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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 **SC** Consortium is a Capability Enhancement Consortium funded at a level of **\$590,000** for fiscal year 2009.

### PROGRAM GOALS

\*All goals and objectives for individual programs were within our strategic plan, created 4/08, and submitted with our budget package.

## **South Carolina Space Grant Consortium Strategic Plan**

April 4, 2008

### **Vision**

The vision of the South Carolina Space Grant Consortium (SCSGC) is to expand opportunities for all South Carolinians through education, research, and public service in NASA-related science, technology, engineering and math (STEM) disciplines.

### **Mission**

The consortium exists to implement the National Space Grant Act of 1988 in South Carolina. Within the larger context of national science and technology initiatives, we promote activity in research, education, and public service related to the NASA mission.

### **Values**

The NASA SCSGC is committed to excellence in students and faculty research and to promoting STEM education and expanding outreach projects across the state of South

Carolina. We specifically seek to include underrepresented groups in all of the programs and activities supported by the SCSGC.

### **Consortium 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.

#### **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 will be submitted on time and in accordance with NASA guidelines.*

**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 scientists at one of the NASA Centers. The SCSGC Director and/or Program Manager will be present at biannual national Space Grant meetings. The SCSGC Director and Program Manager also serve as the Director and Program Manager for the SC NASA EPSCoR Program.*

**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:** The roles and responsibilities of Consortium Management, member institutions, and all categories of affiliate organizations were established with the inception of the SCSGC and were*

*updated in 2004 and then again in 2006. Relevant electronic communication sent to all member institutions, affiliates, and interested parties, as appropriate.*

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

***Outcome Indicators:** Members of the Management Team provide annual reports to representatives of state and federal government on Consortium activities.*

**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:** Facilitate at least one student or faculty project with an industry partner in South Carolina.*

**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.*

**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, especially in areas of aerospace and earth and space science. At least 50 targeted announcements of opportunity will be disseminated through electronic communication and website each year. Coordinate submission of proposals to NASA and other agencies on projects in STEM research and education. Encourage collaborative proposals each year to NASA or other agencies.*

**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. NASA content or other STEM educational opportunities are expanded at these underrepresented institutions.*

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

***Outcome indicator:** In consultation with the Campus Directors, the Management Team will continue to determine appropriate data collection and evaluation procedures that are consistent with available*

resources. The Consortium website was redesigned in 2005 so that evaluation data could be collected through online surveys and compiled for analysis by the Management Team.

## 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. Awards reflect the diversity of the Consortium's membership and statewide balance.*

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

**Outcome indicators:** *SCSGC will note an increase of SC students involved with NASA Center Internships. 100% will make a presentation at the SC Academy meeting or at a national meeting. 100% will provide feedback to their Campus Director and make campus presentations.*

**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.*

**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 graduate from college, 100% make a presentation at the SC Academy of Science or at a National meeting within a year of receiving the award, 80% produce a paper or abstract with their mentors within a year of receiving the award, and 50% continue on to graduate school and pursue a NASA-related discipline.*

**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 year applicants. At least 15 student awards awarded annually within underrepresented groups.*

**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 to include SCSGC in the longitudinal tracking system so that*

*students funded can continue to be tracked in subsequent years at least through first-employment.*

**Objective 2.7:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the fellowship and scholarship programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the fellowship and scholarship program to strengthen activities that are working and drop or improve activities that are not having the intended impact.*

### **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 least eight research awards are distributed among appropriate SCSGC institutions each year. 100% of the REAP recipients submit proposals to NASA or another federal agency within two years. 50% of the REAP recipients submit new proposals which are funded within two years. 100% of the REAP recipients give presentations and submit papers within a year after the end of the grant. 80% of the presentations and papers include students*

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

**Outcome indicator:** *50% submit proposals for a REAP Research Grant or similar program. 100% of the REAP recipients develop presentations and papers within two years. 80% of the presentations and papers include students.*

**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. Submission of REAP Research Grant proposal within two years of the award.*

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

**Objective 3.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the research infrastructure programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the research infrastructure program to strengthen activities that are working and drop or improve*

*activities that are not having the intended impact.*

#### **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 to the higher education community in South Carolina.

**Outcome indicator:** *Distribute announcements of opportunities for education and curriculum enhancement in NASA-related fields to faculty at member institutions.*

**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 and 100% make presentations about their research experience.*

**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, promoting partnerships between industry and academic affiliates.*

**Objective 4.4:** (Diversity) Increase the participation of women and underrepresented groups in all aspects of SCSGC's higher education program.

