TCUP FINAL REPORT
For
FY 2010 NSF COMMITTEE OF VISITOR (COV) REVIEW

Guidance to NSF Staff: This document includes the FY 2010 Committee of Visitors Final Report of the TCUP Program. The COV followed the specific guidance for the COV review process as described in Subchapter 300-Committee of Visitors Reviews (NSF Manual 1, Section VIII) at: www.inside.nsf.gov/od/oia/cov.

The COV report provides a balanced assessment of NSF's performance in two primary areas: (A) the integrity and efficiency of the ***processes*** related to proposal review; and (B) the quality of the ***results*** of NSF's investments that appear over time. The COV also explores the relationships between award decisions and program/NSF-wide goals in order to determine the likelihood that the portfolio will lead to the desired results in the future. The COV studied confidential material for Part A of the Core Questions such as declined proposals and reviewer comments. The *COV report does not contain confidential material or specific information about declined proposals.* Discussions leading to answers for Part B of the Core Questions involved the study of non-confidential material such as results of NSF-funded projects. The report is useful in assessing agency progress in order to meet government-wide performance reporting requirements that are available to the public. We understand that material from COV reports may appear in NSF performance reports and may be subject to an audit.

FY 2010 NSF COMMITTEES OF VISITORS (COV)
PROGRAM REPORT FOR TCUP

The table below has been completed by program staff.

Date of COV: August 31 – September 2, 2010
Program/Cluster/Section: Tribal Colleges and Universities Program (TCUP)
Division: Human Resource Development (HRD)
Directorate: Education and Human Resources (EHR)
Number of actions reviewed: **Awards: 14 Declinations: 17 Other: N/A**
Total number of actions within Program/Cluster/Division during period under review: **Awards: 81 Declinations: 34 Other: N/A**
Manner in which reviewed actions were selected: **Random sample of award and non-award actions ending in the numerals "3", "5" and "8" at end or second from end of award/decline identification number. The sample includes new, incremental and supplemental actions other than this methodology to form a representative sample of the portfolio.** ***Innovation through Institutional Integration (I3) actions may be included in the total number of actions but were not reviewed by this Committee of Visitors.***

PART A. INTEGRITY AND EFFICIENCY OF THE PROGRAM'S PROCESSES AND MANAGEMENT

The COV briefly discussed and provided comments for *each* relevant aspect of the program's review process and management, and based comments on a review of proposal actions (awards, declinations, and withdrawals) that were *completed within the past three fiscal years*. We provided comments for *each* program that was reviewed and for those questions that were relevant to the program under review. We used quantitative information to answer some questions, and made constructive comments noting areas in need of improvement.

A.1 Questions about the quality and effectiveness of the program's use of merit review process. Provide comments in the space below the question**.** Discuss areas of concern in the space provided.

QUALITY AND EFFECTIVENESS OF MERIT REVIEW PROCESS	YES, NO, DATA NOT AVAILABLE, or NOT APPLICABLE[1]
1. Are the review methods (for example, panel, ad hoc, site visits) appropriate? **Comments:** For the last three years, the review methods used for evaluating applications prior to awards included panel and ad hoc reviews. Sites visits were carried out mostly post award. The ad hoc and panel reviews are appropriate methods that allow for selection of the best proposals that could be funded as well as provide insights and feedback on proposals that are considered meritorious but still require revisions. In general there were 5 reviewers per application who gave varying degrees of critical examination of the applications. The panel review is the most appropriate forum to bring a diverse group of reviewers to look at a spectrum of project types and come to an agreement on the qualities of these proposals. The various types of proposals included continuing grant increments, competitive renewals, new projects, returned/revised applications, supplements, and various other categories. Panel comments were summarized and a recommendation for either funding or declination is made after reaching a consensus. In instances where there were disagreements, the majority opinion may prevail and in some instances final decision is deferred to the program director that included in the review analyses findings/evidence for the funding or declination decisions and a clearly stated	**YES**

[1] If "Not Applicable" please explain why in the "Comments" section.

rationale for the decisions made. The overall process is appropriate because several parties work to come to final decisions. The process allows for a good flow of feedback to the applicants as they are given supportive critiques.	
2. Are both merit review criteria addressed a) In individual reviews? b) In panel summaries? c) In Program Officer review analyses? **Comments:** In general, both merit review criteria were addressed in the individual reviews, although with varying degrees of assessment. The reviews differed from proposal to proposal in terms of quality and consistency; a lot depended on the panel group- the experience of the reviewers with the process and their understanding of the two merit criteria. Reviewers were not always consistent in their assessment of what constituted intellectual merit or broader impacts; in many cases the reviews simply stated what the applicants wrote without offering any critical judgment or whether they agree or not. This was usually the case with the broader impacts. It is not known what prior training or instructions were given to the reviewers to assist them in identifying and analyzing the broader impacts of the applications. It may help if the reviewers are given further instruction or training before and during the panel review. Although strengths and weaknesses were addressed in some reviews, these do not necessarily indicate whether the applications have strong intellectual merits or broader impacts. Usually in proposals that were recommended for funding, such discussions were limited. Some reviews also had difficulty identifying what would constitute as broader impacts- hence the comments are rather short or lacking substance. The Panel summaries reflected the individual reviews and likewise, while the intellectual merit was addressed considerably, the broader impact was rather short or superficial. The Program Officer review analyses were always helpful in providing more information about the process and how the recommendations or consensus agreements came about. In most instances, the merit review criteria were addressed substantially. There were a few cases, particularly those with declined funding, where the Intellectual Merit and Broader Impacts were not identifiable due to the way the proposals were written. The review analyses could include more critical judgment of the reviews given	**YES**

by the individual reviewers and how these all fit into the panel discussion.	

3. Do the individual reviewers provide substantive comments to explain their assessment of the proposals? **Comments:** Comments from the reviews varied, but generally provided adequate information to justify or explain their assessment of the proposals. The panel summary and follow up discussions with the program officer supplemented this assessment that helped to understand the rationale for the reviewer recommendations. However, in some cases it appeared that the reviewers either did not have adequate information or were not willing to recommend declining the proposal and would rather defer to the program officer. Some reviewers simply had single liners and also did not provide critical assessment of the approaches and methodologies proposed. In some instances, after the panel discussions, some reviewers changed their assessment of the proposals but failed to update the reviews that finally went out to the applicants. This is rather distressing for some applicants especially if there are so many positive comments and yet the final review and panel summary showed more negative critiques which led to no funding. It would be helpful if the reviewers could amend their reviews before these are sent out to the applicants.	**YES**
4. Do the panel summaries provide the rationale for the panel consensus (or reasons consensus was not reached)? **Comments:** Generally the panel reviewer ratings were consistent with few exceptions indicating divergent views on the quality of the proposals. In those limited cases, clarification was provided through further discussion or seeking additional information from the proposal writers—or in a few cases conducting a site visit to clarify issues and obtain information for a final decision. The summaries often provided the strengths and weaknesses of the proposals as they pertain to the intellectual merit. These were then used as a gauge of whether the proposal was meritorious or not.	**YES**

