

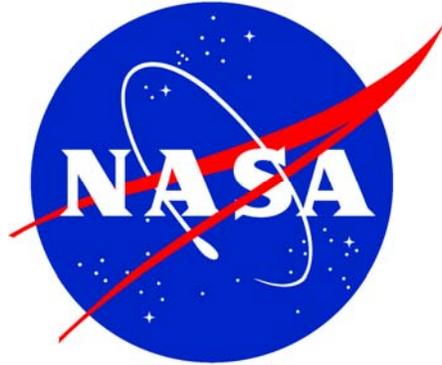


National Aeronautics and
Space Administration

NASA Tribal Colleges and Universities Program

**Fiscal Year 2005
Annual Performance Report
to the
White House Initiative on
Tribal Colleges and Universities**





NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

**FISCAL YEAR 2005 ANNUAL PERFORMANCE REPORT
TO THE
WHITE HOUSE INITIATIVE ON
TRIBAL COLLEGES AND UNIVERSITIES**

Office of Education
NASA Headquarters
Washington, DC 20546-0001

**FISCAL YEAR 2005
ANNUAL PERFORMANCE REPORT
TO THE WHITE HOUSE INITIATIVE ON
TRIBAL COLLEGES AND UNIVERSITIES**

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A. EXECUTIVE SUMMARY

This Annual Performance Report for FY 2005 to the White House Initiative on Tribal Colleges and Universities (WHITCU) responds to Executive Order 13270, "Tribal Colleges and Universities," signed by President George W. Bush on July 3, 2002.

The Executive Order states: "It is the policy of the Federal Government that this Nation's commitment to educational excellence and opportunity must extend as well to the tribal colleges and universities that serve Indian tribes and Alaska Native entities.... Often they are the only postsecondary institutions within some of the Nation's poorest rural areas. They fulfill a vital role: in maintaining and preserving irreplaceable languages and cultural traditions; in offering a high-quality college education to younger students.... Tribal colleges provide crucial services in communities that continue to suffer high rates of unemployment and the resulting social and economic distress...."

NASA accomplished its FY 2005 goals for the Executive Order by partnering with the Tribal Colleges and Universities (TCUs) to achieve the educational and cultural missions of the colleges while fulfilling NASA's mission.

Accomplishments shown in this report address objectives in NASA's three-year plan for FY 2004-2006. It is noteworthy to report that NASA exceeded its FY 2005 budget objective (\$3.7 Million) for TCUs by more than \$332,000 and increased by more than \$396,000 (11%) over the previous fiscal year.

In FY 2005, NASA continued its cooperative agreement with the American Indian Higher Education Consortium (AIHEC) outreaching to 22 of the then 34 TCUs with science, technology, engineering, and mathematics (STEM) enrichment grants, which enabled the colleges to meet critical needs for infrastructure, curricula, and research opportunities.

Evidence of the Agency's commitment to TCUs is also shown through the Goddard Space Flight Center (GSFC) Applied Engineering and Technology Directorate partnership with Salish Kootenai College (SKC) to assist the college in its goal of establishing the first engineering degree-granting curriculum at a TCU. Two key elements of the partnership are a GSFC engineer teaching an engineering course for SKC students via distance education and the establishment of an external advisory committee including members from the Accreditation Board for Engineering and Technology (ABET), the group who approves engineering accreditation. As a result of these efforts, SKC has a newly formed engineering department.

B. AGENCY ACCOMPLISHMENTS

Working collaboratively with NASA's Mission Directorates and Centers, the Office of Education promotes education as an integral component of every major NASA research

and development mission. As we build upon the accomplishments of America's first century of flight, and as NASA approaches its 50th year in 2008, the Office of Education is committed to providing opportunities for all to explore and develop their full learning potential. We engage the underrepresented and underserved communities of students, educators, and researchers in our Nation's TCUs by providing exciting research and internship opportunities that will "light the fire" and "fuel the passion" for a new culture of learning and achievement in the STEM fields.

The following accomplishments were achieved through our collaborations within NASA and with the TCUs.

