



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

**FISCAL YEAR 2007 ANNUAL PERFORMANCE REPORT
TO THE
WHITE HOUSE INITIATIVE ON
TRIBAL COLLEGES AND UNIVERSITIES**

Office of Education

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TABLE OF CONTENTS

A.	EXECUTIVE SUMMARY.....	3
B.	AGENCY ACCOMPLISHMENTS.....	4
	1. Goals and Measureable Objectives Achieved in FY 2007.....	4
	2. Programs Implemented that Exemplified Federal Opportunities for Tribal Colleges.....	5
	3. Total Awards to TCUs during FY 2007.....	9
	4. Agency Funding Decreases/Increases.....	9
C.	SUMMARY OF FY 2007 AGENCY AWARDS BY CATEGORY.....	10
D.	SUMMARY OF FY07 AGENCY AWARDS TO INDIVIDUAL TRIBAL COLLEGES AND UNIVERSITIES.....	11

A. EXECUTIVE SUMMARY

This Annual Performance Report for FY 2007 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 furthered its FY 2007 goals for the Executive Order by working with the Tribal Colleges and Universities (TCUs) to advance the educational and cultural missions of the colleges, particularly through its cooperative agreement with the American Indian Higher Education Consortium (AIHEC), while fulfilling the mission of NASA. NASA achieved three of its four objectives for TCUs as presented in the FY 2006-2008 Performance Plan. The fourth goal of increasing funding to TCUs was not achieved this year due to an overall reduction in funding for the Office of Education and a redirection of funds to address the Agency's priorities. Total FY07 NASA funding allocated to TCUs was \$969,511.

During Fiscal Year 2007, management of the NASA Tribal College and University Project (TCUP) was transferred to Goddard Space Flight Center (GSFC), as part of a realignment of Agency educational programs. A GSFC scientist was selected for the position of TCUP project manager. She brings many years of experience in Native American issues including research, student mentoring, and project management.

B. AGENCY ACCOMPLISHMENTS

Working collaboratively with NASA's Mission Directorates and Centers, the Office of Education promoted education as an integral component of every major NASA research and development mission. As the Nation builds upon the accomplishments of its first century of flight and as NASA celebrates its 50th year in 2008, the Office of Education is committed to providing opportunities for all to explore and develop their full learning potential. NASA engaged the underrepresented and underserved communities of students, educators, and researchers in our Nation's TCUs by providing exciting research and internship opportunities that "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 2007:

NASA achieved three of its four objectives for TCUs as presented in the FY 2006-2008 Performance Plan. The fourth goal of increasing funding to TCUs was not achieved due to an overall reduction in funding for the Office of Education and a redirection of funds to address the Agency's priorities.

- 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 encouraging TCUs to partner with other minority institutions with similar research interests so that they might participate in other minority-serving institution solicitations, such as the NASA University Research Centers (NASA URC). In addition, GSFC created a summer internship program ("externship") with increased flexibility which required students and faculty to spend four weeks at NASA Centers and then return home to finish the internship (in collaboration with a NASA mentor) in order to minimize the length of time spent away from home. As many TCU students cannot be away from home for longer than a few weeks due to family and tribal obligations, a full summer on-site at a NASA Center was identified as a barrier to participation. The combination of intensive on-site training with continued support throughout the remainder of the summer seems to provide a more realistic approach to successful interaction and infrastructure support.

- 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: Faculty/student teams were recruited and placed by NASA education program personnel at several NASA Centers. TCU teams carried out internships at Ames Research Center (ARC), Glenn Research Center (GRC), Goddard Space Flight Center (GSFC), Jet Propulsion Laboratory (JPL), Johnson Space Center (JSC), Kennedy Space Center (KSC), and Marshall Space Flight Center (MSFC). AIHEC's STEM Resource Center completed deployment of the online portal, and each TCU became fully and actively connected.

