



Ocean Exploration
and Research

Competitive Grants

Competitive Grants: What We Do

Engage the expertise and experience of national and international ocean science and technology communities in expeditions and projects by:

- Implementing partnerships
- Soliciting and funding proposals through annual Federal Funding Opportunity announcement through a peer review process
- Direct funding through existing agreements

Competitive Grants: Why We Do It

OER provides Extramural Funding to:

- Further NOAA mission priorities
- Augment and complement OER's systematic exploration
- Leverage OER discoveries into research

Competitive Grants: What We Achieve

OER Competitive Funding by Fiscal Year

2002	\$6,300,000	2009	\$1,800,000
2003	\$5,500,000	2010	\$2,650,000
2004	\$5,100,000	2011	\$400,000
2005	\$6,670,000	2012	\$0
2006	\$3,200,000	2013	\$0
2007	\$2,500,000	2014	\$4,200,000
2008	\$4,050,000	2015*	\$3,000,000

**planned*

Competitive Grants: What We Achieve

- Discover and characterize the ocean environment in NOAA priority areas, such as:
 - Understanding marine ecosystems
 - Revealing new ocean processes that relate to climate change
 - Providing new insights relevant to understanding coastal hazards
- Leverage NOAA and other ocean exploration discoveries into research
- Advance ocean exploration technology

Competitive Grants: What We Achieve

Summary Metrics

Bibliometric Indicator	Value
Number of Publications (p)	574
Total Number of Citations Received (c)	8,479
Average Number of Citations per Paper (c/p)	14.77
H- Index	42
Percentage of Publications in the Top 10% for Citation Counts	≈21.43%

Common bibliometric indicators calculated for publications supported by OER. An H-Index of 42 indicates that this group of 574 publications includes 42 articles that have each received 42 or more citations.

Competitive Grants: Challenges

The principal challenge is being able to sustain a consistent annual Competitive Grants portfolio—both with respect to NOAA funding and with respect to how NOAA and the other funding agencies collaborate to amplify their respective investments.

Competitive Grants: What's Next

- Aligning the Competitive Grants program to focus on high-priority issues as well as following up on important, NOAA-relevant discoveries
- The FY 15 process targets multidisciplinary expeditions to explore the Arctic
- Peer review to evaluate proposals scheduled for spring of 2015



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Advancing Technology

Technology: What We Do

Coordinate within NOAA and across agencies to advance technologies that increase our capability to explore and learn about the ocean

- Lead the Task Force for Ocean Exploration and Research Technology and Infrastructure (TFORT) authorized by 33 U.S.C. 3404 (Public Law 111-11)
- Use the *Okeanos Explorer* as a test bed for new technologies and approaches to ocean exploration
- Lead the NOAA Ocean Observations Innovation Forum, an intra-agency working group that transfers knowledge and experience related to ocean technology across the agency
- Provide funding through the Competitive Grants program, cooperative institutes, and other partners to develop innovative tools and sensors

Technology: Why We Do It

With the goal to increase the pace, scope and efficiency of ocean exploration, OER:

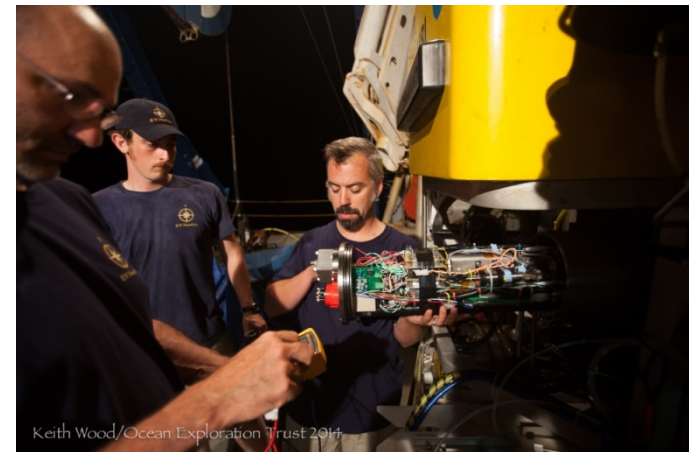
- Leverages technology knowledge and investment across agencies and NOAA to increase capability and achieve cost savings
- Informs partners of exploration mission priorities and problem definition to work together on technology solutions
- Increases our knowledge of the ocean through new platforms, sensors and methodologies
- Increases yield of high quality publicly accessible baseline environmental intelligence of the deep ocean to inform NOAA, nation, industry, NGOs, and academia missions (EX)