1. Goals and measurable objectives achieved in FY 2005:

NASA achieved all four of its objectives relating to the TCUs for FY 2005 as put forth in the FY 2004-2006 Performance Plan:

- Objective 1: Focus the Agency's attention on identifying and removing barriers to TCU participation in NASA programs that support STEM education and achievement.

Objective 1 Accomplishment: Our goal to identify and remove barriers to TCU participation in NASA programs was accomplished by changing an eligibility requirement for participation in the Faculty Awards for Research (FAR) program. The previous eligibility requirement mandated that an applicant be faculty at a four-year college or university. The requirement has been changed to allow community college participation in the FAR program, thus enabling TCU faculty the opportunity to apply for the FAR program.

- Objective 2: Expand outreach activities to improve the relationships between TCUs and NASA, with particular attention paid to activities designed to increase TCU familiarity with the Agency.

Objective 2 Accomplishment: The NASA Office of Education and Office of Small and Disadvantaged Business Utilization held, for the first time, an informative workshop titled "Doing Business with NASA" exclusively for TCUs on July 7-8, 2005, at GSFC in Greenbelt, Maryland. Twenty-two TCUs participated.

- Objective 3: Assist TCUs in the creation of courses leading to a pre-engineering or engineering degree.

Objective 3 Accomplishment: GSFC established and maintained a partnership with SKC to provide assistance with developing and implementing an engineering degree program at the college,

including development and delivery of coursework via distance education.

- Objective 4: Increase the amount of funding in support of TCUs by \$200,000 per year, so that during the three-year period from FY 2004 to FY 2006, the amount of funding will increase by \$600,000 over the FY 2003 baseline of \$3.3 million.

Objective 4 Accomplishment: Total NASA TCU funding for FY 2005 was \$4,032,530, which exceeded the Agency FY 2005 goal of \$3.7 million by more than \$332,000. FY 2005 represented an increase of more than \$396,000 over the FY 2004 accomplishment of \$3,636,371.

2. Programs implemented that exemplified increasing Federal opportunities for Tribal Colleges and Universities:

The following programs are particularly noteworthy examples that exemplify increasing NASA opportunities for TCUs. Partnerships with AIHEC, which comprises all the TCUs and WHITCU, were instrumental in achieving our goals. AIHEC has facilitated collaborations with the TCUs, while WHITCU has facilitated collaborations with other Federal agencies.

- **The AIHEC Partnership** has been successful in supporting STEM education and information technology infrastructure development efforts of individual TCUs, as well as providing to the entire AIHEC membership a wide range of information and technical support services through meetings, workshops, and the AIHEC STEM Resource Center portal.

The NASA-AIHEC Cooperative Agreement has four goals:

1. Strengthen collaboration between NASA and AIHEC to improve high-quality NASA education and research opportunities at the 36 TCUs.
2. Provide NASA summer research experience for TCU faculty and undergraduates at each NASA Center.
3. Enhance STEM infrastructure at the TCUs with a particular focus on establishing engineering degree-granting programs to enable TCUs to expand research for Exploration Systems.
4. Encourage TCUs to participate in NASA research programs through small enrichment grants to the colleges.

NASA's education mission is being significantly furthered through the NASA-AIHEC cooperative agreement, and the academic programming goals of the Nation's TCUs are continuing to advance.

Under the fourth goal of the NASA-AIHEC cooperative agreement, NASA provides individual TCUs the opportunity to receive modest “AIHEC-NASA Enrichment Grants” intended to help meet critical needs for infrastructure, curricula, teacher preparation, and other initiatives to support their efforts to develop and enhance their STEM programs. The following summarizes relevant current NASA-AIHEC cooperative agreement projects:

- Bay Mills Community College (Brimley, Michigan) sponsors a summer STEM enrichment program for high school students.
- Blackfeet Community College (Browning, Montana) developed a science lab that is being used to provide professional development for science teachers and science education enrichment opportunities for K-12 students.
- Dinè College (Tsaile, Arizona) is implementing a research-based summer Geographic Information System (GIS) project. GIS is computer technology that uses an analytic framework for managing and integrating data; solving a problem; or understanding a past, present, or future situation. The 25 Dinè students conduct environmental health monitoring studies supplemented with GIS mapping tools.
- The Institute of American Indian Arts (Santa Fe, New Mexico) developed two courses for the Native Eyes curriculum that provide strategies for integrating and incorporating cultural concepts into the natural sciences.
- Keweenaw Bay Ojibwa Community College (Baraga, Michigan) established a watershed science outreach program with middle school students on the L’Anse Federal Indian Reservation using Global Learning and Observations to Benefit the Environment (GLOBE) educational materials. GLOBE is a worldwide, hands-on primary and secondary school-based education and science program.
- Lac Courte Oreilles Ojibwa Community College (Hayward, Wisconsin) upgraded its GIS program facilities.
- United Tribes Technical College (Bismarck, North Dakota) is continuing its successful “Nakotas on the Prairie” math, science, technology, and culture camp project.
- White Earth Tribal and Community College (Mahnomon, Minnesota) is creating an assessment plan for the environmental science degree program. It is also developing an associate’s degree program in computer science with emphasis in GIS/Global Positioning System, database development, and Web-based interactive applications.

- Stone Child College (Box Elder, Montana) is conducting a bridge program for six high school students that provides college-level STEM courses to participants, as well as the opportunity to participate in a collaborative research project.
- Southwestern Indian Polytechnic Institute (Albuquerque, New Mexico) is implementing a research, education, and outreach program using a mobile robot platform.
- Nebraska Indian Community College (Macy, Nebraska) hired a part-time STEM advisor and six part-time student tutors to increase the retention rates, graduation rates, and general academic success of students in STEM courses and programs.
- **The NASA Administrator's Fellowship Program (NAFP)**, administered by the United Negro College Fund Special Programs (UNCFSP) for NASA, is designed to enhance the professional development of NASA employees and STEM faculty of minority colleges and universities. The program also seeks to increase the ability of these universities to respond to NASA's overall research and development mission.

The following highlights FY 2005 activities of the two NAFP fellows at TCUs -- a robotics engineer from Johnson Space Center, who worked with SKC and a senior systems engineer from GSFC, who is at Haskell Indian Nations University:

- Taught various courses, such as College Algebra, Electric Circuits II, Introduction to Robotics, Calculus III, and The Art of Math.
- Assisted in the development of a NASA Curriculum Improvement Partnership Award (CIPA) proposal to integrate principles of project management into Haskell's environmental science curricula.
- Developed a Step 1 proposal to the National Science Foundation (NSF) Integrative Graduate Education Research and Traineeship Program (IGERT, up to \$3M over 5 years) by coordinating a partnership between Haskell and the University of Kansas' Center for Indigenous Nations Studies.
- Conducted a two-day robotics-intensive workshop for the Montana Space Grant Consortium and delivered a presentation to the Mission Valley Astronomy Club on NASA's Robonaut project.
- **The Harriett G. Jenkins Predoctoral Fellowship Program (JFPF)**, administered by UNCFSP for NASA, provides full-time underrepresented graduate students in science, technology, and education with financial support for their education in NASA-related disciplines. Students are selected for fellowships that include financial support and a six-week, hands-on research experience at a NASA Center or the Jet Propulsion Laboratory. Fellowship tenure is three years for

candidates seeking either a master's or doctorate degree in the NASA-related fields.

JFPF currently supports the graduate education training of one Native American fellow who has a faculty appointment at Crownpoint Institute of Technology (Crownpoint, New Mexico) and is completing his studies toward a Ph.D. degree in biology. His research interests include the effects of radiation on plant growth and development.

- **The Curriculum Improvement Partnership Award (CIPA)** program, administered by UNCFSP for NASA, funds innovative advances in the STEM instructional areas. CIPA assists minority colleges and universities in creating STEM programs that elevate institutional prestige and attract and prepare future generations of students for successful careers in STEM fields.

