

# Mini-Symposium – 2008 Report Broadening Participation of Native Americans in Science and Engineering: Lessons Learned

A report submitted to the Committee on Equal Opportunities in Science and Engineering  
by  
Dr. Marigold Linton, CEOSE Member

October 29, 2008

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The Mini-Symposium on broadening participation of Native Americans in science and engineering was held on October 29, 2008, at the National Science Foundation. It was designed to highlight strategies that increase the number of Native Americans in science and engineering. This activity was co-sponsored by the Committee on Equal Opportunities in Science and Engineering (CEOSE) and the National Science Foundation (NSF) Centers Forum, and it has assistance from The Mississippi eCenter in its development. It was well attended.

The goals were:

- To identify lessons learned and persistent barriers to broadening participation in science and engineering by Native Americans;
- To share ideas and experiences of leaders in the community, as well as those of officials at selected Federal agencies, on broadening the participation of Native Americans in science and engineering;
- To make recommendations to CEOSE on what actions it could take that would best propel the science and engineering agenda forward for Native Americans; and
- To make recommendations to CEOSE and to funding agencies (including NSF) on ideas for policies and programs that will cause institutions to choose to make changes, which taken together will transform the science and engineering enterprise to become much more welcoming, supportive, inclusive, enabling, and advancing of Native Americans who are traditionally underrepresented in science and engineering (and obtain the data to demonstrate this progress).

**Dr. Wesley L. Harris**, CEOSE Chair, set the tone for the mini-symposium and **Dr. Kathie Olsen**, NSF Deputy Director, welcomed everyone. **Dr. Margaret E. M. Tolbert**, the CEOSE Executive Liaison, discussed the format for the meeting and introduced the persons responsible of providing background information on the three main speakers.

Designated discussants enthusiastically participated in the deliberations on the topic of the mini-symposium, following presentations by the three main speakers whose names and presentation titles follow:

*Where Are We and Why Aren't We There Yet?*

**Ms. Holly Pellerin**

Coordinator

Earth, Water and Wildlife Track

National Center for Earth-surface Dynamics (NCED)

Fond du Lac Tribal and Community College

and

Tribal Elder, Fond du Lac Band of the Ojibwe

*Tribal Indigenous Knowledge: The Science, Technology and Tribal Interface at CMOP*

**Mr. Roy Sampsel**

Board Member, Institute for Tribal Government, Portland State University  
Chairman, External Advisory Board, Center for Coastal Margin Observation and Prediction

*Alaska Native Science & Engineering Program (ANSEP), Building a National Model for Excellence in Native American Higher Education Programs*

**Dr. Herb Schroeder**

Associate Dean and Professor of Engineering  
University of Alaska-Anchorage, School of Engineering  
Executive Director, LSAMP Pacific Alliance  
Executive Director, Indigenous Alliance for Engineering & Science Education  
Executive Director, Alaska Native Science & Engineering Program (ANSEP)

The above three speakers were introduced by **Dr. Dragana Brzakovic** of NSF, **Dr. Marigold Linton** of CEOSE, and **Dr. Joan Frye** of NSF, respectively.

**Dr. David R. Burgess**, a former CEOSE member who currently serves as Professor of Biology at Boston College and as a Board member of SACNAS, kicked off the discussion session with the presentation of data and questions that stimulated thought and focused the deliberations.

Recommendations that resulted from the mini-symposium provided by individual discussants who participated in the roundtable discussion are as follows:

- **Ms. Carrie L. Billy, J.D., President & CEO, AIHEC:**
  - Provide SIGNIFICANT resources over a sustained time frame – (longer term grants i.e., 10 years)
  - Provide Access to best practices – widely disseminated and used by grantees and potential grantees.
  - Develop and implement Co-equal partnerships across NSF, addressing, and including all areas, including climate change/geo-sciences education and research.

\* NSF should focus on improving and expanding access to its programs—lead other agencies by example, not by trying to force collaboration. You will just get bogged down in meetings. We need action!

\* We need a TCU EPSCoR!
- **Dr. David R. Burgess, Professor of Biology, Boston College; SACNAS Board Member:**
  - A new program should be created to support the efforts of the colleges and universities graduating large numbers of American Indian/Native American science B.S. students.
  - In states that do not have Tribal Colleges, create new pre-college programs for colleges with large enrollments of American Indian/Native American students.
- **Dr. Diana Dalbotten, Diversity Director, NCED/University of Minnesota – Twin Cities**
  - Support the formation and sustenance of AISES chapters (and SACNAS) at universities, Tribal Colleges, high schools, etc. These matter to the students,

who get more support (social, psychological) there than any where else if the chapter is strong.

