COMMITTEE ON EQUAL OPPORTUNITIES IN SCIENCE AND ENGINEERING

Meeting Minutes

February 19-20, 2009

Meeting Site

National Science Foundation (NSF), Room 1235 S; 4201 Wilson Boulevard; Arlington, Virginia 22230

Meeting Participants

Members Present:

Ms. Sandra Begay-Campbell, Sandia National Laboratories, Albuquerque, NM
Dr. Joseph S. Francisco, Purdue University, West Lafayette, IN
Dr. Evelynn Hammonds, Harvard University, Cambridge, MA
Dr. Wesley L. Harris, Massachusetts Institute of Technology, Cambridge, MA
Dr. Mae C. Jemison, The Jemison Group, Houston, TX (Virtual Participant)
Dr. Richard E. Ladner, University of Washington, Seattle, WA
Dr. Marigold Linton, University of Kansas, Lawrence, KS
Dr. Theresa A. Maldonado, CEOSE Chair, Texas A & M University, College Station, TX
Dr. William C. McCarthy, New Mexico State University, Las Cruces, NM
Dr. Samuel L. Myers, Jr., HHH Institute of Public Affairs, University of Minnesota, Minneapolis, MN (Virtual Participant from China where he is at the Chinese Academy of Social Science)
Dr. Maria Ong, TERC, Cambridge, MA
Dr. Alex Ramirez, HACU National Headquarters, San Antonio, TX

Member Absent:

Dr. Muriel Poston, Skidmore College, Saratoga Springs, NY

CEOSE Executive Liaison/CEOSE Executive Secretary:

Dr. Margaret E. M. Tolbert, Senior Advisor, Office of Integrative Activities, NSF

OIA/NSF Primary Support Staff Members

Ms. Geri Farvés, IT Specialist, Office of Integrative Activities/NSF
Ms. Denita Norris, Program and Technology Specialist, Office of Integrative Activities/NSF

Non-Members Who Presented or Attended the Meeting:

Dr. Aiza Alfonso, IOS/BIO/NSF **Dr. Lenell Allen,** HRD/EHR/NSF **Dr. Rama Bansil,** DMR/MPS/NSF **Dr. Rodey Batiza,** MGS/OCE/GEO **Dr. Katie E. Blanding,** U.S. Army (Federal Liaison to CEOSE) **Dr. Henry Blount,** EPSCoR/OIA/NSF	**Dr. Timothy Killeen**, GEO/NSF **Dr. Fae Kosmo,** OD/NSF **Dr. Nancy Leach,** SRS/SBE/NSF **Dr. James Ledlini,** BIO/NSF **Dr. David W. Lightfoot,** SBE/NSF **Dr. Kelly Mach,** HRD/EHR/NSF **Dr. Lynnette Madsen**, DMR/MPS/NSF

