SUCCESS TIPS FOR WRITING GRANTS TO NSF: SOCIAL, BEHAVIORAL, ECONOMIC, GEOGRAPHIC, AND INTERDISCIPLINARY CROSS-DIRECTORATE PROGRAMS

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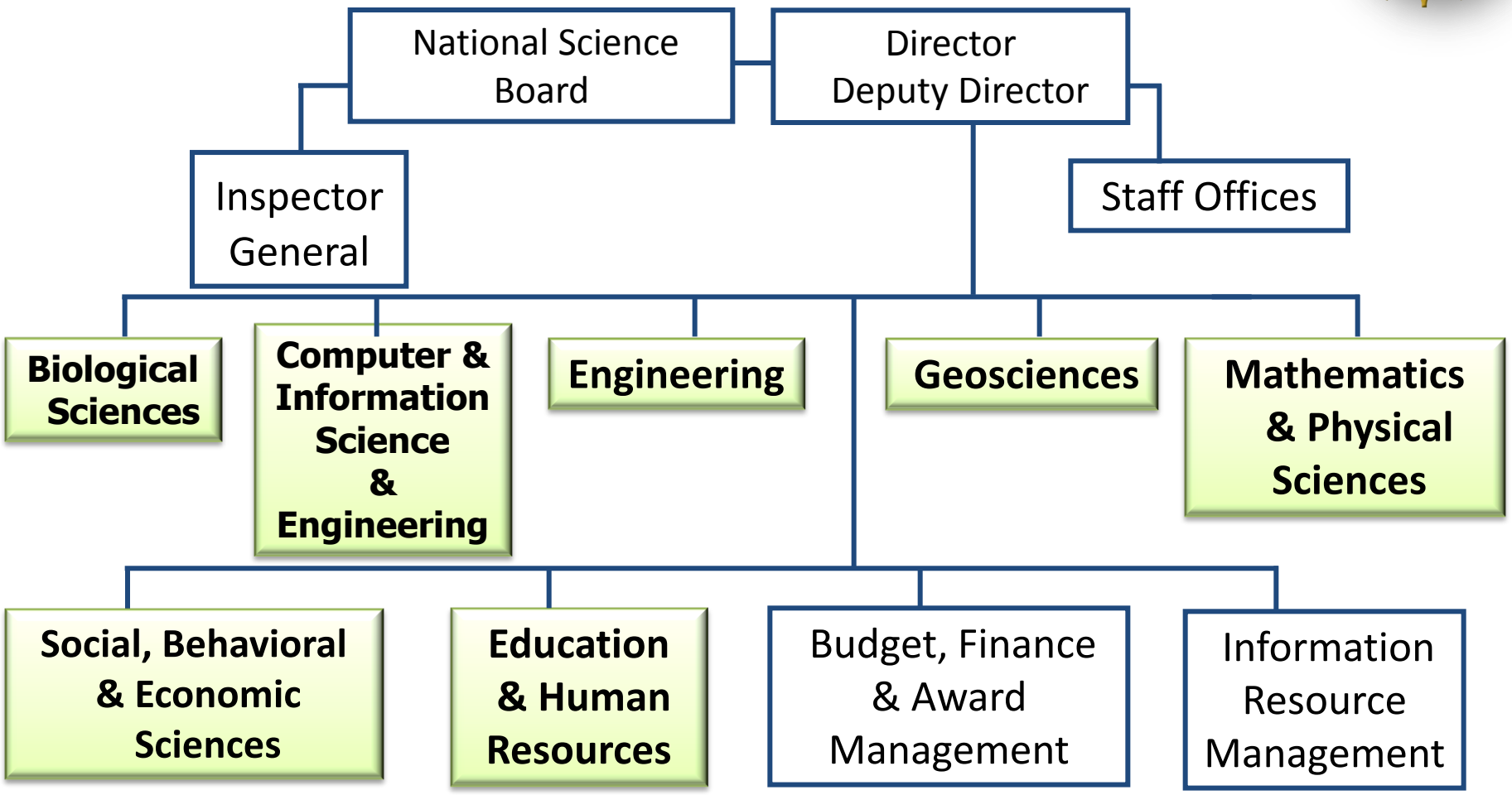
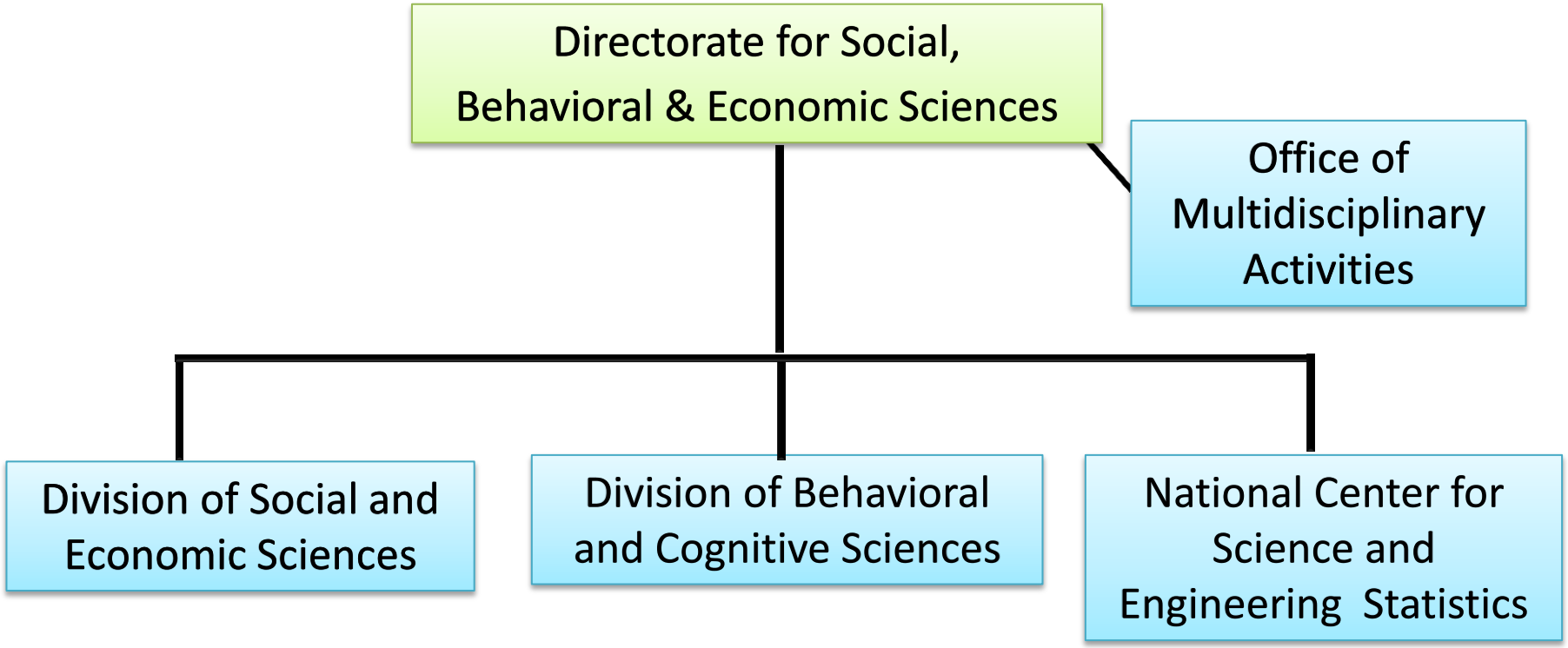
Geography and Spatial Sciences & SEES