5. Does the documentation in the jacket provide the rationale for the award/decline decision? (Note: Documentation in jacket usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), program officer review analysis, and staff diary notes.) **Comments**: The final decisions were consistent with the panel consensus and the review analyses, and justified by the documentation. The program officer supported the recommendation made by the panel and the final decisions were also explained in the context statement, both individual and panel summaries, site visits in limited cases, and the program officer analyses and diary notes. The final decisions for all other applications were consistent with the panel reviews.	**YES**

6. Does the documentation to PI provide the rationale for the award/decline decision? (Note: Documentation to PI usually includes context statement, individual reviews, panel summary (if applicable), site visit reports (if applicable), and, if not otherwise provided in the panel summary, an explanation from the program officer (written or telephoned with diary note in jacket) of the basis for a declination.) **Comments:** Discussion disagreements were well documented and explained. Panel summaries were succinct and addressed the merits of the proposal as well as the weaknesses. The individual reviews, panel summaries and context statements were all consistent with the decisions made. Where there were disagreements, the panel summaries provided further explanation on how the final decisions or consensus were made and supported by the program officer's review analyses. The information provided to the proposers, particularly the individual and panel summary reviews, made the case for the final decisions. Only in one instance did the reviews appear to be inconsistent with the final decision to fund the proposal. In that case, the program officer did explain the reasons for the final decision to be somewhat inconsistent with the reviews. It might have been helpful if the decision were explained further in a diary note.	**YES**

7. Is the time to decision appropriate? Note: Time to Decision --NSF Annual Performance Goal: **For 70 percent of proposals, inform applicants about funding decisions within six months of proposal receipt or deadline or target date, whichever is later**. The date of Division Director concurrence is used in determining the time to decision. Once the Division Director concurs, applicants may be informed that their proposals have been declined or recommended for funding. The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals. **Comments:** Based on the information provided for the assigned proposals, (actual award made, date of DD concurrence for declines, deadline for submissions) the panel thought that the time to decision did not meet the NSF performance goal. However, this conclusion was based only on the sample proposals (which were mostly implementation projects) assigned to each COV panelist and did not include other types of applications. These assigned projects may constitute only a fraction of the whole TCUP portfolio and may not reflect the overall performance of the program in meeting the time to decision. Moreover, as commented upon above, "The NSF-wide goal of 70 percent recognizes that the time to decision is appropriately greater than six months for some programs or some individual proposals." This is likely a factor for the TCUP program, and should be taken into account. Staffing issues (workload, available permanent staff for projects that require constant support and guidance) were likely connected to timing problems and additional permanent program staff may alleviate the situation. On the final day of the panel meeting, we received additional information indicating that the data given to us on time to decision may have been incomplete or incorrect, and that time to decision may actually be within the NSF Annual Performance Goal. Based on that, we feel we cannot make a clear judgment, and since we have been mandated to provide a YES or NO answer to this question, and NO is in doubt, we have taken the cautious approach by not giving a NO answer that could cause unwarranted concern about program personnel performance that could well be within guidelines.	**YES**

8. Additional comments on the quality and effectiveness of the program's use of merit review process:

The process for selection of meritorious proposals through ad hoc and panel reviews are very effective, particularly in cases where there are disagreements. The process clearly shows how reviewers with varying opinions can come to an agreement and make final recommendations that are agreeable if not to all, then to the majority of the reviewers including the program officer. The additional site visit for some projects may be better if done as part of the review prior to award rather than post award. This may require more time and staffing on the part of the program, which may not be possible if there is only one permanent staff.

Timing and staffing are the two major underlying issues. This is not due to lack of effort on the part of the program staff, but it may be due to the way NSF is configured in terms of hiring permanent staff and rotators and when deadlines are set that sometimes do not coincide with the school calendar resulting in unnecessary but unavoidable delays particularly during school breaks, when it is more challenging to contact the pertinent school officials to complete transactions.

The overall balance of the number of program officers in each program needs to be considered when referencing TCUP in particular, because more effort should be put into thinking about the best way to staff for long-term goals. Continuously changing program officers is not the best approach in this instance.

We suggest adopting specific timelines to stay on track.

A.2 Questions concerning the selection of reviewers. Provide comments in the space below the question. Discuss areas of concern in the space provided.

SELECTION OF REVIEWERS	**YES , NO, DATA NOT AVAILABLE, or NOT APPLICABLE[2]**
1. Did the program make use of reviewers having appropriate expertise and/or qualifications? **Comments:** There was a good mix of disciplines, backgrounds, qualifications, and abilities to look at broad issues that relate to each individual tribal college and university. Reviewers came from fields across the STEM disciplines, with expertise in many different areas.	**YES**

[2] If "Not Applicable" please explain why in the "Comments" section.

A lot of reviewers from tribal colleges and universities were included, which is very important because they are well aware of what the institutions really need and how to carry out project implementation.	
2. Did the program use reviewers balanced with respect to characteristics such as geography, type of institution, and underrepresented groups? Note: Demographic data is self reported, with only about 25% of reviewers reporting this information. **Comments:** There was a good balance of reviewers. The program took care in ensuring that then composition of reviewers was diverse and well balanced—taking into consideration the geography, type of institutions (TCUs, 2-year non-Tribal Colleges, Tribal and non-Tribal 4-year institutions, research intensive institutions, and independent consultants), gender, ethnicity, and discipline expertise. Having reviewers from HSIs on the panel or even as ad hoc reviewers could have added another perspective to the review outcomes if they were included more often, particularly because many HSIs have a considerable number of Native American students. Also missing in this group are reviewers from Alaska Native and Native Hawaiian Serving Institutions. Adding more reviewers from these groups can potentially expand the reviewer pool.	**YES**
3. Did the program recognize and resolve conflicts of interest when appropriate? **Comments:** There were no direct conflicts of interest with the reviewed proposals. However, TCUP should expand its reviewer pool so they have more choices of reviewers and "recycle" less. This will help avoid the potential danger of creating conflict of interests, or appearance of COI. The COV panelists believe that there is sufficient number of expert reviewers that can be tapped for this program.	**NOT APPLICABLE**

4. Additional comments on reviewer selection:

There was a good mix of reviewers and the reviews also varied in style and quality. Although overall there was mostly a consensus among the reviewers when it came to final recommendations, the quality of the reviews varied from substantive and helpful critiques to some non-review (lack of critical assessment but repeats what the PI has written in the proposal). This may reflect reviewers' familiarity with the merit review criteria used as well as with the overall review process. Not all were articulate with the concerns or strengths of the proposals.

Overall, the selection process has come up with a good collection of reviewers, and would not seem to be in any need of serious revision. However, expanding the reviewer pool could help bring new opinions and qualities into the mix of the existing pool of experienced reviewers and avoid potential COIs. This could also assist with the process of building leadership by inviting new or unseasoned reviewers, so they eventually will gain the insights on writing competitive proposals.

A possible source of recommendation for potential reviewers may come from funded projects, and TCUP could stress the importance of recommending panel reviewers for proposals; this may allow the program to recruit more American Indian reviewers, as well as other faculty members that are familiar with TCUs.

A.3 Questions concerning the resulting portfolio of awards under review. Provide comments in the space below the question. Discuss areas of concern in the space provided.

