Overview

- What is SciSIP about?
- Investigator Initiated Research
  - Current Status
  - Next Steps
- Statistical Data Collection
“Neal, how much did you say we need to spend on nanotechnology?”
Scientists Can Provide a ‘Black Box’ Answer

ROMAN AUGURS: Roman augurs foretell the future by observing the behavior of hens © Copyright (c) Mary Evans Picture Library 2007
Or…
We Can Use Science

Innovation and Policy are Fundamentally Human and Social Activities
SciSIP Goals

Understanding

develop usable knowledge and theories

Measurement

improve and expand science metrics, datasets and analytical models and tools

Community of Practice

cultivate a community of practice focusing on SciSIP across the academy, the public sector and industry
Investigator Initiated Research

- Solicitations
- Workshops
Human capital development and the collaborative enterprise related to STI outcomes

- Transdisciplinary research teams
- Collaboration between academic and non-academic scientists
- Virtual social networks
- Domain and culturally based evaluation tools

Returns to international knowledge flows

- Benefits from international collaboration
- Contributions of foreign graduate students and postdocs to knowledge creation and diffusion
Creativity and innovation

- Cognitive models of scientific discovery and innovation
- Tools for innovative design based on core cognitive processes

Knowledge production systems

- Gap analysis of the Idea Innovation Network
- Complexity systems modeling of technological evolution
- Mapping tool of science for correlating funding with research outputs
- International database of inter-organizational collaborative agreements (OECD)
Science policy implications

- Theoretical framework for assessing science and technology policies and social welfare outcomes
- Evaluative tools for assessing the distributional consequences of policy initiatives (intellectual property rights; life sciences)
- State science and innovation policy initiatives evaluation tools
- Public-values-based model of science and innovation policies

Broader Impacts

- Simulation models of the knowledge creation and transfer system
- Organizational designs and social networks that incubate, enrich and accelerate innovation
- Tools for policymakers to optimize funding potential
- Database of international research and technology partnerships, with indicators
- Video database on tools and artifacts in innovative design
- Performance evaluations tools enabled by cyberinfrastructure
- Frontier methods of program evaluation
- Theoretical foundations of the innovation system and linkages to economic growth and social well-being
Focus

- Add new methods, models and tools specifically informing the data-collection process
- Add data development including new surveys, datasets, indicators, and benchmarks
- Collaboratories—virtual organizations

57 proposals received March 18

- Extremely high quality (and high cost) proposals

Panel to be held June 9-10

Decisions by end of July
Advancing the Scientific Study of Discovery - Innovation Partnerships
Joint with SBE/IOS, ENGR, CISE and MPS TBD

Describing the Elephant: Studying Innovation and Change in Organizations
Joint with Kauffman Foundation and SBE/IO TBD

A Deeper Look At The Visualization Of Scientific Discovery In The NSF Context
Joint with SBE/SRS, OCI, CISE, MPS Sept 11-12 2008
Data on Organizations

- Researcher Driven
  - Data infrastructure
  - Web 2.0 approach
  - Virtual Collaboratory
- New approaches to collecting data
  - Survey
  - Administrative
  - Webscraping
  - Etc…
- Confidentiality
- Collaboration with businesses
Visual Analytics
Analytics with Multiple Abstractions Over Time
Solicitation III

- Will be posted October 2008
- Deadline January 2009
- Awards May 2009
SciSIP Milestones

- Longer term:
  - An evidence-based understanding of the impacts of the S&E enterprise
  - A capacity to better nourish and harness the capabilities of the national STEM workforce
  - The development of a Community of Practice
The NSF Science & Engineering Enterprise
Statistical Data Collections

SciSIP funded Redesigns and New Surveys
Business Research & Development Survey (BRDS)

- BRDS redesign.
  - Financial measures of domestic and global R&D activity
  - R&D employment detail
  - R&D management, strategy, and technical focus
  - Intellectual property and technology transfer activities
Academic Research & Development Survey

- Survey redesign will.
  - Provide more detailed sources of funds including industry support by field
  - Reflect multi- and interdisciplinary R&D, new fields
  - Explore feasibility of obtaining data on R&D personnel
  - Examine potential means of tracking technology transfer activities
  - Improve international comparability (e.g., collection of non-S&E R&D data)
Other SRS R&D Surveys

- Two surveys of federal government funding of R&D

- New State Government R&D Survey.
  - Data collections for 2006 & 2007 & periodic in the future

- Research Facilities Survey in academic and biomedical facilities (with NIH)

- Nonprofit R&D Survey; early planning stage
  - 2 types of R&D data – performers & funded
  - Characteristics of nonprofits conducting R&D
  - Characteristics of R&D conducted
  - Exploration of intellectual property IP
  - Exploration of Innovation
Research & Development: Other Activities

• R&D Satellite Account—joint work with Bureau of Economic Analysis (BEA).

• R&D investment accounted for about 4 ½% of real GDP growth from 1959-1995 and for 6 ½% from 1995-2002

• Linking NSF’s Business R&D data with BEA data on foreign direct investment

• U.S. firms’ international R&D activities

• Foreign firms’ R&D activity in U.S. by state and industry
Innovation: U.S. Surveys

- Innovation is not the same as R&D
- SRS surveys collect no innovation-specific data
- Planning to obtain data on innovation activities of firms with fewer than 5 employees
- Exploring addition of periodic innovation modules to redesigned Business R&D Survey
Human Resources

- Addition of field of bachelor’s degree to American Community Survey (ACS) which is part of the U.S. Census

- Will provide timely annual estimates of S&E workforce and immigrant scientists & engineers (now dependent on decennial Census data for best estimates)
Human Resources

- SRS Postdoc Data Project to increase quality and quantity of information on postdocs/early career scientists & engineers

- Ongoing work with OECD, UNESCO, and the EU to improve quality and international comparability of data on education, workforce, and mobility – continual incremental improvements

- Exploration of data and ongoing work on S&E jobs outsourcing, off-shoring

- Collecting information on recipients of S&E doctorates from U.S. institutions residing outside the U.S.
Interdisciplinary, Multidisciplinary, and Emerging Fields

- Activities include:
  - Updating taxonomy for fields of science (e.g., exploring bibliometric methods) for education, research, and jobs
  - Identifying emerging fields through survey responses to open-ended questions
  - Collecting information about interdisciplinary/collaborative nature of S&E jobs.
Cyberinfrastructure

- Lack of uniform definitions and agreed-upon measures; multiple definitions as technologies evolve

- SRS continues to track pertinent developments

- Academic Research Facilities Survey as primary vehicle
  - Currently collects data on:
    - Computing and networking
    - Infrastructure
    - Measures of cyberinfrastructure activities (constrained by the data available to survey respondents)
  - Beginning to pick up information relevant to Cyber databases such as computing storage & bricks & mortar necessary to support the cyberinfrastructure
  - Sharing of computing resources
Thank you!

Comments and questions invited.

For more information please contact:

Julia Lane

jlane@nsf.gov