

The National Space Grant Office requires two annual reports, the Annual Performance Data Report (APD – this document) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.

Oregon Space Grant Consortium
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Grant Number: NNX10AK68H

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Oregon Space Grant Consortium is a Program Grant Consortium funded at a level of \$430,000 for fiscal year 2014.

PROGRAM GOALS

The Oregon Space Grant Consortium (OSGC) focuses on interdisciplinary and inter-institutional collaborations among member institutions to strengthen the statewide STEM-based educational infrastructure and increase science literacy for Oregon students with an emphasis on authentic, hands-on student/mentor projects. OSGC relies on the strength of its community college, university, and informal education partners to provide a diverse pool of students, educators, researchers, and administrators to sustain a Consortium that continually and effectively contributes to the National Space Grant Program.

OSGC Goals:

Goal: Contribute to the development of capable and prepared human capital in the STEM disciplines by providing access to unique hands-on research and educational

opportunities to Oregon students, with an emphasis on involvement of women and underrepresented minorities.

Goal: Utilize the state and national network of partners to disseminate NASA information and opportunities to students, teachers, and faculty to increase awareness of and participation in NASA-related research and educational opportunities.

Goal: Invest in a balanced suite of interdisciplinary research, education, and public service programs that reflect the priorities of the National Space Grant Program with a focus on scholarships, fellowships, internships, curriculum enhancement, and faculty development.

Outcome 1

Outcome 1a: Diversity - Goal: Maintain diverse Consortium management, members, and projects. **Objectives: 1)** Achieve diversity levels congruent with or in excess of state demographics of 14.4% underrepresented minorities in STEM fields. **2)** Achieve female participation levels of 40% congruent with NASA's Office of Education requirement.

Outcome 1b: Fellowship/Scholarship Program - Goal: Efficiently administer the fellowship/scholarship call and timely process awards. **Objective:** Maintain online application system that achieves ultimate efficiency and security for data collection, information transfer, and payment processing.

Goal: Encourage community college students to explore programs in STEM. **Objective:** Award up to 12 scholarships to students enrolled at affiliate community colleges.

Goal: Promote/retain undergraduate enrollment in STEM and STEM education/Masters of Arts in Teaching (MAT) programs. **Objective:** Award up to 15 scholarships to undergraduate/MAT students enrolled at affiliate 4-year institutions.

Goal: Build collaboration between students and faculty mentors in a STEM discipline. **Objective:** Award up to five scholarships to students performing research at an OSGC 4-year affiliate institution.

Goal: Provide scholarship opportunities to a diverse group of students. **Objective:** Competitively make awards congruent with diversity demographics (see Outcome 1a).

Outcome 1c: Research Infrastructure - Goal: Design programs to impact the Educate and Employ levels of NASA's Education Framework. **Objectives: 1)** Administer the Faculty Research Award Program call to engage early career faculty to work with NASA related research. **2)** Emphasize hands-on authentic science inquiry and mentorship components.

Goal: Provide opportunities for students and faculty to present their research to peers and potential students/faculty. **Objectives: 1)** Host the annual Student Symposium to highlight OSGC-supported research projects. **2)** Engage and recruit potential students.

Outcome 1d: Higher Education - Goal: Support programs that provide direct student support, encourage student involvement, and foster course enhancement/development based on the strengths of the affiliates and related research. **Objectives: 1)** Support the Undergraduate Research Award Program promoting hands-on, authentic research experiences. **2)** Support STEM course development to encourage development of interdisciplinary courses designed around NASA research areas of interest as defined by the Mission Directorates. **3)** Provide support for NASA center internships. **4)** Support

development of regional STEM centers to promote teacher professional development and access to industry and NASA resources.

Goal: Provide opportunities to a diverse population of students. **Objective:** Support internship opportunities congruent with diversity demographics (see Outcome 1a).

Outcome 2

Outcome 2a: Pre-College - Goal: Support educational professional development programs that bring NASA material and content to the classroom and promote direct and diverse student involvement. **Objective:** Administer the Informal Education Award Program for informal pre-college educational opportunities.

Outcome 3

Outcome 3a: Public Outreach/Informal Education - Goal: Provide information, resources, and networking opportunities to students, educators, and affiliates. **Objective:** Disseminate NASA material, resources, and professional development opportunities via the OSGC website, educator blog, Volcano World online resource, and via social media.

Goal: Utilize informal education and public venues as a means to share faculty research and areas of expertise with students/general public. **Objectives:** 1) Serve as a docent/volunteer at informal education affiliates. 2) Provide speakers for speaker series.

