

**Meeting Minutes**  
**CEOSE Advisory Committee Virtual Meeting**  
**National Science Foundation (NSF)**  
**February 17-18, 2022**

***Day 1: February 17, 2022***

**Welcome, Introductions, Meeting Overview: Dr. Jose D. Fuentes, CEOSE Chair; \*NSF CEOSE Executive Liaison Report –Dr. Alicia Knoedler, OIA/Office Head**

**\*This portion of the meeting was conducted at the beginning of Day 2.**

Dr. Jose D. Fuentes, CEOSE Chair, opened the meeting, welcomed new members, and called for self-introductions of the current members. Dr. Fuentes commented that the new members had participated in an orientation session prior to the full meeting of the Committee. He also provided an overview of the meeting agenda. The Executive Liaison report was moved to Day 2 of the meeting.

**Presentation: CEOSE Subcommittee's Interim Report on the Future of EPSCoR – Dr. Jose D. Fuentes and Dr. Kelly Rusch, Co-Chairs of the Subcommittee**

Dr. Kelly Rusch provided a progress presentation about the work of the Subcommittee on the Future of EPSCoR (Established Program to Stimulate Competitive Research). EPSCoR was established to stimulate competitive research, with its goal to enhance research competitiveness and capacity of our STEM infrastructure in targeted jurisdictions – currently 28 eligible jurisdictions – determined by a five-year running average of NSF R&D dollars that a state or jurisdiction receives. A document review was conducted of various EPSCoR solicitations, internal and external visioning documents, external evaluations, and public comments collected via a Dear Colleague Letter between September and November 2021, receiving 49 responses. The subcommittee coordinated and held six listening sessions around targeted groups of stakeholders, held between September and October 2021. Upon review of the data, the subcommittee divided into four working groups – education/workforce, broadening participation, research capacity/infrastructure, and economic development. Each group analyzed the same data and responses through different lenses based on the topic of the group to capture all angles. Three key areas for future actions were: a) expanding and supporting human capital, especially for underrepresented groups; b) strengthening resources and infrastructure, including the modernization of facilities and research tools; and c) building bridges and requiring partnerships within and across NSF, EPSCoR and non-EPSCoR jurisdictions, as well as sharing ideas and synergies through collaborative proposals that include coordinated and strategic work with private enterprises, K-12 schools, and community organizations. CEOSE members provided positive feedback on eight recommendations, encouraged deeper connections of the data to the EPSCoR goals, offered some suggestions for addressing the recommendations discussed.

**Presentation: Geography of Innovation – NSB Chair and Members: Dr. Ellen Ochoa, Chair, NSB; Dr. Anneila Sargent, Chair, NSB Committee on Oversight; and Dr. Roger Beachy, Chair, Vision 2030 Task Force**

The NSB Vision2030 report published two years ago framed the presentation and discussion by NSB leaders. Some of the key points included:

- NSF continues to support the best research and people to create knowledge that benefits us all.
- US is at an inflection point – science and engineering research and development is increasingly global; knowledge and technology intensive industries are playing a larger role in the US and global economies.
- The demand for STEM talent is growing.
- States vary in size and composition of their STEM workforce in their venture capital investment; the focus on the geography of the innovation roadmap elevates attention to the many interrelated elements that contribute to creating science and technology hubs and the geography of innovation.
- The challenge for NSF (and entire S&E ecosystem) is to determine how we can create more hubs and bring more states and regions and a wider variety of people into the fold.
- Critical input to innovation is human capital; crucial to developing the domestic STEM talent edge is making quality K-12 STEM education accessible to students in all states.

In consideration of the future role of NSF and expanding the geography of innovation, NSB encouraged CEOSE to engage in the ongoing dialogue to help answer and/or find innovative solutions to questions like: What can be done to get NSF funded educational research off the shelf and into classrooms to strengthen K-12 STEM education nationwide? How can we build on the EPSCoR initiative as newly defined to further efforts in building research and educational capacity at all higher education institutions, as well as MSIs, urban vs rural, and EPSCoR vs non-EPSCoR states? What other NSF program(s) might more explicitly address geography? How might expanding the geography of innovation be more explicitly integrated in broader impacts, or into the NSF approach to broadening participation? The NSF Chair emphasized that geography is an important dimension of diversity in the STEM enterprise.

The discussion with NSB also included highlights about a recently formed working group to explore what the board might do to help improve K-12 STEM education; the new Technology, Innovation, and Partnership (TIP) directorate aimed at delivering benefits from research by supercharged research outcomes and speeding up the cycles of discovery and innovation with the expectation that more technology will be more readily available to people; and the emphasis on identifying metrics that actually demonstrate success, especially related to broader impacts of awards. Questions for further discussions were: Do you have some concept of what success looks like in expanding the geography of innovation? What are the best strategies and/or practices and what has been particularly impactful?