RESULTING PORTFOLIO OF AWARDS	APPROPRIATE, NOT APPROPRIATE[3], OR DATA NOT AVAILABLE
1. Overall quality of the research and/or education projects supported by the program. **Comments:** TCUP supports very high quality and competitive projects that are very thoughtful of and relevant to the indigenous culture and educational needs. The projects are very responsive to the national priority of developing a more robust STEM program and pipeline. Through these projects students are provided the opportunities to explore the world of STEM with hands-on research experiences, experiential learning, and development of technical skills. The projects also allow for the development of partnerships with other institutions, which should lead to more interaction and opportunities not only for the students but also the faculty. These projects also allow participating students to pass on their knowledge and enthusiasm as well as share their experiences with the younger generation through service learning in K-12 schools supported by the tribes. Because the projects are tailor-made for the TCUs that allow further development of these institutions there is a growing number of degree programs that have been successfully institutionalized and therefore more students will benefit from the TCUP support.	**APPROPRIATE**

[3] If "Not Appropriate" please explain why in the "Comments" section.

2. Does the program portfolio promote the integration of research and education? **Comments:** The program solicitation encourages the integration of research and data collection—the tribal colleges and universities that are more advanced are using research and data to foster development of their educational programs. The funded projects integrate research and education, by focusing on engaging and providing students with actual hands-on research activities that promote interest in STEM and increase retention in their degree courses. Opportunities were also given to the students so they can develop additional skills that will be useful as they go into the academic pipeline and into the workforce. The infusion of the native ways of doing and knowing is included in the curriculum and in various courses within a given project.	**APPROPRIATE**
3. Are awards appropriate in size and duration for the scope of the projects? **Comments:** Based on the projects assigned to the COV panelists, the consensus is that the awards made are appropriate in size and duration for the scope of the projects. However, the panelists also recognized that not all TCUs have received NSF funding and the program may have to develop other initiatives in order to address this issue. The ability of the NSF to adequately address the high level of need in the field on Indian education is totally dependent on the annual TCUP program budget. In most cases, funding levels meet the basic needs of the projects on a multi-year basis, which has a limiting effect for potential new projects. As a result some TCUs have not enjoyed the advantage of TCUP funding.	**APPROPRIATE**
4. Does the program portfolio have an appropriate balance of: • Innovative/potentially transformative projects? **Comments:** The projects are innovative, cultural, and transformative for their colleges and their communities. The TCUP program allows for the infusion of cultural approaches in the learning environment. This proposition is the foundation for building upon the Native knowledge base of indigenous communities. It also has a stabilizing effect of helping to maintain Native languages and culture that have been ignored over the past decades by the federal government, parochial and the public school systems, and will prove to be transformational for Native education.	**APPROPRIATE**

During the review process, the reviewers were really looking for how the proposed projects included innovative and creative ways of providing students with holistic learning experiences. Projects that were awarded showed aspects of innovation in pedagogical approaches and instructional deliveries, but also maintained some traditional approaches. There were good attempts in having a balance between Western and native ways of learning. Example of innovative project: **(0803161)-** University of Alaska Fairbanks Campus- an innovative aspect include bringing STEM opportunities to remote rural locations through technology-based instruction and using Native Elders as a resource to promote interest in STEM careers. Examples of transformative projects: **(0803141)** Fort Berthold Community College-innovation on approach in teaching future elementary teachers with strong focus on STEM. This is potentially transformative at this institution. **(0903612)** College of the Menominee Nation- developing a 4-year BS degree in elementary education steep in STEM disciplines and use of technology for motivating students- and developing model teaching practices.	
5. Does the program portfolio have an appropriate balance of: • Inter- and Multi- disciplinary projects? **Comments:** The program portfolio has a variety of projects with the nature of these projects focusing on STEM discipline; therefore it contains a good balance of inter- and multi-disciplinary projects.	**APPROPRIATE**

6. Does the program portfolio have an appropriate balance considering, for example, award size, single and multiple investigator awards, or other characteristics as appropriate for the program? **Comments:** The balance is appropriate considering the above characteristics and the scope and duration of the projects. Additional funded projects that include multiple investigators could be helpful to encourage collaborative efforts.	**APPROPRIATE**

7. Does the program portfolio have an appropriate balance of: • Awards to new investigators? NOTE: A new investigator is an investigator who has not been a PI on a previously funded NSF grant. **Comments:** The TCUP Principal Investigator as required by the solicitation should be the chief academic officer of the institution, or other senior academic officer responsible for oversight and management of curriculum and instructional policies for the institution. Thus, given that such people are often called upon to be the PIs for various proposals, it is not surprising that none of the current PIs for TCUP are new investigators. The COV panelists however agree that this is an appropriate requirement for the PIs to ensure that the institutional projects would be successful.	**APPROPRIATE**
8. Does the program portfolio have an appropriate balance of: • Geographical distribution of Principal Investigators? **Comments:** The portfolio follows the geographical distribution of the TCUs, and because of the concentration of the institutions in specific areas, the geographical distribution is as appropriate as possible in this circumstance. TCUP will have a new initiative, TCU STEM Infusion Projects (TSIPs), which will encourage new or struggling TCUs to build on their programs and hopefully this will add more balance in the type of PIs and institutions that gets NSF funding.	**APPROPRIATE**
9. Does the program portfolio have an appropriate balance of: • Institutional types? **Comments:** This program specifically targets tribal colleges and universities, so by its nature will provide funding for many two-year Native American serving colleges. In addition, AN/NH institutions are also funded. Given the goals of the project and the nature of the institutions, the balance of institutional types is completely appropriate.	**APPROPRIATE**
10. Does the program portfolio have an appropriate balance: • Across disciplines and sub disciplines of the activity?	**APPROPRIATE**

Comments: The focus of the projects is to develop relevant education materials and academic training based on STEM disciplines. Thus, the program portfolio has the appropriate balance across disciplines.	
11. Does the program portfolio have appropriate participation of underrepresented groups? **Comments:** The participation is appropriate because the target audience is Tribal Colleges and Universities or Native American serving institutions. The mix is not restrictive because TCUs have open-door admission policies and serve the nation appropriately. They serve far beyond the target population. Although it is likely that not all PIs belong to the targeted groups, there is a very high likelihood that many are Native Americans, thus, it is likely that the portfolio has a very strong representation of underrepresented groups.	**YES**
12. Is the program relevant to national priorities, agency mission, relevant fields and other constituent needs? Include citations of relevant external reports. **Comments:** The program is highly relevant to national priorities. The mission of TCUP is to support the STEM capacity of targeted institutions of higher education and provide them the funding as they develop their programs. The focus on STEM is in line with the national priority and the NSF mission. This is an important priority because of studies that showed the dwindling numbers of students enrolling in STEM disciplines despite the government putting in a lot of money into STEM education programs. One factor that is believed to have contributed to this is the lack of qualified teachers who have the subject-matter knowledge in these areas (Kuenzi, J: CRS Report to Congress, 2008). Therefore, by having programs that support the training of K-12 teachers in STEM might increase interest in STEM careers among younger students, particularly at the K-12 levels. The changing US demographic is another reason to support efforts to train minority groups in STEM. Based on the surveys made by the US Census Bureau (Aug 14, 2008) it is projected that by the year 2050, the US population will be made of more than 50% minority groups. The TCUP is certainly relevant to the needs of an underserved constituent population, American Indians, who wish to establish the direction of their own education and are definitely underrepresented in STEM programs. This has	**APPROPRIATE**