December, 2011

National Science Foundation



National Science Foundation



Behavioral and Cognitive Sciences Division

…supports research to develop and advance scientific knowledge about humans spanning areas of inquiry including brain and behavior, language and culture, origins and evolution, and geography and the environment.

SBE Budget

Standing Program Senior Research

Division for Behavioral & Cognitive Sciences

FY12 Program Allocations (millions of dollars)

• Archaeology & Archaeometry	$7.5
• Biological Anthropology	$6.7
• Cultural Anthropology	$4.7
• Cognitive Neuroscience	$8.0
• Developmental & Learning Sciences	$7.9
• Geography & Spatial Sciences	$7.4
• Linguistics	$6.6
• Documenting Endangered Languages	$2.3
• Perception, Action, & Cognition	$8.7
• Social Psychology	$7.1

Social and Economic Sciences Division

…seeks to enhance our understanding of human, social and organizational behavior by building social science infrastructure, by developing social disciplinary and interdisciplinary research projects that advance knowledge in the social and economic sciences.

SBE Budget

Standing Program Senior Research

Division for Social & Economic Sciences

FY11 Program Allocations (millions of dollars)

• Decision, Risk, & Management Sciences	$9.0
• Economics	$24.1
• Science of Organizations	$3.5
• Law and Social Science	$6.0
• Methodology, Measurement & Statistics	$4.3
• Political Science	$9.2
• Science, Technology and Society	~$9.0
• Sociology	$9.6

SBE Budget

Standing Program Senior Research

Division Funding Rates (FY11)

