CENTER FOR GLOBAL CHANGE SCIENCE

The MIT Center for Global Change Science (*http://cgcs.mit.edu*) conducts interdisciplinary research that informs policy action on climate change and sustainability. The center seeks to advance knowledge of the natural mechanisms in the ocean, atmosphere, and land systems that together control the Earth's climate; to apply improved understanding to study the relationship between the environment and society; and to contribute to sustainable solutions to the challenges of global environmental change. The center utilizes theory, observations, and numerical models of the natural processes and social systems, concentrating on the circulations, cycles, and interactions of water, air, energy, and nutrients in the Earth system, the linkages among them, and the feedbacks among social, economic, and environmental systems.

The center was founded in 1990 to foster cooperative effort among faculty, students, and research scientists in meteorology, oceanography, hydrology, atmospheric sciences, climate physics, chemistry, biology, ecology, and satellite remote sensing. Participants are drawn primarily from the departments of Earth, Atmospheric and Planetary Sciences; Civil and Environmental Engineering; Biology; Aeronautics and Astronautics; and the Institute for Data, Systems, and Society.

The major research initiatives in center are the MIT Joint Program on the Science and Policy of Global Change (*https://catalog.mit.edu/mit/research/joint-program-science-policy-global-change*), the MIT Climate Modeling Initiative (CMI), and the Advanced Global Atmospheric Gases Experiment (AGAGE). Through the MIT Joint Program, the center sustains substantial collaborative effort with faculty, students, and researchers in Economics, the Sloan School of Management, Urban Studies and Planning, Political Science, and the MIT Energy Initiative.

CMI is an open-source collaborative that has developed the MIT General Circulation Model, which is applied to a wide range of modeling challenges in atmospheres, oceans, the cryosphere, biogeochemical cycles, ocean ecology, and the coupling together of all these processes.

AGAGE measures greenhouse gases globally and infers their sources and sinks using inverse methods. It is distinguished by its capability to measure over the globe at high frequency almost all of the important gas species in the Montreal Protocol (e.g., Chloroflurocarbons [CFCs], Hydrochlorofluorocarbons [HCFCs]) to protect the ozone layer and almost all of the significant non-CO_2 gases in the Kyoto Protocol (e.g., HFCs, methane, and nitrous oxide) to mitigate climate change.

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