been the law of the land since the 1970s, when three major pieces of legislation, the Indian Education Act of 1972 (P.L. 92-318), the Indian Self-Determination and Education Assistance Act of 1975 (P.L. 93-638), and Title XI of the Education Amendments Act of 1978 (P.L. 95-561) established the principle of educational self-determination for the native peoples of North America. However, the promises of this legislation were only hollow ones until the resources were available to fulfill them. One of the jewels in the crown of Indian educational self-determination has been the tribal college movement, and the TCUP program directly addresses the need for resources to help these colleges succeed. This is the right time to carry out STEM education programs to prepare the next generation of scientists and engineers, and NSF through TCUP is responding to this call. By allowing TCUs to develop programs that are relevant to their culture while learning the Western science and technology, these institutions are able to provide more meaningful materials to their students. The current administration has reaffirmed the federal government's responsibility to honor tribal sovereignty by supporting programs to further the development of tribal communities. The TCUP program represents one small but important part of addressing the long overlooked developmental needs of Native students and communities.	

13. Additional comments on the quality of the projects or the balance of the portfolio:

The overall quality of these projects has had a strong impact on STEM education at the tribal colleges—which have greatly benefited from the help of the program and has allowed more Native Americans to succeed in an area of higher education in which they have been greatly underrepresented.

Overall, the focus on STEM is appropriate since this is an area where there is a very low representation of Native Americans.

A.4 Management of the program under review. Please comment on:

1. Management of the program.

Comments:

The program management structure, designed to implement a layered review process involving peer review augmented by program staff input and oversight, is accomplishing its intended goal—the funding of high quality research and educational projects. Where a project has addressable technical shortcomings but is still worth doing, the program staff has been able to intervene effectively.

A very important part of the program management is the realization that very challenging programs in STEM may attract indigenous students, but having programs that are relevant to the indigenous culture will retain and graduate these students.

In terms of projects, the program maintains a number of continuing grants as well as new projects, and the budget allotment is carefully monitored to ensure that there are sufficient numbers of new projects each year. Review of proposals is done through peer review using ad hoc and panel reviewers and post award monitoring through annual progress reports and sometimes site visits. Project directors are required to attend the Human Resources Development-Joint Annual Meeting for grantees; this venue is used by the program to meet all the PIs of TCUP as well as provide reminders and directions for the use of the template for the annual reports.

There is only one permanent program director for TCUP and sometimes additional staffing could be done through IPAs. The program has been steadily growing and may need additional staff to support the many activities and initiatives of the program as well as provide guidance to the grantees.

2. Responsiveness of the program to emerging research and education opportunities.

Comments:

The program has shown responsiveness to emerging research and education opportunities by continually evaluating the program performance and assessing institutional TCUP projects' annually. As a result, TCUP has put in place several programmatic changes that include encouraging institutions to creatively integrate NSF funded awards with STEM programs, through the Innovation through Institutional Integration (I3) initiative. Moreover, realizing that there is a low representation of Native Americans in the field of engineering, TCUP has partnered with the Directorate of Engineering to develop the TCUP Pre-Engineering Education Collaboratives (PEEC). This initiative provides support for pilot projects to establish or enhance engineering pipelines in TCUP institutions. Initiatives that are less robust (CP) were also discontinued.

The main educational opportunity, to which this program is responsive, is to bring more underrepresented students into the STEM workforce and thus increase our national competitiveness and self-reliance. With national demographics tilting toward groups currently underrepresented in STEM areas, this is an educational opportunity that is of high priority to our nation. This program directly responds to that opportunity in an effective way.

The program increasingly has promoted opportunities to address emerging research issues particularly within the established tribal colleges and universities as well as those in reform of their educational programs. PI meetings, forums, technical assistance and site visits contribute to this effort.

3. Program planning and prioritization process (internal and external) that guided the development of the portfolio.

Comments:

TCUP provides awards to enhance the quality of STEM instructional and outreach programs at TCUs, Alaska Native- and Hawaiian Native-serving institutions, in order for their students to have better access to, retention within, and graduation from STEM programs. Program planning and prioritization, as laid out in the most recent management plan (for FY 2009-2011), is well thought out and effective. One example is the method devised to handle planning proposals, which are rarely submitted since "most eligible institutions have either received planning funds previously, or chose to

by-pass that stage." Rather than treating the funding of such proposals as a low or nonexistent priority, the program has recognized that they could be important for the few institutions needing them, and handles them on a no-deadline basis with ad hoc review.

The nature of the innovative projects funded by the grant program will often mandate careful formative feedback, so the impact monitoring plan, to assist the awardee institutions in obtaining such feedback, is an exceptionally good aspect. The involvement of the Quality Education for Minorities Network is an excellent feature in leveraging outside resources to help projects that may need assistance based on their own and NSF-facilitated formative feedback.

The other components of program planning, support, and prioritization, such as collaboration with other diversity-focused programs, should help the TCUP program remain an effective effort that supports the research and educational efforts of tribal colleges in a substantive way.

Projections for potential funding priorities are made on an annual basis. The number of projects funded each year is contingent upon funds available. Potential applicants are advised and guided by the program director on the possible funding opportunities. The budgets for the projects as well as expenses for program implementation seemed to be well thought through, thus allowing programs to have a good idea on how many projects can be awarded for the following competition based on a projected budget allocation and program expenses.

Overall, the program has developed a well-timed and organized program management plan that seems very feasible and yet flexible to changes that may take place during the fiscal year.

4. Responsiveness of program to previous COV comments and recommendations.

Comments:

The response was generally good and useful, and efforts to address or at least respond to all points were made. In particular, after attempting to address the matter of newly established tribal colleges' relative lack of access to TCUP funding, but having the community be unresponsive, the program has chosen to make another try rather than just saying, "didn't work; sorry," by inaugurating a TCUP STEM Infusion Projects strand.

One area that may still need attention is the time-to-decision. As already noted above under question A.1.7, it is recognized that the NSF 70%-in-six-months goal is an agency-wide target and that some programs may intrinsically need longer (particularly for large awards, as is pointed out in the response to the previous COV). However, it would be useful to take another look to see whether there are any roadblocks that could be removed. Also, the comment in A.1.7 should be noted that there may have been a problem with the data set provided to the TCUP sub panel that is the basis for the observations about time-to-decision.

The issue regarding inconsistencies in annual progress reports was resolved by providing the grantees a template which the grantees can use for their reporting. Although this may not result in all reports to be highly consistent, grantees are providing the important information that is requested in the template. The TCUP Annual Report Template is a well structured and developed reporting tool and will be useful in evaluating project impacts.

During the 2007 COV, recommendations were made to increase the travel budget, to provide more technical assistance, add more staffing, conduct more site visits and fund a greater number of new

proposals, but the ability to respond affirmatively is driven by the limitations of the annual budget for the program.