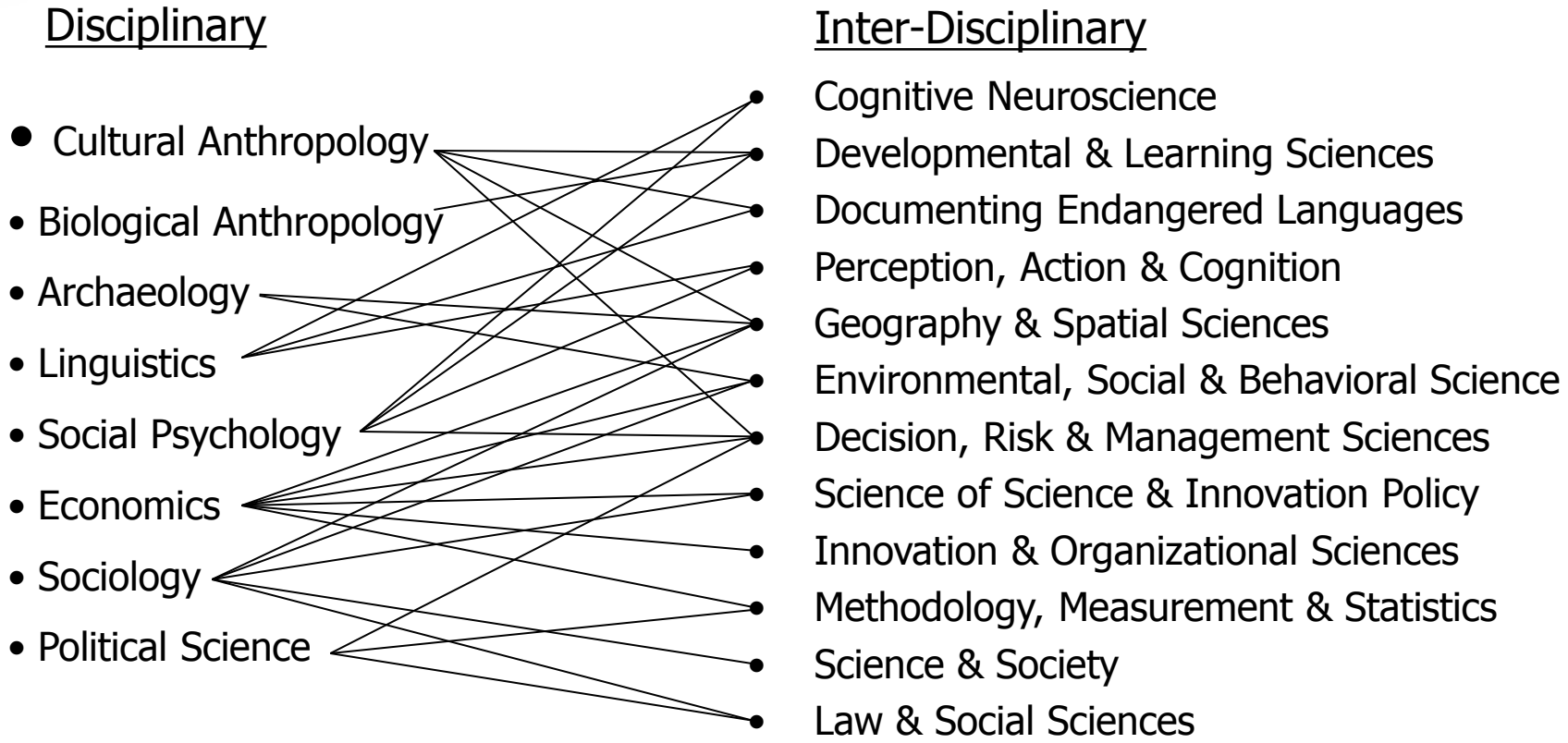
Behavioral & Cognitive Sciences

Competitive Proposal Actions	Competitive Awards	Funding Rate
2,649	470	18%

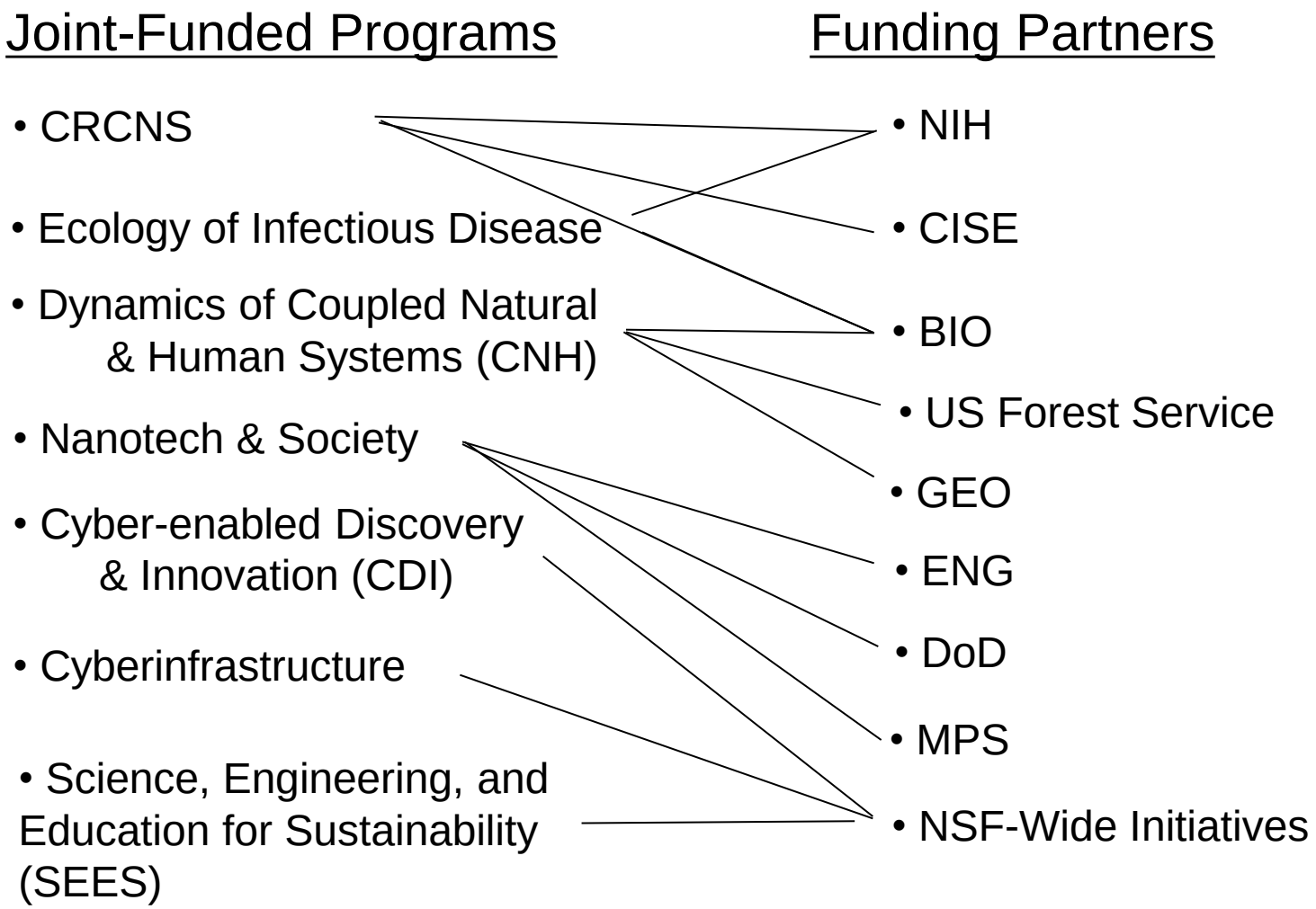
Social & Economic Sciences

Competitive Proposal Actions	Competitive Awards	Funding Rate
2,289	471	21%

Social, Behavioral & Economic Sciences Programs



Social, Behavioral & Economic Sciences Joint Funding



Interdisciplinary Research at NSF

- Growing list of interdisciplinary opportunities
- Most need social science involvement
- Social science can take the lead – not be tacked on at the end…

Science, Engineering and Education for Sustainability (SEES)

Ben van der Pluijm

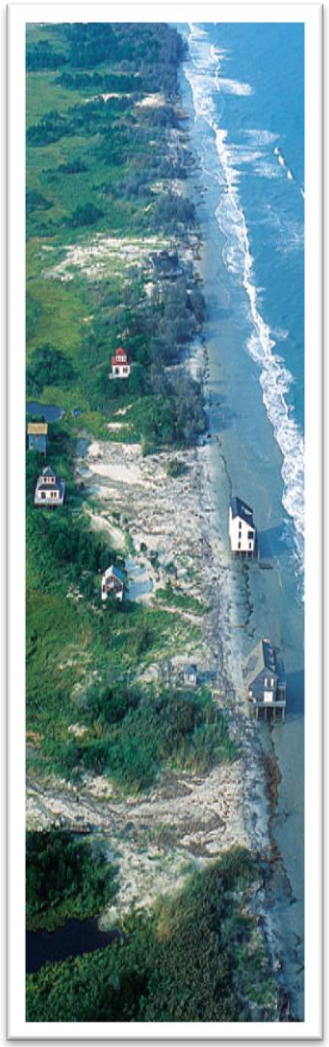
National Science Foundation

2012

Science, Engineering and Education for Sustainability (SEES)

NSF's Science, Engineering, and Education for Sustainability (SEES) portfolio addresses the ***sustainability grand challenge*** through support for interdisciplinary, use-inspired research and education.

- SEES established in Fiscal Year 2010;
  5-10y activity
- Cross-directorate NSF investment;
  FY11, $88M; FY12 $157M; FY13 $202M(?)
- Portfolio of existing and new programs
- Highlights NSF's unique role for the nation



SEES Mission and goals

Mission:

To advance science, engineering, and education to inform the societal actions needed for environmental and economic sustainability and sustainable human well-being.

Goals:

1. Building the **knowledge base**.
   Support interdisciplinary research and education that can facilitate the move towards global sustainability.
2. Growing the **workforce** of the future.
   Develop a workforce trained in the interdisciplinary scholarship needed to understand and address the complex issues of sustainability.
3. Forging critical **partnerships**.
   Build linkages among existing projects and partners and add new participants in the sustainability research enterprise.