Dr. Vincent Brown, BCS/SBE/NSF **Dr. Joan Burrelli,** SRS/SBE/NSF **Dr. Lynda T. Carlson,** SRS/SBE/NSF **Dr. Wayne Carrenson,** OISE/NSF **Dr. Christine Cataldo,** HRM/OIRM/NSF **Dr. Lura (Jody) Chase,** HRD/EHR/NSF **Dr. Parag Chitnis,** MCB/BIO/NSF **Dr. Gil Clary,** BCS/SBE/NSF **Dr. Walter V. Collier,** C&A Technologies, Inc. **Dr. James P. Collins**, BIO/NSF **Dr. Ted A. Conway,** CBET/ENG/NSF **Dr. Kellina Craig-Henderson,** SBE/NSF **Dr. Sajal Das,** CNS/CISE/NSF **Ms. Corinda Davis,** Beyond The Bottom Line, Inc. **Dr. Kristen Dorans,** American Chemical Society **Dr. Omnia El-Hakim,** ENG/NSF **Dr. Karl A. Erb,** OPP/NSF **Dr. Jaquelina Falkenheim,** SRS/SBE/NSF **Dr. Mark Fiegener,** SRS/SBE/NSF **Dr. Anne Fischer,** HRD/EHR/NSF **Dr. Mary J. Frase,** SRS/SBE/NSF **Dr. Michael Frederberg,** HRD/EHR/NSF **Dr. Clifton Gabriel,** MPS/NSF **Dr. Arlene A. Garrison,** EPSCoR/OIA/NSF **Ms. Tracy Gorman,** OD/NSF **Dr. Roderick J. Harrison,** Howard University **Dr. Judy A. Hayden,** OLPA/NSF **Dr. W. Lance Haworth,** OIA/NSF **Dr. Roosevelt Johnson,** HRD/EHR/NSF **Dr. J. Arthur Jones,** QEM, Inc.	**Dr. J.V. Martinez,** Office of Science/DOE (Federal Liaison to CEOSE) **Dr. Shirley M. McBay,** QEM, Inc. **Mr. Jeffrey A. Nesbit,** OLPA/NSF **Dr. Brian M. Patten,** MPS/NSF **Dr. Thomas W. Peterson,** ENG/NSF **Mr. Matthew D. Powell, J.D.,** OGC/NSF **Dr. Ashanti Johnson Pyrtle,*** Institute for Broadening Participation **Dr. James Rath,** Representative Hinojosa's Office **Dr. Celeste Rohlfing,** MPS/NSF **Dr. Alan Savitzky,** DBI/BIO/NSF **Dr. Victor Santiago,** HRD/EHR/NSF **Dr. Frank P. Scioli,** SES/SBE/NSF **Dr. Laurel Smith-Doer,** SBE/NSF **Dr. Judith S. Sunley**, SBE/NSF **Ms. Marilyn Suiter,** HRD/EHR/NSF **Ms. Sandra Thomas,*** Institute for Broadening Participation **Dr. John Tsapogas,** OISE/NSF **Dr. Patricia Tsuchitani,** BD/BFA/NSF **Ms. Susie Valaitis, ***Institute for Broadening Participation **Dr. Uma D. Venkateswaran,** MPS/NSF **Dr. Wanda E. Ward,** EHR/NSF **Dr. Larry H. Weber**, OISE/NSF **Dr. Mark L. Weiss, BCS/SBE/NSF** **Dr. C. Renee Wilkerson,** CHE/MPS/NSF **Dr. Tessema Guebre X,** DMR/MPS/NSF *Virtual Participant

Meeting Notes

Thursday, February 19, 2009

Welcome and Introductions by Dr. Theresa A. Maldonado, CEOSE Chair

The meeting was called to order at 8:35 a.m. by **Dr. Maldonado.** CEOSE members concurred with the minutes of the October 30-31, 2008 meeting, previously approved by **Dr. Wesley L. Harris**, former chair. **Dr. Maldonado** thanked **Dr. Harris** for his leadership, especially in establishing more effective communications with the National Science Foundation (NSF) and a selection of other federal agencies, as well as for presenting concerns about the broader impacts criterion to NSF senior management.

The chair introduced new members **Drs. Evelynn Hammonds** and **Alex Ramirez** and called for nominations to fill two additional vacancies. She congratulated **Dr. Joseph Francisco** on being elected as President of the American Chemical Society and **Dr. Marigold Linton** on establishment in her honor of a scholarship fund for undergraduates in the sciences at the University of Kansas.

The charge of each *Ad hoc* subcommittee was discussed; members are as follows:

- Subcommittee on Accountability, Evaluation, and Communications -- **Dr. Wesley L. Harris (**Chair)**, Theresa A. Maldonado, Samuel L. Myers, Jr.,** and **Maria (Mia) Ong**.
- Subcommittee on Strategic Planning – **Dr. Muriel Poston (**Chair), **Dr. Joseph Francisco, Dr. Marigold Linton, Dr. Theresa A. Maldonado,** and **Dr. Samuel L. Myers, Jr.**
- Subcommittee on Broadening Participation -- **Dr. William C. McCarthy (**Chair), **Dr. Richard E. Ladner, Dr. Marigold Linton,** and **Dr. Muriel Poston**.

Dr. W. Lance Haworth suggested the establishment of a password protected website for CEOSE members, for information sharing.

Dr. Maldonado reported that in a February 18 meeting with **Dr. Arden Bement**, they discussed CEOSE membership, reappointments, and appointment of officers, and the involvement of NSF senior management in CEOSE meetings and in reviewing nominations. They also discussed CEOSE mini-symposia, the role of CEOSE liaisons to NSF advisory committees, and the America Competes Act, Section 7033, which addresses Hispanic-serving institutions. She suggested to him that CEOSE look at the return on investment of NSF programs relative to broadening participation in science and engineering. **Dr. Bement** plans to introduce **Dr. Harris's** letter dated June 25, 2008, during the National Science Board (NSB) meeting, summarizing the committee's views on the NSF broader impacts criterion.

ACTION: CEOSE members were asked to read the letter and advise whether it needs revision.

