

Outline of the Earth System Division



The Earth System Division was established in 2021 in line with the start of the 5th Medium-and-Long-Term Plan. We collaborate with domestic and international researchers on various research topics related to the understanding of earth system phenomena, prediction and risk assessment of future global environmental changes, and the development of advanced measurement technologies and models necessary for these research activities.

We promote long-term monitoring of greenhouse gases (GHGs) that cause global warming (Center for Global Environmental Research), satellite observation of GHGs (Satellite Observation Center), and research on climate change and changes in atmospheric components that cause it (Climate Change and Air Quality Research Program).

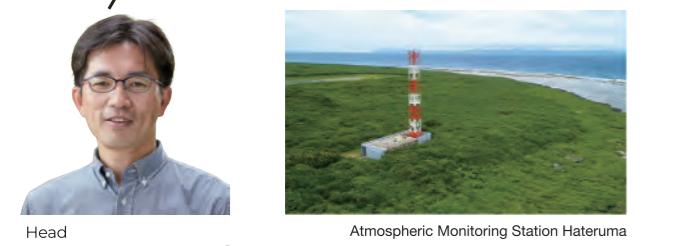
Exterior of the Climate Change Research Hall where the Earth System Division is based

Center for Global Environmental Research

Following the reorganization in 2021, Center for Global Environmental Research was positioned under the newly established Earth System Division. We carry out projects that support global environmental research, such as global environmental monitoring of the atmosphere, ocean, and land, operation of databases, compilation of the Japan's Greenhouse Gas Inventory, and dissemination of research results.

Office for Atmospheric and Oceanic Monitoring | Global-scale monitoring of changes in GHGs

We conduct long-term monitoring for spatial and temporal variations of GHGs and related components in the atmosphere and ocean, and collect fundamental data to understand the factors behind these variations. We also conduct medium- to long-term observations to detect and monitor environmental impacts resulting from climate change.



Office for Global Environmental Data Integration and Analysis | Promotion of the management, publication, and utilization of global environmental research data

We provide support throughout the life cycle of data from research planning to promotion of data utilization. We operate the Global Environmental Database (GED), that collects, organizes, and widely disseminates data. We also develop and operate the Research Data Management System (RDMS), that enables research teams to efficiently manage their data.



Climate Change and Air Quality Research Program

—Providing a scientific basis toward global stabilization—

We implement research on atmospheric composition relevant to climate change. In particular, to assess the progress made in GHG emission reduction, we will develop a method to determine the amount of emissions at the global, national, and city levels from atmospheric observations. We will also improve chemistry-climate modeling to provide scientific knowledge that is necessary for making policy decisions.

Project 3

Simulation and projection of climate and air quality with enhanced numerical modeling capabilities

We will improve the accuracy of the simulation and projection of the changes in climate and air quality, and assess the processes involving clouds, precipitation, atmospheric chemistry, and stratospheric ozone.



Project 1

Quantitative evaluation of natural/anthropogenic GHG sources and sinks on the global scale

We will estimate global GHG emissions and uptake by unified, neutral, and objective methods, by making the best use of the data obtained from ground-based, ship, aircraft, and satellite observations.



Project 2

Quantitative evaluation of anthropogenic SLCF and GHG emissions on regional, national, and city scales

We will challenge the development of new methods to estimate GHG and SLCF (Short-Lived Climate Forcers)* emissions on the national and city scales by expanding the capability of ground-based, ship, aircraft, and satellite observations.



GOAL!



Through these projects, we will provide the scientific basis and constraints for the stabilization of climate and air quality by pursuing the understanding of atmospheric processes, emissions verifications, and future projections, and contribute to the achievement of the long-term goals of the Paris Agreement.

