National Science Foundation
Advisory Committee for Social, Behavioral and Economic Sciences (SBE AC)
June 5-6, 2008

Hilton Arlington Hotel
950 N. Stafford Street
Arlington, VA

Meeting Summary

<u>**Members Present:**</u>
Dr. Christine Bachrach (Ex Officio), Demographic & Behavioral Science (DBS) Branch, National Institutes of Health, Bethesda MD
Dr. Cecelia Conrad, Department of Economics, Pomona College, Claremont, CA
Dr. Susan Cutter (AC-ERE Liaison), Department of Geography, University of South Carolina, Columbia, SC
Dr. Fred Gault, Science Innovation and Electronic Information Division, Tunney's Pasute, Ottawa, Ontario
Dr. Lila Gleitman, Institute for Research in Cognitive Science, University of Pennsylvania, Philadelphia, PA
Dr. Michael Goodchild, Chair, Department of Geography, University of California, Santa Barbara, CA
Dr. Nina Jablonski, Department of Anthropology, Penn State, University Park, PA
Dr. John King, (AC-CI Liaison) University of Michigan, Ann Arbor, MI
Dr. Jeffrey Mackie-Mason , (CISE Liaison) School of Information, University of Michigan, Ann Arbor, MI
Dr. David Poeppel, Department of Linguistics and Biology, University of Maryland, College Park, MD

<u>**Virtual Members:**</u>
Dr. Samuel L. Meers, Jr. (CEOSE Liaison), Hubert H. Humphrey Institutes of Public Affairs, University of Minnesota, Minneapolis, MN

<u>**Members Absent:**</u>
Dr. Ira Harkavy, Center for Community Partnerships, University of Pennsylvania, Philadelphia, PA
Dr. Janet Harkness, Survey research and methodology Program, University of Nebraska-Lincoln, Lincoln, NE
Professor Guillermina Jasso, Department of Sociology, New York University, New York, NY
Dr. Ruth Delois Peterson, Department of Sociology, Ohio State University, Columbus, OH
Dr. Paula E. Stephan, Andrew Young School of Policy Studies, Georgia State University, Atlanta, GA
Sir Roderick Floud (Ex Officio), London Metropolitan University, London, England

<u>**SBE Senior Staff Present:**</u>
Dr. David Lightfoot, Assistant Director, SBE
Dr. Judith Sunley, Deputy Assistant Director, SBE
Dr. Mark Weiss, Division Director, Behavioral and Cognitive Sciences (BCS)
Dr. Edward Hackett, Division Director, Social and Economic Sciences (SES)
Dr. Lynda Carlson, Division Director, Science Resources Statistics (SRS)
Ms. Lisa Jones, Acting Budget Officer, SBE

The spring meeting of the Advisory Committee for the Social Behavioral and Economic Sciences (SBE AC) was held June 5-6, 2008, at the Hilton Arlington Hotel in Arlington, VA.

SBE Advisory Committee Meeting: June 5th, 2008

The June 2008 meeting of the Social, Behavioral and Economics Directorate Advisory Council was called into session by Dr. Michael Goodchild, who welcomed the committee and began table introductions.

Review of Minutes and Directorate Update

Dr. David Lightfoot gave an update on activities within SBE and introduced staff members new to SBE since the last AC meeting. Dr. Lightfoot discussed minutes from the last meeting; raised a motion to adopt those minutes; and the minutes were accepted by the AC. Dr. Lightfoot discussed news from the Directorate, beginning with the budget. He noted that FY2007 was a good year for the Foundation and SBE in particular, as it reflected the American Competitiveness Initiative (ACI). The FY 2008 budget was written with a substantial increase based on the ACI's intention to double the budget but it was stalled in Congress. The AOAM (Agency Operations and Award Management) line of the budget (formerly S&E (Salary & Expenditure)) was increased in the FY08 budget by a substantial 14%. The budget for FY09 has substantial increases but the expectation is that the government will be on a Continuing Resolution. There will be an AD retreat coming up soon and the goal is to be prepared for the administration transition.

The Director has had a series of Director's Reviews (DR) for the various directorates. The SBE DR was done successfully in February. An abbreviated form of this presentation was also done successfully for the NSB.

Dr. Lightfoot discussed other important SBE activities:
- The HSD COV has occurred and we are thinking about "life after HSD".
- This has been a big year for the Science of Learning Centers which began in 2004. The first cohort of centers is now up for a 5 year renewal. The NSB August meeting will cover the second cohort and they are ramping up to full funding. This will help shape the future of the Science of Learning programs.
- We have had a lot of activity in the cyber infrastructure domain. The beginning of CDI (Cyber-enabled Discovery Innovation) has shown a particularly strong SBE response. Panels are currently in progress.
- The Directorate has been in talks with the Department of Defense about possible funding opportunities for the SBE sciences.
- We have been continuing discussion within the agency on transformative research and this has been added as an extra bullet to the Intellectual Merit review criterion. It is not a requirement but it is a dimension on which we want comments from reviewers and panelists.
- The FacTIR working group reports that SGER grants have been divided into two kinds of smaller awards that can be made without external review: Rapid (time-sensitive rewards, $200K) and Eager (for exploratory, $300K).
- Lastly, many SBE staff members have been involved in writing a *Prospectus for Grand Challenges for the SBE Sciences*. It was submitted to OSTP for clearance a year ago, but has been stymied and we are considering other avenues for publication.

Budget Process and Status

Presentation

Marty Rubenstein, Director of the NSF Budget Office gave a presentation entitled "FY2010 Budget Planning: A Transition Year".

Ms. Rubenstein highlighted that NSF, being a small independent agency, has a lot of flexibility. There are only two political appointees, who tend to remain on staff even during times of transition. That is key for the organization to continue and move on. Another advantage is that the NSF enjoys bipartisan support. However, the downside is that the NSF is not always a priority for a transition team. Since we do not know what is going to happen in regard to the next administration, we are going to position ourselves to be ready for what ever happens. We are going to push to have the baseline changed at a higher level. It could set a bookmark for the new administration. In the fall we will be talking with OMB but we are also going to use

the FY10 budget to work on our transition process, explain why we are important and where we fit into the government. Although we will not officially submit a budget to OMB until after the new president is inaugurated, we will remain in regular contact with OMB. We are likely to be operating under a Continuing Resolution for a while.

Discussion

- Can the foundation be more proactive, like approaching candidates? (Dr. Poeppel)
  - It is illegal for federal employees to do that as it borders on lobbying and invokes the Hatch Act. We have to wait until we are officially contacted. We constantly go through OMB. The community is free to do whatever the community so desires, however.
- Can you give the community some hints? (Dr. Poeppel)
  - We talk with people at AAAS and other groups. There are also university associations. If the candidates form OSTP working groups, we can talk to them.