CIPA provided funding to three TCUs in FY 2005:

- Keweenaw Bay Ojibwa Community College (Baraga, Michigan), Keweenaw Bay Earth Science Diversity Initiative for Native American Students.
- Stone Child College (Box Elder, MT), Bear Paw Academy.
- Crownpoint Institute of Technology, Alternative Energy Development Program.

- **Universities Space Research Association (USRA) and Sinte Gleska University (SGU)** are partnering to provide opportunities for eight TCUs to enhance undergraduate curricula in Earth system science. Remotely sensed data and research from NASA and other sources will be used in conjunction with a Problem-Based Learning (PBL) approach to assist faculty with course enhancements. The PBL approach requires students to engage in a variety of research strategies - data collection in the field and the lab, analysis of data, library research, and interviews with local experts and tribal elders. USRA provides expertise on the use and acquisition of NASA data and on remote sensing and image processing. SGU faculty provides instruction on the PBL technique to science faculty at eight other TCUs and expertise on cultural issues that relate to science curricula.

The goal of this three-year program is to introduce and enhance the use of NASA Earth-science data and products in TCU courses, thereby helping faculty inspire undergraduate students to careers in Earth system science and related professions. The project objectives are to enhance Earth system science concepts in the TCU science teacher's classroom through integrating the system

approach to Earth science and the Native-American cultural view of Mother Earth; to work with participating TCU science-teaching faculty; to develop “observational,” hands-on, and problem-based teaching methods to draw students into the excitement of Earth system science; and to increase the use of spatial thinking in the classroom. This professional development program focuses on two- and four-year TCU undergraduate science-teaching faculty. Faculty members are expected to integrate their newly acquired Earth science information and teaching techniques into their classrooms via the development of amended or new course materials.

Partnering TCUs are Sinte Gleska University, Little Priest Tribal College, Fort Berthold Community College, Oglala Lakota College, Fond du Lac Tribal and Community College, Sitting Bull College, Blackfeet Community College, Turtle Mountain Community College, and United Tribes Technical College.

- **The Landsat Data Continuity Mission (LDCM)** continued to serve in an exemplary capacity with its commitment to the mentoring program with SKC. Three students participated in a five-week internship with GSFC through the LDCM lab. The level of hands-on instruction and very high level of scientists’ time devoted to the students is continuing to impact the college’s capability, as well as NASA’s reputation as a partner in sharing scientific knowledge and technology within the TCU community.
- **The North Dakota Association of Tribal Colleges (NDATC) partnership** supported two students in ten-week summer internships. NDATC was also able to support a group of TCU students’ presentations at the American Geophysical Union (AGU) fall meeting. The inclusion and experience for the students was invaluable and opens the door to future opportunities. The appointment of Dr. Bull Bennett to the staff of NDATC as Science Liaison demonstrates a deeper level of commitment to science by the five North Dakota TCUs. GSFC worked closely with Dr. Bennett as a focal point for engaging the students, faculty, and administration of the colleges.
- **The Goddard Space Flight Center (GSFC) Office of Higher Education and the Applied Engineering and Technology Directorate (AETD)** have been instrumental in 2005 in partnering with SKC in development of a computer engineering degree program. It is worthy of note that currently there are no bachelor of engineering degree programs at any TCU. During FY 2005, with input and support of SKC faculty and President Joe MacDonald, an external advisory committee was established and convened at SKC

with the goal of structuring a program that meets the needs of the college, the student body, the tribal leaders, and NASA (as a contributing partner). The advisory committee consisted of a GSFC Native American engineer, GSFC AETD management, representatives from the National Academy of Engineering, the National Science Foundation, the Accreditation Board for Engineering and Technology (ABET), Massachusetts Institute of Technology (MIT), Montana State University (MSU), and successful engineering industry leaders from the Flathead Reservation. Dr. Tim Olsen of SKC has been appointed head of the newly formed engineering department as the college moves ahead to implement the degree program.