Ocean Exploration
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Technology: What We Achieve

- Develop, implement, and transfer new model and tools for collaborative telepresence enabled exploration (*Okeanos Explorer*)
- Develop, implement, and transfer new methods and tools for water column detection and characterization with multibeam (*Okeanos Explorer*-UNH-QPS)
- Collaboratively develop and implement new open-source ROV control software (*Okeanos Explorer*-UCAR/Academia-Industry)
- Develop, implement and transfer new model and tools for end-to-end data management and data integrity monitoring to ensure high quality publicly accessible data (*Okeanos Explorer*) (transferred to and adapted by *Falkor* and *Nautilus*)



Technology: What We Achieve

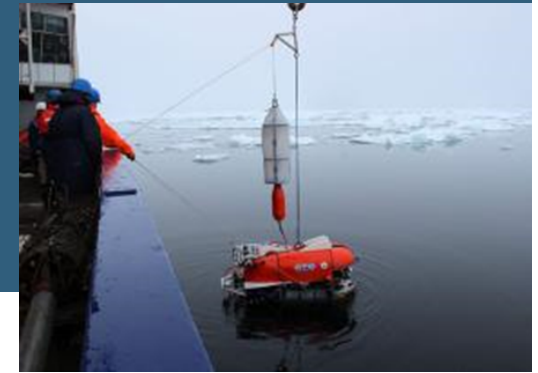
- Partnership with GEOMAR to develop 3D georectified interactive models of ocean features imaged by *Deep Discoverer* (*Okeanos Explorer*)
- Implement Cooperative Research and Development Agreements with strategic partners to develop innovative ocean technologies
- Participate with other NOAA partners, including National Marine Fisheries Service and National Ocean Service to coordinate technology funding initiatives that support cross-cutting priorities



Technology: Challenges

- Developing a vision for ocean exploration operations in 10 and 20 years consistent with the statute, NOAA priorities, and national program recommendations (e.g., OE 2020)
- Maximizing synergy and opportunity across OER investments in the *Okeanos Explorer*, the Competitive Grants program, and external partnerships
- Obtaining resources to invest in future capability and continue current operations
- Availability of ship time to support ocean technology pilot tests and demonstrations
- Acquiring and maintaining technical expertise within the program
- Demonstrating the synergies that exist between technologies that support ocean exploration along with other high-priority NOAA missions
- Developing opportunities to collaborate across federal agencies

Technology: What's Next



Future directions and opportunities

- Continued pilot tests and demonstration of AUVs, UAVs, and other innovative observing technologies
- Work with Office of Naval Research for NOAA participation in their technology demonstration event planned for September 2015
- Work with the U.S. Coast Guard for NOAA participation in Arctic Shield – a technology demonstration initiative using the USCGC *Healy* in the Arctic in 2015 and 2016
- Advocate for new resources to support innovative technology initiatives, including test beds, to improve ocean exploration capability
- Engage other industries (space, biotech, medical) to develop advance “sensors” and “in-situ” sample analysis methods for shipboard, tethered and untethered vehicle use with EX and other platforms.
- Integrate UAV’s into EX telepresence enabled exploration for atmospheric and air-sea measurements, and for comparison, monitoring, and integration of visual and acoustic data marine mammal data (*Okeanos Explorer*).
- Share and transfer telepresence model to other NOAA missions.