

**COMMITTEE ON EQUAL OPPORTUNITIES IN  
SCIENCE AND ENGINEERING**

**MEETING MINUTES  
June 19, 2012**

**MEETING PARTICIPANTS**

**Members Present**

**Dr. Karl S. Booksh**, University of Delaware, DE  
**Dr. Cecilia Conrad**, Pomona College, Claremont, CA  
**Dr. George Middendorf**, Howard University, Washington, DC  
**Dr. Evelynn Hammonds**, Harvard University, Cambridge, MA  
**Dr. Ira Harkavy**, University of Pennsylvania, Philadelphia, PA  
**Dr. Marigold Linton**, University of Kansas, Lawrence, KS  
**Dr. Maria (Mia) Ong**, TERC, Cambridge, MA  
**Dr. Eugenia Paulus**, North Hennepin Community College,  
Brooklyn Park, MN  
**Dr. Alexander Ramírez**, San Antonio, TX  
**Dr. Wendy Raymond**, Williams College, Williamstown, MA  
**Dr. Keivan G. Stassun**, Vanderbilt University, TN  
**Dr. Joseph A. Whittaker**, Morgan State University, MD

**Members Absent**

**Dr. Lueny Morrell**, Hewlett Packard, Mayaguez, PR  
**Dr. Ainissa F. Ramirez**, Yale University, CT

**Federal Agency Liaisons to CEOSE Present**

**Dr. Katie E. Blanding**, United States Department of Education  
**Ms. Lisa Evans, J.D.**, National Institutes of Health  
**Dr. Linda Gunderson**, United States Department of the Interior  
**Ms. Susan Heller-Zeisler**, National Institute of Standards and  
Technology  
**Dr. Meldon Hollis**, White House Initiative on Historically Black  
Colleges and Universities  
**Ms. Era L. Marshall**, Smithsonian Institution  
**Dr. Donald Sweet**, US Geological Survey  
**Dr. Audrey A. Trotman**, National Oceanic and Atmospheric  
Administration  
**Dr. Jermelina Tupas**, United States Department of Agriculture

**Federal Agency Liaisons Absent**

**Dr. Paul T. Anastas**, United States Environmental Protection  
Agency  
**Ms. Evelyn Kent**, United States Department of Defense  
**Dr. Sara Klucking**, United States Department of Homeland  
Security  
**Dr. Jeremy Lawson**, NIST  
**Dr. Carl S. Person**, National Aeronautics and Space  
Administration  
**Dr. Muquarrab Qureshi**, United States Department of  
Agriculture

**CEOSE Designated Federal Officer – Executive Liaison**

**Dr. Wanda E. Ward**, Senior Advisor, Office of the Director, National Science Foundation (NSF)

**CEOSE Executive Secretary**

**Dr. Kelly Mack**, ADVANCE Program Officer, NSF

**OIA/NSF Primary Support Staff Members**

**Mr. Steven Buhneing**, NSF

## Non-Members Who Attended the Meeting, Participated in Discussions, and/or Made Presentations

|   |   |
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| <p>Dr. Morris Aizenman, OAD/MPS/NSF<br/>Dr. Gabrielle Allen, OD/OCI/NSF<br/>Ms. Nnenna Anonio, LFO/BFA/NSF<br/>Dr. Bernice Anderson, EHR/NSF<br/>Dr. Ugonna Bbefrogu, OD/OPP/NSF<br/>Dr. Ron Buckmire, EMR/DUE/NSF<br/>Ms. Joan Burrelli, Retired<br/>Mr. Michael Conward, NSF Summer Scholar<br/>Dr. Tessema Grebre, DMR/MPS/NSF<br/>Dr. Jong On Hahm, OISE/BIO/NSF<br/>Dr. Omnia El-Hakim, ENG/NSF<br/>Dr. Jaquelina (Jaqui) Falkenheim, NCSSES/SBE/NSF<br/>Ms. Sherrie Green, OD/OIA/NSF<br/>Dr. Bernadette Hence, WHI on HBCUs<br/>Dr. Jill Karsten, OAD/GEO/NSF<br/>Dr. Tim Killeen, OAD/GEO/NSF<br/>Dr. Fae Korsmo, OD/NSF<br/>Dr. Peter Lea, DUE/EHR/NSF</p> | <p>Dr. Lynette Madsen, DMR/MPS/NSF<br/>Dr. Cora Marrett, Deputy Director/NSF<br/>Dr. Krish Mathur, Department of Education<br/>Dr. Gail McClure, OAD/EHR/NSF<br/>Dr. Steven Meacham, OD/OIA/NSF<br/>Dr. Olayemi Olatunji, NCSSES/SBE/NSF<br/>Dr. Joeletta Patrick, NASA Office of Education<br/>Dr. Matt Platz, MPS/CHE/NSF<br/>Dr. Muriel Poston, HRD/EHR/NSF<br/>Dr. Elizabeth Rom, OCE/GEO/NSF<br/>Ms. Marilyn Suiter, HRD/EHR/NSF<br/>Dr. Subra Suresh, Director/NSF<br/>Dr. Mark Suskin, OCI/CISE/NSF<br/>Dr. Brandon Stephens, OD/OIA/NSF<br/>Dr. Barkot Teserna, Department of Education<br/>Dr. Sean Watts, DEB/BIO/NSF</p> |
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### Welcome and Introductions

The meeting was called to order at 9AM by Dr. Cecelia Conrad, Chair of the CEOSE.

Dr. Conrad introduced herself as the new Chair of CEOSE and opened the meeting with introductions of the CEOSE members. New members were asked to provide additional background details.

Dr. Conrad provided a report to the Committee on the Executive CEOSE Committee Meeting with the NSF Deputy Director. Dr. Conrad noted several major issues that were discussed. Details include the following:

**NSF Budget.** The budget was discussed at the strategic and practical levels for 2012 and 2013 fiscal years. Issues pertinent to CEOSE include, but are not limited to:

- Number of CEOSE meetings per year: CEOSE is asked to reduce its meeting expenditures. Other advisory committees have reduced to two meetings a year. A virtual meeting can be considered as an alternative.
- Lack of funding available for the mini-symposia.

**Metrics of Broadening Participation.** Discussion included: how best to interpret the budget in terms of percentages actually being spent on broadening participation; the broader impacts criteria; developing a plan to code the different ways that grants might satisfy the broader impacts criteria in terms of broadening participation vs. the other activities that are now listed as meeting the needs of that criteria overall.

