

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.

Idaho Space Grant Consortium
Lead Institution: University of Idaho
Director: Dr. Joseph D. Law
Telephone Number: 208-885-7230
Consortium URL: www.idahospacegrant.org
Grant Number: NNX10AM75H

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 Idaho Space Grant Consortium (ISGC) is a Designated Consortium funded at a level of \$575,000 for fiscal year 2014.

PROGRAM GOALS

The goals of the ISGC, as stated in the 2010 ISGC Space Grant proposal, are:

1. To contribute to the development of NASA's future workforce in disciplines needed to achieve NASA's strategic goals;
2. To attract and retain students, teachers, and faculty of diverse backgrounds in STEM disciplines; and
3. To develop partnerships with NASA and related industries that provide the opportunity for Idaho students and professionals to contribute to the strategic research priorities of NASA, and to become engaged in NASA's mission.

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

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals.*

The ISGC continued to support Outcome 1 through scholarship, fellowship, internship, and undergraduate research opportunities. These opportunities can inspire students to pursue STEM careers as evidenced by the following quotes:

Idaho Space Consortium's Space Grant has relieved part of the financial responsibility making it easier to focus on school. The events I have helped with have shown me how STEM can be fun and interesting to children. STEM is a field that needs more attention and respect than it is given. Seeing how children respond to STEM based events makes me think STEM can be better understood by the average person if a fun and engaging approach is taken. I have always been interested in STEM but many of the events I have helped with have broadened my interest in those fields. – Ben Bolton, ISGC Scholarship recipient, University of Idaho.

It heightened my interest for Astronomy as I helped organize an Astronomy day at my school. It could be a hobby of mine later in life. It helped me better connect with faculty that I was doing volunteer work with, and those relations helped me have conversations about potential careers. It gave me an opportunity to present information about science to students which strengthens the idea that I may want to teach someday. – Korey Gambill, ISGC Scholarship recipient, College of Idaho.

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

ISGC continued to engage K-12 students in STEM activities to inspire them to pursue careers in STEM. The 2015 Idaho TECH Mars Rover Engineering Design Competitions held at Idaho State University and the College of Southern Idaho engaged over 175 students in grades 4 through 6 to create Mars rovers constructed out of Legos and to compete in a series of challenges. Fifteen teachers from all over Idaho coached the teams and integrated the Idaho TECH lesson plans into their curriculum.

PROGRAM ACCOMPLISHMENTS

Please note: The data below represents performance from June 25, 2014 to April 23, 2015. Performance data will be finalized in June 2015.

Outcome 1: *Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals. (Employ and Educate)*

Fellowships and Scholarships

Objective: The total number of undergraduate and graduate students proposing for ISGC support through the ISGC fellowship and scholarship programs will increase by 10% per year through 2015

- Metric: Number of undergraduate students submitting applications for ISGC scholarships
 - * 2012-2013 scholarship applications received: 65
 - * 2013-2014 scholarship applications received: 45
 - * 2014-2015 scholarship applications received: 109
- Metric: Number of graduate students submitting applications for ISGC fellowships
 - * 2012-2013 fellowship applications received: 16
 - * 2013-2014 fellowship applications received: 15
 - * 2014-2015 fellowship applications received: 15

Objective: By 2015, the proportionate numbers of underrepresented minority students receiving ISGC support through the scholarship and fellowship program will meet or exceed the proportions represented by demographics the state of Idaho. (Idaho underrepresented undergraduate enrollment in all fields, including non-STEM fields: 12.2%)¹

- Metric: Number of underrepresented graduate and undergraduate students receiving ISGC support

¹ Table 265. Fall enrollment in degree-granting institutions, by race/ethnicity of student and state or jurisdiction: 2013 (Percentages for Black, Hispanic, American Indian/ Alaska Native, and Pacific Islander)
http://nces.ed.gov/programs/digest/d14/tables/dt14_306.60.asp?current=yes

- * 2012-2013: 10% underrepresented; 31% women
- * 2013-2014: 0% underrepresented; 40% women
- * 2014-2015: 8% underrepresented; 42% women

Objective: By 2015, 50% of ISGC scholars will be involved in NASA related research through programs such as but not limited to the Idaho Research Involving Student Engineers and Educators (RISE), Robotic Lunar Exploration Program (RLEP), and rocket launch opportunities such as RockOn!

