

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.

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

PROGRAM GOALS

2014 ISGC Goals and Objectives

- Diversity in Fellowship/Scholarship, Research Infrastructure and Higher Education program areas.
 - Reach the underrepresented minority percentage (currently 31%)
 - Reach the ISGC target of 40% for female awards
- Fellowships and scholarships
 - Provide scholarships and fellowships to students at ISGC academic institutions.
 - Receive at least 60 applicants for fellowships/scholarships.
 - Ninety percent of scholarship recipients will enter graduate school or STEM employment at their "next educational step" (66% employment specifically at NASA, aerospace companies, universities or other educational institutions)
- Undergraduate research programs/assistantships in aerospace engineering and science

- There will be seven undergraduate research programs at ISGC academic institutions
- Ninety percent of undergraduate research program participants will enter graduate school or STEM employment at their “next educational step” (66% employment specifically at NASA, aerospace companies, universities or other educational institutions).
- Seed grants
 - At least three of the grants will be awarded to women or underrepresented minorities
- External internships/Academies
 - At least three NASA Center summer interns/Academy participants from ISGC academic institutions will be supported during summer 2014
- Educational activities outside of classroom
 - Support for at least five projects in a variety of areas: aeronautics, rocketry, and spacecraft
- Higher education STEM courses
 - Support at least two course development activities that expand the STEM knowledge and incorporate hands-on activities
- Teacher training
 - Offer standards-based teacher training in geographically diverse areas of the consortium
- Informal education
 - Offer four informal education programs in both Chicago and Rockford
 - At least one informal education program will focus on rural Illinois communities
 - At least one informal education program will involve collaboration with a community college

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

- Outcome 1: ISGC exceeded its target percentage for the participation of women and of underrepresented minorities (at the new target level) in ISGC Scholarship/Fellowship (48% and 32% respectively). Research Infrastructure programs. Females – 32%; minorities – 32%.
- Outcome 1: ISGC continues to participate in the Great Midwestern Region Space Grant rocket competition. Two undergraduate student teams from Illinois are participating in the competition on May 19 – 21, 2015.
- Outcome 2: Six middle-school STEM teachers from the Chicago Public Schools completed their Master of Science in Science Education degree at DePaul in FY 2014.

PROGRAM ACCOMPLISHMENTS

- *Diversity in Fellowship/Scholarship*

- Direct participation by underrepresented minority students was 32 %, exceeding the target of 31%.
- Direct participation by females was 48%, exceeding the target of 40%.
- *Fellowships and scholarships*
 - Applications were received from eight of the nine active academic affiliates in ISGC.
 - Received 64 fellowship and scholarship applications for 26 awards, making the selection process competitive.
- *Undergraduate research programs/assistantships in aerospace engineering and science*
 - Support was given to (7) undergraduate research programs at (6) ISGC academic institutions; one of the programs was targeted at underrepresented minority students.
 - Four of the undergrad research students were selected to present their research posters at the Great Midwest Regional Space Grant meeting in September 2014.
- *Seed grants*
 - Four seed grants were awarded to junior faculty/researchers.
 - Three of the four seed grants were awarded to women or underrepresented minorities.
- *External internships/Academies*
 - Two students from ISGC academic institutions selected by NASA researchers were supported to attend NASA Center Academies/internships.
- *Educational activities outside of classroom*
 - Supported (7) hands-on projects: high-altitude balloon project; design/build fly remote control aircraft at UIUC; NASA Student Launch rocket team; NASA Lunabotics Mining Competition team; students building full-size aircraft; SAE Formula Electric car and (4) teams to participate in Great Midwestern Regional Rocket Competition organized by the Wisconsin Space Grant.
- *Higher education STEM courses/curricula*
 - Two new courses; one in satellite systems engineering and the other on space missions operations (tabled until Summer 2015).
 - Proposal to work with community colleges was accepted.

Outcome 2:

- *Teacher training*
 - ISGC continues its support of DePaul's Master of Science in Science Education (MSSE) degree program for Chicago Public School middle-school teachers. Six teachers completed their MSSE degree this year; 30 teachers remain in the program.
 - The Discovery Center Museum in Rockford offered teacher workshops. 355 teachers from 31 school districts and 15 private schools participated. The workshops trained teachers on astronomy and rocketry, including activities to be used in the classroom and in afterschool programs.

Outcome 3: Informal education

- Four informal education programs were funded with ISGC 2014 base grant funds.
- In 2014, Astronomy Conversations reached more than 37,000 people, with the help of Space Grant funding.
- Discovery Center's YES program reached 824 youth who completed 17,740 hours of volunteer time to provide informal education at the Center and at rural events in the summer. The YES volunteers applied the knowledge they learn at community venues with the Outreach to Space exhibits, as well as in the museum environment where they conducted science cart activities with the public, reaching more than 80,000 people.
- Discover Engineering (a celebration of National Engineers Week) introduced and excited children about the world of engineering. Various opportunities in the field of engineering were showcased by 20 different organizations, including UTC Aerospace Systems, Rock Valley College (a community college) and the public library in Rockford. A total of 1,221 people attended Discover Engineering, with the Discovery Center conducting hands-on activities for 355 young people.
- As a follow-up to last year's Adler Planetarium's "Scientists Supporting Clergy in Their Roles as Informal Science Educators", *The Clergy Letter Project* was established. This on-line newsletter continues to provide scientific resources for clergy who have expressed interest in working with scientists to raise the level of public science literacy by including scientific themes into church programs.