**General Comments.** There is now a regular practice of a monthly conversation with NSF Executive Liaison and the Committee Chair and Co-Chair. Such meetings create an opportunity for CEOSE to provide input on decisions as they are being made or before they move to final decision making stages.

Dr. Conrad opened the meeting for questions, comments, and follow-up issues to be raised with the NSF Director. The following were suggested as topics for discussion:

- Mechanism for coding broader participation
- Challenges that would force CEOSE to have fewer meetings
- Limited to no data on broadening participation efforts across the NSF, limited tracking of broadening participation activity
- Lack of focus of NSF on underrepresented continents; there is significant engagement with Europe and Asia, but relatively little engagement in Africa, other parts of South America besides Brazil.
- Status of undocumented students who have had difficulty getting research experience because of prohibitions on employment and restrictions on federal funds
- HSI Dear Colleague Letter, and the current status of an HSI program in light of the 2014 budget being developed
- Objectives and plans for the Career/Life Balance conference that was announced
- Mini symposia; the role that they play; funding
- Metrics and the new broader impacts criterion
- Dr. Karl Booksh presented data from NSF Report on Minorities, Women and Persons with Disabilities in Science and Engineering
  - Increased representation for African-Americans and Hispanics (.13% percent/year) and Native Americans are statistically flat
  - Statistically negative trends for students with disabilities
  - Budget expenditures include: \$200 million for African-Americans; \$100 million for Hispanics; \$60 million for Native Americans; \$20 million for students with disabilities
  - Recognized need to educate and inform Congress

In response to the general comments, Dr. Ward noted the following:

- There is a government wide issuance asking all agencies to reduce conference costs by 30% percent; that will have an impact on site visits, amount of travel program officers can do for their site visits and other professionally related kinds of activity.
- NSF has been actively engaged in reviewing what is listed as broadening participation programs:
  - focused programs - entire budget is dedicated to broadening participation
  - emphasis programs – program has a track that focuses expressly on broadening participation among many other emphases or foci
- Two challenges exist: 1) accuracy in determining the level of the broadening participation investment in the NSF portfolio; 2) tracking/monitoring that investment with appropriate metrics.

### **Meeting with NSF Director and Deputy Director**

Dr. Subra Suresh and Dr. Cora Marrett joined the meeting. Dr. Suresh thanked the members for sacrificing their time to participate, and began the discussion with several opening remarks focused on the current status of broadening participation efforts across the NSF:

- The 2013 budget request by the President to Congress is slightly less than \$7.4 billion; that presents a proposed increase of 4.8% compared to the 2012 level. NSF budget continues to have bipartisan support and strong support in the administration.
- This year is 40th anniversary of Title IX. Event planned: the Career/Life Balance event tentatively scheduled for January 2013 to include partners outside NSF and outside the federal government (i.e., AAU and APLU).

- Presidential event for Champions of Change, recognizing individuals for their commitment to helping people with disabilities. Six of 14 have been supported by NSF.
- A Dear Colleague Letter was issued specifically addressing Hispanic Serving Institutions and regions.
- NSF Global Summit on Scientific Merit Review brought together 48 funding agencies, responsible for more than 90% of science and engineering funding on the planet. Goal is to examine shared principles and collectively engage them.
- Meeting with the executive director of the National Academy of Sciences to initiate mechanisms for bringing together the leaders from Sub-Saharan Africa to discuss ways in which NSF can enhance the scientific enterprise.

Dr. Marrett noted the following:

- Dr. Marrett acknowledged the new CEOSE leadership: Drs. Conrad (CEOSE Chair) and Ramirez (CEOSE Co-Chair).
- NSF desires CEOSE input on a range of issues including, but not limited to diversity and inclusion both within NSF and the external community.
- A proposal is being considered to create a council on diversity and inclusion similar to CEOSE. CEOSE input is needed in expectations for success of this council.

Dr. Suresh acknowledged the service of two outgoing CEOSE members who had served on the Committee for six years:

- Dr. Joseph Francisco
- Dr. Richard Ladner

Following opening remarks by Drs. Suresh and Marrett, CEOSE members posed several questions. The responses are as follows:

***CEOSE Question: What is the plan for collecting information for evaluation and assessment, tracking and improvement, especially with the anticipated shift in broadening impacts criterion.***

The Director responded by noting that:

- It is imperative that NSF develop criteria for tracking, assessing, etc. The input of CEOSE is welcome on this topic.
- NSF is aware of hidden broadening participation opportunities, including underrepresented continents with which NSF has not fully engaged, i.e., non-resilient parts of South America and Africa.
- Regarding the emphasis vs focused activities (noted earlier by Dr. Ward):
  - NSF is developing a new table of expenditures that will clearly list expenditures with consistency across directorates and offices and will allow NSF to report and interpret broadening participation in a consistent way.
  - After the table is finalized, it will be presented to the Committee on STEM Education (COSTEM) to gain consistency of definitions across the 15 federal agencies that make up the Council, and to assess rates of expenditure before outcomes are assessed.

***CEOSE Question: Is there thought about how to gather and track data on individual investigators who have had tremendous success in broadening participation, yet have not been in an emphasized or targeted program?***

Dr. Suresh:

- After the infrastructure is established, these kinds of data can be collected, collated and tracked.

***CEOSE Question: What is the plan for the Career/Life Balance conference? What role can CEOSE play?***

Dr. Suresh noted:

- No date has been set.
- NSF will provide leadership, policies and strategies that address this issue by engaging the university community, sister agencies; and by disseminating best practices, celebrating major successes.
- CEOSE is needed to provide ideas and insight on what can be done external and internal to NSF, disseminate information to the academic community, including minority serving institutions, particularly as it relates to women of color.

***CEOSE Question: Having collected data going back to 1985: the annual rate for African-American and Hispanic doctorates earned increased by only 0.15% a year; people with disabilities decreased statistically since '85 and American Indians have not increased at all. What can NSF do in its leadership role in “moving the needle”?***

Dr. Suresh noted:

- The NSF WIDER Program takes an institution wide approach to addressing undergraduate STEM education.
- NSF has directed efforts toward gathering and monitoring data over longer periods of time so there is sufficient data to answer such questions.

Dr. Marrett noted:

- The SBE Science of Broadening Participation effort will provide needed information on what works and under what kinds of conditions.

