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# NASA/MINORITY UNIVERSITY RESEARCH AND EDUCATION PROGRAM (MUREP)

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## MUREP for American Indian and Alaskan Native STEM Engagement (MAIANSE)

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FY2014 Annual Report

Data provided by the following Grantees: Kiksapa Consulting, Haskell Indian Nations University, Chief Dull Knife College, Salish Kootenai College

DECEMBER 4, 2015

## **ACTIVITY DESCRIPTION**

NASA provides financial assistance (grants and cooperative agreements) to the Nation's Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs), Tribal Colleges and Universities (TCUs), American Indian and Alaskan Native Serving Institutions (AIANSIs), Predominantly Black Institutions (PBIs) and eligible community colleges. The Administration recognizes the valuable role that these institutions play in educating our citizens, as reflected in the five Minority-Serving Institutions (MSI) focused Executive Orders signed by the President.

NASA's Minority University Research and Education Activity (MUREP) investments enhance the research, academic, and technology capabilities of MSIs through multi-year awards. Awards assist faculty and students in research and provide authentic STEM engagement related to NASA missions. These competitive awards provide NASA specific knowledge and skills to learners who have been historically underrepresented and underserved in STEM. MUREP investments also assist NASA in meeting the goal of a diverse workforce through student participation in internships, scholarships, and fellowships at NASA Centers and JPL.

MUREP's goals for TCUs are to enhance their technical expertise; increase the participation of underrepresented and underserved students in science, technology, engineering and mathematics (STEM) disciplines; and to provide opportunities to participate in NASA-related education and research activities. MAIANSE is guided by Executive Order 13592: "Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities." NASA is highly committed to ensuring the broadest participation of TCUs in the Agency's research and education programs as well as its overall mission.

In FY2013 several Office of Education activities were consolidated into MUREP including those related to the Tribal Colleges and University Project (TCUP). The resulting activity is now known as MUREP for American Indian and Alaskan Native STEM Engagement (MAIANSE). Through the most recent TCU solicitation, Tribal College & University, Experiential Learning Opportunities (TCU-ELO), three awards were given to: Southwest Indian Polytechnic Institute, Chief Dull Knife College and Haskell Indian Nations University. Due to the timing of the awards received by the institutions, the majority of their activities will be reflected in the FY15 Annual Performance Report.

This past year was the last of a 3-year cooperative agreement focused on the recently consolidated TCUP activity. MAIANSE is comprised not only of the competed awards, which totaled approximately \$857K during the year, but also reflected the oversight of MUREP funded TCU activities across the agency. MUREP funding of TCUs amounted to \$1.28M and represented over 82% of the overall NASA investment in TCUs for FY2014 being \$1.55M<sup>1</sup>.

MAIANSE awards for the past year continued to focus on the following:

- "externship" opportunities or Research Experiences for Undergraduates (REUs), which provide NASA expertise and training in research, engineering, and education opportunities to Tribal College and University faculty and students out in Indian country – bringing NASA to the TCUs;

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<sup>1</sup> FY2013 data is reflected for this report, as the FY2014 was not yet compiled.

- Center Summer Research Experience (SRE) internships which provide NASA Center expertise, experiences, and mentoring; and
- A tribal college engineering internship program to participate in a NASA flight mission and enhance TCU engineering training.
- Offering students diverse experiential learning opportunities at their respective tribal colleges

### **ACTIVITY GOALS**

The goals of the TCU ELO are to utilize NASA's unique contributions in collaboration with tribal colleges and universities and tribal-serving institutions to improve the overall quality of the Nation's STEM (Science, Technology, Engineering and Mathematics) education.

To achieve these goals, MAIANSE seeks to:

- Increase learners' involvement and interest in STEM, educate them on the value of STEM in their lives, and positively influence the perception of their ability to participate in STEM;
- Strengthen efforts to attract and retain increased numbers of students in NASA STEM programs to encourage their pursuit of educational disciplines and careers critical to NASA's and the Nation's future engineering, scientific, and technical workforce;
- Provide opportunities for TCU students, faculty and staff; and high school students who are likely to matriculate to TCUs, to engage in NASA-related STEM scientific research and engineering activities;
- Expand outreach activities between NASA and tribal colleges and universities to increase TCU access to NASA's unique science and exploration assets and data in the creation of experiential learning opportunities for students;
- Enhance NASA's knowledge of the unique TCU assets and requirements, and enhance NASA-TCU partnerships

MAIANSE achieved these goals through the following efforts:

**Faculty and Research Support:** MAIANSE provides NASA competency-building education and research opportunities for faculty through the Summer Research Experience Internship/Externship Programs as well as the American Indian/Alaskan Native Climate Change Working Group (AI/AN CCWG) program. Faculty received training in science, engineering, GIS and remote sensing at NASA Centers as well as during training sessions out in tribal colleges and universities that prepared them to conduct earth surface dynamics research activities locally. Through these facets of MAIANSE, faculty members had the opportunity to not only engage with NASA personnel, but also shared ideas and present research in a collegial environment.

**Student Support & Student Involvement Higher Education:** MAIANSE provides NASA competency-building education and research opportunities to individuals to develop qualified undergraduate students who are prepared for employment in STEM disciplines at NASA, industry, and higher education. This support is provided through both the Academic Year Research Experience for Undergrads (REU) as well as the Summer REU. There were over 40 TCU students that had the opportunity to engage in authentic NASA-related, mission-based R&D activities through the 2014 Summer Research Internship/Externship Programs in which students carry out NASA-related scientific activities in cooperation with NASA/science or engineering mentors at a Tribal College or NASA center.