**Discussion: Data Questions for the NCSES Hackathon – Dr. Kaye Husbands-Fealing, CEOSE Vice Chair**

CEOSE members had a brainstorming session about what are the kinds/types of data needed from NCSES to address the issues of intersectionality, going beyond the intersections of gender, ethnicity, and

disability status. This discussion included members discussing how to enhance several of the tables in the recent *Women, Minorities, and Persons with Disabilities in Science and Engineering* report. Other suggestions included how to make BP data more accessible in interesting ways such as an analysis of HSIs that provide useful information about the low vs high resource HSIs for baccalaureate origins of Hispanics STEM graduates; a review of faculty demographics overlaid on enrollment and STEM degrees and how does that vary across institutions; deeper examination of attrition rates across various demographic populations; and time series disaggregated data analyses about the types of institutions that students are attending, etc.

### **Discussion: CEOSE Liaison Reports – CEOSE Liaisons**

Several reports for Advisory Committee (AC) meetings were presented. Dr. Vernon Morris highlighted the GEO AC activities with BIO and described GEO's engagement with the American Geophysical Union. He also shared information about GEO's new solicitation, Cultural Transformation in Geosciences. Dr. Suzanne Barbour stressed that the BIO Directorate is renewing its commitment to building the pipeline and broadening participation, calling attention to programmatic efforts Leading Cultural Change Through Professional Societies of Biology (NSF 22-542), Building Research Capacity of New Faculty in Biology (NSF 22-500), and Research and Mentoring for Postbaccalaureates in Biological Sciences (NSF 22-506). Dr. Ryan Emanuel shared that the OPP AC has a Subcommittee on Diversity and Inclusion in the Polar Sciences, and it was motivated by the past CEOSE report regarding the need for increased sensitivity to diverse community engagement and impact. Dr. Kaye Husbands-Fealing discussed a few of the topics of the EHR AC meeting, including engagement with the new TIP directorate, increased emphasis on the career technical workforce, and challenges related to college payoff. Dr. James Martin noted that discussions at the ENG AC meeting also addressed partnerships, innovation, and broadening participation, as well as emphasizing the lessons learned from the COVID pandemic from multiple perspectives of the haves and have nots in terms of individuals, institutions, and geography. Dr. Sandra Graham reported that SBE AC is requesting more information about who is applying and who is getting funded, as well as what feedback is given to unsuccessful proposals. Dr. Timothy Pinkston provided the overview of the CISE AC meeting with special emphasis on CISE's various convenings of MSIs. Dr. Tabbetha Dobbins provided a summary of the MPS AC meeting and highlighted several new BP programs (e.g., Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences – NSF 22-503 and MPS ASCEND Mentoring – NSF 22-524).

### ***Day 2: February 18, 2022***

### **Opening Remarks – Dr. Jose Fuentes, CEOSE Chair**

The Chair provided a recap of day one, briefly discussed the outcomes for day two, and called for the Executive Liaison report. Also, Dr. Fuentes stressed that the Government Accountability Office is interested in learning how the CEOSE recommendations are implemented by NSF.

Dr. Alicia Knoedler presented the Executive Liaison Report, covering a range of topics/areas: NSF logistics/timeline remote work and to the building; the NSF involvement in the collaboration between Intel and the White House in Ohio where there are BP workforce opportunities to advance semi-conductor design and manufacturing; an upcoming presentation to NSB about the Equity Ecosystem and NSF; the tracking of nine executive orders that are connected to BP, diversity, equity, and inclusion; and

that NSF is seeking nominations for the National Medal of Science through May 20<sup>th</sup>. – The NSF INCLUDES update focused on the five new alliances and the expansion of the membership and activities of the NSF INCLUDES National Network.

### **Working Session: BP Data Hackathon with NCSES - Dr. Amy Burke, SBE, NCSES**

Dr. Amy Burke provided an overview/update about the available NCSES data resources. The data briefing covered topics from innovation to R&D to STEM education and workforce. Reports available on the website (<https://nces.nsf.gov/>) show trends over time. She pointed out that the nature of the STEM workforce has changed, the reports on STEM workers now include the skilled technical workforce. Dividing in three working groups, the hackathon activities included the introduction to the NCSES data tool – introductory level, hands-on demonstration of how to use the tool to conduct some of the analyses important to BP stakeholders, and the website navigation/demonstration of the table and chart builder tool.

### **CEOSE Discussion: Topics/Ideas to Share with Leadership**

The members identified numerous issues to discuss with NSF leadership during the next session and/or in the future. They included the following: How are we trying to diversify faculty to match up with student recruitment, retention, and success? Do we need an additional merit review criterion focused on equity and not solely on BP (in the proposal appraisal process)? How do we address inequality issues within geographic funding? How is NSF's programmatic engagement with industry helping to advance inclusion in STEM? Additionally, members pointed out the need to mine NSF data to report on program impacts on different populations and to show how well various populations are being supported, as well as the need to support more research to understand culture and the trajectory of STEM careers.

