

**Advisory Committee for Environmental Research and Education (AC ERE)**

March 29-30, 2017

NSF Room 1235, 4201 Wilson Blvd, Arlington, VA 22230

**Committee Members Present:** Dr. Anthony Janetos (Chair), Dr. Pedro Alvarez, Dr. Tina Bahadori, Dr. David Blockstein, Dr. Ann Bostrom (remote), Dr. Andres Clarens, Dr. Roger Mark De Souza (March 30), Dr. Scott Doney (remote), Dr. Charles Isbell, Dr. Patricia Matrai (March 30), Dr. David McGinnis, Dr. Julia Parrish, Dr. Anu Ramaswami

**NSF Staff:** Dr. Suzi Iacono (Head, Office of Integrative Activities), Dr. Leah Nichols (Staff Associate OIA, Executive Secretary for AC ERE), Dr. Steve Meacham (Senior Staff Associate OIA), Mr. Patrick Southern (Program Specialist, OIA), Dr. Ariela Zycherman (AAAS Policy Fellow, ENG), Dr. Chris Washington (AAAS Policy Fellow, OIA), MS. Elizabeth Baugher (Science Assistant, GEO)

**Wednesday – March 29, 2017**

**9:30 – 9:45a Welcoming Remarks**

Drs. Janetos and Iacono welcomed the committee. Dr. Janetos described how the agenda for the meeting was designed to explore the strategic importance of NSF's ERE portfolio. Dr. Iacono highlighted a couple of NSF's most recent activities.

**9:45 – 10:15a NSF Budget Update**

Presentation by Dr. Michael Sieverts (Director, NSF Budget Division)

Dr. Sieverts provided information on NSF's current budget status. He indicated that NSF will be operating under a continuing resolution through April 28, 2017 and that NSF was not specified in the President's Budget Blueprint.

**10:15 – 11:15a AC ERE Business / Gold Report Supplemental White Paper**

Dr. Clarens provided a summary of the Gold Report white paper, highlighting changes that had been made to the white paper since the committee's last discussion. The committee then discussed each section of the white paper in turn, noting a few places where they wanted to alter wording or adjust emphasis to better match their collective thinking. Since the desired changes did not require substantial editing, Dr. Clarens agreed to make the changes Wednesday evening so the committee could vote to approve the document on Thursday.

**11:30 – 12:30p Sustainable Urban Systems Subcommittee / White Paper**

Subcommittee members present: Stephanie Pincetl (remote) and Elena Irwin (remote)

Dr. Ramaswami (Subcommittee Chair) presented an initial outline for the Sustainable Urban Systems (SUS) Subcommittee's white paper on research needs for advancing understanding of the sustainability of urban systems. The committee then discussed the subcommittee's work thus far and provided

feedback to Dr. Ramaswami for the SUS subcommittee. The committee found that the subcommittee did an excellent job of conveying the need and urgency for this type of science. They also noted the definition of sustainable urban systems was extremely broad and urged the subcommittee to narrow the white paper's focus to increase its effectiveness. They urged the subcommittee to make the differences between SUS research priorities and the examples of thematic research foci very clear and to emphasize how the white paper is building off the existing landscape of urban science to ensure that the research recommendations are novel. The committee decided to convene via teleconference during the summer to discuss a full draft of this white paper.

### **12:30 – 1:30p Working Lunch**

Dr. Nichols presented some new analyses of NSF's ERE portfolio. The text of the AC ERE's Green Report (2009) and Gold Report (2015) were used as input into a text mining algorithm that identified NSF awards with content most like the text of each report. The committee found the analysis to be interesting, but would like to see the data normalized and were uncertain about whether the results actually demonstrated the impact of the reports.

### **1:30 – 2:45p ERE and Economic Competitiveness**

Presentation by Dr. Margaret Leinen (Scripps Institute of Oceanography, remote)  
Discussion led by Dr. Anthony Janetos

Dr. Leinen gave a presentation titled 'ERE and Economic Competitiveness.' She gave a perspective of the current science-policy landscape, noting the importance of science to economic growth. She also noted ERE makes significant contributions to economic growth and avoidance of loss. She then outlined several examples of such contributions, including how businesses rely on weather predictions to most effectively manage their shipping operations and how earthquake monitoring systems can provide sufficient early warning to protect critical systems and lives. She concluded by noting that we need to re-orient the perception of environmental research from a 'cause' to one that allows society to innovate, grow, and respond.

The committee expressed interest in changing the narrative around ERE and explored with Dr. Leinen whether a framing of value as loss prevention and avoidance of harm or a framing of value as creation of economic opportunity would be more effective. They also discussed how the NSF and broad ERE community needs to be able to articulate these impacts and the value of ERE since value emerges from the body of scientific work more so than from the individual investigator. The committee also discussed the importance of ensuring that the need for basic science isn't lost among the applications of that science within frames of this type.

### **3:00 – 4:15p Broader Impacts Panel**

NSF I-Corps: Dr. Lydia McClure (NSF)  
Consortium for Ocean Science Exploration and Engagement (COSEE): Dr. Rick Tankersley (UNC Charlotte)  
NSF / NOAA Partnership: Dr. John Cortinas (NOAA)  
Discussion led by Dr. Julia Parrish

Dr. McClure spoke about NSF's I-Corps program and the lean-start up model they use to help PIs explore the value of their innovations and develop initial strategies for bringing their innovations to the market. Dr. Tankersley discussed the networking model used by the Consortium of Ocean Science Exploration and Engagement as a means of amplifying the broader impacts of the ocean sciences community. And Dr. Cortinas explained how NOAA has partnered with NSF to identify and transform the science emerging from NSF's portfolio into useful tools and products supportive of NOAA's mission.