SEES Portfolio Framework

Topical themes:

- Natural Environment
- Human Environment
- Built Environment

Functional characteristics

- Systems-Thinking
- Partnerships & Networks
- Workforce & Education

Target Audiences:

- Research and Educational Communities
- Stakeholder Networks, nationally and internationally
- Citizens, Business, and Policy-makers

Topical Themes

- ## Natural Environment

  Expanding our understanding of the natural and living environment, particularly coupled human and biophysical effects on **climate systems, hydrological systems, geological systems, and ecosystems**.

- ## Human Environment

  Focusing, across the full spectrum from individuals to societies, on **social, behavioral and economic aspects** of environmental sustainability. Such research also seeks to understand how scientific discovery and its development results in societal adaptation and resilience.

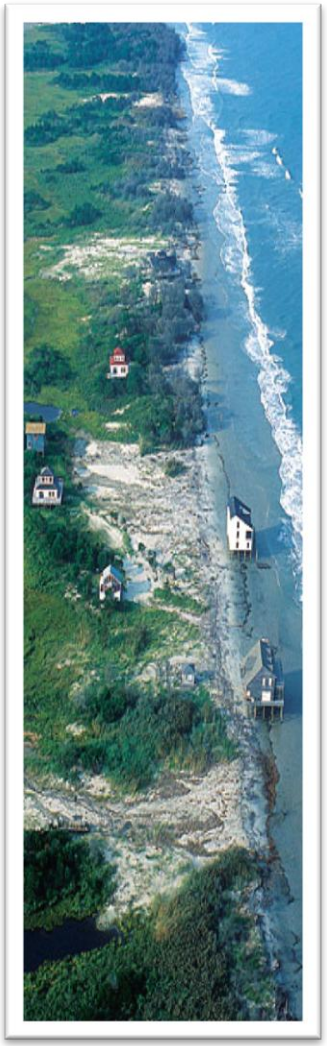
- ## Built Environment

  Examining the interaction between **technological and constructed systems**, such as urban areas, electric grid, cyberinfrastructure, transportation networks, energy resources, materials, and extreme events, in the context of environmental sustainability.

Yr 1&2 (FY10 & 11) Activities

- Ocean Acidification (NSF 12-500)
- Climate Change Education Partnership (NSF 12-523)
- Decadal and Regional Climate Prediction using Earth System Models (NSF 12-522)
- Dimensions of Biodiversity (NSF 12-528)
- Water Sustainability and Climate (NSF 11-551)

- Research Coordination Networks – SEES track (NSF 11-531)
- Dynamics of Coupled Natural and Human Systems – SEES track (NSF 10-612).



Yr3 (FY12) Activities

- SEES Fellows (NSF 11-575)
- Sustainability Research Networks (NSF 11-574)
- Sustainable Energy Pathways (NSF 11-590)
- SEES focus in Partnerships for International Research and Education (PIRE) solicitation (NSF 11-564)

- RCN – SEES track continues (NSF 11-531)
- CNH – SEES track continues (NSF 10-612)
- Climate-related (CRI) competitions continue

New and Future Focus Areas

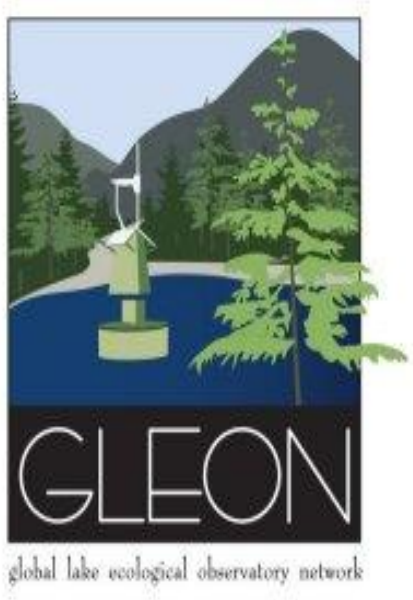
- Arctic Environment (“ArcticSEES”) ; NSF 12-553
  - Vulnerability, resilience, cultural impacts

- Sustainable Chemistry, Engineering and Materials (“SusChEM”)
  - Renewable, non-toxic materials, process improvements
- Coastal Vulnerability (“CoastalSEES”); NSF 12-594
  - Mitigation, adaptation, resilience

- Extreme Events (“HazardsSEES”)
  - Science, engineering, risk assessment, decision-making
- Information Science and Engineering (“CyberSEES”)
  - Energy consumption, grids, clean computing

Research Coordination Networks (RCN)

- 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, …



Research Coordination Networks

- **SEES-RCN track (NSF 11-531)**
- **To advance sustainability science, engineering, and education as an integrative systems approach**
- Interdisciplinary teams
- Encourage diverse stakeholder participation
- Up to 5 years at $150k per year
- Expect to make 10 to 11 awards (~$7M total)
- News release once all projects awarded
- ***Next deadline: February 4th, 2013***

Five RCN elements to bridge disciplines and foster collaboration

Face to face

Fostering personal contacts

Finding common ground and language

Defining shared interests

Focused questions

Establishing boundaries (geographic, conceptual)