### **Discussion with NSF Leadership –Dr. Sethuraman Panchanathan, NSF OD, Director and Dr. Karen Marrongelle, NSF OD, Chief Operating Officer**

The Chair welcomed Drs. Panchanathan and Marrongelle to the meeting and provided a synopsis of the meeting presentations and discussions. Dr. Panchanathan welcomed new members and expressed deep appreciation for the service and commitment of all members. In his opening remarks, the NSF Director commented on launching the TIP Directorate, the financial commitment to STEM research at MSIs, his outreach activities to the HBCU and HSI communities that included separate meetings with the leadership of HBCUs and HSIs. He applauded CEOSE's presentation to the NSB in December 2021 and strongly expressed his support of the collaborative engagement between NSB and CEOSE, underscoring the positive response of NSB (and NSF) to the suggested leadership actions in the current CEOSE report.

The membership discussed the differences between equity and BP in the context of cultures and broader impacts. Drs. Panchanathan and Marrongelle were supportive of the notion that an equity focus is needed to be successful in BP and further commented that there is a need for cultural systemic change to reach the Missing Millions. Dr. Marrongelle added that BP is not distinct from racial equity; they require different lenses and solutions. Therefore, according to the Director, NSF is trying to put in place mechanisms to ensure people and ideas are not left behind (as they have been) and create infrastructure to get those ideas to rise to the level of competing and succeeding.

Dr. Panchanathan commented on his various engagements with industry leaders, pointing out that these leaders want a diverse workforce to advance productivity and innovative outcomes. TIP, for example, will be proactive and intentional with industry partnerships/collaborations. NSF leaders agreed with CEOSE that we need to think creatively and differently about both accelerating innovation across the country and increasing the number of underrepresented groups participation in the economy. Dr. Marrongelle used the community college transfer example to emphasize the need to do things differently. More specifically, the transfer challenge discussed was about being supportive of students starting their career pathways at a community college, but they have to retake half a dozen of their courses at a university because the courses taken at the community college are not accepted as meeting university standards. This example was used to point out the urgent need to collectively look at our practices and understand where we are putting up barriers and where we can take them down. The Director concluded the session by stating that “there needs to be tough decisions within our organizations to stop doing some things and to start doing other things that we know work to keep students on their path” to successful STEM careers.

**Data Discussion: Demographic Data Collection: Ongoing Efforts to Improve Measurement in the Face of Complexity – Dr. Clemencia Cosentino, Section Head, OIA, EAC; Mr. Vernon Ross, Senior Advisor NSF, OD, and Dr. John Finamore, Chief Statistician, SBE, NCSES**

Dr. Clemencia Cosentino led the discussion about NSF’s ongoing efforts to improve demographic data collection, highlighting the new data collection tool, Education and Training Application (ETAP). ETAP is a new platform for connecting applicants, students, post-docs, teachers to opportunities in one location. One of the benefits is reducing burden by allowing students to apply to multiple opportunities through one application. Dr. John Finamore discussed the role of NCSES as a clearinghouse for data on the S&E enterprise, including the collection of data through surveys and other means to help inform conversations about underrepresentation and other policy issues of interest. In acknowledging CEOSE’s interest in measurement challenges in collecting data for underrepresented populations, he stressed that the critical goal is to collect data in a manner that is responsible and that aligns with the needs of agencies, while protecting the privacy and burden of concerns of the American public. Executive Order 1395 has an emphasis on the need to collect better data for underrepresented and underserved populations. Dr. Finamore reiterated the need to avoid collecting data, where disclosure or privacy/confidentiality concerns prevents researchers from using the data. He raised the following concerns about work related to sexual orientation and gender identify: how to best collect data on gender sexual orientation, whether the data could be collected in a way that ensure that people understood the concepts being measured, to what extent would respondents feel comfortable providing that information, and how representative are the data in terms of national population and whether the data can be disseminated where it could still have high utility value. Dr. Ross also stressed the importance of privacy and confidentiality in collecting NSF administrative data. He discussed that one of the ways to reduce that burden and improve data quality is to use a unique identifier so that once you have demographic information on someone, you do not keep asking for it again. This options and other measurement concerns are being discussed by the OMB Equity Data Working Group, created by Executive Order 1395. CEOSE discussed with presenters the value of evidence-based policy making, the need to track participants across multiple programs/activities, the need to link national data systems to conduct longitudinal studies, and the need to have data in a timely manner.

## **Announcements and Final Remarks**

The Chair reminded CEOSE Liaisons to continue to have a strong presence at the advisory committee meetings. Members were encouraged to send the Chair any additional suggestions for the report on the future of EPSCoR. The next CEOSE meeting will be a virtual meeting in June and will include working/writing sessions focused on the 2021 – 2022 biennial report to Congress. The co-leads for writing the various sections of the report were suggested and the meeting was adjourned.