



FY 2017 USGS Budget Request

Enabling Communities and the Nation to Enhance Climate Resilience

The FY 2017 Budget Request for Climate and Land Use Change is \$171,444,000, a net change of +\$31,469,000 from the 2016 Enacted level.

USGS science increases awareness of the impacts of climate change, improving our economy, safety and quality of life.

Dollars in Thousands	2015	2016	2017			Change from 2016 Enacted
	Base	Enacted	Fixed Costs	Program Changes	Request	
Climate and Land Use Change	\$135,975	\$139,975	\$304	\$31,165	\$171,444	\$31,469
Climate Variability	\$57,589	\$57,289	\$148	\$5,566	\$63,003	\$5,714
National Climate Change and Wildlife Science Center/DOI Climate Science Centers (CSCs)	\$26,735	\$26,435	\$32	\$4,441	\$30,908	\$4,473
Great Lakes Climate Science Centers	[\$0]	[\$0]		[\$1,500]	[\$1,500]	[\$1,500]
Tribal Climate Science Partnerships	[\$0]	[\$0]		[\$1,411]	[\$1,411]	[\$1,411]
WaterSMART: Drought	[\$0]	[\$0]		[\$1,030]	[\$1,030]	[\$1,030]
Critical Landscapes: Arctic	[\$0]	[\$0]		[\$500]	[\$500]	[\$500]
Climate Research and Development Program	\$21,495	\$21,495	\$94	\$1,125	\$22,714	\$1,219
WaterSMART: Drought	[\$0]	[\$0]		[\$1,125]	[\$1,125]	[\$1,125]
Carbon Sequestration	\$9,359	\$9,359	\$22	\$0	\$9,381	\$22
Land Use Change	\$78,386	\$82,686	\$156	\$25,599	\$108,441	\$25,755
Land Remote Sensing Program	\$67,894	\$72,194	\$113	\$24,199	\$96,506	\$24,312
Big Earth Data: Data Cube	[\$0]	[\$0]		[\$600]	[\$600]	[\$600]
Critical Landscapes: Arctic	[\$0]	[\$0]		[\$1,857]	[\$1,857]	[\$1,857]
Landsat Science Products for Climate and Natural Resources Assessments	[\$0]	[\$0]		[\$2,992]	[\$2,992]	[\$2,992]
Resilient Coastal Landscapes and Communities: Imagery Datasets and Analytical Tools for Coastal Analysis	[\$0]	[\$0]		[\$500]	[\$500]	[\$500]
WaterSMART: Drought	[\$0]	[\$0]		[\$250]	[\$250]	[\$250]
WaterSMART: Remote Sensing	[\$0]	[\$0]		[\$400]	[\$400]	[\$400]
Landsat 9	[\$0]	[\$4,300]		[\$15,400]	[\$19,700]	[\$15,400]
Sentinel-2	[\$0]	[\$0]		[\$2,200]	[\$2,200]	[\$2,200]
Land Change Science	\$10,492	\$10,492	\$43	\$1,400	\$11,935	\$1,443
WaterSMART: Remote Sensing	[\$0]	[\$0]		[\$400]	[\$400]	[\$400]
WaterSMART: New Tools and Models to Better Manage Water Nationwide	[\$0]	[\$0]		[\$1,000]	[\$1,000]	[\$1,000]

The Climate and Land Use (CLU) Change Mission Area plays an important role in the development of a scientific foundation that enables society to anticipate and adapt to global change. CLU Mission Area scientists are world leaders in understanding how changes in climate influence land use and land cover, ecosystems, natural resources and human communities as well as the Earth's climate history. The CLU Mission Area designs and conducts the scientific research, remote sensing, modeling and forecasting that directly supports natural resource managers and other policy makers who need a science basis for decision making. The data, information, tools and applications produced by the CLU Mission Area are widely used within and outside the USGS and the Federal government; they are also used at the State, local, tribal, and international levels by both public and private decision makers and researchers.

Highlights of the 2017 President's Budget for Climate and Land Use Change include:

Great Lakes Climate Science Center +\$1,500,000 for a total of \$1,500,000: The Climate Science Centers provide interagency coordination and turn scientific knowledge into practical application ready projects and deal with unique regional needs. The 2017 increase would implement a new Center to address the many unique climate-related natural resource challenges in the Great Lakes region.

Tribal Climate Science Partnerships +\$1,411,000 for a total of \$1,411,000: Native American communities are increasingly engaging with the USGS and other partners to develop climate adaptation programs, and their needs for scientific and planning information are likewise increasing. The 2017 increase would address the needs of Tribes to better understand the potential climate change effects on culturally-important resources, and help integrate tribal and indigenous traditional ecological knowledge with more traditional science in management decisions.

WaterSMART: +\$4,205,000 for a total of \$4,205,000 (USGS Total: \$37,064,000): Meeting the water resource needs of the Nation is an increasing challenge because of rapidly changing drivers of water availability, such as climate change, population increases, and water use and land use changes. The 2017 increase would develop a science-based decision process for understanding and managing the impacts of drought on various parts of the Central and Western United States, including California; identify and close the gaps between remote sensing data and derivative products in order to meet the needs of scientists and decision makers; and use remote sensing data to allow monitoring of water storage in smaller storage features such as ponds, thereby improving drought status monitoring.

Landsat 9 +\$15,400,000 for a total of \$19,700,000: Landsat 9 is the critical follow-on mission to Landsat 8, and direct replacement for Landsat 7. The development of Landsat 9 will help ensure the continuation of the four-decade collection of Landsat multi-spectral imagery across the Earth's land surfaces, supporting near-weekly Landsat revisit for hundreds of land cover applications supporting tens of thousands of research and operational users across the Nation. Landsat 9's sensors are more robust and will have the ability to detect more variation in intensity than previous Landsats. Landsat 9 is being developed and operated through an interagency agreement between NASA and DOI USGS. Work on Landsat 9 was initiated by both agencies in 2016, with a funding increase and a directive from Congress. The 2017 increase would be used for continued development of the Landsat 9 ground system to meet the accelerated the launch date of 2021.

Sentinel-2 +\$2,200,000 for a total of \$2,200,000: Acquiring data from the European Space Agency's (ESA's) Sentinel-2 satellites would enhance the ability to meet the increasing demand for more frequent observations, including monitoring of global crop production and the mapping of natural resource features. The 2017 increase would allow the USGS to acquire, store, and disseminate the information from ESA.

Critical Landscapes: Arctic +\$2,357,000 for a total of \$2,357,000 (USGS Total: \$38,991,000): In addition to increasing greenhouse gas emissions, Arctic permafrost thawing contributes to coastal erosion that threatens villages and critical infrastructure and leads to more wildfire, provides a potential pathway for invasive species and affects wildlife habitat. The 2017 increase would develop predictive models that support the evaluation of changes to the environment resulting from the conversion of historically sequestered ice and snow to liquid and gaseous water.

Landsat Products for Climate and Natural Resources Assessments +\$2,992,000 for a total of \$2,992,000: The Landsat archive provides a record of global observations from 1972 to the present. The USGS is currently developing a set of Landsat-based science products that will improve applications used by natural resource managers and contribute to the climate monitoring community's initiative to develop consistent Climate Data Records and Essential Climate Variables. The 2017 increase would develop the computing and online storage resources necessary to rapidly produce and widely disseminate a set of Landsat-based information products.