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

Objective 3 Accomplishment: This is the second year that GSFC has provided technical assistance to Salish Kootenai College (SKC) with developing and implementing a Bachelor's degree program in Computer Engineering. Accomplishments this year included design and delivery of three courses by GSFC engineers for SKC, support for one SKC student to work with a Goddard engineer on a summer internship, pursuit of Accreditation Board for Engineering Technology (ABET) accreditation and accreditation of the program by the Northwest Commission on Colleges and Universities.

Objective 4: Increase the amount of funding in support of TCUs by \$200,000 per year.

NASA was unable to meet this goal because the NASA Office of Education budget was reduced and funds were redirected to address new priorities.

2. **Programs implemented that exemplified Federal opportunities for TCUs:**

NASA's partnership with AIHEC was instrumental in achieving our goals. AIHEC has greatly facilitated collaborations with the TCUs.

- In the third year of this five-year cooperative agreement, AIHEC has been successful in supporting science, technology, engineering and mathematics (STEM) education and information technology infrastructure development efforts of individual TCUs. AIHEC has also provided the entire AIHEC membership with 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 three goals:

1. NASA-AIHEC outreach and information exchange.
2. Expanded opportunities for the Nation's future STEM workforce.
3. TCU STEM capacity building and infrastructure development.

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

Under the NASA-AIHEC cooperative agreement, NASA provides:

- (1) 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;
- (2) summer research experiences (SRE) for TCU faculty and students;
- (3) TCU-wide STEM strategic program planning; and
- (4) various information and technical support services including meetings, workshops, and the AIHEC STEM Resource Center portal, which is available to the entire AIHEC membership.

The following summarizes relevant current NASA-AIHEC cooperative agreement projects:

Enrichment Grants were awarded to nine TCUs. The following colleges were funded to support STEM-related activities:

- (1) Cankdeska Cikana Community College: mathematics lab and weekend STEM academies for middle and high school students
- (2) Fort Berthold Community College: summer bridge program and professional development for K-12 teachers and TCU faculty
- (3) Fort Peck Community College: faculty professional development, curriculum development, and educational software
- (4) Leech Lake Tribal College: acquisition of education technology
- (5) Little Big Horn College: acquisition of robotics equipment and student support for educational outreach to area K-12 schools
- (6) College of Menominee Nation: a middle school STEM academy
- (7) Salish Kootenai College: curriculum development and redesign of the developmental math program
- (8) Sitting Bull College: student research support
- (9) Stone Child College: acquisition of library materials and learning facility upgrades

SRE for TCU faculty and students: Faculty/student teams were recruited and placed by NASA education program personnel at several NASA Centers. TCU teams carried out internships at ARC, GRC, GSFC, JPL, JSC, KSC, and MSFC. A total of 27 participants (7 faculty/mentors; 20 students) from eight colleges and the North Dakota Association of Tribal Colleges took part in the SRE Program. In addition, JSC sent an engineer to a TCU to teach robotics and help develop curricula.

Goddard Space Flight Center

Haskell Indian Nations University, Little Priest Tribal College, Salish Kootenai College (SKC), Southwest Indian Polytechnic Institute (SIPI), North Dakota Association of Tribal Colleges: four faculty members/mentors; eight students

GSFC provided the opportunity to experiment with a different model for the SRE program. Two faculty-student teams from Haskell Indian Nations University and Little Priest Tribal College worked at GSFC, focusing on geospatial technologies, specifically geographic information system and remote sensing research methodologies. Under the general theme of climate change, the individual teams/students identified specific research projects during four weeks of research training mentorship, at the conclusion of which they returned to their home institutions to complete their research projects. A key to this approach was flexibility. As many TCU students cannot be away from home for longer than a few weeks, a full summer on-site at a NASA Center was identified as a barrier to participation. The combination of intensive on-site training with continued support throughout the remainder of the summer provided a more realistic approach to successful interaction and infrastructure support. It is worthy to note that three days of training in GIS (Geographic Information Systems) was provided by the US Fish and Wildlife Service (USFWS) Training Center in Shepherdstown, WV. The training program was no cost to the participants as a result of the interagency collaboration between NASA and USFWS.