Human and Social Dynamics: Committee of Visitors' (COV) Report

Presentation

Dr. Cecilia Conrad was chair of the HSD COV and presented the report to the AC. Dr. Ruth Peterson and Dr. David Poeppel were also AC members on the COV. Dr. Conrad noted how the HSD COV differed from usual COVs since, in this case, HSD is a special funding initiative as opposed to an ongoing program. This made the task more about looking at lessons learned rather than the examination of the mechanics of the program. The conclusion was "cautious optimism" regarding big ideas. There was some enthusiasm for the work in the area of disasters, such as the SGERs for the tsunami, etc. The COV identified three kinds of things where HSD made an impact. The first is the need for integrated frameworks to combine methodologies from different disciplines. The second involved dynamic systems. The COV also acknowledged that HSD brought out the unexpected combination of disciplines that might not have come forth without this specific program and the importance of fostering this cooperation: for example, engineers and anthropologists; and economists with learning scientists. Lastly, the HSD program highlighted the need for adaptive infrastructure, such as data sets, etc., that is able to adapt and change as the needs of the communities change and as disciplines intermingle. Some of the important lessons to be learned, or that were possible because of the HSD grants, were how to incorporate diverse Human Resources to make these programs work. There was a requirement within the HSD solicitation for a management plan. Proposals that had this aspect well developed made outcomes more apparent.

Dr. Lightfoot echoed that this was a special kind of COV. It was problematic due to the lack of history to make the judgments COVs typically make. One of the tasks of this team was to look toward the future, post-HSD, and consider the skillful absorption of funds into the SBE budget. The establishment of the inter-directorate Coupled and Natural Human Systems Program (CNH) is partially a response to the environmental theme of HSD. We will be cultivating more work on this in part through CNH and in part through CDI and complex systems, but we also need to think if we need mechanisms within SBE to deal with environmental work. There is also the matter of infrastructure. The decision of the reallocation of HSD funds will need to happen over the next few months.

Discussion

- The COV suggested a two-prong approach for enhancing interdisciplinary work: enable core programs to do that and at a slightly larger scale, and with some form of centrally-managed activity. (Dr. Conrad) However, there is no recommendation for a new "area" of science. (Dr. Lightfoot)
- The COV were uniformly positive about interdisciplinary research even if a bit critical. The prospects for the remaining work are quite exciting and there are laudable commitments by the POs to support interdisciplinary research. However, the mechanisms/methods of doing so are still undecided and lack consensus. (Dr. Poeppel)

- o Hopefully, the FacTIR program will bring this out, since it is a tricky issue. (Dr. Lightfoot)
- In the way of process, what did the COV find with HSD? (Dr. Goodchild)
  - o Most proposals were reviewed by an interdisciplinary panel, but occasionally external reviews were solicited when panel expertise was insufficient. The COV were impressed with the process and tried to identify a few lessons that might have emerged from the process itself. (Dr. Conrad)
  - o Dr. Teutonico provided some additional clarity that the success rate had increased from about 5% in the beginning to 20% by the end of the program.
- A risk of interdisciplinary teams is that they will not gel. Have you learned anything that can predict such problems? (Dr. Bachrach)
  - o Where the proposal outline included a comprehensive, detailed management plan with labor distribution and how the team members would teach each other, there seemed to be more potential for exciting outcomes. (Conrad)
- In those management plans did you find differences in interdisciplinary teams that represented a single institution versus interdisciplinary teams from different institutions? (Dr. Cutter)
  - o There was no sense of that. The COV did not look at that level of detail, although it did make a difference the more thoughtful the approach in the management plan. The proposals that stood out as potentially transformative – and were indeed successful – were methods driven, often computational methods. There were unusual constellations, but the methodological innovation and integration was what made them work together. (Drs. Conrad & Poeppel)
- Dr. Lightfoot asked if there were some interdisciplinary pot of funds, would it make sense to require a management plan. The response was positive.
- What is the percentage of funding that is allocated within SBE to foster this interdisciplinary research? One of the risks of interdisciplinary work is that there is the potential to result in weaker disciplinary work. Maybe the notion of interdisciplinarity gets to be an aim in itself. How do you decide how much funding you are going to be committing to work that is *required* to be interdisciplinary? (Dr. Gleitman)
  - o This is something the COV struggled with in discussion. The HSD program was an opportunity to get new funds to SBE. The struggle was that the COV wanted the bulk of the funds to go back to the core programs, some of which are interdisciplinary themselves already. The possibilities exist where interdisciplinary research would not be supported absent specific direction. (Dr. Conrad)
  - o The percentage of money would depend upon the definition of "interdisciplinary". SBE has some straight discipline programs but there are also several that are interdisciplinary. What is at stake here is less mature interdisciplinary work. Some groups are already integrating well enough to the point that you have panels of interdisciplinary people, such as PAC and DRMS. (Dr. Lightfoot)
  - o Dr. Hackett gave the example that core programs, such as Economics, fund projects that could look like interdisciplinary work, and warns that some of the easy to count measures could mislead us.
- Dr. Poeppel addressed another problem that the COV noticed, that of experienced grant writers viewing HSD a merely an opportunity for funding, i.e. a pot of money, and attempted to give the appearance of interdisciplinary research. Dr. Poeppel notes that was more reflective of proposals in general, not necessarily awards.
- Dr. King reflected on his experience with CISE and the ITR program. He noted that the interdisciplinary discussion has been absent in CISE because they have not decided if they are a discipline themselves. ITR was very destabilizing for the CISE Directorate and there was a big opportunity for CISE to learn about itself. There is an opportunity for reflective practice here, to think about how we can think differently. Normally COVs are very narrow and so this is an interesting opportunity. It can help inform how the directorate does its work.
  - o Dr. Sunley added to this by describing a problem after the ITR competition. There remained a large community of people who had nowhere to go to continue the work they were doing with that program. It was a difficult transition period coming out of ITR

trying to embed things into the core programs. There were no reflective discussions of the type suggested by Dr. King. These are important questions to be asking. CNH is a very interesting approach that several Directorates took on. This is the kind of thing we are trying to do within SBE.
- o Dr. King talked about the approach taken by CISE.
- The HSD has the three working areas. Did they cross paths or were they essentially three different stove pipes? (Dr. Goodchild)
  - o The divisions were not all necessarily clean divisions into these sub-categories. There were outlines of what characterized all three areas, but the discussions of the nature of the projects were all quite similar. (Dr. Conrad)
  - o PIs had to submit to one particular area. Those areas were then grouped into topic panels. There was a lot of grayness between all of the topics. (Dr. Teutonico)
- Dr. Lightfoot notes this may be a topic worth discussion with the Director.
- Dr. Goodchild called for the acceptance of the HSD COV report. All agreed.

