

Advisory Committee Meeting Minutes
ADVISORY COMMITTEE FOR INTERNATIONAL SCIENCE AND ENGINEERING
November 28-29, 2016
NATIONAL SCIENCE FOUNDATION
Stafford II - Room 1155 Conference Room

AC-ISE Members in Attendance: Susan Avery, Jay Cohen, José Fortes, Julio Ibarra, Steven McLaughlin, Anne Petersen, Winston Soboyejo, Nai-Chang Yeh; Present Via Web: Meg Lowman

AC-ISE Members Not in Attendance: Monica Olvera de la Cruz

Monday, November 28

Welcome – Susan Avery, AC-ISE Chair

Dr. Susan Avery opened the meeting by welcoming all, asking for brief introductions of committee members, NSF OISE staff, and guests. The minutes from the July 2016 meeting were approved. The request for a visit by Office of General Council was announced.

OISE Overview and Update – Rebecca Keiser, OISE Office Head

Dr. Rebecca Keiser thanked the committee for the input they would provide. Dr. Keiser opened with the focus on international collaborations as means to advance the frontiers of science and engineering and prepare a globally engaged US workforce, then provided updates on the following:

Office reorganization status. Dr. Keiser reviewed the prior structure (four regional groups following State, global initiatives, and administrative team) and the new three-cluster structure, along with the new hire of a Budget Analyst. She summarized the key roles of the new clusters and their acting cluster leads. The Countries and Regions cluster serves as the representational unit, with cross fertilization of knowledge enhanced by merging four previously separate groups into one unit. The Programs and Analysis cluster serves as the unit to implement programs and advance analytics.

Recent international activities. Dr. Keiser provided a summary of recent international activities involving the Director and/or the OISE office: (1) her trip to UK and Ireland with the Director, during which center-to-center work, Brexit impacts, mobility issues re-organization of RCUK were addressed; (2) Sam Howerton's trip to China and Japan for the U.S.-China Joint Commission Meeting (JCM) and the Beijing and Tokyo offices; (3) her visits to universities and the insights these gave her; (4) the U.S-India JCM here in DC; (5) the White House Arctic Science Ministerial; and (6) International Brain Conference in New York, the latter two of which included significant involvement by the Director and other NSF parties.

Questions by the committee included implementation of recommendations suggested from the last Committee of Visitors and strategic plan status. The committee was enthusiastic about OISE's progress since the last COV as well as the evident boost in staff morale. The committee was positive about the strategies previously presented. Dr. Keiser noted these were being formalized into a strategic plan. An updated policy document is also nearing completion and OISE will develop a formal Annual Report.

Programs and Analysis Cluster Update – Anne Emig, OISE Acting Cluster Lead

Dr. Anne Emig outlined the status of the portfolio realignment presented at the July meeting, giving particular attention to the following:

- Revising the Global Venture Fund (GVF) from a previously passive approach to a structured and targeted approach for FY2017 with three deadlines and two priority areas:
 - Broadening participation of underrepresented groups in international research
 - Lowering barriers to international collaboration through data sharing and integration
- Proposing a new network-to-network science opportunity, provisionally called Accelerating Research through International Networking (ACCELnet) for inclusion in the FY2018 budget.

Dr. Emig concluded with the cluster's focus to stand up new analysis capabilities, noting the need for a better sense of foreign counterpart and U.S. university investments and priorities. Such information would feed into future workshops and provide reproducible data to inform activities.

The committee discussed approaches to advertising the new GVF, priority areas, review mechanisms, and challenges of reviewing reports of co-managed awards. The committee commended the office for its careful processes and encouraged OISE to get the word out on its accomplishments and what cannot be done given priorities and budget. Dr. Keiser noted the importance of coordinating OISE's efforts with the NSF at large. Dr. Anne Peterson reinforced that OISE understands the need for mutual benefit, and thus can set the example. Dr. Avery asked about PIRE lessons learned, which stimulated discussion about leveraging the budget through partnerships, lead agency relationships, and virtual collaborations.

AC-ISE Request to speak with OGC – Karen Santoro, Office of General Counsel

Karen Santoro clarified the information requested in the COI form and addressed questions about conflicts. Sam Howerton was identified as the OISE COI official to contact with additional questions.