Presentation by Dr. Marigold Linton on Mini-Symposium

Dr. Linton reported on the October 29, 2008 mini-symposium on Native Americans and thanked **Dr. Margaret E. M. Tolbert** for coordinating it. The resulting recommendations were approved by CEOSE for submission to **Dr. Bement.** The recommendations (as edited following the CEOSE February meeting) are as follows:

CEOSE requests that NSF provide measurable goals, objectives, and a timeline for responding to the following recommendations.

- ✓ Serve Native Americans by Expanding and Fine-Tuning Existing NSF programs
  - Provide significant resources over sustained time frame (i.e., longer term grants) for Tribal Colleges and Universities and other institutions serving Native American/Alaska Native/Native Hawaiian institutions.
  - Build on the success of the now defunct NSF Rural Systemic Initiative and explore duplicating it.

- ✓ Work Outside Existing NSF Programs to Serve Native Americans
  - Encourage all NSF directorates to work with organizations such as the American Indian Higher Education Consortium (AIHEC) to disseminate information to Tribal Colleges and Universities, conduct workshops and meetings for STEM faculty of Tribal Colleges and Universities, and ensure that programs and technical assistance include Tribal Colleges and Universities and other institutions serving Native American/Alaska Native/Native Hawaiian institutions.
  - Work with and through professional societies and organizations such as AIHEC, the American Indian Science and Engineering Society (AISES) and the Society for the Advancement of Chicanos/Latinos and Native Americans in Science (SACNAS) to serve Native Americans; support the formation and sustenance of AISES and SACNAS chapters at universities, tribal colleges, etc.
  - Replicate successful projects (e.g., Howard Hughes Medical Institute's (HHMI) Science Education Alliance (SEA) with Tribal Colleges, Sloan program at U of Arizona and others successful programs).

- Develop mechanisms for enabling scientists to appropriately assist remote tribal colleges.

✓ Perform Research and Evaluations to Provide a Better Understanding of Native American Education and Social Issues.

- Develop evaluation capacities of more Native Americans who can evaluate NSF projects, e.g., professional development in and the use of the Indigenous Framework for STEM Evaluation (developed with NSF funding), and other effective techniques.
- Examples of research issues that might be considered:
  - Examine the impacts of financial assistance (scholarships, fellowships and research funding), or lack thereof, on Native American performance and persistence in STEM fields.
  - Identify elements that are effective in producing successful Native American education programs and disseminate to the Native American and broader STEM communities.
  - Study the concept of achievement and the impact across generations of severe cultural and societal events/histories, e.g. genocide, sustained denial of human rights, oppression, denial of education, legal punishment for seeking education, roadblocks to the practice of culture traditions and accomplishments in broader societies, etc. This is intended to address "multi-generational grief".
  - Examine social/psychological impacts on Native American youth who seek STEM training and those factors that ameliorate their alienation from their communities.
  - Study the issue of data collection on the small Native American population, including communicating with tribes to obtain their interests and concerns about the release of annual data about them.

✓ Improve Grant Writing and NSF Review Processes

- Find ways to assist development and follow through of proposals for those Tribal Colleges and institutions serving Native American/Alaska Native/Native Hawaiian that have demonstrated program implementation capabilities but who lack experience and personnel to respond to NSF announcements or knowledge about NSF procedures and requirements. Such assistance might be provided through added or supplemental component to a grant.
- Include non-academics (program managers, teachers, parents, elders) in the development of new NSF programs and on program panels of interest to Native Americans.
- Increase the number of Native American reviewers – both scientists and program managers.

ACTION: Dr. Maldonado, with assistance from **Dr. Tolbert,** will submit the recommendations to **Dr. Bement** for action by NSF.

Presentation by Mr. Jeffrey A. Nesbit, Director of the NSF Office Legislative and Public Affairs (OLPA)

Mr. Nesbit spoke on "Communicating Science Broadly." He advised that the perception among the public and in Congress that basic scientific research doesn't rapidly translate into innovation is inaccurate, and provided several examples. NSF has been presenting documentation to Congress on the return on NSF's investment and NSF's contributions to important areas such as climate change, which has paid off in terms of support and funding—such as inclusion of science in the stimulus package. **Mr. Nesbit** said OLPA's strategy to reach the public includes: 1) hiring a part-time person to project "big science"; 2) educating public information officers on new media and translating science for the public, 3) training NSF-funded principal investigators on translating science for large audiences, and 4) working with organizations like AAAS and American Geophysical Union on workshops for principal investigators and public information officers. OLPA is also promoting news releases issued by university partners on its website and posting videos containing news stories from the major networks--such as those of **Ms. Ann Curry**, a TV anchorwoman, who presented live programming from the South Pole.