- Metric: Number of ISGC Scholars involved in NASA related undergraduate research
 - * 2012-2013: ISGC scholars involved in research: 16 of 29 total (55%)
 - * 2013-2014: ISGC scholars involved in research: 23 of 35 total (66%)²
 - * 2014-2015: ISGC scholars involved in research: Data not yet available

Higher Education

Objective: By 2015 interdisciplinary and collaborative undergraduate courses will be offered at five higher education institutional affiliates in Idaho.

- Metric: Number of higher education institutional affiliates offering interdisciplinary and collaborative undergraduate courses
 - * 2012-2013: Three affiliates offered interdisciplinary courses
 - * 2013-2014: Three affiliates offered interdisciplinary courses
 - * 2014-2015: Four affiliates offered interdisciplinary courses

Objective: By 2015 the percentage of women and underrepresented minority individuals participating in ISGC higher education programs will meet or exceed state percentages (55% female enrollment, in all fields).³

- Metric: Total number of participants in ISGC higher education programs
 - * 2012-2013: 62 total (3 [5%] underrepresented and 15 [24%] female)
 - * 2013-2014: 59 total (8 [8.5%] underrepresented and 15 [25%] female)
 - * 2014-2015: 77 total (7 [9%] underrepresented and 15 [19%] female)

Objective: By 2015 the total number of students participating in ISGC undergraduate research programs will increase by 15%.

- Metric: Total number of ISGC scholars participating in ISGC undergraduate research programs each year.
 - * 2013-2013: 18 (49%)
 - * 2013-2014: ISGC scholars involved in research: 23 of 35 total (66%)
 - * 2014-2015: Data not yet available

Objective: By 2015 the number of higher education institutions participating in the ISGC RLEP, RISE, and/or rocket launch opportunities will be at least five.

- Metric: The number of ISGC education affiliates with teams participating in Idaho RISE, RLEP, RockOn!, Microgravity University
 - * 2012-2013: 2 institutions participating
 - * 2013-2014: 2 institutions participating
 - * 2014-2015: 3 institutions participating

Objective: By 2015 the number of undergraduate and graduate students applying for summer and/or academic year internship programs with NASA or in aerospace industry will increase by 15%.

- Metric: The number of undergraduate and graduate students applying for ISGC-sponsored NASA and aerospace internship programs.
 - * 2012-2013: At least 18, but the full number of applicants was unknown.
 - * 2013-2014: At least 20; but the full number of applicants was unknown.

² Based on survey responses of ISGC scholar recipients, 66% of survey recipients said they were involved in research activities.

³ Table 245. Total fall enrollment in degree-granting institutions, by attendance status, sex, and state or jurisdiction: 2010 and 2011 http://nces.ed.gov/programs/digest/d12/tables/dt12_245.asp

- * 2014-2015: At least 10; but the full number of applicants is unknown due to ISGC's inability to access NASA's OSSI SOLAR system.

Objective: By 2015 the percentage of women and underrepresented minority individuals placed at a NASA center or in aerospace internship programs will meet state percentages.

- Metric: The total number of participants in ISGC-sponsored NASA and aerospace internship programs
 - * 2012-2013: 12
 - * 2013-2014: 11
 - * 2014-2015: 10 (Final number TBD as interns accept/decline offers)
- Metric: The number of women and underrepresented minorities participating in ISGC-sponsored NASA and aerospace internship programs
 - * 2012-2013: 3 (25%) underrepresented; 3 (25%) women
 - * 2013-2014: 0 (0%) underrepresented; 3(27%) women
 - * 2014-2015: 2 (10%) underrepresented; 1 (10%) women (Final number TBD)

Objective: Engage 9 students from 3 higher education institutions in rocket flight opportunities.