Building bridges

Travel grants for extended inter-lab exchanges

Integrating activities at meetings

Creating focused task groups

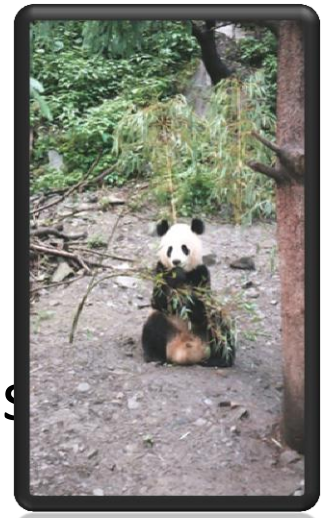
Build a network of collaborations

Establishing trust

Synthesis activities that accomplish more than any one person could have achieved.

Dynamics of Coupled Natural and Human Systems (CNH)

- Long-standing program involving three NSF Directorates: SBE, BIO, and GEO
- Address complex interactions among human and natural systems at diverse scales
- Dynamics of Coupled Natural and Human systems
- Quantitative, interdisciplinary analyses
- CNH (NSF 10-612) encourages SEES themes
- Enhanced funds for SEES-related projects



✧***Next deadline: 3rd Thursday in November 2012***

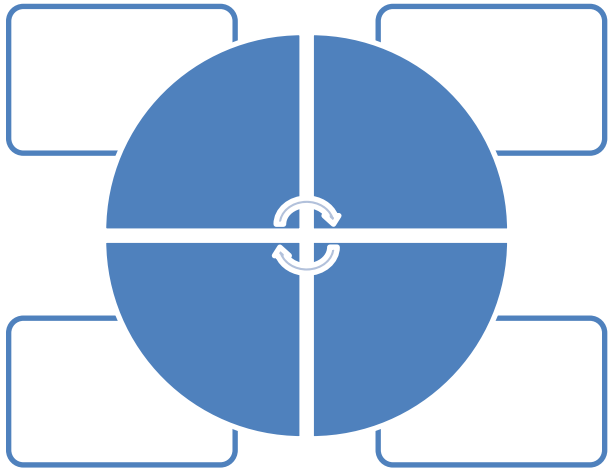
Example CNH awards

- Interactions between changing climate and technological innovations in agricultural decision-making: Implications for land-use and sustainability
- Integration of human choice into models of biogeochemical cycling in urban ecosystems
- Dynamic coupling of the water cycle and patterns of urban growth
- Dynamic interactions among people, livestock, and savanna ecosystems under climate change
- Direct and indirect coupling of fisheries through economic, regulatory, environmental and ecological linkages

Sustainability Research Networks (SRN)

NSF 11-574

- SRNs will connect **interdisciplinary teams** of investigators
- Each SRN will focus on an **ambitious SEES theme**
- Focus on performing cutting-edge research and education relating to the challenges of sustainability



- **Link** scientists, engineers, and educators, at existing institutions, centers, networks, **and** develop **new research nodes**
- Address the **social and cultural dimensions** of sustainability

SEES Fellows

NSF 11-575

- ✧ Goal is to help create the necessary workforce to address these challenges of environmental, energy and societal sustainability.
- ✧ Cross traditional disciplinary boundaries and address issues of sustainability through a systems approach, building bridges between academic inquiry, economic growth, and societal needs.
- ✧ The applicant must propose research that is in the broadly defined area of sustainability sciences, beyond the applicant's current area of core expertise.
- ✧ Potential NSF SEES Fellow must have received his or her doctorate within four years of the application deadline.

NSF SEES Fellows Awards

- 12-20 awards, totaling $6-8M.
- The host institution will receive an award to cover two to three years of fellowship costs over a maximum four-year period.
  - Stipend/salary plus benefits: $88,000 per year
  - Research expenses such as materials and supplies, publication costs, computer, travel: $20,000 per year
    - Includes trips to NSF for PI meetings in years 2 and 3
  - International research partnership: extra $10,000 per year to visit and work with partners
  - Indirect costs
  - **Deadline: 1st Monday in December, 2012**

SEES Takes the Long View

Sustainability requires ***long-term perspectives***, emphasizing:

- Integrated approaches across disciplines
- Developing systems-level models
- Realizing data-enabled science
- Partnerships and linking observational networks
- Exploring linkages between technological solutions and environmental effects
- Communicating research findings to decision-makers and the public

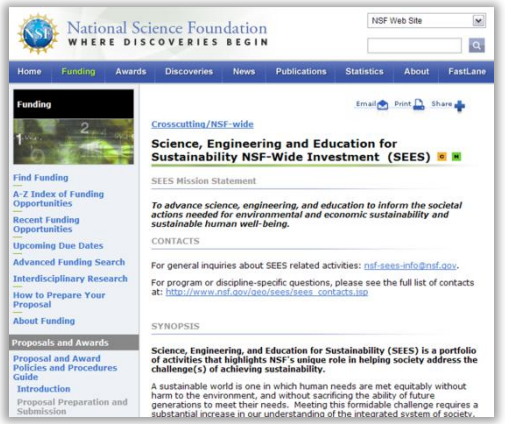
…. ***decadal NSF initiative***.