5. Additional comments on program management:

The co-funding provided from other directorates and programs over the three years being examined, which amounts to nearly $4,000,000, has been effective in leveraging the limited funds available directly through the TCUP program.

Despite the staffing issues for TCUP, this program has managed to carry out 18 site visits to 16 institutions during this review period, albeit these were done mostly as post award visits. Several technical assistance workshops were also conducted through QEM, as well as leadership development workshops through AIHEC.

Providing Technical Assistance workshops is essential for these institutions, some of which have not received grants from federal agencies and will definitely derive benefits from knowing the application and grants processes.

Outreach is particularly important at smaller institutions.

PART B. RESULTS OF NSF INVESTMENTS

. The NSF mission is to:

- promote the progress of science;
- advance national health, prosperity, and welfare; and
- secure the national defense.

To fulfill this mission, NSF has identified four strategic outcome goals: Discovery, Learning, Research Infrastructure, and Stewardship, although the COV does not review accomplishments related to Stewardship.

B. Please provide comments on the activity as it relates to NSF's Strategic Outcome Goals. Provide examples of outcomes ("highlights") as appropriate. Examples should reference the NSF award number, the Principal Investigator(s) names, and their institutions.

B.1 OUTCOME GOAL for Discovery: "*Foster research that will advance the frontier of knowledge, emphasizing areas of greatest opportunity and potential benefit and establishing the nation as a global leader in fundamental and transformational science and engineering."*

Comments:

All the funded projects do support discovery at the faculty and student level, and the greatest contribution they will make to the research enterprise of this nation is in their fostering of undergraduate research, which should stimulate interest in research that will benefit the nation in the future.

Projects that were featured in the TCUP presentation showed that students are engaged in hands-on research activities either at the home institutions or at partnering institutions. These students also serve as role models to high school and middle school students when they carry out service learning and sharing of their research experiences at a level that these younger students could appreciate. The institutional programs also offer students the opportunities to develop critical and analytical thinking and communication skills. Thus the long-term impact could be the development of the next generation of indigenous scientists, engineers, and educators. The immediate impact is to improve the delivery of materials and courses that are compatible with actual hands-on experiences, engaging the students' interest in STEM disciplines.

Examples of outcomes are:

The Oglala Lakota College conservation biology students **(award number 09-03686, PI Charles Tinant)** have been able to extend their study beyond the classroom and into the field. Ms. Alexandra Higa has worked closely with the Oglala Sioux Parks and Recreation Authority (OSPRA) and with Dr. Hugh Quinn (herpetologist) to begin two long-term studies on the biology and ecology of Pine Ridge reservation vertebrates. The first study examines how the reintroduction of the Swift Fox (Vulpes velox), a mesopredator, will affect the prey base of small mammals as mice, voles, and prairie dogs, while the second study is focused on understanding the distribution, abundance, and habitat requirements of the Ornate Box Turtle (Terrapene ornata) in South Dakota.

Both studies are needed in order to develop effective conservation management plans in our region

as the Swift fox is listed and protected as a South Dakota's threatened species (SD Codified law 34A-8) and the Ornate box turtle designated as one of the state species of greatest conservation need. The Ornate box turtle study is an outcome of Ms. Higa and Dr. Quinn's discovery of an unknown population of turtles in Pine Ridge reservation, while teaching field ecology last summer. OLC student interns have worked closely with Ms. Higa, Dr. Quinn, and OSPRA personnel over the summer to locate, capture, attach radios, and monitor both species movement's patterns. This fall, the students will begin to analyze the data they have collected in their ecology and conservation biology courses.

The Thunder Valley Floodplain Analysis Project is evidence that the TCUP program has moved beyond building capacity in STEM education at Oglala Lakota College (OLC) and into directly impacting the needs of the communities we serve. The Thunder Valley Corporation is soliciting funding from Housing and Urban Development (HUD) to purchase approximately 60 acres of land and to build a center for disenfranchised Lakota youth. The remaining land area will be leased to individuals wanting to build homes and businesses on the Pine Ridge Reservation. Momentum on the HUD funding request was stopped until a 100-year and 500-year floodplain analysis was completed. Faculty and students from the OLC Math and Science Department conducted an initial site investigation in May 2010, which was developed into a semester project by Heath Ducheneaux, undergraduate in Natural Resources, for the Introduction to GIS course.

Charles Jason Tinant, earth science instructor, used the initial site investigation and publicly available geospatial data to develop estimates of the 100-year and 500-year flood volumes and to route the flood volumes using Hydrologic Engineering Center (HEC) River Analysis System (RAS) and HEC-GeoRAS software. The resulting 100-year and 500-year floodplain maps are being made available for public comment. Mr. Tinant will use the Thunder Valley Floodplain Analysis Project to teach open channel flow concepts to students in Fluvial Morphology.

The Gaalee'ya STEM Project from the University of Alaska-Fairbanks **(0803161)** offers a different non-traditional delivery of instructions with a focus on global climate change. Based on the latest annual report, this project collaborates with the INBRE, EPSCoR and GLOBE projects based at UAF; this provides more resources for students and faculty in the program. Students in this program take most of their courses through distance learning and discussions are carried out through audio conferences. They do have opportunities to carry out research projects and these may cover the areas of engineering, public health, and environmental science. Students are exposed to networking opportunities, provided tutoring either in person or through on-line discussions, and have other academic support. It appears that this project is able to support interdisciplinary training of students.

HRD 08-03119 (PI Morris, College of the Menominee Nation) has as one of its objectives "To develop and implement additional STEM student research, internships, and (research) exposure opportunities." The project will provide students with field research opportunities that will not only give them hands-on research experience, but will also allow them to see how scientific research directly benefits their communities.

HRD 09-03657 (PI Baker-Big Back, Fort Berthold Community College) includes plans to expand the college's undergraduate STEM research opportunities to include environmental science, an area of critical importance to tribal communities as well as the nation (and the globe, as the importance of sustainability and addressing climate change is penetrating further into the public consciousness).

HRD 08-03166 (PI Henry, Turtle Mountain Community College) will provide many students with undergraduate research experiences directly led by TMCC faculty, but also with such experiences offered in coordination with faculty at four-year colleges; about 30% of the undergraduate research

projects will be such coordinated efforts.

B.2 OUTCOME GOAL for Learning: "*Cultivate a world-class, broadly inclusive science and engineering workforce, and expand the scientific literacy of all citizens.*"

Comments:

All the funded projects do support learning—many involve students who actually participate in research. STEM literacy is in the forefront of the efforts.

Projects seemed to stand out, particularly in the area of expansion of scientific literacy, by the incorporation of community through community activities. Students are encouraged to do service learning and become role models for young people who can relate. This increases interest in STEM.

Since the inception of TCUP in 2001, the program has supported many developmental and educational projects and because of these, many students would have benefited from these projects. There was also emphasis on sustainability of these projects; hence it is likely that many of the projects could be institutionalized, although this information was not provided in the COV materials. There are no recent reports on the enrollment and retention efforts for 2007-2009, however earlier reports showed an increase of 26% from the first 3 cohorts in the number of students enrolled in STEM programs. If this will continue in this trajectory it is very likely that a good number of students from these TCUs will have significant contribution in the STEM academic pipeline and the workforce. At the least, there will be a cadre of students who have gained more knowledge and understanding of STEM, and this will be important for future policy and decision making.

