

South Carolina 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 South Carolina Space Consortium is a Capability Enhancement Consortium funded at a level of \$535,000 for fiscal year 2008.

PROGRAM GOALS

The Consortium has six goals to accomplish its mission statement. All of our research, education, and public outreach programs fulfill one or more of the goals listed below.

GOAL 1. To increase access, understanding, development, and utilization of resources in four areas: space science, Earth system science, biological sciences and aeronautics.

GOAL 2. To encourage cooperative programs among colleges and universities, state organizations, business and industry, and pre-college interests.

GOAL 3. To enhance interdisciplinary research, education and public service activities.

GOAL 4. To recruit and train students, educators, and professionals, especially women and underrepresented groups.

GOAL 5. To promote a strong science, mathematics and technology base throughout all levels of South Carolina education.

GOAL 6. To facilitate statewide communication of NASA opportunities and programs.

- Percentage of students whom have taken their next step and have been successfully tracked though their next step vs last year of SG support.
 - 100% for 2006
 - 100% for 2007
 - N/A for 2008 – all still enrolled

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

Success stories completed in 2008:

The Space Grant program allowed me to see the impact of bioengineering on the Aerospace industry. It got me interested in types of research and jobs I could potentially have in the industry after graduation. (Laura Datko, 2008 Research Experience for Undergraduates)

It helped me to understand what I want to do with my life. I use satellites to do research. (Adam Gerughty, 2008 Undergraduate Research Award Program)

The Space Grant Graduate Fellowship allowed me to travel to conferences to share my research. It also funded a trip I took to the University of Texas at Austin Center for Space Research where I learned new techniques for working with altimetry and GRACE data from a top scientist in the field. (Dara Hooker-Cadden, 2006 Graduate Fellowship Program, 2007 Graduate Fellowship Program, 2008 Graduate Fellowship Program)

“Dara Cadden and Michelle Gierach are doing very well in their Ph.D program due to the space grant funding... Michelle Gierach was invited to NASA/Jet Propulsion Laboratory to give a seminar on her research topic. Once she finishes her PhD she will have a chance to work for NASA & NOAA. This year she was awarded best publication award from USC.” -- Subra Bulusu Ms. Cadden was a year 15 and 16 awardee and Ms. Geirach Year 16

FELLOWSHIP and SCHOLARSHIP, OUTCOME 1

“My 2006-07 REAP award helped further my collaboration with David L. Meier at NASA/JPL and led to new collaborations with Masa Nakamura and Siming Liu at Los Alamos National Laboratory and Sera Markoff at the University of Amsterdam.” – Chris Fragile, CofC REAP awardee Year 14 and completed in 2008.

RESEARCH INFRASTRUCTURE, OUTCOME 1

Our 2008 summer REUs at Clemson and MUSC involved 15 students. All of the student participants have already made presentations about their research projects at symposiums held at the institutions.

HIGHER EDUCATION, OUTCOME 2

We have 3 new member who are actively participating in our programs. The faculty and students at these institutions now have a direct link with NASA and with NASA research that was not there before. Claflin, for example, has received one graduate award.

PROGRAM ACCOMPLISHMENTS

Consortium annual goals and obj by outcome 1, 2 and 3

All of our programs are currently in progress and will end on April 30, 2009 with the exception of our 2008 REUs.

Outcome 1 – Employ and Educate – Fellowship and Scholarship (F/S), Research Infrastructure (RI-our program REAP) and Higher Education

-Fellowships and Scholarship – In year 16 (2008/09) we funded 10 graduate students, 1 Kathy Sullivan (undergraduate) award, 14 undergraduate reserach awards, and 3 NASA Center internships with Yr 16 funds.

- -25 students significantly supported from FY08 funds
- 14 students took next step in FY08 (SG participation supported from FY06-FY08 funds)
 - 6 went to graduate school in STEM disciplines
 - 1 went to work for a NASA contractor
 - 3 went to work in a STEM positions for non-NASA contractors
 - 4 went to work in a STEM positions at a non K-12 Academic institutions

-Research Infrastructure-We funded 8 REAP projects for faculty for a total of \$81,946.

Higher Education- We funded 4 ballooning projects just awarded 12/08 and will launch spring 2009. These student teams create their own projects and will fly on our high-altitude balloon.

Higher Education - Palmetto Academy – We have funded 7 mini-REU awards totaling \$132K for summer 2009. Student applications have just been released this month.

Higher Education – We funded two \$45K REU programs to be held in summer 2009.