WHERE DISCOVERIES BEGIN

Questions about SEES?

Email: nsf-sees-info@nsf.gov

Visit: www.nsf.gov/sees



So…How do you build a fundable proposal?

A good proposal…

… has a good idea, well expressed, with a clear indication of methods for pursuing the idea, evaluating the findings, and making them known to all who need to know.

The Research Topic

- Why should we care?
- Is this a problem worth investing in?
- What is the current state of knowledge?
- How will your research build on and contribute to this body of knowledge?

NSF Supports Basic Research

- Basic scientific research is grounded in a broader theoretical framework
- It focuses on one or a few questions grounded in that broader framework
- It uses scientifically sound approaches to assess the viability of answers to those questions
- Its focused results also contribute to enhancement of broader theoretical knowledge

How to Develop a Proposal

- Understand the ground rules
  - Read announcements and instructions carefully.
  - Read the NSF Grant Proposal Guide.
  - Make sure your project really fits the program scope.
  - Look over prior award abstracts.
  - Talk with NSF program officer about specific questions.
- Coordinate with your sponsored programs office
- Ask successful PIs for copies of their winning proposals

Give yourself plenty of *time*

3 months before the deadline	Develop prospectus for proposal and run your idea past relevant agency program officers.
1 month before the deadline	Complete what you think is a very solid first draft of the entire proposal. Share it with colleagues and ask for honest, constructive advice.
2 weeks before the deadline	Use comments to revise the proposal one or two more times.
1 week before the deadline	Forward the proposal to your sponsored research office (SRO) so that they can complete their work and submit the proposal a day or two before the deadline
5 months after the deadline	You should by this time have heard from your program officer about the status of your proposal.

Sections of an NSF Proposal

- Cover sheet
- Project Summary (one page; specifically addresses intellectual merit & broader impacts)
- Table of Contents
- Project Description (15 pages max regular & CAREER proposals; 10-12 DDRI)
- References cited
- Biographical Sketch(es)
- Budget
- Budget Justification
- Current & Pending Support
- Facilities, Equipment, & Other Resources
- Data Management Plan
- Post-doc mentoring plan
- Special Information & Supplementary Documentation

Tell your story

- Focus on what you will do
  - Not too much on the background!
- Have a solid research plan
  - Connect RQs with methods and analysis
  - Loop needs to be closed
- Create a ‘Goldilocks Budget’
  - One that is just right
  - Seek help on how to structure your budget

Appropriate Expertise

- Address this explicitly in the proposal, especially if special competence in needed

- Bio-sketches can demonstrate competence –
  - Substantive
  - Cultural

- Interdisciplinary research
  - Demonstrate this through collaborators, consultants or subawards

What expenses should be listed in a budget?

All expenses necessary to complete the project.

- For every possible expenditure, ask yourself:
  - Is this expenditure necessary? -- or --
  - Would the research be diminished substantially if this expenditure is not made?

If you answer "Yes" to these questions…include the item in the budget.

If you answer "No," leave the item out.

Some General Tips

- Try to answer any reasonable questions that reviewers might ask about your plans
- Make sure your proposal is technically correct
- Convey enthusiasm in your writing – avoid hype
- Avoid jargon and cute/clever titles/subtitles
- **Comply completely with the guidelines**

When you prepare a proposal, think like those who will evaluate it

- External reviewers
  - Consist of specialists
- Advisory panel members
  - Consists of specialists and generalists; so relevant theory and technical details matter as well as broader significance.
- Program officers
  - We are the investors, seeking "bang for our bucks."

Decisions Will Be Based on Merit Review Criteria

Agencies usually ask reviewers to comment on specific criteria

Intellectual merit

&

Broader impacts

What is the intellectual merit of the proposed project?

- How important is the proposed activity to advancing knowledge and understanding within its own field and across different fields?
- How well qualified is the proposer (individual or team) to conduct the project?
- To what extent does the proposed activity suggest and explore creative, original and *potentially transformative* concepts?
- How well conceived and organized is the proposed activity?
- Is there sufficient access to resources?

