

Directorate for Geosciences Funding

GEO Funding (Dollars in Millions)

	FY 2016 Actual	FY 2016 Estimate	FY 2017 Request	Change Over FY 2016 Estimate	
				Amount	Percent
Atmospheric and Geospace Sciences (AGS)	252.18	253.67	267.92	14.25	5.6%
EarthSciences (EAR)	178.31	179.39	191.68	12.29	6.9%
Integrative and Collaborative Education and Research (ICER)	84.22	83.74	94.95	11.21	13.4%
Ocean Sciences (OCE)	361.31	359.89	379.42	19.53	5.4%
Polar Programs (PLR)	443.02	441.85	464.86	23.01	5.2%
<i>U.S. Antarctic Logistical Support (USALS)</i>	[67.52]	[67.52]	[67.52]	-	-
Total, GEO	\$1,319.04	\$1,318.54	\$1,398.83	\$80.29	6.1%

Totals may not add due to rounding.



Major Emphases

- Risk and Resilience / PREEVENTS
- INFEWS
- Types of activities supported with Mandatory Funding
 - Research programs (emphasis on early career investigators)
 - One-time investments in infrastructure upgrades (replacing obsolete/broken equipment, strategic capability enhancement, etc.)



Cross-Foundational Investments

- Risk and Resilience – started in FY16
- INFEWS – started in FY16
- NSF INCLUDES – steady support, minor variance associated with FY16 SBE budget
- CIF21 and NSCI – transition toward new National Strategic Computing Initiative
- SEES – final year of support in 2017



INNOVATIONS AT THE NEXUS OF FOOD, ENERGY, AND WATER SYSTEMS (INFEWS)

- Responds to urgent need to understand, model, and manage interconnected food-energy-water (FEW) systems, incorporating natural, social, and human-built components.
- Opportunity to build on existing NSF investments to advance the FEW systems knowledge base.
- Investment area for FY 2016 – 2021
- FY 2016
 - NSF issued a multi-directorate INFEWS solicitation; partnering with USDA National Institute of Food and Agriculture (NIFA).
 - ENG and MPS issued DCL (NSF 15-108) to support research activities in nitrogen, phosphorus, and water in the context of INFEWS
 - BIO plans to release a joint DCL with USDA/NIFA on breakthrough technologies for plant and animal phenotyping and microbiomes.
 - INFEWS is a priority research theme area for the NSF Research Traineeship (NRT) program.
- FY 2017
 - Ongoing support for INFEWS research
 - BIO to issue solicitation focused on phytobiomes, microbiomes of plants and surrounding soils and environment.
 - FEW theme may be emphasized in NSF-wide programs, such as EPSCoR, REU, Dynamics of Coupled Natural and Human Systems (CNH), Macrosystems Biology, and data science programs (e.g., BIGDATA and Data Infrastructure Building Blocks (DIBBs)).

Total Funding for INFEWS

(Dollars in Millions)

FY 2015	FY 2016	FY 2017
Actual	Estimate	Request
-	\$48.68	\$62.18

GEO Funding for INFEWS

(Dollars in Millions)

FY 2015	FY 2016	FY 2017
Actual	Estimate	Request
-	\$5.00	\$10.00



Prediction of and Resilience against Extreme EVENTS (PREEVENTS)

- Part of NSF Risk & Resilience investment area planned for FY 2015 – FY 2020
- PREEVENTS supports multidisciplinary expertise in science, engineering, and education to:
 - Deepen fundamental scientific understanding of natural processes underlying geohazards and extreme events.
 - Enable improved quantitative models and qualitative research that can enhance societal preparedness and resilience to natural disasters and extreme natural events.
 - Reduce the impact of extreme events on our life, society, and economy.
 - Improve prediction and warning systems that will support mission agencies such as NOAA, DHS, and USGS.
- Research supported by the Hazards SEES program laid the groundwork for PREEVENTS.
 - In FY 2015, NSF issued final Hazards SEES solicitation.
 - NSF issued PREEVENTS DCL in FY 2015 to support workshops and Research Coordination Networks (RCN).
- PREEVENTS solicitation to be issued in FY 2016.
- In FY 2017, NSF will continue to support proposals including those that are multidisciplinary or require a collaborative team.