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

**Objective 4.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the higher education programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the higher education program to strengthen activities that are working and drop or improve activities that are not having the intended impact.*

#### **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:** (NASA dissemination) Contribute aerospace and space and earth science materials to the formal and informal education communities in South Carolina.

**Outcome indicator:** *Distribute announcements of opportunities for education and curriculum enhancement in NASA-related fields to formal*

*and informal educators across the state; Maintain and update the SCSGC website to provide opportunities and information to formal and informal education groups as well as the general public*

**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.*

**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 50<sup>th</sup> anniversary and will host a few talks promoting the launch of the international collaborative adventure, Moon Mineralogy Mapper.*

**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.*

**Objective 5.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the pre-college/public service programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the pre-college/public service program to strengthen activities that are working and drop or improve activities that are not having the intended impact.*

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

All of our year 17 (2009-10) projects are still on-going except for our REU and Palmetto Research Academy programs. We do, however, have an anecdote related to a project completed and reported in 2009.

Dr. Yong Huang, a faculty awardee of one of 2009 Palmetto Research Academy program, reported to us about three of his 2009 student participants. Leigh Herran was retained as a Ph.D. student at Clemson University. David Calamas will start his M.S. graduate study at the University of Alabama this fall. Khoa Pham joined General Electric in Greenville.

#### PROGRAM ACCOMPLISHMENTS

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

All of our programs are currently in progress and were scheduled to end on April 30, 2010 with the exception of our 2009 REUs and Palmetto Academies. However, all of our research infrastructure and some of our higher education projects have received one year no-cost extensions to complete their projects.

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

-Fellowships and Scholarships – In year 17 (2009/10) we funded 8 graduate students, 1 Kathy Sullivan (undergraduate) award, 6 undergraduate research awards, and 4 NASA Center internships with Yr 17 funds.

- 33 students significantly supported from FY09 funds
  - 1 student reported taking the next step in FY09 by becoming employed in “other STEM academic fields.”

-Research Infrastructure-We funded 9 REAP projects for faculty for a total of \$119,790.

Higher Education- This funding cycle only provided for 2 Palmetto Academies. The remainder of the funding was provided by a Consortium Development competition. Out of these 2 academies, 5 students participated in NASA mentored projects.

Higher Education – We funded two \$45K REU programs in the summer 2009. The REU program at Clemson, Summer Space Biomedical Research Program, included 8 students and 6 faculty. The REU program at MUSC, NASA REU in Bioastronautics at MUSC, included 7 students and 7 faculty. These all involved NASA faculty-mentored related research projects.

Outcome 2 – attract and retain – precollege

We funded 3 pre-service teacher awards for a total of \$9,000 to graduate and undergraduate students pursuing an education undergraduate or graduate degree.

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

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

-The 2009 Palmetto Research Academy developed an outreach project in which the Academy Interns attended a YMCA summer camp consisting of around 50 elementary and secondary students from a variety of ethnic and socioeconomic backgrounds. The interns discussed NASA and their experience in STEM and launched rockets with the kids and provided them with NASA posters and goodies.