***CEOSE Question: How do you scale it up; given that the institutions that are most effective are very different from those that have the majority of the students that really want to pursue STEM degrees?***

Dr. Suresh noted:

- The Career/Life Balance initiative was launched at the agency level first, before scaling up to the White House, Association of American Universities and American Public and Land Grant Institutions.
- Before scaling up, NSF needs a minimum level of infrastructure, including capacity and opportunity to monitor success over time.

Dr. Marrett noted:

- Input from CEOSE is invaluable in this area, particularly since CEOSE members are themselves from different institution types.

CEOSE Response:

- Many of the problems related to broadening participation affect populations that are disadvantaged in multiple ways, therefore, single vector approaches are not going to move in any direction that is significant.
- It is necessary to address this in relation to the school and where people live.
- The approach should involve the range of scientific and social science knowledge to look at each case as an experiment in progress with multiple sites all over the United States to produce a very powerful global research project that would produce results to be assessed and studied on an ongoing basis for extraordinarily large percentages of young people around the world who are left out of the pathway.
- A Diversity Council would demonstrate NSF commitment at such an important time as this.

## Closing Remarks:

Dr. Marrett noted the following:

- The CEOSE Report to Congress can be important in acknowledging some of the successes in broadening participation, as well as the issues that remain to be addressed, with attention to novel approaches to be used in the context of informing the world about the urgency of broadening the participation of underrepresented groups.
- Dr. Suresh acknowledged the service of Dr. Marigold Linton and assured the Committee that their ideas and input are taken seriously.

## Broadening Participation Programs and Initiatives in the Geosciences Directorate

Dr. Tim Killeen, Assistant Director for the Directorate for Geosciences, was welcomed to the meeting. Highlights from Dr. Killeen's presentation on the broadening participation activities in the Geosciences Directorate are summarized below:

- Characteristics
  - GEO is the second largest directorate in the NSF.
  - There are three divisions; education and diversity is housed in the Directorate front office.
  - The GEO budget appropriation is \$880 million dollars.
  - Major facilities and centers occupy about 40 % of the budget.
  - Proposal load:
    - 4500 proposals/year; approximately 1400 awards
    - The success rate for GEO proposals is approximately 30%.
  - Areas of Interest:
    - Chemistry, climate sciences, upper atmosphere, space physics, dynamics of weather systems, the sun itself, solar terrestrial interactive, disasters such as hurricanes, tsunamis and oil spills, sedimentary geology and tectonics, oceanography, marine science
    - GEO manages a fleet of 22 ships.
- GEO is inherently interdisciplinary; links with biological, math, science and ecological science and physics.
- Strategic plan called "Geo Vision" has been created by the advisory committee.
  - Five major elements to this strategic plan: 1) fundamental understanding and prediction, 2) extreme events, 3) hazards improved resiliency, 4) how can we protect and sustain life and 5) human capital and capabilities.
  - Focus on thriving vs sustainability: Sustainability allows for sustaining environments, good and bad; Thriveability implies maintaining quality of life in lieu of limited resources, global environmental change, interactions between societal purposes and the natural bio physical substrate that support life.
  - Human capital focuses on engagement, bringing people into learning spaces.
- Education and Diversity Strategic Plan
  - Advancing public literacy in a system science
  - Pathways for building the geoscience workforce for the future
    - less than 10,000 a year graduating at the undergraduate level, declining at the MS and Ph.D. levels
  - CEOSE insight needed on how to engage students

- Barriers to student engagement:
  - Earth science is taught mostly at middle school; no AP courses in geology anywhere in the country.
  - Less than 25% of all high school students take earth science coursework despite its incredible importance to the future.
  - Only 3% of high school STEM teachers have their highest degree in a geoscience field.
  - SAT tests do not include geoscience as a major theme.
  - Many universities do not accept earth science as a laboratory class credit.
  - Only 17% of community colleges offer geoscience programs.
  - Few geoscience programs exist at underrepresented colleges and universities.
  
- Broadening Participation Progress within GEO
  - 20.3% of GEO proposals were submitted by women PIs.
  - Women comprised 38% of the committee of visitors, 32% of advisory committees and 33% of scientific staff.
  - Formal training in unconscious bias for all of our supervisors within the geosciences is required, particularly for recruitment of new staff.
  - PI from underrepresented groups have submitted almost 5% of the GEO proposals and received 4.1% of the awards.
  - Underrepresented minorities comprised 9% of the COVs, 12% of the GEO advisory committee and 6% of the scientific staff.
  - 1% of GEO proposals came from PIs with disabilities of record; 1% of the GEO awards went to PIs with disabilities of record.
  - 9% of the GEO staff reports disability status of different types.
  - Opportunities for Enhancing Diversity in the Geosciences (OEDG)
    - Initiated 10 years ago
    - Targeted program funded annually
    - Competitions are held every two years.
    - Since 2001, of 622 proposals, 236 awards have been made.
  - Other GEO Supported Activities include:
    - ocean discovery
    - citizen projects
    - field trips
    - institutes and science and technology centers: Jackson State University has the first HBCU earth systems major; a Native American tribal college has the first hydrological major.
    - Partnerships
    - Workshops
    - Mentoring: multi-year mentoring and research experiences with undergraduates and graduates in underrepresented groups
    - clearinghouse resources
    - emphasis on two year colleges and veterans
  
- Regular Evaluation Outcomes
  - GEO has interacted with 3,000 direct participants.
  - GEO has indirect or less intense actions with over 17,000 recipients. The number indirectly served through educators and the waterfall approach is estimated to be over 38,000 recipients.
  - 55% of the 20,000 recipients directly served were from underrepresented minority

groups.

- Other relevant Broadening Participation activities in GEO
  - Funds for increasing access to the major research facilities
  - Introduction of REUs at annual SACNAS meeting
  - Summer intern program
  - Postdoctoral fellowship program
  - Support for conferences, National Association of Black Geologist and Geophysics and SACNAS
  - Research Initiation Awards
  - Support for educational outreach activities
  - SOARS (significant opportunities in atmospheric research and science)
    - Program for undergraduate and graduate students; built around the summer research internship; facilitated by mentoring from top scientists within a supportive learning community
  - 19 REU sites across the country, many have a focus on broadening participation
    - 109 students: 44% women, 30% from underrepresented minority populations, 108 non-traditional students
- New Initiatives
  - SEES (science, engineering and education for sustainability)
    - Focus on workforce needs for sustainability, building and maintaining a healthy pipeline of undergraduate and graduate level scientists and engineers, building capacity at community colleges and minority serving institutions
  - Expeditions in Education
    - Cross-directorate effort focused on bringing pedagogy and a deep understanding of education into adjacency with the importance of frontier science

#### ***CEOSE Comments:***

- Consideration should be given to the creative use of the weather channel to increase interest in the geosciences.
- Geoscience can be of significant interest to American Indians given their profound interest in the earth.
- Emphasize a precise focus on real world problems that can engage pre-K-20 in real world research problems: i.e., lead levels, watersheds, forestry; real world problems that are universal in locality.
- The low success rate of underrepresented minorities could be due to underfunding of institutions where more underrepresented faculty may be located, suggesting institutional bias as opposed to URM PI underperformance.
- A way to improve the recruitment of underrepresented individuals is to remind them of its uses for the betterment of humanity.