Mr. Nesbit said that OLPA's strategy is significantly different from those of other agencies, and it has earned an outstanding rating.

Conversation with NSF Director, Dr. Arden L. Bement, Jr.

Dr. Bement welcomed the new members and thanked the former chair. He discussed the CEOSE activities regarding the broader impacts criterion for NSF and the plan to present the CEOSE letter to the NSB Executive Committee.

Dr. Bement said EHR is exploring ways to implement the America COMPETES Act (ACA) provisions to establish a program for Hispanic-Serving Institutions to promote STEM fields. NSF intends to hold a listening session to solicit input on March 1 and welcomes written comments and communications through March 23.

NSF's new Grant Proposal Guide (NSF 09-1, January 2009) now includes the ACA requirement that each institution receiving an NSF award involving post-doctoral fellows must provide certification that it has a mentoring plan for them (see Chapter II, Section 2d(i)).

In his summary of congressional highlights, **Dr. Bement** advised that: 1) The America Recovery and Reinvestment Act provides $3 billion to NSF. 2) Congress is expected to take up the remaining FY 2009 Appropriations in an omnibus bill. 3) Joan Ferini-Mundy, division director of EHR's Research on Learning in Formal and Informal Settings, will testify before the House Science Committee's Subcommittee on Research and Science Education on the role of informal environments in promoting science learning. 4) The House of Representatives passed HR554, National Nanotechnology Initiative Amendment of 2009, on federal research to understand the environmental, health, and safety risks of nanotechnology.

Dr. Bement responded to questions on increasing retention and enrollment at HSIs; NSF's broadening participation plan and its funding and progress; the need for clarity in the community about "broadening participation" versus "broader impacts"; utilization of membership organizations as partners in broadening participation in science and engineering; funds for science and education for Native Americans and the need for establishing an American Indian Rural Systemic Initiative; and the lack of mention of broadening participation programs in the stimulus package.

Presentation by Dr. Maria (Mia) Ong on "*Policy White Paper on Women of Color in STEM*"

Dr. Ong, a social scientist, presented a draft of a Policy White Paper titled, "Women of Color: An Untapped National Resource for U.S. Science and Engineering" by **Drs. Maria Ong, Lorelle Espinosa**, and **Gary Orfield**. The paper synthesizes 114 empirical works produced over 30 years. She advised that studying the intersection of gender, race, and ethnicity is important because gaps exist in programs for different groups. Programs that focus on women tend to address the needs of white women, while programs that focus on minorities tend to ignore the needs of women. Also, most data on degrees awarded in STEM fields are presented by gender or by race and ethnicity, rendering the status of women of color invisible.

Dr. Ong reported numerous barriers to the upward mobility of women of color in STEM and suggested the following to address them: publish information about women of color in widely read journals such as *Science*, expand existing STEM education programs and create new ones to serve women of color, and hold a White House dinner for women-of-color students and professionals in STEM. The paper identified knowledge gaps that require future research.

CEOSE members commented on the lack of sufficient data on small populations, the shortage of workshop agendas that include issues of women of color in STEM, the need for role models, and the differences in the experiences, career trajectories, and educational issues for women of color from those of white American women.

ACTION: Provide to **Dr. Ong** comments on the Policy White Paper.

Roundtable Discussion with NSF Assistant Directors and Other Major Office Directors: Diversity Issues & Recent Broadening Participation Activities

Drs. Timothy Killeen (AD/GEO) delivered opening remarks about the need for diversity in the geosciences. The following NSF senior managers also provided brief remarks on broadening participation activities in his/her area: **James P. Collins** (BIO), **Karl A. Erb** (OPP), **Clifford J. Gabriel** (MPS), **David W. Lightfoot** (SBE), **Thomas W. Peterson** (ENG), **Wanda E. Ward** (EHR), and **Larry H. Weber** (OISE).

During the discussion, CEOSE members addressed the need for each NSF directorate and office to have a broadening participation plan, the need to address the issue through leadership appointments, and the need for programs that address issues of women of color in science and engineering. Other discussion focused on the disadvantages of minorities residing in places apart from the location of jobs, and the need to involve community and technical colleges. The group also discussed the opportunities in the stimulus package to emphasize career awards, post-doctoral fellowships, and graduate fellowships.