The student projects included topics such as the integration of remote sensing with indigenous, traditional knowledge (working with a researcher/mentor's Norwegian Sami project), water quality in Eastern Oklahoma, air quality monitoring in the Four Corners region, water quality studies on the Winnebago Reservation, two land use/land cover studies on the Winnebago Reservation, and a study of Eagle populations on the Winnebago Reservation.

Glenn Research Center

Diné College: 3 students

One student was placed with the Antenna, Microwave and Optical Systems Branch of the Communications Division at GRC. Using Electromagnetic Simulation and Optimization Software, she created a phase shifter with different substrate layers of dielectric material. Two other students were assigned a variety of projects, including using computer-aided design software to design parts such as a rotation apparatus cell; populating a lunar soil database; testing the combustibility

of chemical wipes in a vacuum environment; and preparing borax (which simulates lunar soil) test samples for analysis at KSC.

Ames Research Center

Salish Kootenai College: 2 students

The SKC students built on the molecular biology work that was done by SRE 2006 students and faculty. The students' research involved the expression, purification, and biophysical analyses of heat-shock protein complexes from hyperthermophile archaea.

Navajo Technical College (NTC): 1 student

One NTC student was placed in the Engineering Systems Division researching and assembling parts for satellites. He was assigned a variety of design and drafting projects involving computer-aided design and had the opportunity to participate in the entire design process, working with machinists who manufacture the part to his design specifications.

Southwest Indian Polytechnic Institute: 1 student

One SIPI student worked with the DEVELOP Program (a NASA Science Mission Directorate Applied Sciences Program), conducting research on climate change using remote sensing technologies and several field studies in the local area, including Yosemite National Park.

Marshall Space Flight Center

Navajo Technical College: 1 faculty member; 2 students

The NTC team at MSFC worked on design projects for the upper stage of the Ares 1 rocket. They developed 3D models using Pro/E software for use by the digital manufacturing group. The team simulated the use of vehicles, buildings, cranes, and tooling to prove out the manufacturing and assembly process involved in the upper stage portion of the ARES 1.

Jet Propulsion Laboratory

Diné College: 1 faculty member; 1 student

The faculty member and student were assigned to create diagnostic code in C++ for the NASA Rovers within the Robotics Section. They examined C++ code and then made modifications for diagnosing Rover parameters.

Leech Lake Tribal College (LLTC): 1 student

One LLTC student continued the work she did last year on digital archives with JPL library staff, which supports her interest in pursuing further academic work in library science.

Johnson Space Center

Southwestern Indian Polytechnic Institute: 20 students, 12 faculty
JSC sent an engineer to SIPI to provide hands-on and classroom experience in robotics for 20 students, as well as curriculum development collaboration with 12 faculty from 10 TCUs.

Kennedy Space Center

Saginaw Chippewa Community College: 1 faculty member; 1 student
The Saginaw Chippewa team worked with the Main Landing Gear Environmental Seals of the shuttles (orbiters), examining standards with respect to production, installation, shelf-life, etc. The team was assigned the project of designing a compression tool to take load tests, collecting dimensional data and load data, analyzing the findings, and preparing a final report.

3. Total awards to TCUs during FY 2007:

A total of \$969,511 was awarded to the TCU Project during FY 2007. Of that amount, \$452,192 was allocated for the AIHEC partnership for disbursement to individual TCUs.

4. Agency funding increases/decreases:

FY 2006 Awards	\$3,613,260
FY 2007 Awards	\$ 969,511
Amount of decrease in awards (Compared to FY 2006 awards)	- \$2,643,749

C. SUMMARY OF FY 2007 AGENCY AWARDS BY CATEGORY

1. Agency/Organization National Aeronautics and Space Administration

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

Dr. Nancy G. Maynard, Project Manager, Tribal Colleges and Universities Program, (301) 614-6572, fax (301) 614-5644, Nancy.G.Maynard@nasa.gov

