● Policies ● Field Trip to Flux Towers



PHYSICAL GEOGRAPHY:

CLIMATE CHANGE AND IMPACTS ON ECOSYSTEMS

GEO871-001 (3 credits)
Dr. Jiquan Chen
Email: jqchen@msu.edu

Monday & Wednesday
12:30 – 13:45 p.m., Geography, Rm. 126

GUEST LECTURES

- Dr. Thomas Dietz, NAS
- Dr. Dave Skole, IPCC
- Dr. Phil Robertson, MSU
- Dr. Geoffrey Henebry, CC & Phenology
- Dr. Steve McNulty, US GCP

SAMPLE READING MATERIALS

- Multiple chapters of IPCC Reports (2022)
- The 5th National Climate Assessment – US (2024)
- World Meteorological Organization Reports
- Hansen et al. (1981). Climate impact of increasing atmospheric carbon dioxide
- Oreskes (2004). The scientific consensus on climate change
- Diffenbaugh & Burke (2019). Global warming has increased global economic inequality
- Arneth et al. (2019). Climate change and ecosystems: Threats, opportunities, and solutions
- Mann et al. (1999). Northern hemisphere temperatures during the past millennium: Inferences, uncertainties, and limitations

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