Consortium Management - Goal: Provide efficient and effective administration and leadership, maintain good intra-consortium communication, participate in the national network, and deliver succinct and timely reporting to NASA's Office of Education. **Objectives:** 1) Host the Annual Affiliate Meeting. 2) Attend national/regional Space Grant meetings. 3) Disseminate information and opportunities to students and affiliates. 4) Maintain the OSGC website with current program information, research and education opportunity announcements, student and educator resources, and other general OSGC and NASA news/updates. 5) Make annual affiliate site visits as permitted. 6) Complete NASA contract reporting in a timely manner. 7) Provide demographics for student awardees for longitudinal tracking program.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, & 3)

Student comments gathered through longitudinal tracking are below:

“Receiving the Oregon Space Grant played an instrumental part in my academic success, as it enabled me to concentrate solely on schoolwork for a few terms without putting myself in more debt.” (Stephen Gibbel, 2013 OSGC Community College Scholarships-Lane Community College)

“Currently it has helped me continue on a path of higher education and expanded my interest in aerospace and STEM related research. The funding provided to me has been crucial in helping with my education, without it I may not have been able to continue in higher education at this point in my life.” (Thomas L'Estrange, 2013 OSGC Graduate Research Fellowship-Oregon State University)

“Participating in the RockOn! 2014 Workshop helped nurture and grow my interest in space related areas of my major, Electrical and Computer Engineering. Since the workshop, I am working on a RockSat-C experiment to be launched on a sounding rocket during Summer 2015 in Wallops, Virginia.” (Sophia Zhang, 2014 OSGC Student Project/Workshop Attendance-NASA/Wallops)

These opportunities are linked to Outcome 1 and 2 with direct contribution to the STEM workforce development in disciplines needed to achieve NASA’s strategic goals and by offering a progression of educational opportunities in the STEM disciplines.

PROGRAM ACCOMPLISHMENTS

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s strategic goals: Employ and Educate

Outcome 1a: Diversity - 1) Maintained diverse Consortium management, member institutions, student participants, and projects. **2)** Made awards congruent with or in excess of state demographics of 14.4% underrepresented minorities in STEM fields and 40% females, congruent with NASA’s Office of Education requirement. 50% of internships, 50% of scholarships and 46% of Undergraduate Research Awards were awarded to female applicants; 24% of scholarship awards and 21% of Undergraduate Research Awards were awarded to underrepresented minorities.

Outcome 1b: Scholarship/Fellowship Program - 1) Awarded 34 awards; 12 Community College, 15 4-Year Institution Scholarships, five Undergraduate Research Scholarships, and two graduate fellowships. **2)** 50% of the awards were awarded to females; 24% to underrepresented minorities in the STEM fields.

Outcome 1c: Research Infrastructure - 1) Supported a Faculty Research Award Program project led by Dr. Scott Fisher at UO. **2)** 20% of associate director’s time supported Research Infrastructure programs including implementation, administration and student mentoring. **3)** Hosted the Student Symposium to highlight student research opportunities; 24 students participated.

Accomplishments relate to NASA’s Education Priorities and current areas of emphasis through hands-on student experiences in STEM disciplines, environmental science and global climate change research, diversity of institutions, faculty, and student participants, and support of innovative research infrastructure for faculty to focus on NASA priorities. (Outcome 1)

Outcome 1d: Higher Education - 1) Continued support for the South Metro-Salem STEM Network (SMS STEM), a collaboration including 13 regional school districts, four higher education affiliates, two community colleges, one informal education affiliate and five community programs. The SMS STEM is a regional hub designed to increase access, excitement, and engagement of students in STEM, and experiential learning, including utilizing NASA and OSGC resources. Provided support for the STEM Network Coordinator who is responsible for developing and implementing the center’s core strategies, which includes connecting the STEM network to business and community, and connecting regional teachers, students, and classrooms with STEM resources. **2)** Supported the OSU AIAA chapter in the Design, Build, Fly competition under the

Undergraduate Research Program. **3)** Supported a combined LBCC/OSU team to participate in the 2015 RockSat-C Workshop at NASA Wallops. **4)** At the time of reporting, supported two female and two male students to participate in 2015 NASA center internships. OSGC typically supports approximately 20 students to participate in NASA internships. With the streamlined internship approach, no contact to NASA centers was allowed, resulting in a steep decline of internship opportunities for Oregon students. **5)** Supported curricula development at OSU within the Honors College, Introduction to Rocket Science, in preparation for a Space Science degree program at OSGC affiliate institutions. **6)** 20% of associate director's salary was devoted to implementing and executing Higher Education programs.