3. FY 2007 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		\$29,398	
2. Direct Institutional Subsidies			
3. Program Evaluation			
4. Training and Technical Assistance		218,711	
5. Facilities and Equipment		29,000	
6. Fellowships, Internships Recruitment, and IPAs		285,147	
7. Student Tuition Assistance, Scholarships, and Other Aid			
8. Economic Development			
9. Administrative Infrastructure		195,000	
10. Third Party Awards			
11. Private Sector Involvement			
12. Other Activities		212,255	
Total	\$868,914,638	\$969,511	.11%

Michael D. Griffin, Administrator
Agency Head (Typed)

Agency Head (Signature)

Date

D. Summary of FY07 Agency Awards to Individual Tribal Colleges and Universities

Agency: National Aeronautics and Space Administration											
Tribal Colleges and Universities	ST	Research & Development	Training & Technical Assistance	Fellowships, Internships, Recruitment, IPAs	Student Tuition Assistance, Scholarships and Other Aid	Facilities & Equipment	Administrative Infrastructure	Third Party Awards	Private Sector Involvement	Other Activities	Grand Total
BAY MILLS COMMUNITY COLLEGE	MI										0
BLACKFEET COMMUNITY COLLEGE	MT										0
CANKDESKA CIKANA COMMUNITY COLLEGE	ND	1,000		13,090							14,090
CHIEF DULL KNIFE COLLEGE	MT										0
COLLEGE OF MENOMINEE NATION	WI			15,000							15,000
DINE COLLEGE	AZ			44,315							44,315
FOND DU LAC TRIBAL AND COMMUNITY COLLEGE	MN										0
FORT BELKNAP COLLEGE	MT										0
FORT BERTHOLD COMMUNITY COLLEGE	ND			9,684							9,684
FORT PECK COMMUNITY COLLEGE	MT			9,980							9,980
HASKELL INDIAN NATIONS UNIVERSITY	KS		124,961	30,130							155,091
ILISAGVIK COLLEGE	AK										0
INSTITUTE OF AMERICAN INDIAN ARTS	NM										0
LAC COURTE OREILLES OJIBWA COMM. COLL.	WI										0
LEECH LAKE TRIBAL COLLEGE	MN			12,744		25,000					37,744
LITTLE BIG HORN COLLEGE	MT					4,000					4,000
LITTLE PRIEST TRIBAL COLLEGE	NE			38,117							38,117
NAVAJO TECHNICAL COLLEGE	NM			37,369							37,369
NEBRASKA INDIAN COMMUNITY COLLEGE	NE										0
NORTH DAKOTA ASSN OF TRIBAL COLLEGES	ND			9,865							9,865
NORTHWEST INDIAN COLLEGE	WA										0
OGLALA LAKOTA COLLEGE	SD		93,750								93,750
SAGINAW CHIPPEWA TRIBAL COLLEGE	MI			19,292							19,292
SALISH KOOTENAI COLLEGE	MT			36,784			195,000				231,784
SINTE GLESKA UNIVERSITY	SD										0
SISETON WAHPETON COLLEGE	SD										0
SITTING BULL COLLEGE	ND	14,448									14,448
SOUTHWESTERN INDIAN POLYTECHNIC INST.	NM			8,777							8,777
STONE CHILD COLLEGE	MT	13,950									13,950
TOHONO O'ODHAM COMMUNITY COLLEGE	AZ										0
TURTLE MOUNTAIN COMMUNITY COLLEGE	ND										0
UNITED TRIBES TECHNICAL COLLEGE	ND									29,255	29,255
WHITE EARTH TRIBAL AND COMM.COLLEGE	MN										0
GSFC STAFF SUPPORT TO THE TCU PROGRAM										183,000	183,000
Category Totals		\$29,398	\$218,711	\$285,147	0	\$29,000	\$195,000	0	0	\$212,255	\$969,511
Name of Agency Liaison:		Dr. Nancy G. Maynard				Title: Project Manager, Tribal Colleges and Universities Program					
Phone:		(301) 614-6572				Fax:		(301) 614-5644			
Signature of Agency Head:											
Date:											