

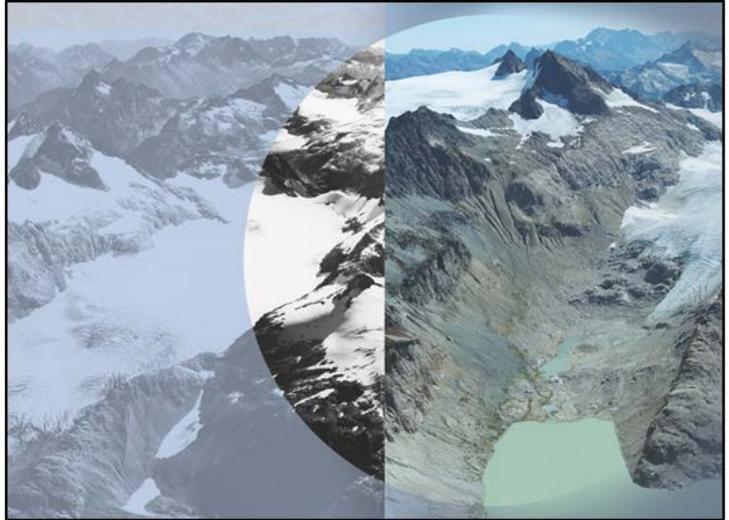
Climate Change Science for a Changing World

FY 2015 President's Proposed Budget

Total request is \$67.6 million (\$18.2 million above FY 2014 enacted level)

Climate change requires that the Nation prepare for an increasingly wide range of temperature and precipitation patterns. Changing climate patterns are affecting forest health, wildfire, water resources, biodiversity, agriculture, and other climate-dependent resources and industries.

The USGS has conducted climate research for more than 100 years. The USGS conducts research to support natural resource managers and infrastructure planners facing increasingly complex challenges under changing conditions such as drought and sea level rise. The proposed budget increase in 2015 would support priority research in three programs: (1) the National Climate Change and Wildlife Science Center and the Department of the Interior Climate Science Centers, (2) Climate Research and Development, and (3) Biological Carbon Sequestration based on Landsat satellite data.



These research activities also contribute to the President's Climate Action Plan by providing data and tools to decision-makers, enhancing interagency coordination, providing actionable climate science, and developing carbon measurement tools to support management of public lands.

National Climate Change and Wildlife Science Center (NCCWSC) and Department of the Interior Climate Science Centers (CSCs)

Established in 2008, the NCCWSC has created eight regional CSCs to provide resource management agencies with science and technical support on the impacts of climate change on fish, wildlife, and ecological processes. The CSCs work with regional partners to identify and develop common priorities.

In 2015, the NCCWSC/CSC Program requests an increase of \$11.5 million to strengthen this work, focusing on interagency and regional coordination of climate science and adaptation planning activities; developing actionable science focused on decision-makers' needs, including providing science to better integrate climate mitigation and adaptation planning; and addressing Native American tribal nations' needs for climate science.



Given persistent drought in the central United States, in 2015 the NCCWSC proposes to address the impacts of drought across multiple CSC regions. The CSCs would leverage their strong regional partnerships and unique convening role, bringing diverse stakeholders to a shared, science-based understanding of drought impacts to their resource management responsibilities, and their potential adaptive management responses.

Climate Research and Development (R&D)

For more than 50 years, the Climate Research and Development (R&D) Program has supported fundamental multidisciplinary research needed to understand patterns of climate and land use change and their impacts on natural systems.

In 2015, the Climate R&D Program requests an increase of \$4.6 million to focus on emerging science needs and climate and land cover change effects on regional ecosystems and infrastructure. The increased funding would allow the USGS to develop a better understanding of long-term patterns of drought, storms, and other hydrologic extremes; this work would provide long-term context for the proposed NCCWSC/CSC activity on drought. The USGS would also use the proposed funding to improve estimates of potential sea-level rise and its effects on coastal ecosystems, by studying geologic records and contributions from melting glaciers and ice sheets.

In addition, the Climate R&D Program proposes to integrate long historical records of land change with modern Landsat satellite-based records of land change, to improve the understanding of how regional changes in climate and land use interact in the Florida peninsula and the Colorado River Basin. These efforts are aimed at improving: (1) forecasts of impacts of specific land use changes on climate patterns; (2) capabilities to predict changes in water availability based on specific management actions in these regions; and (3) the likelihood of sustainable restoration outcomes in the Florida peninsula.

Biological Carbon Sequestration

Biological carbon sequestration refers to both natural and deliberate processes by which carbon dioxide is removed from the atmosphere and stored as carbon in vegetation, soils and sediments. The Energy Independence and Security Act of 2007 called for the Secretary of the Interior to complete a quantitative national assessment of the carbon stored in and released from the Nation's ecosystems. This assessment will help inform land management policies and provide tools for natural resource managers to account for the carbon impacts of routine management practices as well as future climate adaptations. In 2014, work will focus on development of tools for use in land management applications. In this effort, the USGS biological carbon sequestration project will actively partner with the CSCs and with Interior natural resource management agencies, such as the FWS, to refine understanding of the regional impacts of land use decisions on carbon sequestration and develop tools for pilot areas, enabling resource managers to ask "what if" questions about mitigation and adaptation scenarios. The biological carbon sequestration assessment will be completed in 2015 for all fifty states.

In 2015, the biological carbon sequestration project requests an increase of \$2.0 million that will leverage the national biological carbon sequestration assessment results to implement a carbon inventory and tracking system for carbon stocks and flows on all Interior lands, complete with online tools to support decisions about natural resources at regional levels. In order to integrate the findings about carbon storage into the resource decision-making process, the assessment methodology will require further refinement using Landsat satellite data and geospatial modeling, feedback from the 2014 pilot studies, additional consultation with resource managers, and refined decision support tools supporting carbon management objectives and tradeoffs with other ecosystem services. In addition, tracking changes in biological carbon sequestration will be necessary to evaluate the approach and its use by resource managers. This tracking capability will require development of methods to provide annual updates from Landsat-based science products currently in development by the Land Remote Sensing Program, including wildfire burned area extent and surface water extent.

To learn more, visit the USGS Office of Budget, Planning and Integration website: www.usgs.gov/budget