CEOSE members commented that it would be useful to have more time to engage NSF senior management in deliberations about broadening participation, to identify sources of expert advice for the directorates and offices, and to determine the nature of underrepresented minorities among the NSF staff and advisory committees. This may result in a change in the format for the interaction of NSR senior management with CEOSE. Also mentioned was a need to support more students with disabilities.

Dr. Maldonado suggested that the amount of time devoted to roundtable session needs to be increased to about two hours.

Reports of the CEOSE *Ad Hoc* Subcommittee Chairs

Dr. Maldonado reviewed the CEOSE *ad hoc* subcommittees and questioned whether they are sufficient to address all of the issues at hand. For example, she asked if a group is needed to determine if changes to the NSF Proposal and Award Policies and Procedure Guide might have a negative impact on minority-serving institutions and broadening participation in general.

In the Subcommittee for Strategic Planning report, **Dr. Maldonado** who reported in the absence of **Dr. Poston** discussed her presentation to the Mathematical and Physical Sciences Advisory Committee and the recommendations in the biennial report to Congress for 2005-2006. She advised that there is no national strategy for broadening participation and that the CEOSE strategy is the closest. She would like for CEOSE to adopt the philosophy of "failure is not an option," and to think about what CEOSE and NSF want to achieve with broadening participation, and how to know when it is successful. She would like to explore how CEOSE can create a common understanding of what broadening participation is, and how to address CEOSE's broadening participation mandate from Congress.

Dr. Collier reviewed the draft CEOSE 2007-2008 Biennial Report to Congress, generating comments on:

the math and science proficiency of elementary and high school students, the quality of teachers, the need for high school representation in CEOSE, the number of women entering college, the number of doctorate degrees earned, systematic evaluation, and composition of the science and engineering workforce. CEOSE members agreed to provide additional information and insights for the report before NSF review. It was noted that some of the original guidance on the preparation of the report has changed, requiring an update of the schedule of deliverables.

A discussion ensued about the fact that some members of committees of visitors (COVs) do not want to address broadening participation, while other COV members who are passionate about the topic. The question was raised whether the COV report template needs to be revised to focus more on broadening participation, and whether recommendations from the multi-agency study should be included in the CEOSE report.

Dr. Korsmo mentioned that the broadening participation system is being automated to alert program directors to identify programs that are in that area. This system will be user friendly.

ACTION: Dr. Collier asked CEOSE to consider holding a symposium on evaluation and research of broadening participation programs for the purpose of obtaining information for the 2009-2010 CEOSE Biennial Report to Congress.

ACTION: Dr. Collier asked CEOSE to review the recommendations in the draft 2007-2008 CEOSE Biennial Report to Congress and advise which ones should be included.

Adjournment

The meeting was adjourned by **Dr. Maldonado** at 5:30 p.m.

Friday, February 20, 2009

The meeting began at 8:30 a.m. with remarks by **Dr. Maldonado**. It was **AGREED** that a CEOSE mini-symposium focused on women of color will be held in October 2009, with **Drs. Ong** and **Hammonds** in charge of planning and implementation. It was **AGREED** that the June 25, 2008 letter by **Dr. Harris** to **Dr. Bement** needs no revisions, and **Dr. Bement** can present it to NSB at its next meeting. **Dr. Tolbert** was thanked for her leadership in preparing the letter. Members **AGREED** to provide comments on the biennial report to **Dr. Tolbert** by March 10th.

In response to the perception that the science and engineering community is confused about the NSF broader impacts criterion and broadening participation, CEOSE **AGREED** to invite someone from the NSF office that manages the "Boot Camp" for program officers to explain how broadening participation, the NSF broader impact criterion, and implicit bias are addressed in that training session. Online information on implicit bias and broadening participation needs to be updated. The discussion focused on industry as potential partners for CEOSE in addressing broadening participation and sharing best practices in diversity. Details from the deliberations will be considered in formulating the biennial report for 2009-2010.

The *Ad Hoc* Subcommittee on Accountability, Evaluation, and Communications reported that the topic of broadening participation in STEM is growing, and suggested a retreat at which Federal agencies could discuss a vision, goals, and objectives, establish working groups, and define a common language to use in

referring to broadening participation in STEM. Also, industry could be invited to co-sponsor an event; particularly, industries with mature models of broadening participation and its measurement.