#### **Committee Reports by CEOSE Liaisons to NSF Advisory Committees**

**ACRE Advisory Committee.** The ACRE Advisory Committee meeting focused on a discussion about disliking the reference to the pipeline of underrepresented minorities and wanting to use pathways. Important to note that the pathway should refer to the many paths to the same degree, as opposed to low expectations.

**ACCI Advisory Committee.** The ACCI Advisory Committee meeting was a virtual meeting for 4 hours (with ½ hour break); utilized WebEx for videoconferencing; didn't allow for nonverbal communication and was difficult to engage people. There were two major broadening participation issues: 1) a focus on big data for education, longitudinal studies, analysis of meta data for long-standing large scale social science surveys; and 2) a discussion of a new track within IGERT that is interdisciplinary and intended to assist in the training of graduate students who can deal with fundamental challenges and techniques and technologies for advancing big data science, analyzing and dealing with challenging computational science and engineering problems, researching and providing the cyberinfrastructure that makes cutting edge research possible. The Cyberinfrastructure Team program was eliminated, which was the only core education and workforce program that OCI had outside of fellowships and scholarships.

**B&O Advisory Committee.** No report available.

**BIO Advisory Committee.** The BIO Advisory Committee meeting was held in April 2012, virtually, for two hours. The Advisory Committee decided prior to the meeting that it wanted to convene a broadening participation subcommittee to work in the biosciences to ask can bioscience itself unilaterally do broadening participation work and make it successful. Two Co-Chairs were named. There was general discussion about the budget and its impact on the directorate.

**EHR Advisory Committee.** The primary meeting focus of the EHR Advisory Committee was on a directorate-wide launch of core research and development areas, leadership investments, and expeditions. There are four core areas for research and development: 1) STEM learning, 2) STEM learning environments, 3) broadening participation and institutional capacity in STEM, and 4) STEM professional workforce preparation. EHR will be heavily involved in the STEM inventory and strategic planning occurring across the federal agencies with respect to undergraduate education. Question was raised regarding the level of research that was being used to inform the development of the core research areas. Another issue focused on the broad group of stakeholders, many of whom may be more interested in outcomes and not inputs.

**GEO Advisory Committee.** The GEO Advisory Committee meeting was comprised of active discussion on what the division should do to address the overall shortage of URMs in the geosciences. It was agreed that there is a communication gap between geoscientists in the field and the students, in terms of making sure students understand the criticality of the discipline. Because of the inherent international flavor of the geosciences, there is an opportunity to broaden the participation of URM students who generally are the groups that remain close to home, and/or do not get the opportunities to travel. It was also agreed that it is critical to engage teachers and counselors in understanding the criticality of the geoscience disciplines.

**OISE Advisory Committee.** The OISE Advisory Committee meeting was a virtual meeting; it required good Internet connection. The OISE directorate is undergoing extraordinary transition. Major funding for international research and education is being parsed out to other units and other directorates. The Advisory Committee is redefining itself. An end result was a draft of an international science and engineering discussion paper. Currently, the Office has limited data available on diversity or the impact on broadening participation; there is a critical need for establishing appropriate data collection and analysis on broadening participation internationally.

**MPS Advisory Committee.** The MPS Advisory Committee meeting included reports from every division of recent successes, including a nobel prize winner who had been funded by MPS. There

were three main topics of discussion: 1) Complexity, 2) Mid-scale Instrumentation, and 3) Expeditions in Education. There was a suggestion to rename a division, Mathematical and Statistical Sciences. The Chemistry breakout session focused on big data and multiple uses including undergraduate research.

**OPP Advisory Committee.** The OPP Advisory Committee was conducted via WebEx for 5 1/2 hours. Major discussion occurred on the OPP vision statement. On behalf of OPP, Dr. Faulkner thanked Marigold Linton for her years of service and her dedication to broadening participation. Dr. Linton offered, "*if everyone mentored a minority student, the diversity problem would be solved.*"

**SBE Advisory Committee.** The SBE Advisory Committee meeting was held on May 17-18, 2012. There was discussion about the FY 2013 planned investment, included \$14 million in interdisciplinary research and training, including the minority postdoctoral research fellowship program. This will double the number of fellows because the investment will change from going to individuals to going to institutions. A summary of the COV for the SBE office of inter multidisciplinary activities was provided and included the minority postdoc research fellowship program and research for undergraduate experiences. Two issues were raised regarding broadening participation: 1) the observation that minority postdoctoral research fellowships cannot restrict applications to underrepresented minority groups, and 2) REUs' capacity building could not be evaluated; participants are not required to report race/ethnicity. There was discussion of the Intellectual Merit criterion. There was discussion of the Science of Broadening Participation Dear Colleague Letter, which was released in January 2012; funding for this initiative is at \$1 million.

#### **Discussion of CEOSE 2011-12 Biennial Report to Congress**

Dr. Wendy Raymond, Chair of the CEOSE Report Subcommittee, provided a brief discussion of major ideas and issues related to the Biennial Report. A summary of her comments are listed below.

- One idea of a theme for the 2012 report would be a focus on the undergraduate experience, particularly the first two years, which were covered in the reports from the National Academy of Sciences in 2011.
- It is important for CEOSE to come up with concrete recommendations that Congress can choose to act on.
- It was suggested that CEOSE may want to acknowledge successes NSF has made, as well as point out ways in which NSF can improve.
- The Report may summarize some of the changes that occurred in 2011 and 2012 regarding broadening participation; i.e., the America Competes Act and the impact on NSF.
- The Report may provide a context of where NSF is, outline broadening participation history in the last two years, including what the impacts have been as a result of changing the broader impacts language.
- Since other federal agencies do not have a CEOSE, the successes of CEOSE can be included as a model for other agencies.
- To measure the impact of CEOSE: 1) track recommendations from CEOSE, 2) track the broadening participation and broader impacts history, 3) track the engagement of other agencies by CEOSE, 4) track preparation of broadening participation data by directorates for CEOSE review.
- The Report should include the importance of not compromising quality while broadening participation.