ACCI Discussion

Presentation

Dr. John King presented some developments from the Office of Cyber Infrastructure (OCI). There is a new office and the AC operates as an NSF-wide AC. Dan Atkins, Director of OCI, brought a wide view to addressing cyberinfrastructure, including virtual organizations, etc. Because roots of OCI are in high performance computing with a well-organized lobby for big iron and the budget is not growing as anticipated, things OCI wants to do beyond big iron are very constrained. OCI recently had its first COV (of which Dr. King was chair). One of the agenda items reported from the COV is to watch out for the power of incumbency and how it affects ongoing projects people want to continue. Since SBE interests in OCI are tied to things beyond big iron, this is something to keep in mind. The cyberinfrastructure initiative is rather important to the SBE sciences.

Discussion

- How can we help? (Dr. Goodchild)
  - o The first thing is to talk to your colleagues. There is a growing cadre of people who work in SBE related fields that are aware of what is going on in these fields with regard to technology. During this period of constraint, vigilance is necessary to avoid broad funding for a very narrowly construed program. (Dr. King)
  - o A lot of the problems being addressed are not fundamentally technical but social in nature, e.g. ATLAS and CERN. The social organization of production has been the hardest to crack here and the tech people do not know where to go to find answers (i.e. the 9th floor). I think SBE needs to become more assertive on this. We need to talk more about this and put more focus on this. (Dr. King)
  - o This is precisely what we meant by the "human resources" theme in HSD. (Dr. Conrad)
  - o SBE has used co-funding in OCI competitions to aid SBE sciences' involvement. It represents work that would not have been funded in one of our own programs. It's a fragile situation which can change subject to these constant pressures. Drs. Frank Scioli and Terry Langendoen have been detailed to OCI from our directorate. (Dr. Lightfoot)

Linkages to DoD

Dr. Mark Weiss discussed collaborations being contemplated between SBE and DoD, with the awareness that the DoD is hardly a single entity. There have been a number of interactions with various parts of DoD recently.

History: The DoD recently asked the NRC to do some work on the human elements of the military due to the realization that many of the problems they are facing, while having technological aspects, have a very large human component to them as well. This led to Congress' expression of interest in SBE's activities

and how we might foster collaborative work with the military. DoD has started to realize that there is significance in the SBE sciences, and the agency is aware of what the payoffs of the social sciences might be. As in any large organization, there is a large group of people that need to be able to function together and much of the research funded in SBE is applicable to what they need. The current Secretary of Defense, Robert Gates, brings with him an appreciation of the SBE sciences to the DoD. From our side, the NSF gold standard review process is receiving recognition, as are our exceptional links to the academic community.

SBE Involvement: This is not the first time NSF and DoD have worked together. Dr. Lightfoot is a co-chair of the NSTC subcommittee, which also includes some DoD representatives. NSF also has representation on the Human Factors for Homeland and National Security. There have also been SBE-DoD workshops (Interagency Crosspollination Workshop; Human, Social and Cultural Behavior Modeling Workshop) and a joint NSF-DoD Solicitation (Explosives and Related Threats (EXR)). The EXR solicitation was supposed to be highly technical but, thanks to work by Amber Story, this has incorporated an SBE element successfully. SBE has representation on the "Socio-Cultural & Behavioral Science Research" group. Also, Dr. Mark Weiss has given testimony before Congress on "The Role of Social and Behavioral Sciences in National Security."

Collaborations on the horizon: We have prepared an MOU with the DoD policy office (currently under review) through which we can work together. Joint funding of PI-initiated proposals is another area we could move to. DoD has expressed interest in providing some funding to a number of SBE proposals. Plans include a joint NSF-DoD solicitation. Secretary Gates noted in a speech that the DoD needs to engage with the social sciences. We are certainly amenable to that proposition.

Discussion

- Many social scientists are skeptical about associations with DoD. What kind of feedback have you gotten from PIs? (Dr. Jablonski)
  - o The response has been mixed. Older scholars seem to be more negative. However, so far, most of the discussion has been internal to NSF and DoD. By and large, the response has ranged from guarded to positive. (Dr. Weiss)
- What response have you gotten from the DoD concerning how data might be used and how transparent will it be? (Dr. Jablonski)
  - o That was a high priority in initial discussions. Transparency is to be 100%, non-classified, broadly available and disseminated with no constraints and all will use our merit review process. (Dr. Weiss)
  - o Dr. Scioli notes that we have been assured that discussions with potential awardees will provide opportunities to decline the DoD co-funding.
  - o Dr. Weiss adds that we cannot and will not give someone unbeknownst to them funding from another source. We want them to have full knowledge of where the money comes from and there would be no penalty for them if they declined such funds.
  - o DoD is a very large agency and our communities are rarely given the opportunity to think of research proposals that are of a grand scale. One of the opportunities we see in SBE and hopefully across the NSF is that this substantially enhances the opportunities for our communities to get resources. The discussions have been extremely cordial with DoD and we have impressed upon them that we have very high standards of merit review. (Dr. Scioli)
  - o Dr. Lightfoot adds that we are discussing two things: immediate money and a possible future combined solicitation.
- Why would anyone take any money from DoD? What would happen if everyone declined the opportunity? (Dr. Gleitman)
  - o The consequence for the community at large is that there would be more money. As for reasons why PIs might accept this funding: they would be "good citizens" by freeing up money in NSF's limited budget for others but also, for a number of people, it provides a foot in the door for the large DoD grant opportunities.

- What is the scale of interaction? Would the projects be mostly applied science or basic research? (Dr. Poeppel)
    o The scale is under discussion, but it is at a scale that makes it worth our time to invest in the effort. Secretary Gates is specifically interested in basic research and we do not anticipate an applied, directed competition. The areas DoD are interested in are also those that SBE scientists are interested in. (Dr. Weiss)
- Is there a connection with DARPA? (Dr. Mackie-Mason)
    o There is no involvement with DARPA. We are in talks with the Secretary's policy office. (Dr. Weiss)
- Is there an elephant in the room? Should the AC engage it if there is? The relationship of the SBE community to security and defense is important and as a public policy question it is important. If DoD is turning to SBE asking for help, that's an important issue. It's something we ought to engage.
    o Using SBE sciences as a whole, it is not an issue but it seems to be specific subdisciplines. Gates mentioned specifically anthropology, sociology and social psychology. (Dr. Goodchild)
    o Gates used those as examples, discussions have been broader. (Dr. Weiss)
    o There has been a lot of discussion of this topic among anthropologists. The feeling is that it is a potentially tremendous pot of funding, as long as transparency is assured. (Dr. Jablonski)
    o Much of the discussion in the anthropology community has focused on Human Terrain teams embedded with active units and the ethics of that. Our talks with DoD have nothing to do with this whatsoever. (Dr. Weiss)
    o The ASA (American Sociological Association) is looking at this issue and paying attention to it, particularly Minerva. (Herring, from the ASA)
    o Secretary Gates' presentation to the AAU was extremely informative and enlightening from the viewpoint of a citizen. As a social scientist it was interesting that he, a former university president, is approaching us about this and asking for our help. Senior program officers will protect the integrity of SBE processes.
- In regard to how the peer review panels would be operated, the NSF POs and staff are those who will put the panels together.

