



**National Science Foundation
4201 Wilson Boulevard
Arlington, Virginia 22230**

NSF 11-022

Dear Colleague Letter for the Science, Engineering and Education for Sustainability (SEES) NSF-Wide Investment Area

Achieving a sustainable human future in the face of both gradual and abrupt environmental change is one of the most significant challenges facing humanity. NSF will contribute to addressing this challenge by supporting the science and engineering research needed to understand and overcome the barriers to sustainable human well-being. In response to this global challenge, all eleven NSF Directorates and Offices have joined together to support Science, Engineering, and Education for Sustainability (SEES). The purpose of this DCL is to explain the scope of the SEES investment area, alert the community to activities that are being planned for the near term, and point to sources of additional information about future SEES plans.

Through SEES, NSF seeks to enable the discoveries needed to inform actions that lead to environmental, energy and societal sustainability. SEES will include the conceptual, theoretical, empirical, and computational research needed to further develop the basic science, engineering, education, and policy knowledge base relevant to sustainability. Additionally, it will support projects at multiple scales, from the individual to the system level, and will stimulate innovations in education and learning research and practice.

SEES is expected to be a multi-year effort that will address challenges in climate and energy research and education using a systems-based approach to understanding, predicting, and reacting to change in the linked natural, social, and built environment. In 2010, initial efforts focused on a suite of research and education programs at the intersection of climate and environment, with specific attention to incorporating human dimensions. Solicitations were released that addressed ocean acidification, water sustainability and climate, dimensions of biodiversity, earth systems modeling, and climate change education. Plans are to continue these competitions under the SEES portfolio. Future efforts will support research and education that builds connections between current projects, creates new nodes of activity, engages the public, and develops the personnel needed to understand the complexity of sustainability issues.

In FY 2011, NSF plans to encourage interdisciplinary research and education on energy sustainability, with a particular emphasis on the socioeconomic and environmental implications. Potential areas of emphases include the development of sustainable energy technologies, development of techniques for effective and efficient use of water resources, and research in transportation technology. A continued focus will be placed on creating the necessary workforce to address sustainability challenges and connecting elements of the SEES portfolio. Specific efforts will support postdoctoral researchers and early career scientists at the interfaces between social sciences and other science and engineering disciplines.

The SEES Portfolio will support research and education projects that span all eleven NSF Directorates and Offices, including:

- research at the energy-environment-society nexus
- novel energy production, harvesting, storage, transmission, and distribution technologies, and their intelligent control that minimizes environmental impact and corresponding adoption, socioeconomic, and policy issues
- innovative computational science and engineering methods and systems for monitoring, understanding and optimizing life-cycle energy costs and carbon footprints of natural, social and built systems (including IT systems themselves)
- data analysis, modeling, simulation, visualization, and intelligent decision-making facilitated by advanced computation to understand impacts of climate change and to analyze mitigation strategies
- study of societal factors such as vulnerability and resilience, and sensitivity to regional change
- short and long term research enabled by a new generation of experimental and observational

networks

- support for interdisciplinary education/learning science research, development, and professional capacity-building related to sustainability science and engineering
- creation of research and education partnerships around forefront developments in sustainability science and engineering, both nationally and internationally
- development of the workforce required to understand the complexities of environmental, energy, and societal sustainability
- engaging the public to understand issues in sustainability and energy
- development of the cyberinfrastructure and research instrumentation needed to enable sustainability science and engineering
- support of the physical, cyber, and human infrastructure necessary to achieve SEES goals

Researchers who are interested in SEES-related topics are encouraged to consider the following near term activities, as well as periodically check the SEES web page (<http://www.nsf.gov/sees>) for specific guidance on future research funding opportunities:

- The Dynamics of Coupled Natural and Human Systems (CNH) program is encouraging submission of projects related to SEES themes for its FY 2011 competition ([NSF 10-612](#)). CNH is jointly managed by the Biological Sciences; Geosciences; and Social, Behavioral, and Economic Sciences, while other NSF units (including the Directorate for Engineering, the Directorate for Education and Human Resources, the Office of International Science and Engineering, and the Office of Polar Programs) participate in evaluation of proposals and, when appropriate, in funding awards. The CNH program is one of many standing programs contributing to the NSF portfolio of investments for SEES.
- The Catalyzing New International Collaborations program ([NSF 11-508](#)) provides support for the early phase of developing and coordinating research and education activities with foreign partner(s). These activities include, but are not limited to: planning visits, small workshops, initial data gathering activities, and the development of research coordination networks.
- The Research Coordination Networks program ([NSF 11-531](#)) supports planning activities that bring together novel groupings of researchers (including education researchers and experts in public engagement) and the development of innovative methods for networking investigators working on topics related to SEES.
- Where appropriate, researchers are encouraged to include support for postdoctoral researchers within new proposal submissions, especially those SEES-related projects providing opportunities to integrate the social and natural sciences.
- Interdisciplinary workshops are encouraged that would help inform the development of SEES activities over the coming years. Investigators should discuss their ideas with Program Officers in the most relevant NSF core program(s) to determine the saliency of their concepts with SEES goals. See Chapter II.D.8 of the Grant Proposal Guide for information about proposals for conferences, symposia and workshops (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg).

For specific questions about SEES related activities, please see the list of SEES points of contact posted at http://www.nsf.gov/geo/sees/sees_contacts.jsp.

Sincerely,

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