- Metric: Number of students/institutions participating in rocket flight opportunities such as Rock On!
 - * 2012-2013: 13 students from Northwest Nazarene University
 - * 2013-2014: 13 students from Northwest Nazarene University
 - * 2014-2015: 12 students from Northwest Nazarene University

Objective: Have two student led flight experiments that will fly by 2012 in a rocket flight opportunity.

- Metric: Number of student-led flight experiments flown (by year)
 - * 2012-2013: 1
 - * 2013-2014: 1
 - * 2014-2015: 3

Research

Objective: The total number of undergraduate and graduate students proposing for ISGC research support in aerospace and space science fields will increase by 10% per year through 2015.

- Metric: Number of undergraduate students submitting proposals for ISGC research support
 - * 2012-2013: 1 team of 7 students
 - * 2013-2014: 2 teams (total of 25 students)
 - * 2014-2015: 6 teams (total of 39 students)
- Metric: Number of graduate students submitting proposals for ISGC research support.
 - * 2012-2013: 2 graduate students submitted proposals; 2 graduate students funded.
 - * 2013-2014: 1 graduate student submitted a proposal; 1 graduate student funded.
 - * 2014-2015: 3 graduate students submitted proposals; 3 graduate students funded.

Objective: By 2015 proposals for research support (including student research support) in aerospace and space science fields will be received from at least five institutions of higher education in Idaho each year.

- Metric: Total number of higher education institutions proposing for ISGC research and travel grants
 - * 2012-2013: 4 affiliates proposed
 - * 2013-2014: 4 affiliates proposed
 - * 2014-2015: 4 affiliates proposed

Objective: By 2015, ISGC will provide research support to students from at least five higher education institutions within Idaho per year.

- Metric: Number of higher education institutions with students receiving ISGC research funding

- * 2012-2013: 3 affiliates
- * 2013-2014: 3 affiliates
- * 2014-2015: 4 affiliates

Objective: By 2015 the total number of proposals for external NASA research funding will increase by 10%.

- Metric: Total number of proposals submitted for NASA research funding
 - * 2012-2013: 2 proposals submitted by ISGC researchers
 - * 2013-2014: 1 proposal submitted by ISGC researchers
 - * 2014-2015: 1 proposal submitted by ISGC researchers

Objective: Each year, all Research Seed Grants will include undergraduate students.

- Metric: Total number of ISGC Research Seed Grant proposals submitted for research funding
 - * 2012-2013: 6 proposals submitted for research funding
 - * 2013-2014: 8 proposals submitted for research funding
 - * 2014-2015: 11 proposals submitted for research funding
- Metric: Number of undergraduates supported by ISGC Research Seed Grant awards
 - * 2012-2013: 7 undergraduate students supported
 - * 2013-2014: 2 undergraduate students supported
 - * 2014-2015: Data not yet available

Objective: By 2015 the percentage of women and underrepresented minority individuals participating in the ISGC research infrastructure programs will meet state percentages.

- Metric: The total number of participants in ISGC research infrastructure programs
 - * 2012-2013: 20 (includes faculty, undergraduate, and graduate students)
 - * 2013-2014: 11 (includes faculty, undergraduate, and graduate students)
 - * 2014-2015: Data not yet available
- Metric: The number of women and underrepresented minorities participating in ISGC research infrastructure programs
 - * 2012-2013: 10 (50%) (incl. faculty, undergraduate, and graduate students)
 - * 2013-2014: 6 (55%) (incl. faculty, undergraduate, and graduate students)
 - * 2014-2015: Data not yet available

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

K-12 Education

Objective: By 2015 the number of pre-service teachers participating in ISGC STEM initiatives will increase by 10% per year

- Metric: Number of pre-service teachers participating in ISGC STEM initiatives.
 - * 2012-2013: 15 pre-service teachers participated
 - * 2013-2014: 20 pre-service teachers participated
 - * 2014-2015: 5 pre-service teachers participated

Objective: The number of Special Project Grant proposals received from K-12 education affiliates will increase to five per year by 2015.

- Metric: Number of Special Project Grant proposals received from K-12 education affiliates
 - * 2012-2013: 1 proposal received; 1 proposal funded
 - * 2013-2014: 1 proposal received; 1 proposal funded
 - * 2014-2015: 2 proposals received; 2 proposals funded

Objective: The number of Idaho teachers, students, and schools participating in ISGC Pre-College programs will increase by 10% by 2015.