Questions from the NSB

Dr. Michael Goodchild introduced this discussion and focused on two requests from the NSB. The NSB would like a response on the question of institutional quotas on submissions and on the background of proposal submissions. To date, there are no comments yet from the committee members for the first request, and the committee already provided feedback for the latter agenda item.

Dr. Goodchild gave an update on mandatory cost-sharing. While mandatory cost sharing was common practice in NSF until 2004, NSF has since banned it in solicitations.

Discussion

- Has NSF looked at the impact of eliminating the cost-sharing requirements? (Dr. Conrad)
    o The WG is investigating this issue; however, it is difficult to assess. Dr. Sunley commented that the SLCs do not have a cost-sharing requirement, and they have noticed that some now have 25% less funds.
- Was it made widely known? (Dr. Jablonski)
    o This was widely discussed when it was originally implemented. It is no longer an eligibility criterion; and thus the requests are much vaguer. Now most of the programs that require cost-sharing ask for it specifically in the solicitations. There still is the mandatory assumption of 1% cost-sharing.
- Why did they eliminate the cost-share requirement? (Dr. Mackie-Mason)

  o There were a number of factors that went into this decision. NSF felt that mandatory cost-sharing disenfranchised certain groups from competitions. At the same time, institutions were having severe difficulties documenting cost-sharing. There is variation among the degree of institutional commitment, and a limitation to the institutional capacity. There was concern that some institutions were buying their way into awards. Panels were then using this as a selection criteria rather than as an eligibility requirement. While cost-sharing ensures intuitional commitment, it is restrictive for certain smaller institutions. It was notable that NIH forbids mandatory cost-sharing.

In programs that tend to establish long term partnerships, collaborations, or infrastructural setup, cost-sharing may be demanded.

In sum, voluntary cost-sharing may be necessary for certain competitive programs; however, it is important to note that this may not be reviewed fairly among all the programs. Also, it is difficult to track and report the effects of cost-sharing. Finally, it is notable that NIH bans cost-sharing. Dr. Goodchild will draft a response including these concerns and circulate.

NSF Initiatives for FY 2009:
Adaptive Systems Technology

Presentation

Dr. David Lightfoot gave an update on Adaptive Systems Technology (AST). AST focuses on research in the field of neuroscience. While this was prominently funded in the 1980s, over the past 18 months, they have been working on an NSF program to support neuroscience research. The initiative would facilitate research that would develop new methods for brain scanning, and enable chemists to collaborate with cognitive scientists. While the AST program is in FY09 budget, it is not likely to be supported, so it will be built into the FY10 budget. The AST program has requested $15 million. If they are granted the funds, should they subsidize the money with other continuing programs, or should they run their own agency-wide solicitation?

Discussion

- Is there collaboration with the DOD, given that they do quite a bit of research on these issues? (Dr. Jablonski)
  - o Currently there are no collaborations; however that is a possibility.

Cyber-enabled Discovery and Innovation

Presentation

Dr. Cheryl Eavey provided an update on the Cyber-Enabled Discovery and Innovation (CDI) program. Both Drs. Cheryl Eavey and Terry Langendoen are the SBE representatives for the CDI initiative. It was noted that Dr. Langendoen could not attend, because the CDI Type II full proposal panel was occurring simultaneously.

The five-year CDI solicitation promotes innovations and advancements in computational thinking (methods model, algorithms, and tools). Specifically, the program is looking for transformative research that would transform multiple fields, but should be potentially transformative in at least one discipline. There are three themes in CDI: from data to knowledge; understanding complexity; building virtual organizations. PIs could submit proposals as Type I or Type II proposal depending on the scale of the project.

There were 1800 letters of intent, 1300 pre-proposals, and 204 full proposals. The full proposal panels finished June 6th and the CDI WG plans to make their recommendations by the end of the summer. There is about $26 million dedicated this year for awards, which will likely stay constant for FY09. The WG may

include a Type III in the future solicitations; however, that will likely be in 2010. The CDI WG plans to rewrite the virtual organizations section for future competitions.

While this is a foundation-wide solicitation, each directorate is investing in these themes internal to the directorates. For example, in SBE there was a dear colleague letter for complexity, and it was noted that some proposals were awarded this year under those terms.

Discussion

- How has the Virtual Organization (VO) component been integrated into the solicitation given that OCI is also running a VO competition? (Dr. Lightfoot)
  - The CDI solicitation was more concerned on building VOs. VOs will be more embedded in the 09 solicitation rather than as a core element. This work should be computationally innovative in order better integrate the themes of CDI.
- Dr. Lightfoot noted that the CDI initiative and AST program both look at complex systems. Has there been discussion to pull together all of this knowledge together as an integrative activity? (Dr. Gault)
  - Typically NSF hosts PI meetings to foster these types of discussions.
- What is an example of a proposal that transforms two disciplines? (Dr. Poeppel)
  - While this is a requirement for the competition, for only a few proposals were the reviewers and WG able to assess the transformative nature prior to the research. A possible example of a transformative proposal may be where the PI implements an e-Bay framework for trading knowledge within various academic fields.
- How has SBE research responded to the CDI initiative? (Dr. Goodchild)
  - The response has been significant. There were four CDI/SBE pre-proposal panels and two full proposal panels that reviewed SBE related proposals. Due to the nature of the competition, the CDI/SBE WG members found that it was very hard to have truly integrative research across disciplines that was both paradigm shifting and transformative. Terms such as tipping points and emergent behavior were built into the solicitation to prompt an SBE response. While this requires a deep theoretical engagement, the research community responded well.
- How were panelists recruited? (Dr. Goodchild)
  - The CDI/SBE WG members looked for panelists with broad expertise that extended beyond the topics of the submitted proposals. They strove for overlap of a broad perspective, which was deemed to be successful for the pre-proposal and full proposal panels.