- **NASA Langley Research Center Pre-Service Teacher Institute (PSTI)** Sitting Bull College (Fort Yates, North Dakota) hosted the PSTI, July 17-28, 2005. The purpose of the PSTI was to provide teachers with experiences vital for teacher certification in an intensive, hands-on, two-week workshop to enhance their knowledge, skills, and competence in teaching science, mathematics, and technology using content from NASA missions. The opening orientation and closing ceremony were held at the tribally owned Prairie Knights Casino and Lodge with certificates of completion being presented to the 12 participants from Sitting Bull College and United Tribes Technical College.
- **Sinte Gleska University (SGU)** is working with the Jet Propulsion Laboratory on the Earth Science – Research, Education, and Applications Solutions Network (REASoN) cooperative agreement titled, “Using Geospatial Information to Enhance Tribal Rangeland Management Through Education and Understanding.” Utilizing NASA’s technology applications and information, SGU seeks to characterize the problem, explore solutions, and educate the tribal community with regard to impact of the relationships among tribal land resources, economic sustainability, community prosperity, and cultural preservation. A key aspect is to engage the minds of the young (K-12) students to be integrally involved in the education component through classroom/laboratory and field exercises to gather data.

3. Total awards to TCUs during FY 2005:

A total of \$4,032,530 was awarded to TCUs during FY 2005. Of particular note is \$1,330,294 allocated for the AIHEC partnership.

4. Agency funding increases/decreases:

FY 2004 Awards	\$3,636,371
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FY 2005 Awards	\$4,032,530
Amount of increase in awards (Compared to FY 2004 awards)	+ \$396,159
Percent of increase in awards (Compared to FY 2004 awards)	+ 11%

NASA expanded outreach activities to improve the relationships between TCUs and NASA, coupled with new programs and increased funding for existing NASA programs, with particular attention paid to activities designed to increase NASA-focused STEM curricula at the TCUs.

The difference between the FY 2005 budget projection of \$3.7 million and the final budget was an increase of \$332,530 in total Agency funding for the TCU Program.

C. SUMMARY OF FY 2005 AGENCY AWARDS BY CATEGORY

Agency/Organization National Aeronautics and Space Administration

Name, Title, Phone, Fax, and email address of Agency representative preparing report:

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 Manager
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FY 2005 Total Funding for all Institutions of Higher Education (IHE)

CATEGORY	TOTAL AWARDS TO IHE	TOTAL AWARDS TO TCUs	% OF AWARDS TO TCUs
1. Research and Development		\$1,111,525	
2. Direct Institutional Subsidies			
3. Program Evaluation			
4. Training and Technical Assistance		2,400,853	
5. Facilities and Equipment			
6. Fellowships, Internships Recruitment, and IPAs		211,199	
7. Student Tuition Assistance, Scholarships, and Other Aid		29,510	
8. Economic Development			
9. Administrative Infrastructure			
10. Third Party Awards			
11. Private Sector Involvement		279,443	
12. Other Activities			
Total	\$1,153,711,113	\$4,032,530	.34%

Michael D. Griffin, Administrator
 Agency Head (Typed)

 Agency Head (Signature)