- Metric: Number of Idaho schools participating in ISGC pre-college programs
 - * 2012-2013: 65 schools participated
 - * 2013-2014: 32 schools participated
 - * 2014-2015: 18 schools participated

- Metric: Number of students participating in ISGC pre-college programs
 - * 2012-2013: 1660 students participated
 - * 2013-2014: 400 students participated
 - * 2014-2015: 2884 students participated
- Metric: Number of teachers participating in ISGC pre-college programs
 - * 2012-2013: 76 teachers participated
 - * 2013-2014: 65 teachers participated
 - * 2014-2015: 179 teachers participated

Objective: Engage 60 students with an intensive learning experience based on NASA curriculum at two school districts.

- Metric: Number of students participating in program.
 - * 2012-2013: 80
 - * 2013-2014: 212
 - * 2014-2015: 250
- Metric: Number of school district programs offered
 - * 2012-2013: 15 school districts
 - * 2013-2014: 14 school districts
 - * 2014-2015: 16 school districts

Objective: Engage 25 teachers in intensive learning workshops based on NASA curriculum at two school districts.

- Metric: Number of teachers/districts engaged in the program.
 - * 2012-2013: 40 teachers participated; 15 school districts
 - * 2013-2014: 39 teachers participated; 39 school districts
 - * 2014-2015: 15 teachers participated; district data not yet available

Objective: The total number of student teams that participate in Idaho TECH will reach 60 teams in FY 2010.

- Metric: Number of teams participating in Idaho TECH
 - * 2012-2013: 35 teams participated
 - * 2013-2014: 26 teams participated
 - * 2014-2015: 49 teams participated

Objective: The total number of student teams participating in FIRST Lego League will reach 300 teams in FY2010

- Metric: Number of teams participating in FIRST Lego League
 - * 2012-2013: 154 teams participated
 - * 2013-2014: 157 teams participated; 1163 youth (802 boys; 361 girls); 213 adult mentors
 - * 2014-2015: 148 teams participated; 1017 youth (712 boys; 305 girls); 200 adult mentors

Objective: The total number of student teams participating in FIRST Tech Challenge will reach 35 teams in FY 2010

- Metric: Number of teams participating in FIRST TECH Challenge
 - * 2012-2013: 32 teams participated
 - * 2013-2014: 35 teams participated; 242 youth (195 boys; 47 girls); 42 adult mentors
 - * 2014-2015: 35 teams participated; 217 youth (168 boys; 49 girls); 70 adult mentors

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)*

Objective: The number of Special Project Grant proposals received from informal education affiliates will increase to five per year by 2015.

- Metric: Number of Special Project Grant proposals received from informal education affiliates
 - * 2012-2013: 0 proposals received

- * 2013-2014: 1 proposals received; 1 proposal funded
- * 2014-2015: 4 proposals received; 4 proposals funded

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

Diversity of institutions, faculty, and student participants

Diversity of institutions: The ISGC includes seven four-year university/college affiliates, two community college affiliates, five informal education affiliates, and six state government and industry affiliates.

Diversity of students: The ISGC's higher education research, scholarship, and fellowship programs provided STEM opportunities for 115 students, 10 (9%) were minority students underrepresented in STEM fields, 31 (27%) were women, 14 first generation college students, 14 low-income students, and four students with disabilities.

Diversity of faculty: Of the 16 faculty engaged in ISGC activities, four were female and one was from an underrepresented group in STEM fields.