Dynamics of Water Processes in the Environment (DWPE)

Presentation

Dr. Tom Baerwald began with a brief history about the formulation and justification of water as an academic framework for research. This began as a nebulous idea in 2003 and evolved to a more structured interdisciplinary research field, which could promote future collaborations. It was noted that there are a high number of proposals that deal with water and the environment.

Dr. Baerwald has found that water serves as an integral element to promote environmental research. It is this persistent theme that has spawned an interest now in a water initiative. Despite this interest there is no theoretical system or integrative framework to work with. There is a need for a more focused topic of improved predictive models for water in the environment and subsequent integration across existing models. Existing models may not be the preferred mechanism to address this issue; however, it was noted that this is a means to provide a focal point for multidisciplinary work.

While DWPE does not have a budget for FY08, it is a priority for FY09. $10 million has been requested as a placeholder. GEO, BIO, and ENG are actively involved in this initiative, while SBE is not a formal budget partner. Nonetheless, SBE would like to remain involved.

Dr. Baerwald commented that water will enhance the basic process for oriented research; enhance observational and modeling activities; expand the scientific use for practical influences; and enhance educational, workforce and development issues.

Discussion

- Why is water the prominent category as the mode for research? What is the motivation for this organization of an initiative at NSF? (Dr. Gleitman)
    - o Dr. Baerwald commented that there is a need for a more focused activity. The WG needs to flesh out the intellectual and theoretical framework, which could promote sound fundamental research with fundamental societal needs along with modeling capabilities and prediction.
- This work will also cover the question of population displacement due to changes in water levels.
- How aggressively should the SBE community be involved in the foundation-wide initiatives?
    - o There are questions of staff involvement in these issues.
    - o How much are other directorates reaching out to SBE when we reach out?
    - o Will these initiatives payoff for the SBE community in the building of intellectual infrastructure, and how much can be leveraged for SBE's benefits?
- Why should water be used as a way to categorize research, what is the motivation for the focus on water at the NSF?
    - o Basic research on the topic of water and the modeling of water will lead to a more integrative research framework and practical work.
    - o Also water is a natural organizing theme for the environmental sciences.

Preparation for Discussion with the Director

Interdisciplinary Research
In light of the fact that HSD COV members were enthusiastic about interdisciplinary research, Dr. Poeppel commented that he would like more information on how NSF supports this mode research. Dr. Poeppel noted that interdisciplinary research still appeared to be a point of contention for POs at NSF, even though within SBE there appeared to be support for this mode of research. Dr. Lightfoot commented that that there still was discussion going on NSF-wide about role of interdisciplinary research; within SBE for example, there is debate over the reallocation of HSD funds.

There was further discussion among the panel members. Dr. Jablonski noted that interdisciplinary programs could fuel research in core disciplines. However, Dr. Bachrach added that NSF needed further development of the programs and review process for interdisciplinary research. To date, the academic community struggles to evaluate effectively the success of interdisciplinary research, which requires longer to come to fruition. Additionally, Dr. Cutter mentioned that there is no mechanism to evaluate the success of these projects in the long haul, in terms of science and science policy.   The SciSIP program was created to address these issues.

DOD
The panel members would like an update on NSF's relationship with the DOD. How can NSF benefit basic scientific research with this collaboration? In light of this new partnership, it was noted that NSF collaboration with DOD will adhere to the same principles as other collaborations within NSF. Additionally, the solicitation will be developed prior to the change in the administration.

Support Staff
Dr. Poeppel noticed that SBE needed more staff support. Dr. Lightfoot responded that the funding for staff comes from a restricted budget which is kept to a minimum. SBE continues however to keep vacant positions to a minimum.

AST

Dr. Poeppel expressed concern with the AST title. He was not convinced that the language used properly captured the objectives of SBE. Dr. Lightfoot noted that the logic of this initiative is the human brain and that should be highlighted. Given the nature of this new initiative, it was noted that they should be aware of the implications of the terms 'mind' and 'brain'.

SBE within NSF
The panel would like a perspective on the challenges facing SBE to get a sense of where SBE stands with respect to the other directorates.

ACI/ ACA
Dr. Mackie-Mason would like further discussion on the ACI and ACA. What message should the committee take to prepare the ground for this new initiative, in particular within the scope of SBE?

ERE AC

Presentation

Dr. Cutter provided details on the ERE AC committee, which met in April 2008. There is discussion of producing a "green" book to help shape environmental research in the field and broader community. There will be two meetings this summer to further brainstorm about the future directions and strategic initiatives for ERE AC.

These developments are potentially significant for SBE. Specifically, 1-2 representatives from SBE will serve as members on the committee, and thus will be central to the efforts of ERE. The committee requested a need for expertise on the complexities of human uses and constraints in the environment, in terms of world poverty and large scale global processes. The committee is headed toward developing sustainability as a discipline of science that will focus on tipping points and complexities. The ERE AC program will emphasize a need for long term monitoring of environmental and human systems by specifically looking at climate change, disaster, water, and energy sustainability.

In sum, SBE has an interest in this initiative in light of the significant role it will play in leading this type of research.

Sustainability Workshop Reports

Presentation

The Sustainability Workshop was held in Arlington, VA on March 6th. Drs. Tom Baerwald and Robert O'Conner provided details on the workshop: there was an expert round table discussing research priorities on sustainable development, which crossed a broad spectrum of levels of analysis to more specific researchable applications. The panel was comprised of people from many disciplines, which facilitated an academically eclectic group of scholars.

While the workshop covered a wide range of topics, it was noted that there were underlying tensions, specifically with regard to the notion of *sustainability* (criterion I: intellectual merit) and *sustainable development* (criterion II: broader impacts). There was a disjuncture among the panel members between these two notions of thought. Nonetheless, it was recognized that both fields shared interdisciplinary perspectives; there was complex adaptive human and environmental interface; there was a demand for integration across time and space; and there was a possibility for network of observatories for resilience and sustainability.

The panel discussed various directions for research including system involvement in multiple competing stresses; better capability for prediction of results of stress of multiple types; better understanding of the dynamics of poverty; a stronger theoretical framework for creating research around critical terms (i.e. sustainable, adaptable, robust, etc.); and improved predictive capabilities.