The committee then discussed the importance of helping scientists amplify the broader impacts of their science. The committee noted that many scientists are cognizant of the innate societal impacts of their work but are untrained in how to add to this. A committee member noted that many universities are moving toward innovation and implementation training, though other members expressed concern that scientists trained in innovation often leave academia. The committee agreed that capacity building and establishing partnerships are critical to helping scientists to improve the broader impacts of their work.

**4:15 - 5:00p Discussion with Convergence Working Group**

NSF Staff present: Dr. Tom Baerwald (SBE), Dr. Dean Evasius (EHR), (OIA), Dr. Saul Gonzalez (MPS), Dr. Brent Miller (BIO), Dr. Jessica Robin (OISE), Dr. Sarah Ruth (GEO)

Dr. Evasius gave the committee a summary of the Convergence Working Group's work to date and defined convergence as problem driven science that deeply integrates across the disciplines. He also noted that the merit review of convergence projects will likely examine the need for a convergent approach, the readiness to engage in convergence, the integration across disciplines, and the involvement of next generation researchers. Dr. Janetos then briefly summarized the content of the AC ERE's white paper on convergence and discussed how the committee selected the research areas it highlighted in the white paper.

The committee and the convergence working group together explored various aspects of convergence science. There was a rich discussion around understanding when a convergence approach is better than a more traditional approach and the obstacles for pursuing convergence research within siloed institutional structures. Members also discussed the difficulties of reviewing interdisciplinary proposals.

**Thursday – March 30, 2017**

**9:00 – 10:15a Environmental Change and National Security**

Presentations by Dr. Geoffrey Dabelko (Ohio University) and Rod Schoonover (National Intelligence Council)

Discussion led by Roger Mark De Souza

Dr. Schoonover gave a presentation titled 'The Implications of Environmental Change on National Security.' In it he discussed how environmental impacts become national security issues and posited many environmental science questions relevant for ensuring national security. Dr. Dabelko then gave a presentation titled 'Environmental Change and National Security.' He discussed the history of research

focused on understanding the connections between environmental change and security and outlined the current cutting edge and emerging hot topics of this science.

The committee discussed how the NSF-supported investigators can help address the research questions of the national security community. Dr. Schoonover noted that security always has human dimensions, so it is important to connect the social and natural sciences in this space. The security community is also predominantly interested in short (e.g. 0-5 years) to medium (e.g. 5-25 years) time horizons instead of long (100+ year) predictions. Although the security agencies do a lot of science, often in partnership with academic researchers, the flow of non-classified knowledge back to the broader scientific community is minimal. The committee agreed that the NSF is well-positioned to facilitate and encourage greater interaction between the academic research community and the national security community.

**10:30 – 11a Prepare for discussion with NSF leadership**

The committee discussed possible questions for NSF leadership and decided that several committee members would provide brief updates on the committee's current activities.

**11:00 – Noon Discussion with NSF Director France Córdoba and Acting Chief Operating Officer Joan Ferrini-Mundy**

After Dr. Janetos welcomed the Director and Chief Operating Officer (COO) to the meeting, Dr. Cordova welcomed the committee to the NSF and highlighted several of NSF's current activities – including Convergence, INCLUDES, and her recent visit to the Hill for the Arc of Science. Various committee members provided brief updates on the committee's current activities, including the Gold Report white paper, the Sustainable Urban System white paper, and the Convergence white paper. The subsequent discussion focused predominantly around NSF's work on Convergence.

**Noon – 12:30p Working Lunch – Prepare for Discussion with NSF ADs**

The committee took some time during lunch to prepare for its forthcoming meeting with the Assistant Directors.

**12:30 – 1:30p AD Roundtable on Big Ideas**

Dr. Jim Olds (AD, BIO) – Rules of Life

Dr. Jim Kurose (AD, CISE) – Harnessing the Data Revolution

Dr. Scott Borg (Acting AD, GEO) – Navigating the New Arctic

Dr. Fay Cook (AD, SBE) – Work at the Human Technology Frontier

Drs. Olds, Kurose, Borg, and Cook each described NSF's current work on 4 of the Big Ideas. The subsequent discussion focused on the intersections of these Big Ideas with NSF's ERE portfolio. The ADs noted that program directors from many directorates are working in working groups to develop these Big Ideas and integrate perspectives from across NSF – including the ERE portfolio. The committee noted strong ties between ERE and harnessing data. Dr. Cook asked the committee to identify points of intersection between ERE and the Work at the Human Technology Frontier Big Idea.

**1:30 – 3:00p    Wrap Up Discussion**

The committee approved the minutes from the November 2016 teleconference. Members then agreed that the committee should pursue the topics of economic competitiveness and national security, but wanted to take some time to discuss the committee's goals and develop a plan for addressing these topics. They agreed to spend some time during the summer teleconference to discuss their goals and process.

The committee then returned to their discussion of the Gold Report supplemental white paper and approved it pending minor edits. The committee also urged that the white paper be distributed widely throughout the agency and delivered to all of NSF's other Advisory Committees.

**3:00p            Adjourn Meeting**