Countries and Regions Cluster Update – Jessica Robin, OISE Acting Cluster Lead

Dr. Jessica Robin gave an overview of the aims of the Countries and Regions, emphasizing the team approach to managing country portfolios and noting that members of the Programs and Analysis cluster also have country responsibilities. She outlined recent representation activities, including:

- Preparing Director's Briefings
- Participating in Joint Commission Meetings
- Developing joint calls and initiatives, such as the U.S. Brazil Dear Colleague Letter on Cybersecurity Research and the U.S.-Netherlands Dear Colleague Letter on Water Technology.
- Other activities: Chile's request for NSF's institutional analysis of CONICYT; catalytic activities initiated to advance collaboration in the Balkans, Tunisia, and Cuba.

Dr. Robin concluded with future directions for the cluster, including: retaining institutional knowledge; better coordination with OLPA and directorates; identify regional opportunities and countries of interest; advance opportunities for leverage resources with our international counterparts; and State Department outreach. She asked for the committee's recommendations for identifying and advancing collaborations with our international partners and enhancing coordination with the State Department.

The committee asked about how IP, security, and export issues were handled. Dr. Robin noted that principle investigators are reminded it is the university's responsibility to follow export control and also commented on the office's close relationship with the Office of General Council and Large Facilities Office. The committee was enthusiastic about the progress and suggested one proactive approach to consider would be to use regional approaches and regional offices to identify opportunities. Dr. Robin reinforced this suggestion, presenting the OISE's encouragement of regional Balkan workshops.

Africa Engagement Update – Graham Harrison, Lara Campbell, OISE Program Directors

Drs. Harrison and Campbell summarized a "Funding S&T in Africa" scoping workshop involving the World Bank and DC-based research funding councils. They were joined by BIO Deputy Assistant Director Dr. Jane Silverthorne as NSF representatives. Other funding councils included the German DFG, Research Councils UK, four French and two Japanese agencies. The workshop goals were to (1) share how funding agencies work in Africa; (2) explore synergies; and (3) discuss opportunities for collaboration.

A compilation of the research areas funded by the participating agencies was a significant workshop product. Biological sciences/agriculture and environmental/geosciences each receive about a third of funds, with the next largest amounts going to social, behavioral and economic sciences and then to health/medical sciences, and significantly less to other fields. Investments are focused in South Africa, Kenya, Tanzania, and Uganda. Germany funds most (>400) projects, followed by RCUK (>350), and NSF (~300). While the French CNRS funds fewer (~50) projects, these include staff and have big impact.

The World Bank highlighted their African Centers of Excellence. Next steps include: help the World Bank clarify what the centers should be able to achieve; help design future calls; capacity building for African management; and help build research networks through workshops. Drs. Harrison and Campbell concluded by noting they will meet with NSF Engineering Centers and EPSCOR for guidance to share.

Dr. Soboyejo was particularly appreciative of the workshop's direction, as he advises the World Bank on such efforts. He added information on aims of a number of countries to educate 10,000 individuals and suggested the potential for future exchange visits given the graduate programs started by the centers. Differences between capacity building and NSF's education efforts were discussed. Longer term efforts to improve mechanisms for collaborative workshops and calls were noted as worth pursuing.

Working Lunch: Science and Engineering Indicators – John Gawalt, Director, National Center for Science and Engineering Statistics (NCSES), Beethika Khan, Program Director NCSES

John Gawalt provided an overview of the role of the National Center for Science and Engineering Statistics as one of the federal statistical agencies, the types of data collection and analytic reports provided, and interactional activities. Beethika Khan presented an overview of the suite of products included in the Science and Engineering Indicators (SEI). She noted new aspects for the 2018 edition and presented a series of slides documenting worldwide trends from 2000 to 2012, many of which show hubs of importance in particular regions/areas such as China and Asia generally.

The committee asked about data normalization and if the NCSES conducted predictions or projections. There are difficulties of normalizing data, except with respect to R&D intensity relative to GDP, but comparisons, such as citations of peer reviewed publications relative to the global average, are used. Mr. Gawalt commented on the importance of international guidelines for comparative datasets. NCSES

incorporates projections from Bureau of Labor Statistics. The committee discussed what drives these numbers, inflection points, research and innovation cultures, and bridging research to market.