Discussion

- Please elaborate on the 'tension' present at the workshop. (Dr. Cutter)
  - The tension was over the role of sustainability for society at large, more specifically between those who work in development studies and those who work in the broader domain of sustainability science, understanding the science behind sustainability without the development context. The panel struggled with the notion of sustainability and the subsequent implications. Given the interdisciplinary nature of this workshop, the various representatives conceptualize different definitions and terms, most specifically sustainability.
- Was population size and population growth adequately discussed? Is there a research agenda for exploring reproductive decision making? (Dr. Jablonski)
  - Topics of migration and population change inherently bring up notions of reproduction and gender. SBE is actively aware of this dimension; however, the role of reproduction was not overly emphasized in the discussion.
- Please elaborate on the reasons why "technology" was only mentioned once in the report. (Dr. Bachrach)
  - Dr. Ed Hackett responded that technology was mentioned more in the discussion than in the report. There will be a follow up workshop on sustainability and technology. Dr. Tom Baerwald added that the WG has been involved in looking at the broader implications of this issue. The committee has found that sustainability remains prevalent in the discussion, specifically the notion of adaptability. Dr. Cutter commented that the issue of scale was also repeatedly discussed. The committee should be aware of temporal analyses, specifically the implications of forecasting and back-casting.

Discussion with NSF Director, Dr. Arden L. Bement, Jr.

Introduction

The committee members began the session with introductions.

Dr. Arden Bement commented on the restrictions of the FY08 budget, despite the requested additional funding. The FY09 budget requests an increase; however, this is not likely, due to the change in administrations. He anticipates that the senate will not pass any of the appropriation bills, and a continuing resolution will run until next spring. Any new appropriations will not materialize until March or April 09. Given these restrictions, NSF is focusing on the 2010 budget.

The level of advocacy in pushing NSF's budget is the highest ever seen. The House and Senate Science committees have been very strong. Nonetheless, in light of this enthusiasm it comes down to politics, and they are keeping a lid on the budget, given the circumstances.

Discussion

- The COV report for the HSD program has sparked a lot of discussion, specifically the topic of interdisciplinary research. How do you support interdisciplinary research across the foundation? What are the mechanisms?

Dr. Bement responded that interdisciplinary research utilizes two mechanisms: ad hoc and preplanned. For example, involvement in the polar program would fall into preplanned. NSF has strong presence of interdisciplinary programs and WGs. Quite a few decisions are made within NSF by interdisciplinary partnerships. With respect to the question, how do we achieve an effective balance between the obvious benefits of interdisciplinary research and support the core programs, this involves creative and challenging balances. In particular, SBE at NSF is unique when compared to others throughout the world. NSF takes the opportunity to link SBE with the other sciences, specifically with research questions that examine natural disaster research, productivity, education and child development. While there are many dimensions that deal with interdisciplinarity, there must be balance for a strong disciplinary core.

- What are your impressions of SBE and its challenges? What changes have you perceived over the years? What about the attacks from Congress?

SBE is much more interconnected and sophisticated than before. The scope of SBE research is larger. With respect to the challenges from the Hill, some of them are self inflicted. Dr. Bement mentioned that policymakers may judge SBE awards by title only. However, when they look at the body of the proposal their apprehensions subside. Nevertheless, there will always be some members who believe SBE research is common sense even though most of the key corporate decisions are based on uncommon sense from SBE research.

- Please provide more information on the initiative that SBE is taking to develop an MOU with the DOD. The committee has expressed skepticism with a partnership with the DOD.

Dr. Bement commented that the DOD needs advice from SBE to advance the national welfare and national defense, both of which are included in DOD's and SBE's mission. NSF has consistently carried on research programs with the DOD and homeland security. SBE and DOD must follow the guidelines that state that the results have to be unclassified, and the partnerships must adhere to NSF policies and procedures.

- OECD: The committee of SciSIP is looking at the innovation policy. What is the role of NSF with the innovation policy and the context that it is situated?

SciSIP aims to provide a scientific basis for making policy decisions about science, and to provide a stronger basis for supporting science adjustment from the standpoint of innovations and returns. Many of the returns, however, cannot be quantified, but they need to be sharply defined to gain legitimacy and credibility. Congress commonly asks how much investment is enough. Given that NSF is competing with the discretionary part of the non-defense budget, it is difficult to weigh investment of science against security, welfare, health care and the other initiatives.   To date SciSIP has been a difficult notion to quantify.

- Does the role of SBE science in understanding the creative process with respect to innovation come up? (Dr. Goodchild)

Dr. Bement affirmed that SBE contributes to research along with education and learning. Neuroscience is an example of this, since the field has exploded and resulted in a rapid pace of innovation. Other fields of research that have a fundamental SBE component and are experiencing rapid innovation are AST and the study of virtual organizations.

- AST seems to be a good opportunity to invest in the SBE sciences. With respect to the AST initiative, it is a way to deploy funds in SBE which will yield higher payoffs than in other directorates. Given the budgetary situation, what is going to happen to this initiative? The language suggests that substantial funding could be moved, what will happen in FY10? (Dr. Poeppel additionally commented that having served on the COV and HSD program SBE seems understaffed.)

Cross foundation initiatives facilitate transformations. There is a general perception that transformation is stimulated by a focused investment. Typically these initiatives are held as pilot studies for 5 years and are gradually built into the core. The rate of multi-investigator and multi-PIs has significantly increased over the past 10 years, which is a strong indicator that these initiatives are successful. One example recently is the sustainability and complexity initiatives. Over time these could be incorporated into a core program.

Dr. Poeppel commented that it is important for the AST investment to go to SBE because there will be a greater payoff in the disciplines. Dr. Bement responded that the payoff depends on how interested SBE is in this. Growing that program at the rate it deserves will take some work and facility.

Dr. Bement asked questions for the panel

- What is the framework for broadening participation?
- There has been a recurring question about the facilities. How can you build infrastructure with the budget that you have? The MRI cap which grew significantly and the Office of Cyberinfrastructure, which includes networking and virtual organizations, seem significantly vested in SBE.
- Looking ahead, the nation is going to be seriously challenged. Nonetheless, there will be opportunities for investment, which explains why the international program is growing. Being a domestic foundation, NSF is not able to provide funding for research from other countries, which is especially limiting with developing countries. We have been able to recognize the great potentiality and thus fund at universities who then send researchers abroad to address the prominent questions. SBE has a role to play here. NSF signed a MOU with AID a month ago, and now they are trying to get AID to invest more in universities in developing world.

Dr. David Lightfoot commented that SBE is in a unique position with respect to international collaborations. Given the nature of SBE research (i.e. comparative analyses) the infrastructure needed to conduct this international work must be compatible globally. Therefore the infrastructure needs to be maintained on an international level.

Dr. Bement agreed that infrastructure is crucial. In many international activities, researchers want to link institutions with other institutions in order to address new innovative questions. In order to maintain this complex infrastructure, the community should consider creating an endowment for security, protection, and efficiency.

Currently, the University of Minnesota maintains the international infrastructure for the Census data. There is a technological challenge to maintain this, given the technological changes from the past for understanding and analysis of the future.