TCUs need to continue developing their institutional capacity and infrastructure for research and education; NSF is seen as a partner in this aspect through the TCUP.

Project examples:

HRD 07-03729, Principle Investigator Alice L. Chumrau, Salish Kootenai College (SKC): A major accomplishment during the second grant year was the graduation of the first student from the SKC BSSE in Computer Engineering degree program. A graduate from the program is needed before the program becomes eligible for accreditation from the Accrediting Board of Engineering and Technology (ABET), so SKC is now in position to proceed forward with the ABET process. In the third grant year SKC is preparing in earnest for the ABET site visit tentatively planned for fall of 2010.

The lack of scientific literacy among the citizens of our nation is going to be a major issue in the ongoing, highly politicized national conversation on climate change, and more generally on sustainability and other environmental issues. An effort to address this very issue can be found in HRD 09-03704 (PI Akipa, Sisseton-Wahpeton Community College). This project will help develop a two-year Environmental Sustainable Studies degree program at the college, obviously increasing STEM literacy in this important area among those in the program, but the project will also revise and expand an environmental study curriculum in three participating school districts (with the intention to

expand to others) that was originally funded by the Sisseton Wahpeton Rural Systemic Initiative. Along the way a science – entertainment show will be produced for the college's television station, with the specific goal of increasing the understanding of STEM and interest in it throughout the communities served by the college.

HRD 09-03657 (PI Baker-Big Back, Fort Berthold Community College) is also designed to increase scientific literacy in this important area. Part of the project involves holding symposia on environmental science in each tribal community on the entire reservation, allowing each tribe to learn from the college's Environmental Science Learning Community about the important issues of our time in climate science and sustainability. This will also allow each tribe to offer its own cultural perspectives on the blending of current thoughts in these areas with the historical approaches and imperatives of the tribe.

B.3 OUTCOME GOAL for Research Infrastructure: "*Build the nation's research capability through critical investments in advanced instrumentation, facilities, cyberinfrastructure and experimental tools."*

Comments:

Many of the TCUP funded projects have provisions for student and faculty training in both the academic and research areas, however many of the TCUs do not have well developed research capability and infrastructure and may need more support in order to carry out more research projects. Partnering with research institution is one way to develop this capacity and TCUP encourages such partnership.

There were no requests for equipment or scientific instrumentation among the projects assigned to this COV panel. However, the educational materials make use of state of the art technology. By infusing new technology, students will learn new pedagogical approaches and structure through online and distance education; this will help TCUs develop cyber-infrastructure. This will bring new students into the STEM pipeline and will build infrastructure in terms of human capacity.

Project examples:

HRD 09-03686, Principle Investigator Charles Tinant, Oglala Lakota College: In the third year of the TCUP Phase II award, OLC had some initial success with coordinating environmental science service learning projects with Tribal Program needs. In spring 2009, OLC students and adjunct faculty in the NSci 413 Air Quality class, collaborated with OLC Natural Resources Program staff and the Tribal Air Monitoring Support (TAMS) center to locate and install a metrological station at Porcupine Buttes that will provide data of sufficient accuracy to be used in scientific studies.

The following passage is from **HRD 09-03657** (PI Baker-Big Back, Fort Berthold Community College), which is likely more a comment on infrastructure whose development was sparked or leveraged by TCUP rather than directly funded by it, but it seems that the investment was tied into TCUP grants, no matter how funded: "The Fort Berthold Community College has developed the current STEM infrastructure as a result of the TCUP grants provided by NSF. A second story addition to the Student Center was completed in 2006 and designated the 2nd Floor Science and Technology Wing. The classrooms are state-of-the art and … technologically current. The Library is

undergoing renovation to also accommodate technology. The technology infrastructure has continued to keep pace with the influx of new buildings."

The proposal narrative for **HRD 08-03166** (PI Henry, Turtle Mountain Community College) mentions that an earlier HRD award utilized modified teaching strategies and incorporation of more hands-on learning through computer-based mathematics laboratories and other computer-assisted instruction. Though this is not, strictly speaking, an example of investments in infrastructure, it is certainly an example of HRD funding being used to leverage existing infrastructure.

PART C. OTHER TOPICS

FINAL CROSS-TALK SUMMARY

SUMMARY OF BUNDLED HRD COV CROSS-TALK REMARKS
September 2, 2010

A group of COV review team members came together from 5 separate teams on September 2nd to discuss their differences in program perspectives, to find synergies that exist among the programs, and to identify mutual areas of concern that can help gain leverage and traction in broadening participation and increasing program effectiveness. The team members reviewed and evaluated the AGEP, CREST, HBCU, LSAMP, and TCUP programs before joining forces and sharing their views at the cross-talk session. Members were enthusiastically in alignment with anticipating the changing national education needs, encouraging collaboration and communication, and accelerating participation in global enterprises. The following summary represents major concerns of the assembled group.

- **Linkages/feedback mechanism across organizational lines:** The COV panel advocates improved linkages among the programs in HRD, and encourages the use and sharing of tracking and feedback mechanisms used by the programs.
    - A recommendation emerged that any awarded proposal should have the approval of the external review panel regarding its proposed broadening participation emphasis.
    - Several participants want to see more successful, collaborative efforts with other NSF programs, other agencies, National Laboratories, private industry, private foundations, and entrepreneurial research from small companies.
    - The group encourages private-public partnerships to facilitate technology transfer.
    - While use of Ad Hoc reviewers is an acceptable practice, the COV found that mainstream reviewers had more experience and seemed to do a better job. One suggestion to NSF is to provide a clear example of what a strong review looks like to facilitate better quality reviews.
    - Tracking of projects is sometimes difficult when the work ends. The team recommends practices that encourage sustainability and support for the projects.

- **Leadership Transition at the Top:** With new leadership coming in the opportune time exists to propose new methods of doing business. Panelists suggested that it is time to refine/restate NSF's commitment to BP. Some members recommended that NSF assess their structure to see if it promotes or discourages BP.
    - The panelists encourage the new Director of NSF to engage the affected community of institutional leadership and researchers in the first 90 days. Participants felt that by early engagement in the major

concerns of the community, the first 90 days would make it possible to at the very least reinforce and/or establish a framework to meet objectives.

- Considerable discussion revolved around which agency is best qualified to take the lead in managing a national education agenda. Besides NSF, the panel suggested National Institute of Health (NIH) with its very large budget, the Department of Education (DOE) which they did not feel has the needed clout and the Department of Defense (DOD) as possible candidates. The panel suggested that leadership belongs with NSF which is well-positioned to take advantage of leveraging opportunities between agencies. With a formal leveraging mechanism in place, more opportunities to fund education would be possible. The NSF could consider developing a position called the Director of Integration to coordinate leveraging.
- IGERT represents a successful example of different directorates working together and cutting across the institutions as a flagship of graduate education. Panelists recommend identifying more programs like this that fund not just hard sciences but also social sciences to actually promote interdisciplinary education and thereby broaden participation.
- Encouraging collaborative grants with other institutions/organizations and/or companies may greatly expand and leverage the work across many programs and institutions.
- Developing leadership skills provides not only resources but also the type of leverage that enhances partnerships.