## **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 will be submitted on time and in accordance with NASA guidelines.*

**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 scientists at one of the NASA Centers. The SCSGC Director and/or Program Manager will be present at biannual national Space Grant meetings. The SCSGC Director and Program Manager also serve as the Director and Program Manager for the SC NASA EPSCoR Program.*

**Outcome** – *More than three students did participate (4 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:** *The roles and responsibilities of Consortium Management, member institutions, and all categories of affiliate organizations were established with the inception of the SCSGC and were updated in 2004 and then again in 2006. 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:** *Members of the Management Team provide annual reports to representatives of state and federal government on Consortium activities.*

**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:** *Facilitate at least one student or faculty project with an industry partner in South Carolina.*

**Outcome** – *This objective was not met. We did not gain a new industry partner this year. However Boeing is currently building a facility to manufacture their DreamLiner aircraft. We plan on establishing a relationship with them in the near future.*

**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, especially in areas of aerospace and earth and space science. At least 50 targeted announcements of opportunity will be disseminated through electronic communication and website each year. Coordinate submission of proposals to NASA and other agencies on projects in STEM research and education. Encourage collaborative proposals each year to NASA or other agencies.*

**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. NASA content or other STEM educational opportunities are expanded at these underrepresented institutions.*

**Outcome** –*This objective was met. We have worked very hard this past year to pay special attention to our HBCU institutions. The program manager and special projects manager visited these campuses and made presentations about our opportunities to students and faculty.*

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

**Outcome indicator:** *In consultation with the Campus Directors, the Management Team will continue to determine appropriate data collection and evaluation procedures that are consistent with available resources.*

**Outcome** –*This objective was met. We review all of our program annually to ensure that we are tracking our awardees adequately. The Consortium website was redesigned in 2005 so that evaluation data could be collected through online surveys and compiled for analysis by the Management Team. In addition, we use the NSGF for our longitudinal tracking.*

## 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. Awards reflect the diversity of the Consortium's membership and statewide balance.*

**Outcome** –*This objective was met. Campus visits and emails were sent out numerous times by the main office and by the campus directors at each individual institution.*

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

**Outcome indicators:** *SCSGC will note an increase of SC students involved with NASA Center Internships. 100% will make a presentation at the SC Academy meeting or at a national meeting. 100% will provide feedback to their Campus Director and make campus presentations.*

**Outcome** –*This objective was met. We increased students at NASA centers from 3 to 4.*

**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. We only had students at NASA centers for internships. However, we are working on developing relationships with industry (including Boeing, who is currently constructing a new site to build their Dreamliner aircraft in Charleston, SC).*

**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 graduate from college, 100% make a presentation at the SC Academy of Science or at a National meeting within a year of receiving the award, 80% produce a paper or abstract with their mentors within a year of receiving the award, and 50% continue on to graduate school and pursue a NASA-related discipline.*

**Outcome** –*This objective has not been met. Our projects are all currently in progress. We will know if this objective has been met next year upon receiving their final reports. All REU and Palmetto Research Academy students have already made presentations about their research.*

**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 year applicants. At least 15 student awards awarded annually within underrepresented groups.*

**Outcome-**We did not meet this objective. We awarded 22 student awards. 7 went to females and 1 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 to include SCSGC in the longitudinal tracking system so that students funded can continue to be tracked in subsequent years at least through first-employment.*

**Outcome –** *This objective was met by continuing the longitudinal tracking program with the National Space Grant Foundation office.*

**Objective 2.7:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the fellowship and scholarship programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the fellowship and scholarship program to strengthen activities that are working and drop or improve activities that are not having the intended impact.*

**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 least eight research awards are distributed among appropriate SCSGC institutions each year. 100% of the REAP recipients submit proposals to NASA or another federal agency within two years. 50% of the REAP recipients submit new proposals which are funded within two years. 100% of the REAP recipients give presentations and submit papers within a year after the end of the grant. 80% of the presentations and papers include students*

**Outcome –***The status of meeting this objective is unknown. Our projects are all currently in progress. We will know if this objective has been met next year upon receiving their final reports.*

**Objective 3.2:** (Research support) Support new and developing research, especially multidisciplinary and collaborative projects, in fields aligned with

NASA's mission.