China Engagement – Nancy Sung, NSF Beijing Office Head

NSF Panel: Paula Mabee, BIO/DEB Division Director; Jim Ulvestad, MPS/AST Division Director; Irene Qualters, CISE/ACI Division Director; Bruce Hamilton, ENG/CBET Program Director

Dr. Nancy Sung presented background of the dynamic context in 2006 when the NSF Beijing office opened and the current collaborations between the U.S. and China. Dr. Sung introduced an NSF panel that focused on the leveraged partnerships and the need to explore new opportunities:

- Dr. Paula Mabee described NSFC's involvement in the Dimensions of Biodiversity program and her participation in the U.S.-China JCM and meetings regarding China's CERN and NSF's NEON, noting the potential transformation if data sharing occurred globally.
- Dr. Irene Qualters emphasized NSF's unique role and the need to be explicit about rules of engagement, which from cyberinfrastructure perspective are data sharing and software (community contribution to software and credit for data sharing).
- Dr. Jim Ulvestad commented on the essential nature of international collaboration for many of the large facilities/instruments and the critical balance of collaboration with national security issues and sensitivities.
- Dr. Bruce Hamilton described the NSF-NSFC collaboration in Sustainable Engineering, with 6 projects funded and discussion about INFEWS for the next round. He noted that NSFC has some concerns about entering into this interdisciplinary area.

Dr. Sung concluded with questions for the committee: (1) what programmatic mechanisms are needed to advance NSF's engagement with China; (2) what additional policy issues need to be thoughtfully considered; and (3) what resources does NSF need to be effective and wise in engagement with China?

The committee discussed changes in China's practices that emulated the U.S. and NSF as well as the need for a multinational collaborative framework where U.S. cannot do the science alone. The committee noted areas of mutual interest and some red flags. The committee agreed that NSF should be the catalyst for strategic collaboration between U.S. and China. The role NSF should play in promoting a culture of publically available data was stressed. Several members reinforced the existing strong relationships faculty &/or universities have with China that NSF could leverage.

The committee prepared to meet with Dr. Cordova, Dr. Buckius, and the Assistant Directors.

Meeting with NSF Leadership – Dr. France Cordova, Director; Dr. Buckius, Chief Operating Officer; Assistant Directors: Drs. Fleming Crim, Roger Wakimoto, Jim Karose, Jim Olds; Eammon Kelly.

Chair Susan Avery welcomed the NSF leadership and summarized the meeting thus far. Dr. Avery remarked on their positive impression of the office and Dr. Keiser as change agent. She relayed the committee's excitement about the Big Ideas.

Dr. Cordova thanked the committee and provided an update on the transition, noting that NSF has long had respect from both sides of the aisle and thus far there is little evidence of the new administration's directions. The Director remarked that the big ideas have resonated all over, in academic and public

audiences around the world. Following the opening conversation with the Director, the Assistant Directors each described the status of the Big Idea for which their directorate is lead.

- Dr. Fleming Crim noted that MSP is lead on 2 big ideas, Windows on the Universe and Quantum Leap, and devoted to others. He noted that Windows will be born as an international project.
- Dr. Roger Wakimoto described Navigating the New Arctic which GEO leads with strong involvement by SBE, which he views as compelling and likely to survive transition.
- Dr. Jim Karose noted CISE's international relationships (Israel, Netherlands, Finland, Brazil) as well involvement in Harnessing Data, Midscale Infrastructure and Human-Technology Frontier.
- Dr. Jim Olds described how the Rules of Life, led by BIO with MPS and SBE, can advance the bioeconomy.
- Dr. Eammon Kelly provided an update on Includes and noted the international collaboration by Welcome Trust and EHR solicitation and the release of TIMMS data on Nov. 30th.

The Director concluded by reinforcing that these big ideas are for future investments and the intent is to propose beginning with the FY2018 budget to start on a doubling curve.

Continuation of International Strategy for the NSF Big Ideas

Several OISE program officers reported on the activities of big ideas working groups: Joe Miller for the Rules of Life; Mangala Sharma for the Windows on the Universe; Jessica Robin for Convergence working group; and Claire Hemingway for Navigating the New Arctic. It was noted that the various working groups are at different stages of progress.

The committee discussed budget for the big ideas, including that of OISE, the potential bidirectional connection of the big ideas and decadal surveys, and the political landscape. There was substantial discourse about new frontiers identified by U.S. Presidents and the place of innovation in the federal scientific enterprise. There was consensus on the need to show how basic research has paid off and how international science collaborations matter for the U.S. The committee agreed that the Director's initiation of the big ideas has been a significant advance by highlighting the relevance of NSF and preserving the core of basic research.

Chair Susan Avery adjourned the meeting at 5 pm.