- It is important to include the fact that serious additional federal funding is necessary to broaden the participation of UR students.
- The Report may state the problem strongly with emphasis on all UR populations, then indicate that comprehensive approaches are needed for science as a whole.
- Areas of general themes include: deep engagement of higher education institutions in every aspect to make this a national focus, focus particularly in our own communities, focus on the first two years.
- CEOSE can do cumulative reports where national data and other activities are monitored.
- CEOSE could respond to the Director's question: *if you had X dollars what would you do?* This could present a realistic notion of what resources are required to make significant change.

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**Dr. Meldon Hollis**, White House Initiative on Historically Black  
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| <p><b>Dr. Edward Ajhar</b>, AST/MPS/NSF<br/><b>Dr. Guy-Alain Amoussou</b>, DUE/EHR/NSF<br/><b>Dr. Bernice Anderson</b>, EHR/NSF<br/><b>Ms. Nnenna Anonio</b>, LFO/BFA/NSF<br/><b>Ms. Joan Burrelli</b>, Retired<br/><b>Dr. Larry Campbell</b>, Institute of Broadening Participation<br/><b>Dr. Yamilette Colon</b>, DEB/BIO/NSF<br/><b>Mr. Michael Conward</b>, NSF Summer Scholar<br/><b>Dr. Kelli Craig-Henderson</b>, SES/SBE/NSF<br/><b>Dr. Lindsay D'Ambrosio</b>, IIP/ENG/NSF<br/><b>Dr. Jessie Dearo</b>, HRD/EHR/NSF<br/><b>Dr. Liv Detrick</b>, Institute of Broadening Participation<br/><b>Dr. Omnia El-Hakim</b>, ENG/NSF<br/><b>Dr. Jaquelina (Jaqui) Falkenheim</b>, NCSSES/SBE/NSF<br/><b>Dr. Allison Fauver</b>, Institute of Broadening Participation<br/><b>Dr. Sonia Feigenbaum</b>, Department of Education<br/><b>Dr. David Friscic</b>, OD/OPP/NSF<br/><b>Dr. Treda Grayson</b>, Environmental Protection Agency<br/><b>Ms. Sherrie Green</b>, OD/OIA/NSF<br/><b>Dr. Jong-on Hahm</b>, OISE/NSF</p> | <p><b>Dr. Bernadette Hence</b>, WHI on HBCUs<br/><b>Dr. Sara Hernandez</b>, Cornell University<br/><b>Ms. Martha James</b>, OIA/NSF<br/><b>Dr. Ashanti Johnson</b>, Institute of Broadening Participation<br/><b>Dr. Brendon Jones</b>, Institute of Broadening Participation<br/><b>Dr. Sean Jones</b>, DMR/MPS/NSF<br/><b>Dr. Heena Lakhani</b>, OAD/EHR/NSF<br/><b>Dr. Peter Lea</b>, DUE/EHR/NSF<br/><b>Dr. Krish Mathur</b>, Department of Education<br/><b>Dr. Melvin Monette</b>, Institute of Broadening Participation<br/><b>Ms. Elizabeth Padilla</b>, NSF Summer Scholar<br/><b>Dr. Muriel Poston</b>, HRD/EHR/NSF<br/><b>Dr. Elizabeth Rom</b>, OCE/GEO/NSF<br/><b>Dr. Richard Smith</b>, HRD/EHR/NSF<br/><b>Ms. Marilyn Suiter</b>, HRD/EHR/NSF<br/><b>Dr. Joanne Tornow</b>, OAD/SBE/NSF<br/><b>Dr. Sean Watts</b>, DEB/BIO/NSF<br/><b>Ms. Tanisha Williams</b>, NSF Summer Scholar</p> |
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## **Opening Remarks and Introductions**

The meeting was called to order by Dr. Conrad at 9:00AM.

Dr. Conrad invited comments and/or corrections to the minutes from the October, 2011 meeting. All members concurred on the minutes with no changes noted.

Dr. Conrad invited comments on the CEOSE Biennial Report. Dr. Wendy Raymond presented general themes that arose from CEOSE members. The comments are presented below.

- CEOSE will move away from the PCAST report as a basis for a theme; focus will be on the first two years of undergraduate education.
- The Report will include a request to Congress and NSF to develop the best STEM talent in the United States that is fully inclusive of women, underrepresented minorities and persons with disabilities so everyone in our democracy can do the best science possible.
- The CEOSE Report will reference the PCAST report; focus on developing a million new scientists at the undergraduate level with undergraduate degrees by the year 2022.
- The Report will highlight specificity in metrics, such as the numbers of underrepresented STEM degree earners needed to reach the one million mark as a metric.
- The Report will highlight missing/incomplete data and metrics as related to participation of underrepresented minorities and persons with disabilities.
- The Report will articulate specific issues to be addressed and solutions.
- CEOSE will recommend that Congress establish similar committees at other federal agencies, and link these efforts across agencies to address the one million STEM degrees benchmark by 2022.
- The Report will articulate that NSF is a leader in broadening participation and will continue to be. CEOSE has contributed to this.
- The Report should take on a long term view and be used as a stepping stone toward

facilitating the next Report so that there is a completely linked set of reports that asks Congress to do very specific things to achieve the larger goal of inclusion.

#### General Comments:

- Dr. Mathur of the Department of Education reported about a recently signed memorandum of understanding between NSF and Department of Ed.
- Dr. Meldon Hollis, White House initiative for Historically Black Colleges, reported the following:
  - The President is expected to sign a new Executive Order for African-Americans in education.
  - The WHI for HBCUs has tracked a drastic drop of federal support to HBCUs between 2010 and 2011. The issue is expected to be raised with the NSF and other federal agencies to determine if there can be better cooperation, coordination and leveraging.
  - An MOU has been signed by two government agencies of Brazil and HBCUs.
  - The HBCU national conference will take place September 25-26, 2012; plans are underway to ensure STEM issues related to HBCUs are a part of the agenda.

#### **NSF Executive Liaison Report**

Dr. Wanda Ward, CEOSE Executive Liaison, provided a report on the progress of NSF in the area of broadening participation. Highlights from the report are listed below.

