

Science, Engineering, and Education for Sustainability SEES Portfolio



OPP OAC

November 10, 2010

Sustainability Science and Engineering

- ▶ The National Academy of Sciences recent definition:
- ▶ “The interactions between **natural and social systems** and how those interactions affect the challenge of **sustainability**:
- ▶ ...meeting the needs of present and future generations while substantially reducing poverty and conserving the planet’s life support systems”
- ▶ www.pnas.org/site/misc/sustainability.shtml

Dynamics of Coupled Natural and Human Systems (CNH)

- CNH (NSF 10-612) encourages SEES themes
- Interdisciplinary standing NSF program (GEO, BIO and SBE).
- Quantitative, interdisciplinary analyses of human and natural system processes and complex interactions at diverse scales
- Adds support for exploratory/new team awards and Research Coordination Networks
- Due date December 2010.



Some specific SEES portfolio examples:

- ▶ research at the energy–environment–society nexus
- ▶ novel energy production, harvesting, storage, transmission, and distribution technologies
- ▶ 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
- ▶ study of societal factors such as vulnerability and resilience, and sensitivity to regional change

SEES Major Aims

- ▶ Support **research and education** to inform global community sustainability
- ▶ Build **connections** between current projects and create new nodes of activity
- ▶ Develop **personnel** needed to understand complex issues of sustainability

**Environmental
Research and
Education**



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Science, Engineering and Education for Sustainability (SEES) NSF-Wide Investment

NSF established the Science, Engineering, and Education for Sustainability (SEES) investment area in FY 2010 in order to 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. Initial efforts were focused on coordination of a suite of research and education programs at the intersection of climate and environment, including specific attention to incorporating human dimensions.

SEES is expected to be a 5-year effort, extending through FY15. Continuing efforts will focus on supporting research that facilitates global community sustainability, specifically through building connections between current projects, creating new nodes of activity, and developing personnel needed to solve sustainability issues. Future efforts will be expanded to include sustainable energy research in science and engineering, and its socioeconomic and environmental

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FY10: CRI —Starting (and continuing) point for SEES

▶ CRI: Climate Research Investment



- ▶ Emphasis on climate and environment, including human sciences
 - Water, Sustainability, and Climate (WSC)
 - Ocean Acidification (OA)
 - Dimensions of Biodiversity (DB)
 - Climate Change Education (CCEP)
 - Regional and Decadal Earth System Modeling (EaSM)

FY10 awards



SEES News Releases

- **News Release:** [NSF Awards Grants to Study Effects of Ocean Acidification \(NSF 10-186\)](#) (October 13, 2010)
- **News Release:** [NSF Awards Grants for Study of Water Sustainability and Climate \(NSF 10-182\)](#) (October 6, 2010)
- **News Release:** [NSF Awards Grants to Study Dimensions of Earth's Biodiversity \(NSF 10-179\)](#) (October 5, 2010)
- **News Release:** [Climate Change Education Partnership awards \(NSF 10-165\)](#) (September 10, 2010)
- **News Release:** [Improving Predictions of Climate Change and Its Impacts \(NSF 10-044\)](#) (March 22, 2010)
- **JOINT NSF, DOE, and USDA PRESS CONFERENCE:** [New interagency program to improve predictions of climate change and its impacts](#) (March 22, 2010)

SEES Related News Releases

- **News Release:** [NSF Awards Grants on Interactions Among the Environment, Economy and Society \(NSF 10-194\)](#) (October 19, 2010)
- **News Release:** [NSF Awards Grants for Research on Coupled Natural and Human Systems \(NSF 10-198\)](#) (October 21, 2010)



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CRI Statistics

WSC	OA	CCEP-1	BD	EaSM
Letters of Intent				
311	130	174	288	174
Number of Projects				
171	106	110	195	137
Funding Amounts in FY 2010				
\$16 M	\$12 M	\$12 M	\$26 M	\$0 M

Notes: FY10 competitions resulted in:

- 70 awards totaling \$66M (FY10) and \$19M (FY11)
- EaSM awards to be made in FY11, including DOE and USDA funds

Research Coordination Networks

- Supports groups of investigators to communicate and coordinate efforts
- across disciplinary, organizational, institutional and geographical boundaries about a common theme.
- NOT funding a research project
- Include diverse range of career states
- A research theme – question, phenomenon, organism, technology, technique, disciplinary boundary, ...
- Usually 5 years @ at least \$100k per year