Tuesday, November 29

Overseas Offices (Closed Session)

The closed session began at 8:37 am with Drs. Meg Lowman and Libby Lyons, NSF Tokyo Regional Office Head, on the line and other members behind closed doors. Dr. Rebecca Keiser opened by summarizing the facilitation, representation, reporting roles of the overseas offices and describing the history and current status of the Tokyo Regional Office. Dr. Keiser then presented a proposal for a pilot of project-based teams, starting first with Japan and subsequently UK and Canada. OISE would work with the directorates to identify subject matter experts and with State in planning and deploying the teams who would be tasked with reporting targeted collaboration exploration and relationship building, etc.

The committee discussed focus areas, costs of overseas offices, timing of pilot activities and potential office closures, diplomatic issues associated with changes, and country versus regional scope of activities. Dr. Keiser clarified the focus of small teams in the first phase on areas with some existing collaboration where the aim is seek to expand and in a second phase on areas where NSF wants to build collaborations. OISE would put in the seed money, but would like directorate contributions. The committee agreed that the project-based team proposal is a positive and needed new approach. However, the committee recommended to consider the timing of changes and to attempt piloting the project-team approach while maintaining the Tokyo Regional Office. The committee was enthusiastic about regional approaches but recognized budget difficulties. The closed session ended promptly at 9:30 am.

2018-2022 NSF Strategic Plan – Steve Meacham, Office of Integrative Activities

Dr. Stephan Meacham described the process of development of the strategic plan, high-level questions for updating the plan, and how the advisory committee can provide input (strategicplan@nsf.gov). Dr. Meacham highlighted core values, strategic goals and objectives, noting the aim is to improve language not alter the investment on ideas, people, and tools, for example in G1/O1.

The committee had a lively discussion touching on the relative contributions of NSF investments in the mission statement areas, the difficulties of measuring impact, and the value of presenting effective stories of the benefits to society for multiple audiences. Dr. Meacham described the strategic review committees and the metrics for which NSF is accountable to OMB. The committee then discussed the implications of “diverse and inclusive” workforce wording. The committee expressed diverse opinions of the need for an “Innovation Division” but agreed on the need to define innovation.

Data Analytic Tools – Paul Morris, Program Director Office of Integrative Activities

Dr. Paul Morris described the analytic tools developed in-house using open source frameworks to search unstructured text. Dr. Morris presented several plots of data using the text mining tool and gave a live demonstration. He described advantages of the text mining tool over cover sheet information, which underreports international collaborations by about one third. He illustrated the view on impact of investments permitted by connecting the NSF data with DOD, NIH and Web of Science data.

The committee was excited about the potential of this approach to provide the storyboards for communicating the impact of NSF to various audiences.

Discussion of Regional Workshops across US – Susan Avery, AC-ISE Chair

Dr. Rebecca Keiser opened the brainstorming session with a request for input as OISE formulates plans for regional workshops across the U.S. The committee suggested a variety of approaches: a series of webinars; panel discussions at scientific conferences; panel discussions involving NSF and counterpart agencies at university-based meetings; targeted meetings with AAU, APLU, vice Presidents of Research or International officers; and priming visits with emails or other preliminary interactions. The committee agreed that both evangelizing international collaborations and fact-finding are goals. The committee suggested identifying goals of the dialog, then choosing locations, and considering multiple level of interactions, including grass roots and a second level to weave interests into a global strategy.

Closing Remarks and Wrap Up – Susan Avery, AC-ISE Chair

Next Steps/Follow-Up. The Advisory Committee concluded that they are pleased with the progress and discussions and have no additional particular recommendations. Two agenda items were determined to require email follow-up prior to the next meeting.

1. Susan Avery asked whether the committee would like to formulate a response to the NSF strategic plan. Drs. Avery and Petersen agreed to codify key components of the committee's conversation on international engagement and innovation to provide as input for the strategic plan. They will prepare a rough draft to circulate to the committee.
2. To continue refining plans for regional workshops, Rebecca Keiser will provide a brief write up of the possible structure on the regional workshops for the committees' feedback.

Meeting Dates. Dr. Keiser proposed February as the next meeting, around budget formulation and ideally overlapping with the US-Israel Binational Science Foundation's board meeting hosted by NSF. The best fit for dates was determined to be February 28 – March 1, with travel to NSF on February 27.

The chair adjourned the meeting approximately 12:00 pm.