These accomplishments relate to NASA's Education Priorities and current areas of emphasis by utilizing hands-on student experiences and engagement with community colleges, higher education institutions, business, and industry, by promoting environmental science and global climate change research, and by supporting diversity of institutions, faculty, and student participants. (Outcome 1)

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty: Educate and Engage

Outcome 2a: Pre-College Education - 1) Supported The Museum at Warm Spring's Seeds of Discovery interactive student engagement program via the Informal Education Award Program.

These accomplishments relate to NASA's Education Priorities and current areas of emphasis through hands-on student experiences and engaging middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise. (Outcome 2)

Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA's mission: Engage and Inspire

Outcome 3a: Public Outreach Programs - 1) Disseminated NASA material, information, resources, and professional development opportunities via the OSGC website and social media avenues. **2)** The director served as a docent for the Evergreen Aviation & Space Museum, contributed articles for the Museum newsletter, and served as advisor to the Museum's Education Advisory Board.

These accomplishments relate to NASA's Education Priorities and current areas of emphasis by engaging middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise. (Outcome 3)

Consortium Management - 1) Hosted annual affiliate meeting, attended by affiliates, NASA initiative representatives, scholars, administrators, and special guest speaker, Montana Space Grant director. **2)** Attended the Western Region Space Grant Meeting and the National Council of Space Grant Directors Meeting. **3)** The director served on National Space Grant Program boards as nominated/elected. **4)** The director served as technical reviewer for three other Space Grant Consortia and as a NASA EPSCoR reviewer. **5)** The associate director served on the National Space Grant Distinguished

Service Award Selection Committee. **6)** Disseminated NASA info and opportunities via the OSGC website and social media resources. **7)** Maintained the OSGC website to be 508 compliant. **8)** Completed NASA contract reporting in a timely manner. **9)** Collected student demographics/information for longitudinal tracking.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

- **Diversity:** OSGC maintains a diverse Consortium management, faculty, institutions, student participants, and projects. The 19 members include seven state higher ed institutions, three private higher ed institutions, six community colleges, and three informal ed institutions, representing all geographic locations of the state. All are active members of the consortium. OSGC has successfully made awards congruent with or in excess of diversity demographics (see Outcome 1a); of the 74 significantly funded students, 47% are female and 18% are underrepresented.
- **Minority-Serving Institution Collaborations:** Pacific University is the state's only MSI, serving Pacific Islanders. 20% of Undergraduate Research Scholarships were awarded to PU students. Exploring collaboration with Hawaii Space Grant to provide opportunities for underrepresented students, particularly Pacific Islanders.
- **NASA Education Priorities:** OSGC's program portfolio was designed specifically to focus on the current areas of emphasis of NASA's education priorities as stated in the NASA Education Strategic Coordination Framework: A Portfolio Approach.

➤ Authentic, hands-on student experiences in science and engineering disciplines.

OSGC provided support for hands-on science and engineering undergraduate experiences that support NASA education priorities: Graduate Research Fellowships; UP participation in the NASA Robotic Mining Competition; OSU AIAA's participation in the Design, Build, Fly Competition, OSU/LBCC's participation in RockSat-C at NASA Wallops Flight Facility, and four NASA Center Internships.

➤ Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise.

OSGC supports the efforts of SMS STEM Center to engage the K-12 community. The SMS STEM Center efforts use NASA inspired, hands-on learning experiences to captivate students and mentors and ensure the broadest distribution of NASA content.

➤ Community Colleges

Developing connections between community colleges, 4-year institution astronomy professors and respective administrators to promote curriculum development, provide online opportunities and access to remote astronomical data to enhance the student community college experience with the goal of matriculating to a 4-year institution. Provided hands-on opportunities including NASA Center internships and RockSat-C Workshop participation for students attending affiliated community colleges. Provided 12 scholarships to students attending OSGC affiliated community colleges.

➤ Aeronautics research

At the time of reporting, OSGC provided funds for four NASA Center internships to work directly with a NASA mentor on NASA-related projects.

- Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities.

OSGC supported one early career faculty member at UO to receive funding through the Faculty Research Award Program. Faculty research funding was limited in order to focus efforts on student research opportunities.