Dr. Wesley Harris advised that he, **Dr. McBay, Dr. Hammonds, and Ms. Begay-Campbell** are members of the National Academy of Science (NAS) committee—The Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline—appointed as a result of the "*Rising above the Gathering Storm*" report to examine the potential economic benefits of educating and training underrepresented minorities in STEM fields. The committee is identifying stakeholders in the federal and state governments, education, industry, and philanthropic areas, and wants to hold them accountable in producing a highly educated, highly trained minority workforce in STEM fields.

The final report, scheduled to be released in mid-summer, mentions CEOSE. The committee will be looking to CEOSE to support the report with numbers, graphs, and information on the issues of the impact of data suppression and disaggregation. CEOSE members expressed disappointment that persons with disabilities are omitted from the study, and that an earlier NAS report on persons with disabilities focused only on medical issues.

CEOSE members expressed concern about having an NSF official lead the discussion with the NSF assistant directors and major office directors given that CEOSE is an independent advisory committee. Members recommended that a CEOSE member lead such discussions if the roundtable format is not changed. Others pointed out that CEOSE had requested the NSF panel, and that more feedback and questions and answers would be useful in making it a CEOSE, rather than NSF, panel.

ACTION: CEOSE members will determine the format for interactions with and presentations by NSF assistant directors and major office directors.

Presentations by Dr. Kellina Craig-Henderson and Dr. Laurel Smith-Doerr: *A Science of Broadening Participation*

Dr. Craig-Henderson shared some thoughts about the roles of the social, behavioral, and economic sciences in the science of broadening participation, and how the tools and techniques those scientists use can be helpful. She reviewed the demographic realities and legal aspects of broadening participation. For example, even with new laws, the proportion of women, underrepresented minorities, and persons with disabilities in occupations is well below their proportion in the general population, and this affects America's ability to sustain its scientific preeminence. Also, the number of foreign nationals coming to the U.S. to pursue graduate study and employment is slowing because a growing global participation in science and engineering affords them other options. This underscores the need to expand America's home-grown cadre of scientists and engineers.

Diversity training programs in general do not appear to increase the ranks of underrepresented minorities in management or senior-level positions. According to research by sociologist **Dr. Frank Dobbin** and his colleagues, teaching and lecturing employees to embrace the benefits of diversity and having a diverse staff don't result in greater numbers of underrepresented individuals in management. More effective are multi-pronged approaches that include mentoring, having a person in the organization responsible for diversity, and having network groups of employee to address issues. Many well-intentioned interventions (including a fair number in the public domain) lack empirical evidence demonstrating their effectiveness.

Many research examples were discussed. For example, a fair amount of research has explored gender differences in the corporate world, and women's differences in style of negotiation, which have

implications for pay raises, promotions, etc. Research results by **Dr. Linda Babcock** show that it may be a liability for women to negotiate the same way that men do. Without empirical research, it is not known whether training in negotiation and assertiveness training would help.

Other research has shown that the ability of individual group members to perform well is reduced when they are concerned about negative stereotypes, and that groups that have more diverse thinkers come up with more innovative strategies.

Dr. Smith-Doerr reported on an SBE workshop held in response to a CEOSE recommendation that NSF sponsor additional social science research on the barriers to broadening participation in STEM. The participants represented a wide array of sciences. They reported that, despite decades of programmatic efforts to broaden participation in STEM, the statistics show that little progress has been made.

Dr. Smith-Doerr said that we may lack a fundamental understanding of the barriers to broadening participation. Because the social, behavioral, and economic sciences have been marginalized (or at least that is the perception among experts in SBE), the communication needed among various disciplines has not occurred. Workshop participants did not suggest a separate program within SBE, since it might become "ghetto-ized." Other factors identified at the workshop and at the CEOSE meeting include the need to adopt common terminology, to develop social science measures and theories to guide research, to assure diversity among the researchers, to identify Federal funding for the research, and to study how broadening participation issues differ for different underrepresented groups (e.g., women, minorities, and persons with disabilities). Additional details on the workshop are available on the University of Michigan website.

After discussion, CEOSE members concluded that having a science of broadening participation program would help get the research started and funded in the scientific community. It was noted that some of the work described by **Drs. Craig-Henderson** and **Smith-Dorr** is reminiscent of aspects of the Science of Learning Centers, and that there could be collaboration with them.. Also discussed were the appropriate amount of research accountability, how funding would be allocated among various aspects of the science, the need for definitive data to show the need for more underrepresented minorities in the workforce and how this would support American leadership in STEM, and the employment prospects for degree recipients.

