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

5 & 6 April 2023

Summary Minutes

Committee Members in Attendance: Andrés Clarens, Vicki Grassian, Kimberly Jones (Chair), Diane Pataki, Raina Plowright, Robin Leichenko, Amanda Lynch, Benjamin McCall, Claire Monteleoni, Bo Li, Ada Monzon, Rodolfo Torres. Committee Members Absent: Cathy Whitlock, Daniel Wildcat.

NSF Staff: Arnoldo Valle-Levinson (GEO, Executive Secretary for AC ERE), Alicia Knoedler (OIA), Steve Meacham (OIA), Bruce Hamilton (ENG), Brandi Schottel (ENG), Una Alford (OIA), Ashley Pierce (ENG), Allen Moore (BIO), Amanda Haes (MPS), Tom Evans (SBE), Lori Takeuchi (EDU), Kemi Ladeji-Osias (ENG), Kim Littlefield (OIA), Bernice Anderson (OIA).

Wednesday, April 5th, 2023

11:00 - 11:30 am Welcoming Remarks

Alicia Knoedler, Head, Office of Integrative Activities, NSF. Alicia introduced the new members of AC-ERE: Bo Li, Ada Monzon, and Rodolfo Torres. She also gave an overview of NSF's budget, of NSF's new initiatives, of the AC-ERE status, and of the meeting agenda. At the end, Dr, Knoedler took questions.

11:30-11:35 pm Committee Business
The minutes of the September 2022 meeting were approved.

11:35 – 12:45 pm NSF and Research Community Collaborations to Broaden Institutional Participation in Environmental Research and Education.

Session moderated by Dr. Kimberly Jones.

Dr. Kimberly Littlefield, an NSF Program Director in OIA, described the program, Growing Research Access for Nationally Transformative Equity and Diversity, GRANTED (PD 23-221Y). This program is relevant to all of NSF's major themes, including building a resilient planet and creating opportunities everywhere. GRANTED focuses on 8 different sectors: research development, technology commercialization, research administration, policy, leadership, integrity, training, and corporate relations. The program addresses systemic barriers by improving research capacity in emerging and underserved institutions. A recent funding opportunity is described in a Dear Colleague Letter (NSF 23-152). Information on the program has been disseminated through virtual office hours.

Dr. Littlefield described the Research Enterprise as composed of three parts: i) Institutions & Organizations, ii) Researchers, and iii) Staff & Administration. GRANTED looks for bold ideas to

promote research enterprise support. Dr. Littlefield noted points of intersection between GRANTED and ERE and also emphasised NSF programs for Excellence in Research for HBCU and for Minority Serving Institutions.

Dr. Raj Pandya, a VP for Community Science for the American Geophysical Union (AGU) gave a presentation. Dr. Pandya talked about the goals in AGU's strategic plan: advancing science, advancing inclusion, and building partnerships. He described AGU's emphasis on *Community Science* to advance community priorities and needs. He further described allyships for communities that tackle environmental and climate injustice. He encouraged NSF in its support for Emerging Research Institutions and their staff and students by enabling, recognizing, rewarding, and sharing their leadership in community science and scientific justice. He suggested several different approaches to lowering barriers to participation (streamline or stage grant application processes; more planning/development grants; share financial infrastructure; grant training by and for ERIs; engage ERI personnel more in the review process; fund more community science; define and require equitable partnerships; and change the culture of science.

The session closed with Robin Parent, Associate Vice President, DEI and STEM Education, and Wendy Fink, Associate Vice President, Food, Agriculture & Natural Resources and ED, Academic Programs, both from the Association of Public and Land-grant Universities (APLU). Robin talked about APLU and its mission, in particular related to Broadening Participation. Wendy talked about the Commission of Food, Environment, Renewable Resources. She mentioned that for the Board of Agriculture Assembly, broadening participation looks like embedded diversity and advocacy for equity.

The presentations were followed by discussions centered around two framing questions:

1. How can Emerging Research Institutions build capacity at the institutional level?
2. How do we get feedback on appropriate methods for engagement with Emerging Research Institutions and other institutions?

12:45 – 12:55 pm **Break**

12:55 – 2:25 pm **Water Availability and Security: Impacts for Environmental Systems**
Moderators: *Cathy Whitlock and Andrés Clarens*

Dr. Whitlock introduced the session. Dr. Valle-Levinson talked about NSF funding related to water issues based on award searches using the terms *Water Quality*, *Water Quantity*, *Water & Climate*, *Water Availability*, and *Water Security*.

Dr. Thomas Hertel, Distinguished Professor of Agricultural Economics, Purdue University, discussed an AccelNet project on the sustainability of land and water resources. He mentioned the global impacts of groundwater extractions and pollution by phosphorous and nitrogen. He emphasized a) the economic impacts of water issues; b) the spatial resolution of water issues: local vs global; c) labor markets and equity; and d) climate policies. He encouraged a global to local and back to global perspective.