- Several major issues related to broadening participation:
  - U.S. STEM talent development
  - Program development
  - Criticality of outreach, critical systems and processes
  - Declining representation of persons of color at higher degrees; contrasted with increased representation of non-minority men at the same level.
  - Declining representation at the professoriate levels, even for groups like women in the life sciences, and for non-minority women.
- Update on NSF broadening participation activities
  - Career/Life Balance (CLB) Initiative
    - The cohesive career-life balance program takes into account the career family life course and reduces departure of women from the STEM pathway.
    - Focus includes higher education and career levels from graduate students through early and late career; includes NSF CAREER program, 10 NSF postdoctorate programs, ADVANCE and graduate research fellowships.
    - CLB activities include flexibility for child births/adoptions, no cost extensions for parental leave, and support for research technician.
    - NSF has successfully implemented CLB supplements to PIs; the supplement covers up to three months for a research technician or equivalent.
    - NSF has issued a Dear Colleague Letter for the CAREER program highlighting CLB funding opportunities. Prior CLB language for the CAREER solicitation did not exist.
    - NSF has set a goal for the next decade for women to comprise 41% of tenured faculty; currently at 28% with PhD production at 41%. For women of color the goal is 17%; current rate is 6%.

- Promoting federal policy: Title IX, International Conference Travel Support
  - NSF attempts to reduce requirement of 6 months travel to access coverage for dependent care costs, partnering with OSTP, White House.
  - NSF is participating in an interagency collaboration with Department of Energy, NASA, Department of Justice and Department of Education related to Title IX.
    - This is consistent with CEOSE's recommendation of greater federal interagency collaboration.
    - White House 40th anniversary event to celebrate Title IX is occurring; NSF Office of Diversity and Inclusion will host a panel on site.
- Enhancing program management
  - NSF Working Group has been meeting with different parts of NSF to enhance program management opportunities for CLB: development of content and resources, provision of online training, development of instructions for program officers, outreach to principal investigators.
- Partnership and communication
  - NSF will foster a federal-university partnership to develop a coherent set of policies and practices related to CLB.
  - NSF collaboration underway with Association of American Universities, Association of Public and Land Grant Universities, National Council of Women and Girls.
  - Like the NSF issuance of the CAREER Dear Colleague Letter, the same is planned for NSF postdoctoral programs.
  - NSF participated in the first European Gender Summit; NSF will host a panel at the upcoming Summit this year to discuss CLB issues and strategies.
- Integration
  - I-3 activity promotes integration at three levels:
    - Integration by unifying theme,
    - Integration of funding sources, and
    - Integration at the institutional level.
- Veterans education in science and engineering
  - NSF Engineering directorate leads this multi-directorate activity.
- Merit review
  - CEOSE has provided feedback.
  - Merit review still under consideration for change.
  - NSF Office of Information and Resource Management has been engaged to determine a systematic way to promote and monitor efforts related to broader impacts issues.
  - OIRM proposes the following:
    - Automated electronic capability for language changes in FastLane, PIMS and E-correspondence module and E-Jacket to increase broader impacts emphasis
    - Revision of language in FastLane elements, such as in the proposal review instructions
    - Revision of the PIMS boilerplate language on proposal review and review criteria
    - Division of the project summary text box in FastLane into two distinct boxes

- labeled intellectual merit and broader impacts to ensure that each PI addresses both areas when entering the project summary
  - Revision of annual and final project report templates to require each PI to explicitly address progress in all areas of the project, including broader impacts activities
  - Revision of the format of the research.gov progress report to require that PIs explicitly address progress in all areas of the project
  - Update of the merit review website to include new criteria and description
- Critical systems, processes, infrastructure
  - NSF is exploring measures to provide baccalaureate origins data, particularly for students from underrepresented groups, as well as annual MSI data.

#### NSF Response to CEOSE Recommendations

- **RECOMMENDATION:** Augment program support to HBCUs, TCUs, LSAMP.
  - NSF investment is currently at 5% of the total budget for all MSIs (e.g., HBCUs, TCUs and HSIs).
- **RECOMMENDATION:** Increase funding to programs that serve or invest and support persons with disabilities and all underrepresented groups.
  - NSF is making progress in its effort to revise its tabulation of broadening participation in the FY14 budget.
- **RECOMMENDATION:** Establish an HSI program.
  - Dear Colleague Letter was issued for increasing the participation of Hispanics in STEM.
  - NSF meeting with senior leadership from HACU is ongoing.
  - NSF made a presentation at the Texas Hispanic Serving Institutions Spring Consortium.
- **RECOMMENDATION:** Focus on women of color.
  - NSF addresses issues of women of color through the Career/Life Balance activities.
  - NSF ADVANCE program leads this effort.
- **RECOMMENDATION:** Promote systematization of tracking CEOSE recommendations.
  - Annual approach to be taken for assessing NSF progress on CEOSE recommendations will reflect actions completed, in progress, no action taken and why.
  - Recommendations will best be addressed by theme.
  - NSF will develop an internal SharePoint interface to provide greater opportunity to make dynamic use of CEOSE recommendations.
- **RECOMMENDATION:** Determine NSF investments in broadening participation.
  - NSF recognizes the challenge of defining broadening participation.
    - CEOSE language includes women and girls, underrepresented minorities and persons with disabilities.
    - With geography added to broadening participation, EPSCoR can be included in the BP portfolio.
    - Focus includes individuals and different types of institutions.
  - Revision of current framework to redefine focused programs (total budget dedicated to the program), emphasis programs (program promotes broadening participation) and potential programs is underway.
  - One solution involves examining historical trends for prior levels of investment to determine focused vs emphasis program status.

- Another solution involves pre-determining a range of investments or a threshold level (e.g., at least 25% of budget toward broadening participation) to determine focused vs emphasis program qualification.

## Implementation of Merit Review Criteria

Dr. Joanne Turnow, Deputy Assistant Director in the Social, Behavioral and Economic Sciences directorate, delivered a presentation on implementation of the new NSF merit review criteria. Dr. Turnow was accompanied by Ms. Jean Feldman, Head of the NSF Policy Office. Highlights of her presentation are below.

