

The National Global Change Research Plan 2012-2021

A Strategic Plan for the U.S. Global Change Research Program (USGCRP)

Global change is having important and immediate impacts on society. Increases in world population, industrialization, and other human activities are altering the atmosphere, oceans, land, ice cover, ecosystems, and distribution of species over the planet. People working in agriculture, energy, health, coastal management and other sectors are grappling with how these changes may affect decisions both today and in years to come. Understanding the science of global change and its impacts on society is essential to ensuring these decisions are well-informed.

Recognizing this imperative, Congress passed the Global Change Research Act of 1990, which mandated the USGCRP to coordinate the work of 13 agencies that fund scientific research on global change. This coordination optimizes efforts across the Federal government, leverages synergies, and facilitates communication among member agencies, partners in industry, academia, and state, local, and foreign governments.

Over two decades, USGCRP's research has helped uncover the potential risks and opportunities associated with global change and contributed to the advancement and application of global change knowledge. For example, mathematical models of the general circulation of the atmosphere and ocean now can reproduce major features of the global temperature record of the 20th century, providing confidence that climate projections accurately reflect the link between rising levels of greenhouse gases in the atmosphere and planetary warming. Despite this important progress, more

research is needed to better understand the underlying processes and variability of the Earth system and the complex causes and consequences of human-induced global change. At the same time, increased publicly accessible, durable data and information is also needed to support partnerships among all sectors of society to foster sound decisions for a sustainable future.

USGCRP's new ten-year strategic plan addresses these needs and reflects recommendations and input from reports by the National Academies, stakeholder listening sessions, public comments, and collaborative planning among Federal agencies. It charts an ambitious course to advance the Program's legislative mandate by deepening basic scientific understanding and providing information and tools to support the Nation's preparation for and response to global change.

Vision

The USGCRP's vision is for a Nation, globally engaged and guided by science, meeting the challenges of climate and global change.

Mission

The Program's mission is to build a knowledge base that informs human responses to climate and global change through coordinated and integrated Federal programs of research, education, communication, and decision support.

The Program will coordinate Federal research efforts through four strategic goals:

Goal 1. Advance Science: Advance scientific knowledge of the integrated natural and human components of the Earth system.

Goal 2. Inform Decisions: Provide the scientific basis to inform and enable timely decisions on adaptation and mitigation.

Goal 3. Conduct Sustained Assessments: Build sustained assessment capacity that improves the Nation's ability to understand, anticipate, and respond to global change impacts and vulnerabilities.

Goal 4. Communicate and Educate: Advance communications and education to broaden public understanding of global change and develop the scientific workforce of the future.



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The Plan recognizes that effective responses to global change require a deep understanding of the integrated Earth system and the incorporation of information from the physical, chemical, biological, and social sciences. USGCRP will strengthen its integrated framework through the use of advanced computing, integrated large data sets, and modeling capabilities that can span scientific disciplines. It will increase use of research findings from the biological, social, and economic sciences to assist in understanding the implications of policy and development decisions.

To help inform decision-makers with the best available information on global change, USGCRP is strengthening the engagement between the science and decision-making communities, developing user-friendly information tools, and improving its assessment capabilities. These will enable a critical synthesis and evaluation of climate- and global-change science, with a focus on vulnerability assessment and evaluating progress in responding to change, while providing decision-makers with access to relevant and accurate science. USGCRP will continue to coordinate ongoing, comprehensive assessment efforts across regions and sectors at multiple scales. It will build a sustained, collaborative network of public and private partners and stakeholders, to link and align Federal capacity with a wide range of interested communities.

To be fully effective, USGCRP must effectively communicate its findings and engage in two-way dialogue about global change with a diverse set of audiences. By integrating communication and education into the Program's core research activities over the next decade, USGCRP will serve as a credible

and authoritative source of global change scientific information. The Program's education efforts will support the critical goal of developing a scientific workforce capable of bridging the physical, chemical, biological, and social sciences, and coordinating that integrated knowledge-base with the engineering and planning skills needed to respond to global change challenges.

Effective preparation for and response to global change also requires international research and cooperation. USGCRP will continue to collaborate with counterparts around the globe to coordinate data collection and delivery, build robust models and assessments, and understand processes and trends that link the continents, oceans, and atmosphere. Observations across the globe are crucial to develop the long-term data sets needed to leverage and build upon U.S. investments.



This Strategic Plan acknowledges several looming challenges in global change research. Among them, the Nation is at risk of experiencing observational gaps that would affect the ability to monitor and understand natural and human-induced variability, due to developmental and launch delays of replacements for aging systems (e.g., Earth Observing System satellites). Understanding global change is an inherently data-rich and long-term process. This plan recognizes the need to maintain and enhance consistent data collection and processing capabilities.

This Strategic Plan envisions an ambitious research program that coordinates the work of Federal agencies to bring scientific insights to bear on timely, relevant decision-making for the benefit of the Nation.