 Date

D. SUMMARY OF FY 2005 AGENCY AWARDS TO INDIVIDUAL TRIBAL COLLEGES AND UNIVERSITIES

Tribal Colleges and Universities	St.	Research & Development	Direct Institutional Subsidies	Program Evaluation	Training & Technical Assistance	Facilities & Equipment	Fellowships, Internships, Recruitment, IPAs	Student Tuition Assistance, Scholarships	Economic Development	Administrative Infrastructure	Third Party Awards	Private Sector Involvement	Other Activities	Grand Total
BAY MILLS COMMUNITY COLLEGE	MI	\$163,402												\$163,402
BLACKFEET COMMUNITY COLLEGE	MT	\$5,000												\$5,000
CANKDESKA CIKANA COMMUNITY COLLEGE	ND	\$100,000												\$100,000
CHIEF DULL KNIFE COLLEGE	MT													\$0
COLLEGE OF MENOMINEE NATION	WI													\$0
COMANCHE NATION COLLEGE	OK													\$0
CROWNPOINT INSTITUTE OF TECHNOLOGY	NM				\$95,993		\$30,500							\$126,493
DINE COLLEGE	AZ													\$0
DQ UNIVERSITY	CA													\$0
FOND DU LAC TRIBAL & COMMUNITY COLLEGE	MN	\$5,000						\$2,000						\$7,000
FORT BELKNAP COMMUNITY COLLEGE	MT													\$0
FORT BERTHOLD COMMUNITY COLLEGE	ND	\$5,000												\$5,000
FORT PECK COMMUNITY COLLEGE	MT													\$0
HASKELL INDIAN NATIONS UNIVERSITY	KS						\$41,700	\$14,250						\$55,950
INSTITUTE OF AMERICAN INDIAN ARTS	NM													\$0
KEWEENAW BAY OJIBWA COMMUNITY COLLEGE	MI				\$95,760									\$95,760
LAC COURTE OREILLES OJIBWA COMMUNITY COLLEGE	WI													\$0
LEECH LAKE TRIBAL COLLEGE	MN													\$0
LITTLE BIG HORN COLLEGE	MT													\$0
LITTLE PRIEST TRIBAL COLLEGE	NE	\$26,572			\$1,490			\$5,000						\$33,062
NEBRASKA INDIAN COMMUNITY COLLEGE	NE				\$2,169			\$500						\$2,669
NORTHWEST INDIAN COLLEGE	WA	\$5,000						\$7,760						\$12,760
OGLALA LAKOTA COLLEGE	SD	\$138,428												\$138,428
SAGINAW CHIPPEWA TRIBAL COLLEGE	MI													\$0
SALISH KOOTENAI COLLEGE	MT	\$148,123			\$568,908		\$138,999							\$856,030
SI TANKA/HURON UNIVERSITY	SD													\$0
SINTE GLESKA UNIVERSITY	SD	\$250,000												\$250,000
SISSETON WAHPETON COMMUNITY COLLEGE	SD													\$0
SITTING BULL COLLEGE	ND	\$5,000			\$54,857									\$59,857
SOUTHWESTERN INDIAN POLYTECHNIC INSTITUTE	NM	\$250,000												\$250,000
STONE CHILD COLLEGE	MT				\$98,382									\$98,382
TOHONO OODHAM COMMUNITY COLLEGE	AZ													\$0
TURTLE MOUNTAIN COMMUNITY COLLEGE	ND	\$5,000												\$5,000
UNITED TRIBES TECHNICAL COLLEGE	ND	\$5,000												\$5,000
WHITE EARTH TRIBAL AND COMMUNITY COLLEGE	MN													\$0
WIND RIVER TRIBAL COLLEGE	WY													\$0
AMERICAN INDIAN HIGHER ED. CONSORTIUM	VA				\$1,330,294									\$1,330,294
OTHER														\$0
AMERICAN COUNCIL ON EDUCATION					\$33,000									\$33,000
EDUTECH LTD.												\$40,800		\$40,800
NASA RESEARCH & EDUCATION SUPPORT SVCS. (NRESS)												\$217,643		\$217,643
NORTH DAKOTA ASSOC. OF TRIBAL COLLEGES (NDATC)					\$120,000									\$120,000
SCIENCE SYSTEMS AND APPLICATIONS, INC. (SSAI)												\$21,000		\$21,000
Category Totals		\$1,111,525	\$0	\$0	\$2,400,853	\$0	\$211,199	\$29,510	\$0	\$0	\$0	\$279,443	\$0	\$4,032,530

Notes:

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Signature of Agency Head:

Date:

E. REPORT SUMMARY

NASA remains committed to increasing diversity, particularly through outreaching to the TCUs, in critical STEM disciplines relevant to NASA's mission and the Vision for Space Exploration. TCUs are important to preparing the future workforce of engineers, scientists, and business leaders.

NASA plans to continue working with the TCUs to enhance STEM education and to include the colleges in NASA education and research programs. Plans are under way for faculty and student teams from 14 TCUs to work at most of the NASA Centers in the summer of FY 2006 in the NASA/AIHEC Student Research Experience. This will be the first time that all the NASA Centers were invited to host the TCUs for summer research, and each Center asked for one or more college teams. We expect this to be the beginning of a continuing partnership between the NASA Centers and the TCUs.