- Background
  - Task force was established in spring of 2010; it had been more than 13 years since the last review of the merit review criteria.
  - At the time when NSF was developing a new strategic plan, it also presented an opportunity to align review criteria with the strategic plan.
  - History of anecdotal reports about confusion related to the broader impact review criterion and inconsistency on how the criterion was being applied.
- Overview of Task Force Work
  - Issues that were considered
    - Strengths and weaknesses of the current criterion
    - How merit review is used by PIs, reviewers and NSF staff
    - Weight of the criterion in influencing the reviewer and development of the proposal
    - Impact of criteria on shaping the research project
    - Assessment of the outcomes of activities relevant to each criterion
    - America Competes Reauthorization Act of 2010 instructs NSF to have a broader review criterion and to develop and implement a policy related to the broader impacts review criterion.
    - NSF was asked to develop policy that would encourage institutions to articulate what they were doing to support the activities for fulfilling broader impact review criterion.
    - Outreach internally to NSF staff and externally to PIs about the new policy
  - In their deliberation, the task force got input from stakeholders: interviews of NSF senior leadership, interviews of institutional administrators, surveys of NSF program officers and division/deputy directors, as well as advisory committee members. Input was gathered from community colleges to Research 1 institutions in different geographical locations.
    - 60% response rate
    - NSF website listed several open questions related to the issues: over 600 responses
    - Other data: Committee of Visitors reports, project summaries
  - Results
    - Difference of opinion on how good NSF guidance was: all agreed intellectual merit was good but less so for broader impacts. There is a statistically significant difference between the two criteria.

- No statistically significant difference in the views of the different groups: all felt intellectual merit guidance was better than broader impacts review criteria.
  - Belief that PIs and reviewers had very good understanding of the intellectual merit review criteria, but much less understanding of the broader impacts review criterion.
  - All felt that much more weight was placed on intellectual merit than on broader impacts.
  - Significant number of respondents felt comfortable with the idea of more weight on intellectual merit, but wanted to increase the impact of broader impacts criteria in decision making.
- Current Status
    - Survey information was incorporated into a first attempt at revising the review criteria; presented at May 2011 meeting of the National Science Board.
    - Recommendation
      - Include a context of the guiding principles for evaluating proposals.
- Dear Colleague Letter released on June 14 requesting input on the revised criteria.
    - 280 comments on those documents: nearly 2/3 from university faculty, scientific societies
    - Most comments not entirely enthusiastic about the first draft
    - Concern that the intent of the broader impacts concept had been weakened by this revision
    - Concern expressed about the role of broadening participation
- Second revision of the review criteria and underlying principles was presented to the National Science Board in December of 2011; it was approved and published in January 2012.
    - NSB board reaffirmed that the two review criteria did capture what it is we are looking for in NSF proposals/ projects.
    - Revisions need to be made to the description of broader impacts criterion and how it is to be implemented.
    - NSB felt the use of the review criteria should be guided by core principles: 1) All NSF projects should be of the highest quality and have the potential to advance science. 2) Broader impacts may be accomplished through the research itself. 3) There should be mechanisms to accomplish a meaningful assessment of the outcomes of NSF projects.
- Revision to the grant proposal guide includes discussion about importance of societally relevant outcomes.
- NSF is charged to develop an implementation plan for applying the two merit review criteria.
- Ongoing Activity
    - Internal staff memo was sent within the building
    - Importance notice was sent to external community
    - Federal Register Notice posted
    - Currently revising NSF policy documents

- Draft proposal guide made available for comment
- Searching for all places where the merit review criteria in its current form exists in NSF business systems to make revisions; expected to be completed by January 2013
- Gathering frequently asked questions
- Developing outreach materials

**ACTION ITEM:** Comments from CEOSE are welcomed, and should be submitted by July 12, 2012.

## Novel Approaches to Broadening Participation

Dr. Ashanti Johnson, Executive Director of the Institute for Broadening Participation (IBP), delivered a presentation on novel approaches to broadening participation. Highlights from the presentation are listed below.

- Focus of IBP is on increasing diversity in STEM
- IBP uses four strategies: 1) catalyzing partnerships, 2) synthesizing information, 3) creating and maintaining web resources, and 4) conducting extensive outreach.
- IBP defines URM as: American Indian, Alaskan, African, Native Hawaiian, other Pacific islanders, women, persons with disabilities and some geographic regions and those who have historically been denied access to higher education.
- Strategy I - Catalyzing Partnerships
  - Goals: 1) reducing isolation among diversity practitioners, 2) increasing information sharing and 3) cultivating a community of practice of broadening participation
  - Several tools:
    - Small meetings where we bring together groups of 10 to 12 individuals at various venues to focus on specific diversity topics
    - Networking and diversity receptions in venues that would not normally have attention on diversity topics
    - Matchmaking where potential partners are connected with diversity experts
    - Conference panels of experts to share best practices
    - Travel support for individuals interested in diversity
    - Connect majority and minority serving institutions
- Strategy II - Synthesizing Information
  - IBP developed a process of compiling information in an easier format.
  - 5-step process
    - Literature review
    - Supplementary interviews with research and focus groups to better understand the findings
    - Development of materials that translates the information in useful formats
    - Complimentary outreach to ensure materials get in the hands of people who can use them
    - Extensive evaluation of the effectiveness of the materials and overall process
- Strategy III - Maintaining Web Resources.
  - IBP maintains family of websites that include profiles, news, events, and advanced search tools.
  - Websites include links to 1300 educational programs, K-12 to postdoctoral; over

1900 institutions across the country. Programs searchable by discipline, subdiscipline, keywords, geography, funder.

- Flagship website, [www.PathwaytoScience.ORG](http://www.PathwaytoScience.ORG), generates over 72,000 visits and 75,000 page views per month during academic year.
  - Website is database driven and updated daily.
  - Website contains institutional hubs to show programs that are located within single institution.
  - Website features mentoring manual and resource toolboxes with links to support materials.
- Strategy IV - Outreach
    - Iterative process
    - Team of regional specialists who assist in student recruitment in exchange for travel and material support from IBP
    - Student directory with over 40,000 students, 70% are underrepresented minorities
    - Heavy reliance on website for disseminating information
    - Outreach cycle begins with activities, conferences, webinars, campus visits and continues with targeted bulk emails to students in our directory followed by face-to-face outreach.
    - Faculty staff and administrators--important for our outreach
      - IBP provides: education on cultural awareness, networking activities, one-on-one assistance in proposal writing, assistance in developing recruitment and retention plans, lists of students for recruitment purposes, distribution of information listservs.
- IBP currently has demographic information of student participants, as well as institutions previously attended, prior program participation, number of interactions with IBP, and future career plans; biographical profiles are posted.