Outcome 2 – attract and retain – precollege

We funded 5 pre-service teacher awards for a total of \$15,000 to graduate and undergraduate students pursuing an education undergraduate or graduate degree.

Outcome 3 –engage and inspire – public service/general public

Possible new partner with Industry - Star Technology and Research (Jerome Pearson) – The main office staff met with Jerome Pearson, President of Star Technology and Research, about partnering with his company and possible student internships.

-Our campus directors act as NASA representatives on their campuses and in their communities.

1. Consortium Management

GOAL: To facilitate statewide communication of NASA opportunities and programs.

Objective 1.1: (Reporting) The Management Team will provide timely reporting and responses to NASA Headquarters regarding Consortium operations and finances.

Outcome Indicator: *All reports on time.*

Outcome – *All reports, proposals and requests were submitted early.*

Objective 1.2: (National Network) The Management Team will work to strengthen relationships with NASA Centers, the national Space Grant network, and the state’s NASA EPSCoR Program.

Outcome Indicators: *Each year at least three students will participate in an internship program at a NASA Center and all faculty research projects are required to have a strong relationship with NASA Centers.*

Outcome – *More than three students did participate (6 total). This objective was met.*

Objective 1.3: (Consortium Network) The Management Team will faithfully represent the diverse interest and resources of the Consortium member institutions and affiliates.

Outcome Indicators: *Relevant electronic communication sent to all member institutions, affiliates, and interested parties, as appropriate.*

Outcome – *This objective was met.*

Objective 1.4: (State government) The Management Team will ensure that Consortium programs are aligned with state and federal priorities.

Outcome Indicators: *Annual reports to representatives of state and federal government.*

Outcome – *This objective was met.*

Objective 1.5: (State industry) The Management Team will foster interaction between the Consortium and state industries involved in aerospace and related technologies.

Outcome indicator: *One student or faculty project with an industry partner in South Carolina.*

Outcome – *This objective was not met. Possible partnership with Star Technology and Research.*

Objective 1.6: (Link to public) The Management Team will seek to maintain and improve the effectiveness of the Consortium as the link between the public and NASA in the state.

Outcome indicator: Consortium website was completely redesigned in 2005 and is updated on a weekly basis to reflect new opportunities within NASA.

Outcome –This objective was met.

Objective 1.7: (Increase resources) The Management Team will pursue opportunities to increase the resources available to the Consortium, to broaden participation within the state, to collaborate with other state Consortia in areas of mutual interest and capability, and to assure long-term sustainability.

Outcome indicator: Serve as a clearinghouse for information on funding opportunities from NASA and other agencies that support STEM-related research and education. At least 50 targeted announcements a year.

Outcome –This objective was met.

Objective 1.8: (Diversity) The Management Team will ensure diversity in all Consortium programs and activities by seeking to include women, underrepresented minorities, and persons with disabilities.

Outcome indicator: Diversity will be modeled in all aspects of the Consortium and participation by underrepresented groups will increase

Outcome –This objective was met. program manager HBSU campuses and made presentation.

Objective 1.9: (Evaluation) The Management Team will continually monitor and seek to improve the quality and effectiveness of the state program.

Outcome indicator: Continue to determine appropriate data collection and evaluation procedures that are consistent with available resources. that evaluation data is collected through online surveys.

Outcome –This objective was met. We review program annually to ensure that we are tracking our awardees.

2. Fellowship/Scholarship Program

Goal: To recruit and train students, educators, and professionals, especially women and underrepresented groups.

Objective 2.1: (Competitiveness) Ensure the fair distribution of funds to member universities and educational affiliates.

Outcome indicator: Annual Call for Fellowship/Scholarship applications at all higher education members and affiliates, competitive review, and selection of awardees.

Outcome –This objective was met. Campus visits and emails were sent numerous times.

Objective 2.2: (NASA Center ties) Offer hands-on, tangible research experiences to student research fellowship awardees at NASA Centers.

Outcome indicators: Track increases. 100% will make a presentation at the SC Academy meeting or at a national meeting. 100% will provide feedback.

Outcome –This objective was met. We supported 9 (3 SG, 6 ESMD).

Objective 2.3: (Industry ties) Offer hands-on, tangible research experiences to student research fellowship awardees at aerospace and related science and technology industries.

Outcome indicator: At least one student will receive supplemental funding through SCSGC each year.

Outcome –This objective was not met. Possible partnership next year.