Dr. Mark Stone, Professor of Civil, Construction, and Environmental Engineering & Director of UNM Resilience Institute, University of New Mexico, talked about a Sustainable Regional Systems Research Networks (SRS-RN) project. The key focus of the network is to increase awareness of natural hazards (droughts, wildfires, and floods). Dr. Stone gave an example of the gradual shrinking of several lakes in New Mexico and Arizona. He mentioned the decreased water

availability and security from high air temperatures and human extractions. Wildfires are breaking records because of fuel loads (land-management practices), drought conditions (warmer temps); and human interactions (downed power lines on windy days). He highlighted a couple of projects related to headwaters in the U.S. and throughout the Americas.

Dr. Doug Maughan, Office Head, NSF Convergence Accelerator talked about Convergence Accelerator opportunities that deliver solutions with national societal impact. A Dear Colleague Letter invites the community to submit ideas to organize workshops that assist NSF in selecting convergence research track topics (NSF 23-066). The main goal is societal impact and sustainability. Of particular relevance to this group is Track K, Equitable Water Solutions, looking for real-world solutions to address sustainable water supply systems and use of continual watershed planning for equitable access to safe water supplies. This includes a whole-of-society approach with direct community engagement and co-design for addressing water resilience, i.e., long-term reliable solutions for the Nation. He invited the audience to consult the web page.

The three presentations were followed by a Panel Discussion. Dr. Clarens talked about previous efforts by the AC-ERE that produced relevant reports and recommended that future efforts build on the AC's earlier work.

The discussion started with the need for social scientists to bridge disciplines on these topics. Dr. Lynch brought up relevant activities at the World Meteorological Organization. Dr. Grassian mentioned the environmental problems that link water with air and climate through greenhouse gases.

Dr. Whitlock asked Dr. Maughan about international partnerships through the Convergence Accelerator. Dr. Maughan mentioned that they are figuring out how to do it because water problems are global. Discussions then centered on approaches to international collaborations with NSF.

The discussion was framed around three questions**:**

1. Are there pressing topics related to water security and availability currently not emphasized at NSF (solicitations and/or awarded projects)?
2. Is there sufficient focus on linkages between water and other environmental systems (e.g., air, land, climate)?
3. What are your thoughts on the potential for societal impacts from NSF's current portfolio of water-related projects? Should other issues be emphasized along with/instead of?

2:30 – 3:00 pm Break

2:45 - 3:30 pm Preparation for Discussion with NSF Senior Leadership

The discussion centered on Broadening Participation and NSF's GRANTED program in particular.

Thursday, April 6th, 2023

11:00 – 11:15 am **Discussion from Day 1**

Dr. Jones gave an overview of Day 1

11:15 – 11:30 am **NSF Global Centers Solicitation**
Paul Raterron, NSF, Office of International Science and Engineering

Dr. Raterron presented the Global Centers solicitation for interdisciplinary, use-inspired research on climate change and clean energy, a collaboration with agencies in Australia, Canada, and the United Kingdom. Dr. Raterron described two Tracks: Track 1 for Global Center Implementation; and Track 2 for community-driven Global Center Design. The discussion centered on 'use-inspired' research vs 'translational research.'

11:30 – 12:30 pm **Environmental Equity: Continuing the Discussion**
Moderator: *Kimberly Jones*
Subcommittee Members: *Andrés Clarens, Kimberly Jones, Robin Leichenko, Amanda Lynch, Claire Monteleoni*

Panel:
Renee Collini, Director, Gulf Center for Equitable Climate Resilience, The Water Institute

Dr. Collini provided personal context and talked about different research phases: *Scoping*, *Conducting,* and *Disseminating* Research.

In *Scoping*, one should include considerations of equity and justice, and determine the areas of research that have been understudied. Part of the considerations should be whether we scope 'for' our own benefit or scope 'with' collaborators. Listening and learning without adding burden or work. Define 'hammers' and 'nails'. Understand history and context of research. Work within existing relationships.

In *Conducting*, co-develop or co-conduct research by exploring questions together. Define whether it is community-led or community-informed research. Acknowledge power structures. Value knowledge equitably; address intellectual property; and explain extractive research practices.

In *Disseminating*, consider who you are sharing your research with and how the results are disseminated.

Dr. Collini presented a couple of case studies that illustrated *Scoping*, *Conducting*, and *Disseminating.*

Things to consider include: language justice, working with existing relationships, building on trust, developing skills to engage with communities,

Marccus Hendricks, Director of Stormwater Infrastructure Resilience and Justice Laboratory, University of Maryland and Senior Advisor, Council on Environmental Quality.

Dr. Hendricks talked about an infrastructure crisis, as indicated by the American Society of Civil Engineers. Social stratification is affected by this crisis. He also distinguished between Environmental Justice and Social Vulnerability, noting that social failures have resulted in infrastructural processes challenges.