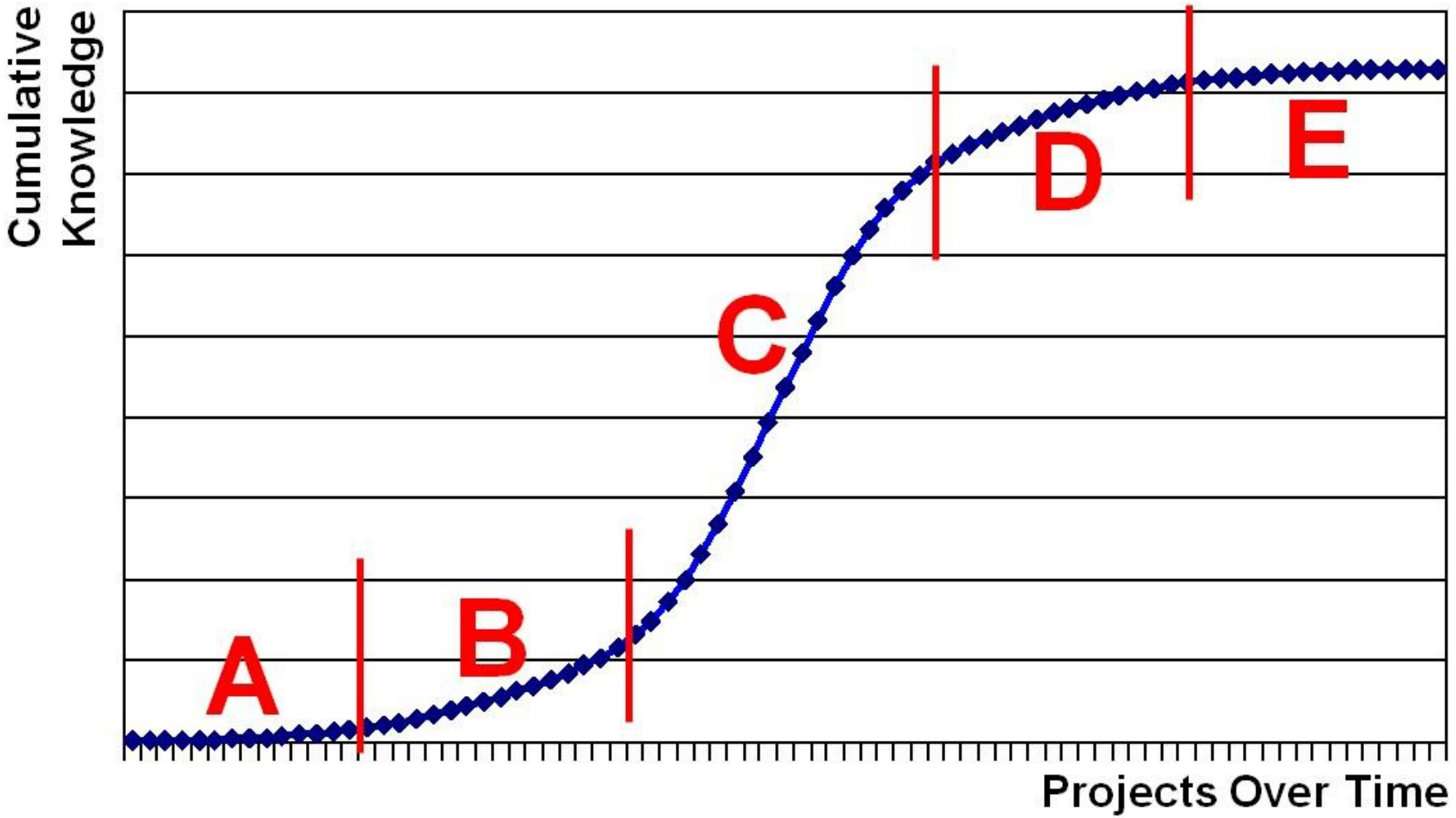
What are the broader impacts of the proposed project?

- How well does the activity advance discovery and understanding while promoting teaching, training, and learning?
- How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, geographic, etc.)?
- Will the results be disseminated broadly to enhance scientific and technological understanding?
- What may be the benefits of the proposed activity to society?

What is a Program Officer looking for?

- Significant new contributions to general scientific understandings.
- Enhancements of theoretical understandings in addition to any expansion of specific knowledge.
- Broader impacts, such as enhanced education, greater diversity, improved infrastructure or methods, and beneficial potential applications.
- Dissemination of results, especially in refereed, widely disseminated publications and more.

The Isserman Curve



Major reasons proposals are declined

- Proposals fail to establish a sound theoretical framework and/or are poorly related to relevant literature.
- Proposals fail to specify research methods in sufficient detail or have flawed research plans
- Plans for data analysis are insufficient
- Theoretical frameworks are sound and research plans are solid, but they do not match up with each other.

What if your proposal is declined?

- Do not call the relevant program officer in anger!
  - Go for a walk
- Evaluate the reviews.
  - If criticisms focus on correctable points, revise and resubmit the proposal.
  - If criticisms are more general, consider other funding sources or other lines of inquiry.
- If you have questions or want additional information, contact the person who handled your proposal.

What if your proposal is funded?

- Cheer!
- Work with the funding agency to ensure that the "Bang for the Buck" is maintained during any pre-award budget discussions.
- Check with the funding agency regarding any significant changes during the project.
- Conduct the research properly and disseminate the results promptly.
- Regularly report findings, products, and contributions (even after the funding has ended).

Contact Information

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Consult the NSF web site to identify program officers for other programs or competitions.