Dr. Bement added that there needs to be a distinction between projects and programs.

- Dr. Goodchild commented that society is changing rapidly. How is the research timescale adjusting?

Dr. Bement responded that policy should be informed by science, but the timeline for decision making is relatively short given the length of time needed for finding results. How do you reach temporal consensus that can be used in decision making? What is the dynamic interaction of scientists and decision makers? These are important questions to address.

Committee Discussion

Dr. Bachrach stated that there are major missed opportunities where the U.S .has not collaborated in international data collections. The community needs to think about how to recover from that.

SBE should be aware of its peculiar position among the other sciences. SBE provides concrete substantive research for scientific inquiry, thus the community needs to make sure that they include the full breadth of SBE into the examples. The Directors Review for NSF and NSB captured the imagination of people, because it took a look at the full spectrum. They looked at the non-traditional aspects of the discipline. It was startling and received extremely well. It is important to understand the nature of brain matter that comprises conscious, language, networks, etc.

Dr. Poeppel asked what are 2 bullet examples of SBE? The AC responded that the area of brain/function/cognition and tipping points (prominent structural shifts) are prominent examples used.

The social sciences in particular are conducted in an unusual way in this country because they are prominently funded by the NSF. In light of this framework, there are alliances conducive for the social sciences. There is a difference between science for policy and policy. The utility of the social science for policy is uniquely strong.

Friday, June 6, 2008

SBE Issues:
Human Capital and succession planning in SBE

Presentation

Dr. Judy Sunley provided an update on the human capital strategic plan and elucidated on SBE's role. There is a 25% turnover every year among management at NSF. By 2011 over 40% of the permanent staff will be eligible to retire. Given these numbers, NSF must implement a systematic recruitment and replacement method. Although a number of the POs are rotators, NSF needs to maintain a satisfactory level of institutional memory.

There has been a 40% increase in the number of proposals, while the staff only increased by 8%. Employees at NSF are overworked, which is compounded by the fact that the nature of the POs work is more complex and interdisciplinary.

The elements of the NSF human capital strategic plan include a workforce and succession plan. The committee aims to facilitate seamless transitions, develop and nurture leaders at the directorate and division level, and clearly assign responsibilities for the senior permanent staff. The community must consistently recruit the highest quality POs. The community can support this endeavor by recruiting though the professional societies, AC, and panels.

Discussion

- Members of the AC noted that there is a consistent worry about the rotating situation with lack of continuity for the PO, administration, and the clientele.
- In light of the rapid turnover and limited institutional memory, the AC was concerned that the resubmission process is inadequately maintained.
  - Dr. Sunley commented on the former point stating that SBE has the permission to hire the new authorized staff; however, they do not have the funds to do so. SBE is functioning at its personnel ceiling. Additionally, SBE has converted a few rotators to permanent; this is a cluster mechanism to maintain institutional memory and foster greater stability for the programs.
  - With respect to the latter comment on the resubmission process, Dr. Sunley commented that there is no official category for resubmissions. This is contrary to the NIH policies and procedures.

SBE is currently searching for a successor for Dr. Ed Hackett. They are in the preliminary stages after dealing with some unavoidable delays. The panel will be notified as the search continues. Dr. David Lightfoot will stay one more year and the search for a new AD will begin soon.

Broadening Participation

Presentation

Dr. Fae Korsmo provided an update on broadening participation (BP). This is first advisory committee within NSF to look at this plan at this time. The process of building consensus on BP has stimulated a lot of thought and effort for this initiative. The goals of BP and recommended action included: establishing a portfolio of NSF BP programs, that has an emphasis on BP which allows more options for the PI;

maintaining and ensuring that the reviewer system is current, updated and easily accessible for reviewer registration; providing training for the NSF staff; establishing a publicly available website (currently they are creating a pilot); enhancing BP across the foundation; promoting effectiveness via AC meetings and COVs. Dr. Fae Korsmo needs comments by mid-July.

Discussion

Dr. Goodchild commented that SciSIP could play a large role in this in terms of training and taking the results and applying it to SBE.

International Activities

Presentation

Drs. Bonnie Thompson and Rick Nader provided an update on international activities. OISE aims to make collaborations as easy as possible for PIs and in terms of the workload for POs. OISE encourages international activities; however, this lies on the principle of parallel review and parallel funding such that international collaborations will be reviewed in the normal process by NSF. Ideally, NSF hopes for convergence between the two granting institutions. NSF would only fund the US component to collaborative proposals.

OISE is increasing the number of MOUs with international research organizations. It is noted that the British and French are interested in the topic of change and complexity science. The International Forum for Funding Agencies is an international organization that promotes international collaboration. Given the nature of research in SBE, there is a need for a global infrastructure for the social sciences.

OISE comprises 35 POs who are organized regionally. They aim to build excellence through international research and education; and broaden participation through quality international experience for early career scientists and engineers. OISE supports intellectual partnerships as opposed to field work; engages students and junior researchers; and fosters global networking. Dr. Nader emphasized that OISE plays a catalytic role to provide access and leverage to advance discovery and promote networking; and nurture, build and develop to prepare globally engage workforces.

Most often the office co-funds with other directorates at NSF. They are especially active with HSD, SciSIP and Partnership for International Research and Education (PIRE). OISE is committed to supporting graduate students, dissertation enhancement and post-doctoral research. This, however, is underutilized, so they want to increase the applicant pool and interest.

OISE is an advocate for SBE activities. The PIRE program is a 5 year grant for 500k/year. The PI can apply to address questions of sustainability, social networking, and new ground for experiments.

Discussion

- Dr. Poeppel asked that they elaborate on examples of activities in Latin America.
  - While neither Drs. Thompson nor Nader work on that region, the NATO type institute is ongoing and features the Americas. There is more information of the awards on the website. These awards have the potential to have important political implications. Chile has vast resources for astronomical activities and a strong applied mathematics group.
- Dr. Goodchild asked whether China is open for NSF proposals.
  - This depends on which field. The academic community is very eager to cooperate, while the government is more hesitant. Currently there is a lot of pressure to produce, so that community is actively looking for partnerships.
  - PIRE is a mechanism to facilitate collaborations with China; however, it has institutional submission limits. In China there are two major funding organizations, yet one funds a limited range of sciences, specifically economics, the NNSC was established during the reform period.

Interaction with Representatives of SBE Professional Organizations

Presentation

Drs. Norman Bradburn and Howard Silver provided information on this session. The Federation for the Behavioral, Cognitive, & Psychological Sciences serves as an advocacy group for the behavioral/biological sciences, and serves as an organization of organizations. There are 33 university departments and 5 APA divisions that serve as affiliates. It is funded by dues and contributions. It is a complex structure which allows for flexibility.   It is housed in the APA building.