- Find out how often lack of scholarships and other funding leads to school dropouts from STEM programs. I know this has been the case with many STEM juniors or seniors that I know.
- Find a way to include non-academics (program managers, teachers, parents, elders) in the new development of new NSF programs, and on programs panel.

We need better research on promoting math (best practices) with Native Americans, but emphasis on control groups and number only hampers this research - how do you get reliable numbers with small groups and informal programs?

- **Dr. Anselm G. Davis**, Executive Director, White House Initiative on Tribal Colleges and Universities:
  - Find ways to ensure that everyone working with American Indians understand the history of education in the life of Indians and make adjustments.
  - Continue to provide resources in the hands of Indian people, which will help self-determination effort.
  - Research the Rural Systemic Initiative, and duplicate it.
- **Dr. Willard Sakiestemwa Gilbert** – Professor, College Education, Northern Arizona University:
  - Seek collaborative efforts with national Indian organizations to help set the agenda for the STEM initiative at the National Indian Education Association. The National Congress of the American Indians and the American Indians Science and Engineering Society have already started this discussion.
  - Find more programs that address the issues of providing STEM programs at the elementary level that targets the integration of traditional language and culture (i.e. traditions, stories, values, language, and indigenous ways of knowing) into the existing science curriculum from K-12.
  - Providing funding a program for professional development in areas of teacher training in how to teach science and how to develop native cultural knowledge based on cultural – based curriculum.
- **Dr. Gerald Gipp**, Former NSF Program Officer & Former AIHEC:
  - The NSF Director should create an American Indian Initiative, which cuts across all Directorates.
    - Mandates
    - 1a. Each Directorate should assess its current contributions to promoting pre-k-12 education and post-secondary education for American Indians.
    - 1b. Each Directorate should consider changes in their program authority to increase service to American Indian education.
  - NSF should take a lead role to advocate for coordination with other federal agencies to create real partnerships (pre-k-12 – HE).
- **Dr. Marigold Linton**, Director American Indian Outreach, University of Kansas
  - Think of ways to improve grant writing and review.
    - ✓ Grant proposals are too often rejected on technical grounds rather than on the quality of the ideas.

- ✓ The number of Native reviewers should be increased – both scientists and participants.
- **Dr. J.V. Martinez**, Senior Advisor, Scientific Institutional Outreach, Office of Science/US Department of Energy:
  - Fund a sociology-based study to understand the social content re: STEM education in Indian country;
  - Re-institute Rural Systemic Initiative directed to TCU;
  - Conduct a study to evaluate infrastructure in TCU that hinders STEM education.
  - Catalog the more successful STEM education experience in TCU.
- **Dr. William E. McHenry**, Executive Director, The Mississippi eCenter/Jackson State University:
  - Provide a forum (on-line) to continue the discussion, which was begun with this mini-symposium.
  - Use technology to link Tribal Colleges with NSF funded projects to encourage transfer and BS Degree completion.
  - Link TCUP & LSAMP with STCs and other large Center programs at NSF to encourage – where possible – infrastructure development.
- **Dr. Gerald E. (Carty) Monette**, Senior Advisor, Quality Education for Minorities Network, Inc.:
  - Professional Development
    - ✓ TCU faculty
    - ✓ K-12 faculty
 Focused on STEM Instructional Improvement, and for TCU STEM faculty include research opportunities for undergraduate (STEM Learning).
  - Teacher Education
  - Use the TCUP as a vehicle for collaboration and partnership ventures with NSF among Directorates.
  - Climate change initiatives, instruction, and research.
  - Application of Technology to improve STEM instruction and research.
  - Provide project specific evaluations on Tribal College and University campuses; however, be sure that those who are conducting those evaluations are familiar with the Tribal Colleges and Universities.
  - Develop the evaluation capabilities of more Native Americans who can evaluate NSF projects.
- **Dr. Holly Pellerin**, Tribal Elder & Coordinator for Earth, Water and Wildlife Track of NCED, Fond du Lac Band of the Ojibwe:
  - Let us write what we need for STEM advancement and try to work with us to fill our needs, and it will fill our needs as people of our Earth. Include STEM.
  - Don't make us quibble over money or compete with other Indians.
  - Do what you mean for American Indians. Participation as real partners – not just “add ins”.
- **Dr. Carl S. Person**, Manager, Minority University Research and Education Programs, Office of Education, NASA Headquarters:

- Recommend NSF consider a program designed to place scientists and engineers from across the country at TCUs. Individuals could spend up to two years conducting research and/or teaching at the Tribal Colleges.
- Recommend NSF take the lead in developing, planning, and implementing a crosscutting Federal Agency program focusing on internship and externship in which Federal representatives spend the summer in Indian country. Representatives from Federal Agencies would serve as mentors for cohorts of student and faculty teams involved in hands-on research. The goal is to involve them in research that they can continue their campuses with on-going connections to the visiting scientists or engineers.
- **Dr. Patricia Petite, President, Fond du Lac Tribal College:**
  - Community Outreach
    - ✓ Families – partnership
    - ✓ Schools P-12
    - ✓ Tutors - family nights (math and science)
  - Teacher Training
    - ✓ Re-train
    - ✓ Curriculum
  - Flexible Requirements
    - ✓ One size doesn't fit all.
    - ✓ Resources
- **Dr. Clifton A. Poodry, Director, Minority Opportunities in Research Division, NIGMS/NIH:**
  - Continue to gather data on the nature of the problem.
    - Less than 50% American Indians graduate from high school.
    - Half live on reservations.
    - Are the high school and college graduates going rates different for reservation versus non-reservation Indians?
  - Is success over reported? Because identity is self-identified. Being an American Indian is not a race/ethnicity but a tribal affiliation – which varies by tribe.
  - The RSI clearly had an impact on K-12 and may be worth reviving.
  - Work with and through professional societies (e.g., SACNAS and AISES).
  - A very successful project for American Indian graduate students is the Sloan Program at the University of AZ. Form a partnership, and expand it.
  - Look to form a partnership with HHMI in its educational program. The Phage Discovery Project could easily be extended to TCU and to high school students.

The concept of multi-generational grief is extremely important. Many families have several generations who have been failed by education systems. The effects of the boarding school days have been inherited and pass on to containing poor outcomes.
- **Dr. Paul E. Racette, Co-Vice Chair, Goddard's Native American Advisory Committee, NASA Goddard Space Flight Center:**
  - Establish guest faculty program at TCUs that draw professionals from government, industry, and academia. Benefits include:
    - ✓ Two way exchange,
    - ✓ Faculty relief,
    - ✓ Curriculum enrichment,

- ✓ Grant writing, and
  - ✓ Increased understanding of cultural differences and strengths.
- Foster partnership between Native American communities, institutions, and faculty and government and industry. Foster partnering between federal agencies.
- Access the effectiveness of minority programs in reaching Native American institutions and students. Biases exist in the application, selection, and evaluation processes.
- **Mr. Roy Sampsel, Chairman, External Advisory Board, CMOP/Oregon Health and Science University; Board Member, Institute for Tribal Government/PSU:**
  - NSF should help other Federal agencies understand what the needs are in SET education and report to congress on the need for resources.
  - Develop long term funding that would be in the timeframe of five to ten years.
  - Understanding how complex the Indians/tribal world is so that NSF can address the full range of issues.
- **Dr. James Wyche, Director, Human Resources Development Division/EHR/NSF:**
  - Integrate the culture of native people with STEM education via NSF programmatic activities.
  - To improve sustainability, NSF should provide a minimum published time frame in which a teacher ed., student, or related preparation activities are supported.
  - Use best practice(s) of RSI to “re-model” a TCUP STEM activity to improve teacher/student education in native and tribal colleges.
- **Ms. Sara L. Young, Director, American Indian Research Opportunities, Montana State University:**
  - Continue dialogue with Native American programs and community leaders to create new programs that NSF can support in Indian country.
  - Strengthen the broadening participation requirements in all NSF funded projects – outside of the EHR divisions.
  - Provide incentives for STEM teachers and faculty to serve in reservation K-12 schools and tribal colleges who are struggling to hire STEM teachers and faculty.

Following remarks by **Dr. W. Lance Haworth**, Director of the Office of Integrative Activities of NSF, **Dr. Harris** advised that the above recommendations would be summarized for review and approval by members of CEOSE. The resulting summarized list of recommendations will be submitted by CEOSE to the NSF Director for action.