Objective 2.4: (Mentoring and professional development) Provide mentoring and professional development experiences to student researchers, which will develop skills that contribute to the future workforce.

Outcome indicator: 100% of awardees, 100% make a presentation. 80% produce a paper, and 50% continue to graduate school and pursue a NASA-related discipline.

Outcome –This objective has not been met. Our projects are all currently in progress.

Objective 2.5: (Diversity) Ensure funding for fellowships and scholarships to women, underrepresented minorities, and persons with disabilities by utilizing intensive marketing techniques (personal visits, direct faculty contacts, email) to encourage women and minority students to apply for funding.

Outcome indicator: Awards to women and minorities equal or exceed previous years. At least 15 awards,

Outcome-Awarded 33 student awards. 13 went to females and 6 went to underrepresented minorities.

Objective 2.6: (Longitudinal tracking) All students who have received significant fellowship or scholarship assistance from SCSGC will be longitudinally tracked through first employment or beginning of advanced degrees.

Outcome indicator: Continue arrangements with National Space Grant Foundation.

Outcome – This objective was met.

Objective 2.7: See Objective 1.9.

Outcome indicator: Adjustments are made to the fellowship and scholarship program to strengthen it.

Outcome –This objective has been met. We review our programs, policies and applications annually.

3. Research Infrastructure

Goal: To enhance interdisciplinary research, education and public service activities; to encourage cooperative programs among colleges and universities, state organizations, business and industry, and pre-college interests

Objective 3.1: (Research proposals) Increase the number of research proposals submitted by SCSGC institutions in fields aligned with NASA's mission.

Outcome indicator: At 8 research awards .100% of the REAP recipients submit proposals. 100% of the REAP recipients give presentations and submit.

Outcome –Our projects are all currently in progress. We will know if this objective has been met next year.

Objective 3.2: (Research support) Support new and developing research, especially multidisciplinary and collaborative projects, in fields aligned with NASA’s mission.

Outcome indicator: See objective 3.1

Objective 3.3: (Collaborations) Build research collaborations both within and outside the state.

Outcome indicator: At least one planning trip to a NASA Center supported each year from SCSGC.

Outcome –Our projects are all currently in progress.

Objective 3.4: (Diversity) Increase the participation of women and underrepresented groups in statewide research programs and facilitate their subsequent entry into STEM careers.

Outcome indicator: Sponsor activities that encourage women and underrepresented to enter STEM careers.

Outcome –This objective has been met.

Objective 3.5: See Objective 1.9.

Outcome indicator: Adjustments are made to strengthen the research infrastructure program.

Outcome –This objective has been met.

4. Higher Education

Goal: To increase access, understanding, development, and utilization of resources in four areas: space science, Earth system science, biological sciences and aeronautics; to enhance interdisciplinary research, education and public service activities.

Objective 4.1: (Curriculum and NASA content) Contribute aerospace and space and earth science materials.

Outcome indicator: Distribute announcements of opportunities for education and curriculum enhancement.

Outcome – This objective has been met. Emails are sent out on a daily basis to distribution lists.

Objective 4.2: (Student Research) Provide opportunities where students gain hands-on knowledge of scientific methods and processes, gain understanding of the importance of teamwork, experience the exhilarating feeling of discovery, spark an interest in continuing NASA-relevant research in graduate school, and enter the STEM workforce by working on NASA-related endeavors.

Outcome indicator: 100% of the participants are exposed to current NASA research make presentations.

Outcome –ALL REU (HE) participants have been exposed to NASA research and have all presented.

Objective 4.3: (Industry involvement) Establish and maintain linkages between SCSGC and higher education and industry in South Carolina by encouraging educational partnerships between the state’s academic institutions and private industry.

Outcome indicator: At least two collaborative proposals will be funded.

Outcome – This objective has not yet been met. We are working to obtain industry partners.

Objective 4.4: (Diversity) Increase the participation of women and underrepresented.

Outcome indicator: SCSGC will sponsor activities that encourage women and students from underrepresented.

Outcome –This objective has been met. REU’s involved 15 students, 6 were female and/or minority.

Objective 4.5: Same as Objective 1.9

Outcome indicator: Adjustments are made to the higher education program to strengthen activities.

Outcome - This objective has been met. We require final reports from all participants.

5. K-12 (Precollege) Education/Public Service

Goal: To promote a strong science, mathematics and technology base throughout all levels of South Carolina education

Objective 5.1: Same as Objective 4.1.

Outcome indicator: Distribute announcements of opportunities for education and curriculum enhancement in

Maintain and update the SCSGC website to provide opportunities and information.