To briefly elaborate, they focus on advocacy and regulations. Specifically the organization lobbies Congress for support for funding for the behavioral sciences; monitors for potential threats to the behavioral sciences; stays abreast of funding opportunities for member organizations; and actively looks for opportunities to develop funding.   With respect to regulations, the organization maintains data and protection of human subjects. In certain cases they assist congressional committees in finding witnesses with regard to hot, contentious topics.

They promote education through a series of activities: in particular via forums and science cafes. Additionally, they showcase the results of NSF funding. The Federation is going to put out a book of essays on different topics and will focus on relating the state of science to practical problems.

Dr. Howard Silver provided an extensive history of COSSA, which serves an advocacy group. This federation has evolved over the past 30 years. The membership is the major professional disciplinary organization. A number of interdisciplinary organizations have joined, and there a number of centers, institutes, universities and disciplines affiliated with COSSA.

COSSA has testified to appropriation sub-committees in terms of preparing hearings and getting witnesses to address legislation. They run a coalition for the advancement of health with behavioral and social science research, a coalition for international education, and interact frequently with the national academy.

This year, Dr. Silver noted that a lot of the focus has been on enhancing diversity, which resembles the efforts promoted at the NSF. They note that policy makers take advantage of the SBE sciences, so they are committed to making sure that the policy makers know that they are using SBE research as often as the actually do.

Discussion

- Dr. Cutter acknowledged the contributions of Neal Lane in promoting the social sciences with Senator Hutchison.
- Dr. Goodchild asked for elaboration on the relationship between organizations and the private sector.
    - o   Dr. Silver responded that they have not had time to address these issues and explore the impacts. The initial involvement directly has been primarily firms making a living off the publications of the SBE sciences. Though there have been other ones that are more indirect. The existence of the NSF allows for interactions like this to occur, which commonly end in the private sector.

SBE Infrastructure

Presentation:

Dr. Ed Hackett's presentation focused on new developments in the social sciences ("Looking Backward, Looking Forward": Technology & Research in the Human Sciences). Before exploring new developments, Dr. Hackett briefly reviewed the early scientific surveys that occurred in turn of the century London, which

examined changing living conditions and laid the foundations for their modern counterparts: ANEAS (1948), PSID (1968) and the GSS. Dr. Hackett then proceeded to look at the future of social science research in the near-term, the medium-term and the long-term:

- In the near-term, there is a focus on increasing the resolution of data in terms of physical and social dimensions. In addition, there is a need for more data from hard to access groups, such as minority groups and greater spatial and social resolution. CENS (Center for Embedded Natural Sensors), a joint collaboration between UCLA and the NSF, is working on the issue of increased data resolution.
    - In addition, surveys are currently being enriched in several ways: a more international view of the world is being taken, subjects are taking a more active role in research and new individual level measures are being taken, such as bio-measurements.
- In the medium-term, it foreseeable that there will be the development of massive transaction data sets.
- In the long-term, the day to day social world will expand to intimately involve the virtual.

Discussion:

- What is going to be the methods and models for projects like CENS and what about confidentiality and privacy? May need a statement of principles about possible ethical behavior?
    - Data, method, theory and ethics all need to be considered in tandem.
- The data discussed in the presentation will be gathered; however, will we be able to do science with them or just use them in business efforts?
- There could be problem distributing these research datasets to the community
    - It is important that data is placed in federation and that there is inter-operability
- A challenge for the SBE sciences is how do we interpret these new richer datasets?
    - There needs to be a focus for the SBE community.
    - There is a need for theoretical development to underline these new datasets
    - What questions will drive these datasets?
- There are many projects that are being carried on similar to CENS not tied to the NSF.
- Sometimes technology can lead to theoretical breakthroughs via the use of increased computational power.

Thinking ahead: FY 2010

Presentation:

Dr. David Lightfoot began his short presentation by focusing on the 2010 budget. The broader context or motivating idea behind the upcoming budget is a budget that grows but does not grow with big new initiatives, a budget with small scale increments including some large scale increments from the 09 budget (enhanced CDI, the water initiative and AST). In addition there will be no big agency-wide initiatives; however there will be local initiatives, such as:

- The exploration of innovation through programs like SciSIP, which will enable SBE to look at innovation across a wide range of sciences and collaborating with other directorates, essentially a broadened version of SciSIP that is far more inter-disciplinary.
- An initiative in the environment that will be an expansion of the previous CNH work. This is a promising area of study considering that the likely new administration will be interested in human factors and the environment (interest in this endeavor has been shown by the Polar programs and BIO directorate).

Discussion:

- SciSIP has the potential to be a very broad program, examining innovation as a social and human system that enables idea generation and the adoption of new technologies and the adoption of old

technologies for new uses. In addition, SciSIP naturally draws together a number of academic communities.

- A focus on the environment is very timely.
- Innovation and the environment are good focuses that are plagued with measurement errors.
    o The more expansive ideas presented by Dr. Hackett will partially take place in these two new emphasizes
- There is a need for a renewed level of interest for understanding humans as primates and how that affects their behavior (especially in new areas such as virtual environments).
    o How humans as primates operate in virtual environments.
- What type of products can be generated by humans in virtual environments? (massive human networks)
    o This could fit in the scope of SciSIP (maybe expand the SciSIP solicitation for such work).
    o Similar work to this has been funded by core SBE programs and would have fit well with HSD.
- Knowledge can be studied as a phenomenon unto itself which could create stronger connections with other parts of the agencies.
- Much more emphasizes on support for post-docs in the SBE sciences (could be transformative to the sciences).
    o This is currently happening to some extent in SBE.
- There is elaboration on human factors and the environment.
    o Possibly there should be increased investment in the CNH program.

Identification of Agenda Items for Next Meeting, Dates for Spring/Fall 2009 Meeting

Presentation:

Dr. Michael Goodchild announced the date and location of the next SBE AC meeting, November 20 and 21st, 2008 at the National Science Foundation in Arlington, VA. Dr. Goodchild and the committee also suggested the following agenda items for the fall meeting:

- A section on OCI and virtual organizations. To encourage the further discussion of the cyber elements of the SBE sciences
- Massive data-sets, with a focus on empiricism and how to do it in this context
- A more detailed discussion of complexity
- Data preservation
- An exploration of SciSIP results and how this program and concept fit with innovation
- Possibly inviting some representatives from business, especially from virtual organizations and computing in SBE sciences
- Discuss the social science agenda from the National Academies
- A discussion of how the HSD funds will be/are re-allocated.