Presentation by Dr. Shirley M. McBay, President of Quality Education for Minorities (QEM) Network, Inc.: *A Report on the Series of Outreach Meetings on the Impact of the Suppression of Small Data Cells in the Survey of Earned Doctorates Reports*

Dr. McBay reported on a series of NSF-funded workshops conducted by QEM on the suppression of small data cells in a 2007 SRS report on a Survey of Earned Doctorates (SED). One concern raised was whether the suppression of small numbers, due to concerns about privacy and confidentiality, had a negative impact on underrepresented minority communities; i.e., the success of non-minorities is shown in the data in the report, but not the success of underrepresented minorities. Another concern was that the decision to suppress the data was not subjected to prior review. Alternative strategies, such as changing the minimum numbers reported or aggregating the data over time, had drawbacks.

An April 2008 report, *Inside Higher Education,* called attention to the impact of the suppression of data, apparently resulting in a number of complaints to NSF and a subsequent release, in late 2007, of the data for 2006, without suppression. In 2008, QEM followed up with eight small-group workshops in five states and the District of Columbia.

Workshop participants discussed the harm that suppressing the number of minority degrees could cause for some racial and ethnic groups. For example, American Indians would be highly impacted because of the small number of degrees earned by this group. The data are considered valuable for making comparisons, developing policies, measuring accomplishments, planning budgets, identifying potential role models, and preparing proposals.

The workshops resulted in several overarching recommendations:

- Inform the data user community about issues pertaining to confidentiality and the impact of data suppression.
- Get feedback from other organizations on confidentiality issues.
- Obtain external advice on the implementation of a confidentiality pledge.
- SRS develop an action plan to deal with the situation caused by the suppression of data and discuss this plan with the sponsors of the SBE report (e.g., NSF, NIH, NASA, NEH, DoE, and USDA), and with the SBE Advisory Committee, of the SBE report.
- Include U.S. Citizens and permanent residents in the tables in the report.
- Use a different coding system.

The conclusion was that the suppression of data would have a major impact on the ability of institutions and organizations to address the underrepresentation of minorities, and that SRS should consult frequently with data users, follow the advice of the various reports, and establish internal procedures for responding to feedback.

The next step is that the NAS Committee on National Statistics, at the request of SRS, will convene an expert panel to review a position paper being prepared by SRS as well as the QEM report, and offer advice regarding how SRS might proceed.

CEOSE members said they were aware of the issue and had met with SRS staff in 2008. They learned that no one had launched a formal complaint about data suppression. Subsequent to that meeting, CEOSE members submitted a letter to **Dr. Bement** about data suppression concerns and their concurrence with his reversal of the decision to suppress the data.

Presentations by Dr. Lynda T. Carlson, Director, and Dr. Mary J. Frase, Deputy Director of the NSF Division of Science Resources Statistics (SRS)*: An Update on the Next Steps in Providing Race, Ethnicity, and Gender (REG) Data from the Survey of Earned Doctorates (SED)*

Dr. Lynda Carlson reported that SRS made a broad effort to hear the community concerns when the original 2006 SED tables were issued, and to consider alternative approaches. She noted that NSF funded and attended the outreach workshops led by QEM and its contractor, SRI. SRS also conducted a web survey of data users and purchasers of the race ethnicity and gender tables. As a result, significant changes were made, such as providing consistent time-series data that enable trends to be clear.

Dr. Mary Frase reported that the meetings addressed a set of tables that broke down, in detailed fields, the distribution by race, ethnicity, and gender (REG). The issue was that, when the data were broken down by fields, there were a lot of small cells of less than five, resulting in a "D" shown in the table. While the data may not have been shown in those tables, however, the counts were included in the totals and in other tables.

To protect confidentiality, federal statistical agencies traditionally use three methods: 1) Suppression of small cell counts; SRS had applied suppression rules in the SED for many years before 2007, but in 2007 this was extended to the suppression to all variables; 2) Aggregation to prevent disclosing individually

identifiable data; and 3) Noise addition--adding or subtracting from small cells to disguise the actual number. SRS did not pursue the latter approach; but instead, used a hybrid which the data were "rolled up" to a point where there were no problems with confidentiality.

SRS heard repeatedly that indicating zeros in appropriate fields was important. SRS also heard that: 1) Of the three alternatives presented, the one that combined Blacks, Hispanics, and American Indians into single underrepresented minority group was not useful; 2) Combining years decreases the ability to see trends over time; 3) If aggregation of years is required, then two years should be the maximum; and 4) There were problems with combining "multi-race" data into an "other" category.

