National Science Foundation Major Research Equipment and Facilities Management: Ensuring Fiscal Responsibility and Accountability

Witnesses:
Cora Marrett
Deputy Director, National Science Foundation
Jose-Marie Griffiths
Chairman, Subcommittee on Facilities, National Science Board;
Vice President, Academic Affairs, Bryant University
James Yeck
IceCube Project Director, University of Wisconsin-Madison
Tony Beasley
Chief Operating Officer/Project Manager, National Ecological Observing Network
Tim Cowles
Vice President/Director, Ocean Observing, Consortium for Ocean Leadership

Members Present:
Mo Brooks (R-AL), Chairman
Daniel Lipinski (D-IL), Ranking Member

On March 8, 2012 the House Committee on Science, Space, and Technology Subcommittee on Research and Science Education held a hearing to review the National Science Foundation (NSF) Major Research Equipment and Facilities Management (MREFC) oversight and operation. NSF's MREFC account supports large research infrastructure projects which build equipment and facilities where scientists, engineers, students, teachers, and researchers undertake basic research. The MREFC program was created by NSF in 1995 to "separate the construction funding for a large facility - which can rise and fall dramatically over the course of a few years - from the more continuous funding of facility operation and individual-investigator research." To be considered for MREFC funding NSF requires the project to be "transformative in nature, with the potential to shift the paradigm in scientific understanding." Throughout the early 2000s several additions were made to the MREFC selection process including the involvement of the National Science Board (NSB). The $196.17 million MREFC budget request for fiscal year (FY) 2013 highlights six MREFC projects including the National Ecological Observatory Network (NEON) and the Ocean Observatories Initiative (OOI). NEON is an ecological observation platform designed to detect ecological changes and enable the forecasting of its impacts. Data will be collected from 62 sites spread throughout the U.S. over a 30 year period to help analyze the impacts of invasive species, climate change, and land use change on natural resources. OOI is an interconnected network of sensor systems that will be deployed throughout the world's oceans. These sensors will collect climate, carbon, ecosystem, and geodynamic data in order to provide openly available data to educators, researchers, and average citizens.

In his opening statement Chairman of the Subcommittee Mo Brooks (R-AL) provided an overview of the MREFC program. He stated that the MREFC program funds projects that are "too expensive for a specific Directorate to take up on its own." He clarified that MREFC projects focus specifically on the construction of major equipment and facilities. Upon completion of the construction of the facilities the funding is passed to separate NSF programs. Brooks stated that over the last ten years there has been a push to refine the process of choosing MREFC projects, consequently leading to an increase in the involvement of NSB. Brooks expressed support for the MREFC program but called for appropriate oversight to "guarantee the greatest return on taxpayer investments."

Ranking Member of the Subcommittee Daniel Lipinski (D-IL) opened by describing the funding quandary that Congress faces when he said, "…the larger question [is] how we balance support for research infrastructure with support for research grants." He stated that a 2003 NSB report found that 22-27 percent of the NSF budget should be allocated to the MREFC program. He is concerned that the FY 2013 budget request falls at the bottom end of this range.

Cora Marrett Deputy Director at NSF described the mission of the MREFC when she said, “[The MREFC is] designed to maintain and strengthen the vitality of the U.S. science and engineering enterprise.” She emphasized the important role of NSF in maintaining U.S. innovation in science and engineering research. Marrett said each NSF facility helps to push science into a new frontier and works as a platform for scientists and researchers of the future. She hailed NEON and OOI as a representation of a new transformational class of facilities.

The Chief Operating Officer of NEON Tony Beasley, opened by communicating the scientific motivation behind NEON. He said this scientific motivation is to create a national observatory to gather basic scientific knowledge to understand the effects of a changing climate on humanity. Beasley said in 1998 NSB first identified NEON as a potential MREFC project and the project was eventually accepted for funding by NSF in 2011. With regards to oversight of the MREFC, Beasley said, “It [the oversight process] examines whether the projects will meet the overall scientific objectives of the facility in a safe, cost effective, and low risk manner.” He stated that from 2006-2010 MREFC oversight officials conducted 16 reviews of NEON, and NEON is now actively exchanged in dialogue with NSF on the progress of the facility.

In his testimony Timothy Cowles, Program Director of OOI, began by saying, “Observatories provide the opportunity to open new windows into the natural world.” He said OOI will consist of a cyber network of ocean instrumentation spanning coastal regions and ocean floors throughout the world’s oceans. He said the benefits of OOI will include addressing ocean circulation, climate variability, and coastal ecosystems. These benefits will ultimately improve climate forecasting over a range of ocean processes. Regarding OOI’s experience with the MREFC oversight process, Cowles said the oversight “forges a level of rigor in the project team that is essential for both the construction and transition into the operational phase.” He called the interaction between NSF and the project team “critical” in the overall success of OOI.

Brooks utilized his allotted question and answer time to inquire about MREFC program contingency funds. Contingency funds are a separate fund, included in the original funding request, set aside to cover the anticipated risks associated with the project in order to safeguard against overrunning project costs. Brooks asked Beasley and Cowles to comment on their $76 million and $88 million project contingency funds. Beasley described that the $76 million was included in their initial budget proposal representing money allocated for funding risks. Cowles said OOI used a specific formula in calculating the funding risk involved with each step of the project to determine their contingency fund. That total came out to be $88 million that OOI can withdraw if needed through an NSF approval process.

Lipinski asked Marrett what the role of Congress should be in the MREFC program. Marrett responded that Congress plays a huge role in ultimately deciding the fate of these projects through funding. If Congress grants an MREFC approved project funding then the project will be on its way to construction, but if they deny funding of an MREFC approved project than the project is set on a path to fail. Marrett assured Lipinski that NSF is open to congressional participation in any stage of the MREFC program selection process.

Opening statements, witness testimony, and a web cast of the hearing can be found at the House Committee on Science, Space, and Technology web site.