❖ **Broadening Participation:** Put teeth into it in the review process; identify a clear definition in the Strategic Plan that outlines goals and strategies for broadening participation.

- Consider using individuals who participate in programs and panels as mentors. Panels teach others how to do a better job of writing new proposals.
- A number of participants identified a need to increase the presence of minorities on panels.
- Generate increased participation from those who have been excluded from awards, grants, and fellowships over the years, particularly in STEM areas.
- Broader participation could come not only from giving others the opportunity to see what it is to develop an excellent proposal but also from obtaining diverse viewpoints from panelists.
- Develop a stand-alone section in standards that speaks to Broadening Participation so that it is not necessary to dilute what you emphasize in the science section.
- Several COV team members support the model of a separate panel or ad hoc reviewers to ensure that BP receives proper commentary and that PIs understand the need to incorporate it. The significance of the panel input drives the level of funding as determined by the scientific review, and appropriately, funds are not released until the criterion has been met. Be sure that panels have the expertise to deal with broadening participation and speak strongly to it.

- The funding structure should work to broaden participation rather than hinder it; if funding criteria are too bureaucratic, the result is a negative effect. The concern is that NSF does not have a mechanism in place that would allocate funding unless every piece of the proposal was rewritten to reflect a significant number of smaller proposals.
- Broadening Participation as a required criterion would also be appropriately included at the annual review stage and clearly addressed before the release of continuing grant increments.
- The panel asks which broad impacts NSF wants and further suggests setting standards and achievement metrics that NSF will examine yearly.
- Members suggested that NSF include reviewers who can do a critical analysis of broader impact. Most of the focus seems to be on intellectual merit.
- Improve communication between programs/agencies/organizations to strengthen alliances and make use of existing resources.

❖ **Structure of NSF – does it help or hinder Broadening Participation:** The consensus of the HRD COV Teams is that NSF should not consolidate these five programs. Other concerns emerged that ask whether NSF had a role in determining what is in the best interest of the country to leverage and improve on education.

- Objections have been raised over proposed consolidation of the HRD programs. From a financial standpoint, some panelists feel that putting all the grant money in one pot is going to be a detriment especially to HBCU and TCUP and that the funding structure is short-sighted with the possibility of backfiring on the goal of broadening participation.
- While the group recognized that human capital resources in some programs showed an increase since the time of the last program evaluations, a suggestion emerged to increase staffing to better manage programs and strengthen opportunities to meet goals for BP and BI.
- A focus of new hires in specialized areas would allow for an increase in site visits by PIs that adds value to assessing programs, hiring individuals with experience in techniques for broadening participation increases the chance for achieving BP goals, and hiring someone at the executive level with expertise in leveraging opportunities among key parties/agencies.
- Concerns emerged in discussions that smaller institutions don't have the sophistication to compete with larger institutions and if programs merge, the communities with small institutions will "hear" a message that the federal government doesn't care, and they fear loss of identity.
- Talk to affected parties before making the organizational and funding changes that are going to generate long-term consequences.
- Even with structure that has to be addressed and realigned, and with internal problems that have to be solved, the NSF is the ideal agency to carry the banner and lead the national initiative to improve the quality of research and higher education.
- The incentive is there for NSF to emerge as a leader and to get creative to generate and leverage diverse funding pools.

- The panelists would like to see NSF become an advocate of change – emerge as the federal "Change Agent" in pursuit of advanced education and funding resources.

❖ **Allocation of Resources**:

- Look for ways to fund infrastructure development that includes equipment and laboratories or a way to leverage program resources with other NSF opportunities.
- Put funds directly into supporting students and personnel without taking away from the dollars set aside for research-related expenses.
- Find a way to train students to become active members of faculty by learning how to write proposals, develop networks, and engage with people to expand partnerships and innovative research.
- Set aside funding for information technology tools along with the training to work with new software so that emerging science moves into the next generation with quality results and smooth transitions.
- To ensure that programs are sustainable provide increased support so that you can measure outcomes.
- Look for innovative programs that cultivate entrepreneurial students and programs. Students want to know how they can earn a living, make money and enjoy their work. Without the incentive, they may choose other options that have less satisfying results.
- Consider engaging with private industry to forge partnerships that support internships for students within the organization. Identify success stories where these partnerships have worked.

❖ **Demonstrate the Effectiveness of the HRD Programs:** A number of participants believe that NSF programs have a weak system for disseminating information on the successes coming out of these programs. Panelists feel that more investment of funds in NSF programs would be possible if a plan to attract other organizations was in place. Members advocate strengthening the information pipeline and generating national publicity for program accomplishments.

- Use simple graphs; convince people on the outside with presentations that are simple and straightforward.
- Publicize accomplishments of note; even consider putting ads in major media outlets
- Consider engaging the services of public relations firms to create interest in investors that have the resources to fund programs.
- Tell other institutions what we do, that NSF looks for opportunities to engage in collaborative grants and are looking for partnerships and new funding sources to advance education globally.
- Widely disseminate information on best practices to share information at the national level.
- Get the attention of the internal press, the Office of Legislative and Public Affairs, and ultimately the media to put the spotlight on successful NSF programs.
- Develop data bases and target groups to share program information.

- **Role of the National Science Board:** Some discussion came up about how the National Science board can set priorities with respect to addressing BP and hold programs responsible for addressing it or do without funding. Perhaps this is an enforcement role for NSB.

    - Revisited the discussion regarding the possibility of weighting the merit review criteria.
    - Members were in passionate agreement that the composition of the National Science Board needs more diversity.
    - Broadening impact has to be evident throughout the structure including the National Science Board.

TCUP COV COMMENTS

C.1. Please comment on any program areas in need of improvement or gaps (if any) within program areas.

Across the Portfolio

- Intra-agency communication and collaboration between LSAMP and other NSF programs (e.g. REU, STEP, OISE) should be more explicitly emphasized and encouraged.

Program-Specific

- The TCUP program is still young and at this stage in its development the real question is how to sustain projects so that TCUP and future projects are able to capitalize on their already established momentum?

- An important piece to meeting the long-term objective of increasing the representation of Indians in the STEM pipeline is to encourage continuation and renewal awards.

- The TCUP program needs a better tracking mechanism such that project outputs and outcomes can be reported, shared, and monitored.
    - Do students find job opportunities in their subject areas?
    - Do the institutions have partnerships with other universities that enable students to continue their education?

- Collecting accurate, culturally-sensitive data is an important area in need of improvement. "American Indian Measures of Success" is one example of a data collection packet that has been used. NSF could potentially contribute to this established survey process and add questions to suit NSF's needs.

- Smaller institutions have insufficient staff and/or time for writing multiple grants and would benefit from a sponsored research program office where grants can be handled directly. Additionally, some project staff require additional training in FastLane.

C.2. Please provide comments as appropriate on the program's performance in meeting program-specific goals and objectives that are not covered by the above questions.

Across the Portfolio

- How robust are the Directorate's databases that track demographics and other data on the programs' target populations? Is the Directorate's use of money and performance evaluated with respect to those numbers?