**Targeted Institution Research and Academic Infrastructure:** in FY2014 the funded MAIANSE activities continued to support scientific research and academic support at partner institutions.

**Course Development:** N/A

### **ACTIVITY ACCOMPLISHMENTS**

MAIANSE sought to contribute to the Agency's efforts in broadening participation of underrepresented groups in STEM. This was accomplished through attracting and retention of tribal college students. MAIANSE programs provided mentoring support, academic development and enhancements, social and professional networks and have helped students to complete undergraduate degrees.

Activity Accomplishments are representative of events that took place during the 2014 fiscal year. These accomplishments are reflected in the following highlights:

NASA MAIANSE provided support for two workshops of the American Indian Alaska Native Climate Change Working Group. The meetings afford TCU students and faculty the opportunity to participate in professional meetings and present posters of their research. The fall 2013 meeting was held in Hanover, NH and was hosted by Dartmouth College. The spring 2014 meeting was held at the National Center for Atmospheric Research in Boulder, CO. Both meetings were well attended by Federal Agency partners and TCU student/presenters. The focus of this year's meetings centered on engagement of indigenous communities that are experiencing climate change impacts and the possibility of tribe relocation.

The 2014 NASA REU summer externship program involved 20 students from 12 TCUs: Blackfeet Community College, Lac Courte Oreilles Ojibiwa Community College, Sitting Bull College, Navajo Technical College, Northwest Indian College, Oglala Lakota College, Leech Lake Community College, Salish Kootenai College, Sinte Gleska University, Southwestern Indian Polytechnic Institute (SIPI), Tohono O'dham Community College, and White Earth Tribal and Community College

NASA inducted 1 tribal college student into the NASA Student Ambassadors Virtual Community, Cohort VI. Their selection is part of the agency's effort to engage undergraduate and graduate students in science, engineering, mathematics and technology, or STEM, research and interactive opportunities. Students were nominated by NASA mentors and managers primarily as a result of their summer research experiences as part of the NASA. The student hailed from Salish Kootenai College in Pablo, MT.

Undergraduate tribal college students continued working as student research interns on BisonSat, all from Salish Kootenai College, building and testing the flight unit in preparation for delivery to the launch provider during the summer. Students developed the 2014 Flight Readiness Review activities, in addition to building a fully functional flight backup unit ready for substitution for the primary flight unit should the primary unit be damaged late in flight readiness testing.

Chief Dull Knife College, one of our newest awardees via the FY13 TCU-ELO solicitation, was able to get up and running by the summer of 2014. Their 10 undergraduate and 8 high school students worked on several, exciting topics including: environmentally safe coal extraction, West Nile Virus identification, geospatial location, river sediment metagenomics, building a wind tunnel for rocket testing

### **OTHER RELATED ACTIVITIES**

- *October 31- November 2, 2013, Denver, CO.* NASA supported the 35<sup>th</sup> Annual American Indian Science and Engineering Society (AISES) National Conference. NASA supported the conference by sending a team to provide recruitment support at the Career Fair. Over **60 student resumes** were collected and more than 200 students were engaged during the event.
- *Full year grant* – AISES provided mentoring and leadership development for 5 students as they transitioned from TCUs to 4-year institutions and/or graduate school.

### **ACTIVITY CONTRIBUTIONS TO ANNUAL PERFORMANCE INDICATORS (API)**

Note: Our programs/activities were measured according to Annual Performance Goals (APGs) up until this fiscal year. The new measurement marks are described as Annual Performance Indicators (APIs).

*ED-14-1: Provide significant, direct student awards in higher education to (1) students across all institutional categories and types (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students, (3) women, and (4) persons with disabilities at percentages that meet or exceed the national percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education's National Center for Education Statistics for a minimum of two of the four categories..*

MAIANSE targets underrepresented and underserved students, including women and girls, and persons with disabilities to participate in its higher education STEM activities. Based on the nature of the MAIANSE activity and its focus on students and faculty attending tribal colleges and university, NASA MAIANSE has 100% participation of underserved and underrepresented students in FY2014 and reached all of these with significant direct awards. There were 43 students with significant, direct awards during this period.

*ED-14-6: 250,000 educators participate in NASA-supported professional development, research, and internships that use NASA-unique STEM content.*

FY2014<sup>2</sup>: Total # of Educators participating in MAIANSE supported activities - 11.

*ED-14-8: One million elementary and secondary students participate in NASA STEM engagement activities.*

While the recent TCU-ELO solicitation awarded in mid FY14 were designed for TCUs to work with elementary and secondary schools, that activity will not be reflected until the FY15 Annual Performance Report.

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<sup>2</sup> Only represents reported data by participant

### **IMPROVEMENTS MADE DURING THE PAST YEAR**

- There was an increased focus on better communication within the TCU community. There was a concerted effort to begin regular dialogue with awarded TCUs as well as those TCUs geographically near them. MAIANSE efforts were bolstered by taking trips to Indian Country and visiting with TCU faculty, staff and students at Southwest Indian Polytechnic Institute, Haskell Indian Nations University and Navajo Technical University.

### **ACTIVITY PARTNERS**

The following partners were instrumental in activity execution: The American Indian/Alaska Native Climate Change Working Group (AI/AN CCWG), American Indian Higher Education Consortium (AIHEC), American Indian Science and Engineering Society (AISES), Kiksapa Consulting LLC, Haskell Indian Nations University (host site for Summer REU), Salish Kootenai College, and the United States Geological Survey (USGS).