## Hispanic Serving Institutions

Dr. Sonia Feigenbaum, Director of the Hispanic Serving Institutions Division of the Department of Education, delivered a presentation on Hispanic Serving Institutions. Highlights from the presentation are listed below.

- Overview of Hispanic Serving Institutions
  - Originally called Title V; HSI STEM program is Title III.F program.
    - Competition in FY 2011
    - Five-year grants
    - Grants are institutionally based
- Our goal is to expand opportunities for Hispanic students and to expand and enhance academic offers, program quality, institutional stability to colleges and universities that educate the majority of Hispanic students.
- Funding:
  - In FY 2010 -- \$117.5 million
  - In FY 2011-- \$104 million

- Designation of eligibility:
  - Required of institutions every year
  - Separate from grant competition eligibility
  - Institution has to have an enrollment of undergraduate full-time equivalent of students that is 25% or more
  - Only institutions of higher education eligible that are accredited by a nationally recognized agency
  
- Common Activities: academic quality, faculty development, curriculum development, tutoring and mentoring, student facilities, use of technology in the classroom and remotely, as well as STEM based projects
  
- Areas for Collaboration
  - Goal is to think creatively about what it is that the Department of Education can do and focus on what NSF can do for the constituency.
  - It is important to focus on the actual population and have grant opportunities available for Hispanic students or Hispanic faculty members. Current Department of Education awards are institutional.
  - Enabling of more data-based decision making is necessary.
  - Funding for student study abroad or faculty international collaboration is needed.
  
- Overview of funded awards
  - 109 grants
  - Majority focused on improving technology in web-based student services
  - Faculty development--an important component
  - Use of English Language Learning and link to the use of technology
  - Learning centers--very important
  - Transitional services for first generation students
  - Professional and STEM education for students
  - Tutoring--another main component
  - Outreach to high school students
  - Endowment and scholarships
  
- General Discussion
  - If NSF develops its own HSI program, it is important to converse with other agencies with programs and identify gaps in serving this community, particularly in light of diminishing dollars.
  - NSF has an opportunity to think creatively about STEM education/research at HSIs.
  - There is a need to strengthen a focus on specific disciplines or fields, particularly computer science.
  - The Dept of Education does not maintain a Hispanic Serving Institutions list; Excelencia in Education has compiled a list using IPEDS data.
    - Institutional eligibility changes annually.
    - Dept of Education maintains a list of grantees, not a list of Hispanic Serving Institutions.

Dr. Conrad thanked Dr. Marigold Linton for her service on CEOSE and invited comments from Dr. Linton. Dr. Linton replied with general comments of appreciation, the representation of American Indians on CEOSE and the need for CEOSE to continuously examine its work in the area of

broadening participation.

## **Broadening Participation in STEM Resource Network/ Science of Broadening Participation**

Drs. Jessie Dearo and Kelli Craig-Henderson, NSF Program Officer and Deputy Division Director, respectively, delivered a presentation on the science of broadening participation and the broadening participation STEM resource network initiative. Highlights are listed below.

### **Science of Broadening Participation**

- Issuance of Dear Colleague Letter
  - Released in January 2012
  - Investigators from SBE fields were invited to submit proposals to standing programs within SBE and other research representatives of the science of broadening participation.
  - Proposals were reviewed alongside other proposals in standing programs; meritorious proposals were then evaluated for a special reserve amount of funding to be supplemented by the science of broadening participation funding.
  - 15 proposals submitted for review in last review cycle; of them, 12 supplemental awards were made.
- Proposed road map for science of broadening participation
  - There are more internal discussions about SBP; discussions have been central within SBE, EHR and MPS.
  - In FY 2013 an external workshop will be held.
    - Workshop will include researchers, practitioners engaged in this work, and other stakeholders who have an interest in the science of broadening participation.
- Announcement of a Dear Colleague Letter, jointly sponsored by SBE and EHR directorates
- Beyond FY13, anticipation of science of broadening participation program, managed by SBE

### **Broadening Participation in STEM Resource Network**

- Already announced in a Dear Colleague Letter
- Will support and coordinate a wide range of stakeholders to achieve broadening participation in STEM education programs; synthesizing some of the knowledge learned from grantees over the past several decades; build communities of expertise; develop tools and materials; recognize and reward excellence in broadening participation in STEM and stimulate innovation
- Intended to focus on all stakeholders throughout NSF, at universities and colleges and other organizations that are working toward diversity in the STEM workforce
- Process beginning with a design phase, proposals due July 12, 2012
- Will provide funding for undertaking assessments with stakeholders, assessments of needs and building partnerships
- Full implementation not expected until May 2014 or 2015

- General Discussion:
  - Include other organizations with long history of supporting broadening participation, e.g., Sloan Foundation.
  - Include historians of science and technology tracking the long history of this issue and its evolution in the United States.
  - Focus is needed on utilizing research approaches and techniques to apply to real world experiments and processes; engage multiple researchers in long-term, participatory research designed to engage practitioners and sites around the question; create ongoing groups outside of NSF to be part of the activity and to evaluate change.
  - The Network is at the client institution/stakeholder and PI levels—important for NSF to consider both the institutional level and societal level.
  - It is important for NSF to maintain a focus on quality of the program, not just increasing numbers.
  - NSF could consider how this approach produces change within NSF and document what change has happened.

## Announcements, Final Remarks

Dr. Cecilia Conrad, CEOSE Chair, provided final remarks before adjourning the meeting.

- CEOSE has requested to be placed in a more proactive position to give advice; there are several items that now require the response of CEOSE:
  - CEOSE will review broader impacts criteria.
  - Responses are requested on Table 11 (NSF investments in broadening participation) very soon in order to have an impact on the 2014 budget proposal.
  - Responses are requested on draft tables, provided by Dr. Ward, for tracking CEOSE recommendations and progress made.
    - Draft tables should provide an area for feedback within the table.
- Tabled Discussions
  - Future meeting agenda item: NSF centers and major research facilities
  - Future meeting agenda item: Status of broadening participation within NSF
  - The issue of CEOSE mini symposia
  - Additional information needed on the progress of EHR is defining an agenda related to STEM and broadening participation
  - Additional information needed on degree of variation across advisory committees and the extent to which this is a focus for NSF
  - Number of CEOSE meetings
  - CEOSE requests for updated information on the monthly conference calls of the executive committee
  - CEOSE requests for updated information on broadening participation within the directorates after formal presentation to CEOSE—CEOSE will present to directorates its current information on the directorate and request that it be updated.