Total Funding for R&R

(Dollars in Millions)

FY 2015	FY 2016	FY 2017
Actual	Estimate	Request
\$19.43	\$41.15	\$43.15

GEO Funding for R&R

(Dollars in Millions)

FY 2015	FY 2016	FY 2017
Actual	Estimate	Request
-	\$17.75	\$17.75



Risk and Resilience to Extreme Natural Events

January 2016 Snowstorm 'Jonas' one of the most powerful winter storms to hit the Mid-Atlantic since 1950

- Category 4 "crippling" rating on NOAA's Northeast Snowfall Impact Scale (NESIS) used to rank Northeast snowstorms.
- Covered 434,000 sq. miles and affected more than 100M people.
- Almost 24M people experienced more than 20 inches of snow; 1.5M saw more than 30 inches.
- Sustained winds topped 30 mph and gusted to ~80 mph.
- 250,000 customers lost power and hundreds of vehicle crashes reported.
- Responsible for at least 48 deaths.
- Full financial damage still unknown; similar storm in 1996 caused estimated economic loss of \$4.6B and insured loss of \$920M.

U.S. blizzard to cause multi-billion dollar losses

Snowstorm 'Jonas' comes to an end with hefty price tag

How much did Jonas cost the economy?

Here's how much winter storm Jonas cost the East Coast

Snowstorm costs Morris County nearly \$1 Million



Image Credit: Joshua Roberts, Reuters



Image Credit: Alex Wong, AP



Science, Engineering and Education for Sustainability (SEES)

- Multi-year effort to coordinate and grow research and education associated with the environment, energy, and sustainability.
- FY 2017 is last year in which funding associated with SEES investment area.
 - SEES funding will support Dimensions of Biodiversity, Earth Systems Modeling (EaSM), Sustainability Research Networks (SRN), Coastal SEES, and Sustainable Chemistry, Energy and Materials (SusChEM).
 - Hazards SEES related research will be supported under Risk & Resilience.
 - Water Sustainability and Climate (WSC) and food and energy systems sustainability research will be folded into INFEWS.
 - SusChEM anticipated to transition to an ongoing program among three NSF directorates (MPS, ENG, and GEO).

Total Funding for SEES
(Dollars in Millions)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Request
\$183.01	\$74.73	\$52.48

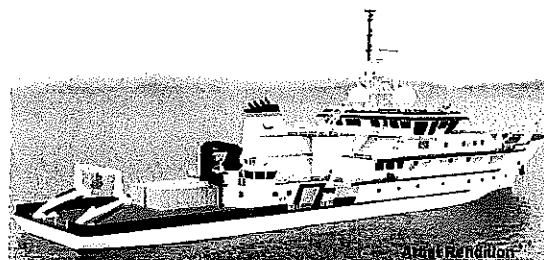
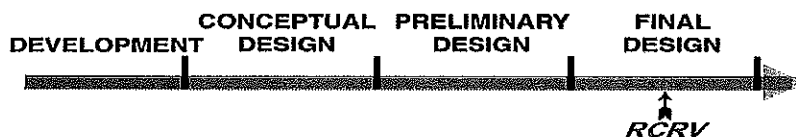
GEO Funding for SEES
(Dollars in Millions)

FY 2015 Actual	FY 2016 Estimate	FY 2017 Request
\$59.00	\$34.00	\$18.50



Two Major Infrastructure Investments

- Regional Class Research Vessels
- Antarctic Infrastructure Modernization for Science



RCRV -

- 2-ship plan consistent with "Sea Change" recommendations
- OSU project team - drawing from the Sikuliaq experience, hiring UAF personnel, and using the same naval architecture firm
- NSF – conducted BSR which includes review of other OSU large construction projects, and has hired a naval architect consultant with large research vessel experience
- NSB approved inclusion in future budget request May 2015
- Final Design Review planned for Oct 2016
- \$106 million requested via MREFC Account in 2017 to initiate construction