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

- **Diversity:** ISGC consists of 12 institutions, 10 of which are universities and 2 informal education institutions. Of the 10 universities, 5 are PhD-granting. There are affiliates scattered throughout the state, though the majority of them are located in the Chicago area. Five of the affiliate directors and the associate director of ISGC are female. Excluding CSU (which is an MSI), the enrollment at the other academic affiliates is overwhelmingly white; however, ISGC works very hard to involve underrepresented students in its programs. In 2014, ISGC exceeded its minority target of 31%. Female representation among student participants varies between 32% - 48%.
- **Minority-Serving Institution Collaborations:** Chicago State University continues to be an active member of ISGC. In 2014, participation focused on an undergraduate research program and scholarships. All three research advisors were female faculty.
- **NASA Education Priorities:**
 - *Hands-on student experiences* – ISGC supported 44 students in seven undergraduate research programs and four research seed grants. Two ISGC students were selected for NASA intern/Academy research experiences. ISGC funded four extracurricular projects at UIUC: design/build fly remote control aircraft at UIUC; USLI rocket team; NASA Lunabotics Mining Competition team; students building full-size aircraft; and two teams in the Great Midwestern

- Region Space Grant rocket competition. The Adler also conducted a high-altitude ballooning project involving six students.
- *Diversity of institutions, faculty, and student participants* – Eleven of our 12 consortium institutions are actively involved in ISGC. This group includes urban and rural institutions scattered throughout the state. Seven of the 16 proposal PIs were women. Direct participation by supported underrepresented minority students was 31% (combining fellowships and research infrastructure numbers). Of the same groups, direct participation by supported female students was 31%,..
 - *Middle school teacher training* – Three teacher programs were funded with base grant funds. The Discovery Center Museum programs involved a series of workshops that included middle school teachers. The program provided training to teachers on weather, astronomy and rocketry, including activities to be used in the classroom and in afterschool programs. Another program that ISGC continued to support was the Master of Science of Science Education (MSSE) degree at DePaul. MSSE includes both traditional coursework as well as NASA materials that will be used in the classroom.
 - *Community colleges* - Chicago State University continues to work with Harold Washington College (one of the City Colleges of Chicago) in astronomy education research. The Discovery Center Museum works with Rock Valley College during its Discover Engineering program. A community college student works on the high altitude ballooning project at The Adler with university students. ISGC was selected in 2014 to receive one of the Space Grant community college grants. We have established the beginnings of a relationship with the City Colleges of Chicago.
 - *Aeronautics research* –Five undergraduate research projects at ISGC affiliates were aeronautics-related.
 - *Research support for early career faculty* – ISGC continued to strongly support its research seed grant program for early career faculty and researchers at smaller institutions. Four faculty were selected for base grant funding. Each selected researcher receives funds to conduct research in areas of interest to NASA and gather data that will lead to a proposal(s) for further funding.

IMPROVEMENTS MADE IN THE PAST YEAR

- ISGC exceeded (48%) of its target percentage for the participation of women in the ISGC Scholarship/Fellowship program and exceeded its target for minorities in both the Fellow/Scholar program and Research Infrastructure projects.
- ISGC continues its reduced funding in administrative costs so that as much funding as possible can support programs.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

University of Illinois at Urbana-Champaign
 PhD-granting research university
 Lead institution for ISGC

Public, land-grant institution
ISGC activities: management; undergraduate research; scholarships and fellowships;
seed grants; course development; design/build/fly student projects

Illinois Institute of Technology
PhD-granting research university
Private university
ISGC activities: undergraduate research; scholarships and fellowships; seed grants;
course development

Northwestern University
PhD-granting research university
Private university
ISGC activities: undergraduate research; scholarships and fellowships; seed grants;
course development, teacher training

The University of Chicago
PhD granting research university
Private university
ISGC activities: undergraduate research; scholarships and fellowships; seed grants;

Southern Illinois University Edwardsville
Master's-granting university (professional degrees in medical fields)
Public institution
ISGC activities: seed grants; scholarships and fellowships; course development

University of Illinois at Chicago
PhD granting research university
Public institution
ISGC activities: undergraduate research; scholarships and fellowships; seed grants

DePaul University, Chicago
Master's granting university
Private institution
Eighth-largest private, not-for-profit university in the nation
ISGC activities: scholarships; K-12 teacher training; undergraduate research; seed grants

Bradley University, Peoria
Master's granting university (one PhD program)
Private Institution
ISGC activities: scholarships; seed grants; K-12 teacher training

Chicago State University, Chicago
Master's granting university
Public institution
Recognized as a Minority Serving Institution

ISGC activities: undergraduate research; scholarships; seed grants; course development

Western Illinois University, Macomb (will focus on reactivation in 2012)

Master's granting university

Public institution

ISGC activities: K-12 teacher training; scholarships

Adler Planetarium & Astronomy Museum, Chicago

Planetarium, education and research institution

Not-for-profit

ISGC activities: seed grants; K-12 teacher training; higher education programs; informal education programs

Discovery Center Museum, Rockford

Educational and recreational institution

Not-for-profit

ISGC activities: K-12 teacher training; informal education programs