IMPROVEMENTS MADE IN THE PAST YEAR

1) Brought faculty from Honors College, oceanic and atmospheric sciences, physics, mechanical engineering, and astronomy together to begin conversation about vision, strategy, and implementation of a statewide, multi-institutional space studies program. 2) Completed a hallway improvement project, including paint and installation of wall panels adjacent to the Space Grant office, to display Student Symposium posters. 3) Utilized social media to increase the visibility of Space Grant. 4) Demonstrated an increase in the percentage of students going into STEM fields as reported in the longitudinal tracking data from FY06-FY14.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Higher Education Affiliate Institutions:

- **Eastern Oregon University (EOU)** - Small university focusing on teacher education; participates in Scholarship and Internship Programs. Affiliate Rep: Chemistry.
- **George Fox University (GFU)** - Private university focuses on liberal arts and science education; participates in the Scholarship and Internship Programs; a partner in the SMS STEM Center collaboration. Affiliate Rep: Mathematics and Physics.
- **Lane Community College (LCC)** - Comprehensive campus with focus on technology, continuing education, math and science; LCC Aviation Academy Offers Flight Technology and Aviation Maintenance Technology programs and a pilot certification program; participates in the Scholarship Program. Affiliate Reps: Aviation and physics/astronomy.
- **Linn-Benton Community College (LBCC)** - Offers associate degrees, transfer degrees and certificates for specific skills; focuses on robotics, mechatronics, and pre-engineering; participates in the Scholarship, Internship, and Undergraduate Research Award Programs. Affiliate Rep: Engineering.
- **Oregon Institute of Technology (OIT)** - Public institution of technology focusing on pro technical and health related fields; participates in the Scholarship, Internship, and Undergraduate Research Award Programs; a partner in the SMS STEM Center collaboration. Affiliate Rep: Computer Systems Engineering.
- **Oregon State University (OSU)** - Lead institution focusing on engineering, earth, oceanic, and atmospheric science, radiation biology, ecology, biochemistry, and pharmacy; participates in the Scholarship, Internship, and Undergraduate Research Award Programs. Affiliate Rep: Mechanical Engineering.

- **Pacific University (PU)** - Private, historic university focusing on liberal arts and health professions, and math and science education; participates in the Scholarship and Internship Programs. Affiliate Rep: Physics.
- **Portland Community College Cascade Campus (PCC)** - Small diverse urban campus focusing on adult education; participates in the OSGC Scholarship and Internship Programs. Affiliate Rep: Portland Teachers Program (PTP)
- **Portland Community College Rock Creek Campus (PCC)** - Urban campus with diverse focus on adult education including biology, veterinary, green energy, and aviation maintenance technology; participates in the OSGC Scholarship and Internship Programs. Affiliate Rep: Science and geology.
- **Portland Community College Sylvania Campus (PCC)** - Large urban campus known for performing arts center, nationally recognized nursing and dental programs, and machine manufacturing technology program; participates in the Scholarship and Internship Programs. Affiliate Rep: Physics.
- **Portland State University (PSU)** - Urban campus internationally recognized for its urban planning, social work, environmental studies programs, and microgravity drop tower research and collaborations with NASA and the International Space Station; participates in the Scholarship, Internship, and Undergraduate Research Award Programs. Affiliate Rep: Geology.
- **Southern Oregon University (SOU)** - Smaller liberal arts university focusing on criminology, natural sciences, and environmental science; participates in the Scholarship and Internship Programs. Affiliate Rep: Physics.
- **University of Oregon (UO)** - Oregon's flagship institution; a teaching and research university; offers more than 200 academic programs; manages the Pine Mountain Observatory in Bend, OR; participates in the Scholarship, Internship, and Undergraduate Research Award Programs. Affiliate Rep: Physics.
- **University of Portland (UP)** - Private university focusing on education and engineering; participates in the Scholarship, Internship, and Undergraduate Research Award Programs and the NASA Robotic Mining Competition. Affiliate Rep: Mechanical Engineering.
- **Western Oregon University (WOU)** –Nationally renowned Teaching Research Institute, engaged in community-based projects; focuses on science and math education; participates in the Scholarship and Internship Programs; partner in the SMS STEM Center collaboration. Affiliate representative: Physics.

Informal Education Affiliates:

- **Evergreen Aviation & Space Museum** – Home of the Spruce Goose; its mission to inspire, educate, promote, and preserve aviation and space history; participates in Higher Education Programs; partner in the SMS Stem Center collaboration.
- **Oregon Museum of Science and Industry (OMSI)** –Oregon's premier hands-on science and technology museum; has three theatres, a planetarium, and exhibit halls with a focus on natural science, industry, and technology; houses the state's largest Science on a Sphere as well as smaller, mobile scale models. OSGC supports OMSI by providing letters of support to leverage the NASA network and obtain additional funding opportunities for the museum.

- **The Museum at Warm Springs** – Tribal museum in central Oregon that brings three tribal communities together; partners with the local school district to offer hands-on science education utilizing expertise from within the community and around the state.