Outcome – This objective has been met. We distribute information on a daily.

Objective 5.2: (Pre-service Educators) To increase the number of quality educators pursuing STEM education degrees.

Outcome indicator: Pre-Service awardees will be tracked to see how many complete their degree programs and become science and math teachers in SC. At least two awardees will pursue a career teaching STEM fields.

SCSGC will also inquire about their using NASA educational materials in their classrooms.

Outcome – This objective has not yet been met. All of our awardees are still enrolled in their classes.

Objective 5.3: (Science and education events) The SCSGC will support activities of scientific discovery across the state and will support NASA’s commitment to renewing a spirit of exploration and discovery and will use the excitement of space exploration to promote this policy to the general public.

Outcome indicator: SCSGC staff will develop and host opportunities to promote NASA throughout the state of South Carolina. In 2008, the SCSGC will host several statewide events to celebrate NASA’s 50th anniversary

and will host a few talks promoting the launch of the international collaborative adventure, Moon Mineralogy Mapper.

Outcome – This objective has been met. We are working on our 50 year activities and activities related to the International Year of Astronomy celebration.

Objective 5.4: (Diversity) Increase the participation of women and underrepresented groups in all aspects of SCSGC's pre-college/general public program.

Outcome indicator: SCSGC will sponsor activities that encourage women and students from underrepresented groups to enter STEM careers.

Outcome – This objective has been met. We visited each campus to promote our programs. Special attention was paid to recruiting women and underrepresented minorities to apply for our competitive programs.

Objective 5.5: See Objective 1.9.

Outcome indicator: Adjustments are made to the pre-college/public service program to strengthen them.

Outcome – We are constantly evaluating our programs and making adjustments.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking: For those students that were significantly supported from FY 08 funds, all 25 of them are still enrolled in the degree that they were pursuing while they received their Space Grant award. For all students that were significantly supported in the period spanning FY06-FY08, 6 students graduated and are pursuing advanced STEM degrees, 1 student is working for a NASA contractor, 3 students accepted STEM positions in industry, and 4 are working in STEM positions at non-K-12 academic institutions. The remaining students have not yet received the degree that they were pursuing while they received their Space Grant award.
 - 100% for 2006
 - 100% for 2007
 - N/A for 2008 – all still enrolled
- Course Development: - This year, we have funded 3 CD awards through REAP: Muddy Waters: Wetlands and Delta Degradation Curriculum Module, Consumptional Biology Modules, and Intergrating Fuel Cell Concepts and Construction for the Chemistry Curriculum
- Matching Funds: - The ratio of NASA funds to matching funds is 1 to 0.83 (\$535K to \$444,005). The matching funds come from state member institutions through campus directors' time on Space Grant, institutional match for Graduate awardees, and through REAP awardees' required 1:1 institutional match for their research projects.
- Minority-Serving Institutions: Three new schools have joined (in 2006 and 2008) and are actively participating in all programs – Claflin University, Francis Marion University and Lander University.

IMPROVEMENTS MADE IN THE PAST YEAR

-Cyndi Hall, Ballooning and Palmetto Academy Project Director, has been added as a part-time employee to run our new Palmetto Academy and Ballooning programs.

-Francis Marion University and Claflin University joined in 2006 and Lander University in 2008 and are all participating.

-In the last few years, we have had a change in 3 campus directors, invigorating our programs with new ideas and a fresh perspective.

-Tara Scozzaro (Program Manager) and Cyndi Hall (Project Director) visited each campus in the SCSGC to promote and advertise our programs. This was well-received by all campus directors and attendees. To date, we have already received a record number of letters of intent to our currently open research program. All of our campuses requested that this become an annual event.

-We have worked on involving the campus directors MORE in our report and proposal writing. Claflin and USC have taken charge in managing the writing two of our current proposals (MSIP and ESMD).

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Benedict College, private, liberal arts college, HBCU; Coastal Carolina University; The Citadel, public military college; Claflin University, independent, liberal arts college, HBCU; Clemson University, research-one university; College of Charleston, public, liberal arts school; Francis Marion University, public, liberal arts minority-serving institution (40%); Furman University, private, liberal arts college; Lander University, public, liberal arts university, minority-serving institution (24%); Medical University of South Carolina, research-one medical university; South Carolina State University, land-grant public college, HBCU; University of South Carolina, research-one university; University of the Virgin Islands, public, liberal arts, HBCU; Wofford College, independent, liberal arts college