Dr. Hendricks talked about his Stormwater Infrastructure Resilience and Justice Lab and the research on sustainable infrastructure he has been conducting. He closed by saying that equity in infrastructure includes procedural, distributive, and restorative justice. Community science is essential to plan a resilient society.

Discussions centered on how to engage communities and students effectively and ethically. Comments were made on community engagement courses and citizen science.

12:30 - 1:00 pm Break

01:00 - 1:30 pm Liaison Reports

Rodolfo Torres (MPS) mentioned efforts in conjunction with ERE to list the topics where there is common interest. He mentioned the need to continue with curiosity-driven research.

Cathy Whitlock (GEO) discussed several activities going on in GEO, focusing on broadening participation.

Robin Leichenko (SBE) talked about initiatives focused on Equity and noted that SBE is receptive to interactions on activities related to the Environment.

Kimberly Jones (ENG) reported on ENG efforts related to broadening participation.

Ada Monzon (EDU) reported on EDU efforts associated with STEM education, and talked about activities that drive inspiration from natural resources to enhance STEM education.

1:30 – 2:30 pm Minimizing Environmental Impacts of Research

Moderator: *Benjamin McCall*
Interest Group: *Benjamin McCall, Vicki Grassian, Kimberly Jones*

Dr. McCall outlined the session, then showed a timeline of the efforts geared toward this topic, emphasizing the draft of a white paper. He went over the key points of the white paper. He underscored the impact of research on climate, particularly CO2 emissions and the limited efforts to engage PIs on this topic, although the Signals in the Soils program has moved in that direction. In proposing projects and considering broader impacts in the review process, the focus has been on the positive aspects of research, rather than the negatives.

Dr. McCall reported on plans for discussions with other advisory committees where questions might include: a need for examples; where in a proposal would a statement about mitigating impacts on the environment best be included? How to describe the impacts? Some impacts are out of PI's control. The Interest Group also provided feedback related to how to measure impact as there are inequities in institutional capabilities, should it become an evaluation criterion. The approach should remain flexible as this evolves.

The current thinking is that there should be an increase in awareness, develop actionable advice and measure impact of recommendations. As the next steps, Dr. McCall will introduce the idea to other ACs and solicit feedback; then prepare a white paper for the fall meeting.

Dr. McCall gave an opportunity for other AC members to react to the comments. Dr. Monzon said that the reducing the environmental impact of research should be treated as a bonus in evaluation

of proposal. Dr. Li agreed that a few sentences could be included in the Broader Impacts, with low, medium, or high risk to the environment. Dr. Whitlock worried about taking up space in the proposal if it would not be used to evaluate the proposal, and was concerned that it might be burdensome on institutions and PIs. Dr. Pataki thinks it might be part of the methods (or Broader Impacts) and it'd be best to think of socio-environmental impacts. Dr. Plowright provided comments on the white paper. Dr. Leichenko agreed that it would be a long process to get this through. Dr. Torres indicated that there could be some guidelines and best practices but was cautious about implementing more requirements in a proposal. Dr. Grassian indicated that we want to move beyond business as usual. Step 1 should be awareness and socializing people to this topic.

Melanie Buser, Asst. Director for Environmental Health, OSTP
Dr. Buser started talking about Environmental Health Initiatives at OSTP and opportunities to pursue partnerships with AC-ERE. She mentioned topics on drinking water contaminants; sustainable chemistry & biotech as well as VA toxic exposures research, air quality, and community health. Exposing health inequities can enable more impactful policy decisions by the community. She mentioned environmental drivers of cancer. Then she talked about exploring collaborations with this team. She mentioned Administration priorities related to the environment.

Dr. Buser discussed themes related to leading with principles of sustainability; citizen and community science; leveraging local partnerships; and the use of e-medicine and telehealth. From the discussion came the suggestion that the topic be called "Enhancing Environmental Sustainability of Research"

2:30 – 3:00 pm **Building a Resilient Planet**
Tim Patten, GEO Deputy Assistant Director
Dr. Patten talked about the motivation of NSF's plan for Building a Resilient Planet, which is driven by the importance to society of climate and energy. He mentioned that the emphasis in this plan is on the response of Earth's systems to a changing climate; on adaptation and resilience; on clean energy technologies; on nature-based solutions; and on greenhouse measurement and removal. He touched on selected FY2024 budget request activities: national resilience networks; clean energy convergent coordination hubs; sustainable regional systems; design for extreme environments; and biofoundries. He concluded that Building a Resilient Planet takes on the challenges the US faces today; that it advances CHIPS and Science Act priorities; and that NSF brings expertise to resilience research from all disciplines.

3:00 – 3:30 pm **AC-ERE Discussion Wrap-up**

Dr. Jones led a discussion on the Broadening Participation theme. Discussion centered on activities that lead to building networks and engaged research and on accessibility to NSF funding. Conversations also revolved around open access publication and the socio-economic implications of the publishing enterprise.

3:30 pm **Adjourn**