Minority-Serving Institution Collaborations: Idaho currently lacks any designated minority-serving institutions. However, the ISGC is working to increase interactions with underrepresented minorities by increasing partnerships with the community colleges in Idaho (that often have a higher percentage of underrepresented minority students), and providing special project grant opportunities to minority-focused organizations such as the National Society of Black Engineers (NSBE) by supporting events like the "Dynamic Engineers Lecture Series" in February 2015 featuring Dr. Olugbenga Famodu (Senior Process Engineer at Intel)

NASA Education Priorities:

- *Authentic, hands-on student experiences in science and engineering disciplines*
 - ISGC continued to support hands-on student research programs such as RISE, RLEP, RockOn!, and Microgravity University. New this year was an undergraduate research project to create a 3-D printed CubeSat. Five additional undergraduate research grants are in the process of being awarded. (Final award paperwork will be completed in May).
- *Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise.*
 - The ISGC sponsored two Idaho teachers to join the Field Investigations to Enable Solar System Science and Exploration (FINESSE) team while they conducted research at Craters of the Moon National Monument and Preserve. By working side-by-side with scientists the teachers are able to bring a new enthusiasm for field work back to the classroom.
- *Community Colleges – develop new relationships as well as sustain and strengthen existing institutional relationships with community colleges.*
 - While executing the Space Grant community college grant (awarded in 2014) the ISGC worked closely this year with four Idaho community colleges – College of Southern Idaho, College of Western Idaho, Eastern Idaho Technical College, and North Idaho College. Through this increased collaboration, those community colleges are now more aware of the programs available to Idaho students and educators through the ISGC.
- *Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities.*

- The ISGC is in the process of awarding four research seed grants (Final award paperwork will be completed in May).

IMPROVEMENTS MADE IN THE PAST YEAR

In FY 14, The ISGC made improvements in multiple areas. First was updating and implementing new procedures for adding and removing affiliates. The ISGC also continued to document and update its processes in data collection and management. Finally, the ISGC worked to increase communication with affiliates through regular e-newsletters and by introducing a new website.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The ISGC partners with academic, informal education, and industry affiliates throughout Idaho to deliver outstanding programs for students, researchers, and the public.

Academic Affiliates (in alphabetical order)

- **Boise State University:** Public 4-year research university with over 22,000 students.
- **Brigham Young University – Idaho:** Private 4-year university with over 15,000 students.
- **College of Idaho:** Private 4-year liberal arts college with over 1,100 students.
- **College of Southern Idaho:** Public 2-year community college with over 7,000 students.
- **Idaho State University:** Public 4-year research university with over 14,400 students.
- **Lewis-Clark State College:** Public 4-year college with over 4,300 students.
- **North Idaho College:** Public 2-year community college with over 6,000 students.
- **Northwest Nazarene University:** Private 4-year liberal arts university with over 1,400 students.
- **University of Idaho:** (*Lead institution for ISGC*) Public 4-year research university with over 11,500 students.

Informal Education Affiliates (in alphabetical order)

- **Discovery Center of Idaho:** Non-profit science center offering interactive, hands-on STEM exhibits and educational programs for people of all ages and walks of life.
- **Eastern Idaho Engineering Council:** Non-profit organization performing educational and charitable activities in the areas of engineering, science and technology.
- **Idaho Academy of Science:** Non-profit scientific and educational organization dedicated to furthering the cause of science and science education in Idaho.
- **Idaho Science Teachers Association:** Idaho State Chapter of the National Science Teachers Association. Focuses on enhancing science education in Idaho.
- **Palouse Discovery Science Center:** Non-profit science center featuring hands-on science and learning experiences for people of all ages.

Government and Industry Affiliates (in alphabetical order)

- **Bruneau Dunes State Park and Observatory:** Home to the largest single-structured sand dune in North America. The observatory offers tours and solar viewing for the public.
- **Craters of the Moon National Monument and Preserve:** One of the best places in the world to see the effects of volcanism and frequently visited by researchers.
- **Idaho Museum of Natural History:** State museum of natural history featuring the Idaho Virtualization Laboratory and offering classes in anthropology, Earth science, and life sciences for all ages.

- **Idaho State Department of Education:** Provides expertise and technical assistance to promote educational excellence throughout Idaho.
- **Idaho National Laboratory:** The U.S. Department of Energy's lead nuclear energy research laboratory. The lab works with higher education institutions, researchers, industry, and with students of all levels in a variety of capacities.
- **Idaho Transportation Department - Division of Aeronautics:** Facilitates programs and services to foster an exemplary system of airports to meet Idaho aviation community needs.