SRS laid out a plan of action based on user comments as follows:

What users said

- Important to show small counts of underrepresented minorities,
- Zeroes are important; need to display zeroes,
- Not useful if aggregate into underrepresented minorities,
- Lose data/ability to follow trends if aggregate years,
- Field aggregation must be meaningful; CIP a possibility for this purpose, and
- Not making full use of data if include multi-racial in Other category.

How SRS will address

- Protect confidentiality by aggregating small fields rather than by suppressing small cells,
- Display zeroes,
- Report all underrepresented minority groups separately,
- Report data for single years,
- Use CIP to inform aggregation of small fields, and
- Report separately those reporting more than one race.

In March, SRS will post on the website an updated progress report and background paper. The NAS Committee on National Statistics panel will convene in the April-May time period. If no concerns are raised as a result of that meeting, the tables will be available in June. Users will no longer be charged for the tables; they will be made available on the website. Finally, the full interagency summary report containing the tables will be available after the sponsoring agencies have received it.

Reports by *CEOSE Liaisons to NSF Advisory Committees*

After a discussion of issues pertinent to Liaison responsibilities, it was **AGREED** that, if a CEOSE Liaison cannot attend his/her assigned directorate or office advisory committee meeting, a substitute member should be identified to cover that meeting. Also **AGREED: Dr. Ramirez** will serve as liaison to the Cyberinfrastructure AC; **Dr. Hammonds** to the OISE AC; **Dr. Ong** to the GPA AC; and **Dr. Ladner** to the B&O AC, with **Dr. Francisco** substituting when he cannot attend. **Drs. Francisco** and **Myers** agreed to attend GEO AC meetings, with one attending at a time.

Ms. Begay-Campbell reported that the ERE AC is finalizing a green book with strategies and actions that will address challenges in climate change and environmental issues. **Dr. Harris** reported that the Cyberinfrastructure AC discussed the CEOSE mandate and activities. The ENG AC will not meet until April. **Dr. Ladner** reported that at the CISE AC meeting, a broadening participation strategic plan was presented but not well received. He will contact **Dr. Wing** about this matter and report back to CEOSE. **Dr. Myers** participated virtually in the SBE AC meeting. He is troubled by the failure of the science of

broadening participation to make its way into the active research agenda, and that the literature and theory about the science focus on affects and deficiencies rather than structural and institutional factors. He wants CEOSE to send a strong signal to SBE to advance the science of broadening participation. He also suggested that CEOSE contact advisory committee speakers such as the Director of the NSF Office of Legislative and Public Affairs. **Dr. Maldonado** reported that the MPS AC discussed large facilities as well as CEOSE during its most recent meeting.

Continuation of Reports of the CEOSE *Ad Hoc* Subcommittee Chairs

As a part of the Strategic Planning Subcommittee's report, **Ms. Davis** and **Dr. Collier** of Beyond The Bottom Line, Inc. presented information and got feedback on the draft 2007-2008 CEOSE biennial report. March 10 was set as the deadline for additional comments. Members made suggestions on how to clearly present data on the status in science and engineering of women, underrepresented minorities, and persons with disabilities. **Dr. Ong** suggested that the discussion by CEOSE on SRS data suppression be included in the draft report. **ACTION: Dr. Maldonado** and other CEOSE members will arrange a conference call with the contractor to discuss the draft report.

ACTION: CEOSE members were requested to send to **Dr. Tolbert** items for the June 2009 meeting agenda by May 19.

ACTION: Dr. Maldonado requested that members advise of themes for CEOSE meetings.

Dr. Tolbert reported that NSF published a "Dear Colleague Letter" (http://www.nsf.gov/about/performance/dir_advisory.jsp) about the method to use in nominating a person, or nominating oneself, for membership in any NSF advisory committee, including CEOSE. She advised that some nominations have been received and added to the current list of nominees, which resulted from nominations by CEOSE members and NSF officials.

Adjournment

The meeting was adjourned at 2:10 p.m.

CERTIFICATION OF THE ACCURACY OF THE CEOSE MEETING MINUTES

Dr. Theresa A. Maldonado, Chair of the Committee on Equal Opportunities in Science and Engineering, approved the meeting minutes on May 15, 2009, in a telephone conversation with **Dr. Margaret E.M. Tolbert,** CEOSE Executive Liaison.