Environmental Sciences

The Environmental Sciences Division is an interdisciplinary research and development organization with more than 60 years of achievement in local, regional, national, and international environmental research. Researchers focus on complex challenges such as clean and available water and biological carbon dioxide capture and storage in soils. Our vision is to expand scientific knowledge and develop innovative strategies and technologies that will strengthen the nation's leadership in creating solutions to help sustain Earth's natural resources.

Addressing Fundamental Challenges

Our scientists conduct research, develop technology, and perform analyses to understand and assess responses of environmental systems at the environment-human interface and the consequences of alternative energy and environmental strategies.

Aquatic ecology—Advancing aquatic ecosystem science to promote sustainable and secure water and energy resources

Atmospheric radiation measurement data science and integration—Providing data and computing capabilities to advance understanding of atmospheric radiation and cloud physics

Earth science—Understanding processes that govern the fate and transformation of trace elements, nutrients, and contaminants in terrestrial and aquatic ecosystems over a broad range of spatiotemporal scales

Ecosystem science—Understanding mechanisms of terrestrial response to environmental change and multiple scales for the projection of the future fate and function of terrestrial biomes

Remote sensing and environmental informatics—Developing and providing integrated data products, data delivery systems, and data analysis tools

Renewable energy systems—Providing innovative, cost-effective energy solutions for bioenergy and waterpower applications

Society, energy, and environment—Developing methods, analyses, and assessments useful in the management of human health, environmental, and societal risks associated with emerging technologies and legacy wastes

Terrestrial systems modeling—Understanding the interactions in land ecosystems to predict earth system dynamics

12,500
Atmospheric and biogeochemical data products

135
Staff

1 billion
Tons of potential biomass resources identified

807
Publications in the past 5 years

40-year
Mystery solved with mercury methylation gene discovery

"Our researchers advance understanding of the natural world from the molecular to the global scale in Earth system science."

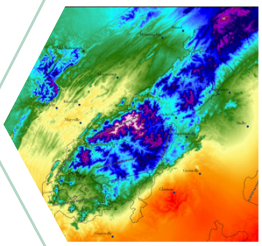
Eric Pierce, ***Director, Environmental Sciences Division***

OAK RIDGE National Laboratory

U.S. DEPARTMENT OF ENERGY

Unique Research Capabilities

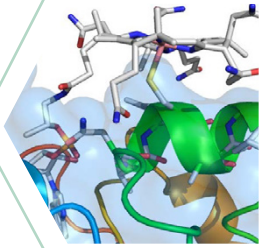
Atmospheric Radiation Measurement (ARM) Data Center—Sharing computing resources and data on atmospheric radiation balance to inform models of global climate change



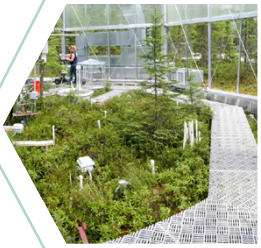
ORNL Distributed Active Archive Center (ORNL DAAC) for Biogeochemical Dynamics—Providing scientists and stakeholders with access to biogeochemical and ecological data and models

Aquatic Ecology Laboratory—Understanding aquatic ecosystem interactions to develop technologies and solutions that will sustain energy water resources

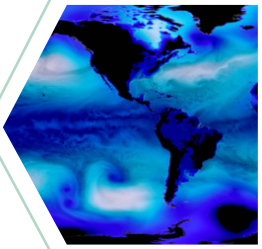
Next-Generation Ecosystem Experiments (NGEE Arctic)—Advancing predictive understanding of the structure and function of the Arctic terrestrial ecosystems in response to climate change



Biogeochemical Transformations at Critical Interfaces—Examining exchange and feedback processes occurring at critical interfaces that control mercury biogeochemical fate and transformation



Spruce and Peatland Responses Under Changing Environments (SPRUCE)—Assessing the response of northern peatland ecosystems to increases in temperature and exposures to elevated atmospheric CO_2 concentration



Climate Change Science Institute—Integrating expertise in measurements, data, and simulation to improve understanding and prediction of a changing climate

CONTACT:

Eric Pierce
Director,
Environmental Sciences Division

pierceem@ornl.gov
865-574-9968

One Bethel Valley Road,
Oak Ridge, TN 37830

ornl.gov/esd

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