Program-Specific

- For Tribal Colleges and Universities (TCUs) to be successful at meeting program-specific goals, they must make STEM relevant to the communities they serve. TCUs need to have mechanisms in place to gather and utilize valuable input from their communities.

C.3. Please identify agency-wide issues that should be addressed by NSF to help improve the program's performance.

Across the Portfolio

- The Foundation should assess the extent to which each directorate is involved in advancing the Broadening Participation (BP) agenda and take corrective steps where appropriate. Preparing a yearly report on the progress in this area to share what strides other programs are making in BP would be informative and useful.

- The COV recommends that solicitations from other NSF programs encourage collaboration with HRD programs.

- Electronically-assembled panels should be established to ensure that proposals recommended for funding fulfill BP criteria.

- BP has an enormous agenda and the majority of the responsibility to carry out this agency-wide initiative is being placed on the smallest directorate with the least amount of resources, the Directorate for Education and Human Resources (EHR). While EHR is well-suited to provide leadership, all of the directorates should participate in fulfilling this directive. NSF policies with respect to BP should reflect that it is an agency-wide commitment and the Foundation needs to be clearer about what is expected from the various directorates.

- A more rigorous definition of BP is needed. In order to provide leadership on this issue, NSF should have explicit merit review procedures associated with the BP component of proposals.

- PIs should be provided with more information regarding the BP aspect of the merit review process. Additionally, the BP portion of the merit review process should be addressed separately in some way. For instance, one person from each panel could look specifically at the BP-related award components. Ultimately, a separate review is the best way to proceed.

- Make BP a more explicit part of future metrics and assessment so that accountability is built into BP goals.

Program-Specific

- NSF needs to be cognizant of the fact that TCUs are culturally-based and preserve that foundation. TCUs have a valuable and unique perspective to offer in collaborative environments.

C.4. Please provide comments on any other issues the COV feels are relevant.

Across the Portfolio

- Mandate BP within the Broader Impacts criterion and develop associated implications for non-compliance.

- Identify ways NSF can partner with government and private entities to pool resources to broaden participation.

Program-Specific

- To increase the effectiveness of funding, it would be helpful to encourage more collaboration and pooling of resources.

- It is important that the distinct needs of the program and the institutions of higher education (IHEs), as well as the IHE's stage on the developmental continuum, be considered when developing program and project implementation strategies and policies.

- Leveraging external resources to promote BP is encouraged.

- Increased interagency communication and collaboration could help to maximize impacts and streamline the administrative components of multiple awards at one institution.

- The COV subpanel for the TCUP program has great concerns about TCUP being absorbed into a larger Comprehensive Broadening Participation of Undergraduates in STEM (CBP-US) program that will cause it to lose its specific identity. The histories and missions of the TCUs differ in substantial ways from those of the HBCUs and HSIs, and because of this the TCUs will not be served nearly as well in a broader program that is not constructed with those histories and missions in mind. There are several interwoven threads to the TCU missions that have their roots in the history of Native education in the Western Hemisphere since first contact with Europeans, as well as in the traditions of the American Indian, Alaskan Native, and Native Hawaiian peoples served by the program. In its nine years of operation the TCUP program has evolved to align itself well with those missions and incorporate a solid knowledge of those missions into its operation. This has been done in close consultation with the tribal colleges, and thus the TCUP program has gained their trust. That is no small feat, considering the distrust many tribal colleges developed for grant programs in the early years of the TCUs that, frankly, often featured a majority

institution showing up on a TCU's doorstep seeking a partnership for some project that would be more attractive to a funder with a TCU partner, then having the majority institution disappear from sight once the funding was secured. TCUP is structured so that this cannot happen, since any partnership constructed through a TCUP-funded project has to have a tribal college as the lead institution, and there is a specific fund set aside to which only the tribal colleges have access. The particular feature of the proposal for a combined program that would allow non-Native institutions to apply for funding once reserved for the TCUs is going to be viewed with particular alarm by the tribal colleges. The main reaction is likely to be, "Here we go again!" It would take a long time for a new, combined program to regain the trust lost through the elimination of TCUP, and in fact it is not likely ever to happen.

Before proceeding with any such absorption of TCUP into a larger program, those proposing the consolidation should familiarize themselves with the history of Native education in the Western Hemisphere, perhaps through reading Margaret Szasz's "Education and the American Indian" (Albuquerque, University of New Mexico Press, 1998) and then consulting closely with those who understand that history and thus understand the alarm with which this consolidation of programs will be viewed in the communities TCUP serves. In particular, it is important to understand the purpose of the three major pieces of federal legislation in the 1970s that crystallized the principle of American Indian educational self-determination into law, namely, the Indian Education Act of 1972 (P.L. 92–318), the Indian Self-Determination and Education Assistance Act of 1975 (P.L. 93–638), and Title XI of the Education Amendments Act of 1978 (P.L. 95–561). In particular, this last piece of legislation states flatly that "it shall be the policy of the Bureau (of Indian Affairs), in carrying out the functions of the Bureau, to facilitate Indian control of Indian affairs in all matters relating to education." TCUP is structured not just to respect this legal and cultural principle, but to build upon it by allowing the tribal colleges to structure programs that directly serve them through an NSF program designed specifically for them with people dedicated to understanding the major differences between the TCUs and the other entities that would be served by a combined program.

The biggest fear that the TCUs will have about the combining of the various programs under review in this cycle into one large über-program is that due to the numbers, Native Americans will become effectively invisible in such a combination. We know that those proposing this combination are people of good will who would not intend for this to happen, but in practice it seems that it always does. (We are familiar with presentations in which reference is made to underserved minorities in the U.S. as "African Americans and Hispanics," and we suspect that the reader is also, but we have never seen reference made to underrepresented minorities as, for example, "African Americans and Native Americans." The latter has an omission more obvious to most people, and would generally be questioned and corrected immediately).

In brief, the TCUP subpanel believes that this proposed consolidation is not well thought out and would be harmful to the mission being served effectively by TCUP. We urge that it not be implemented.

C.5. NSF would appreciate your comments on how to improve the COV review process, format and report template.

Across the Portfolio

- Provide systematic training in the steps to be used in extracting programmatic data.
- The off-site processes allowed the COV to concentrate on the specifics of the program and helped the group cover the materials and come to agreement more quickly.
- The links and PDFs embedded in the PowerPoint presentations increased accessibility to the materials.
- In a bundled COV, it would have been nice to touch base with the other programs prior to the cross-talk discussion. Being isolated from each group limited the potential benefits of a more diverse pool of ideas.
- It is difficult to reconcile the concerns put forward by individual sub-panels into a single document. Some recommendations/concerns may be diluted by other sub-panel observations.
- Sub-panels may have experienced an unequal emphasis in preparation for the COV, which led to logistical problems.

Program-Specific

- It was a good idea to have an off-site review for parts A & B because this helped to move the discussion along and reach consensus faster.
- All of the information that was needed was given. Actually, there was more given than necessary.

SIGNATURE BLOCK:

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For the TCUP COV
James Renick
Chair

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Jermelina Tupas
Sub Chair