**Outcome indicator:** 50% submit proposals for a REAP Research Grant or similar program. 100% of the REAP recipients develop presentations and papers within two years. 80% of the presentations and papers include students.

**Outcome** – The status of meeting this objective is unknown. Our projects are all currently in progress. We will know if this objective has been met next year upon receiving their final reports.

**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. Submission of REAP Research Grant proposal within two years of the award.

**Outcome** – The status of meeting this objective is unknown. Our projects are all currently in progress. We will know if this objective has been met next year upon receiving their final reports.

**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:** 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. Two of the 13 Research Infrastructure participants were women and only three of the 13 were an underrepresented minority.

**Objective 3.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the research infrastructure programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** Adjustments are made to the research infrastructure program to strengthen activities that are working and drop or improve activities that are not having the intended impact.

**Outcome** – This objective has been met. We require final reports from all participants. These reports must be very detailed and include all necessary information to complete our annual reporting back to NASA HQ.

#### 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 to the higher education community in South Carolina.

**Outcome indicator:** Distribute announcements of opportunities for education and curriculum enhancement in NASA-related fields to faculty at member institutions.

**Outcome** – This objective has been met. We act as conduits of information about opportunities for the higher education community. Emails are sent out on a daily basis to distribution lists and to campus directors for addition dissemination.

**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 and 100% make presentations about their research experience.

**Outcome** – This objective has been partially met. ALL of our REU and Palmetto Research Academy (HE) participants have been exposed to NASA research and have presented their projects.

**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, promoting partnerships between industry and academic affiliates.

**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 groups in all aspects of SCSGC’s higher education 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. Our HE programs involved 28 students, 8 were female and 6 were an underrepresented minority.

**Objective 4.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the higher education programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** Adjustments are made to the higher education program to strengthen activities that are working and drop or improve activities that are not having the intended impact.

**Outcome** - This objective has been met. We require final reports from all participants. These reports must be very detailed and include all necessary information to complete our annual reporting back to NASA HQ. In addition, the Palmetto Research Academy has a specific evaluation to assess successful aspects or weaknesses of the program design.

## **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:** (NASA dissemination) Contribute aerospace and space and earth science materials to the formal and informal education communities in South Carolina.

**Outcome indicator:** *Distribute announcements of opportunities for education and curriculum enhancement in NASA-related fields to formal and informal educators across the state; Maintain and update the SCSGC website to provide opportunities and information to formal and informal education groups as well as the general public.*

**Outcome** – *This objective has been met. We distribute information on a daily basis to our contacts throughout the state.*

**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. 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.*

**Outcome** – *This objective has been met. In April 2010, the College of Charleston opened its new Science Center Building, which hosts the SC Space Grant Consortium offices. At this grand opening event, we were proud to have Diane DeTroye from Space Grant and NASA HQ as a guest speaker. It was estimated that over 2000 students, faculty, staff and the public attended this opening ceremony. Students had posters, there were NASA projects demonstrated throughout the building. Students were working on our SCSGC High Altitude Balloon project for the attendees to view.*

**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.*

*While we did not receive many female applicants, we do feel we made an impression on female undergraduate students in SC.*

**Objective 5.5:** (Evaluation) The Consortium will develop methods to document, measure, and assess the impact of the pre-college/public service programs in conjunction with its implementation of an overall evaluation strategy (see 1.9).

**Outcome indicator:** *Adjustments are made to the pre-college/public service program to strengthen activities that are working and drop or improve activities that are not having the intended impact.*

**Outcome** – We are constantly evaluating our programs and making necessary adjustments to better our opportunities.

### PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Longitudinal Tracking:** For those students that were significantly supported from FY 09 funds, 32 of 33 of them are still enrolled in the degree that they were pursuing while they received their Space Grant award. One awardee has been employed in an “other” STEM academic field.
- **Course Development:** Yong Huang, of Clemson, to support a curriculum development project, “Biomedical Manufacturing.” The objective of this curriculum development study is *to develop a biomedical manufacturing course and a biomedical manufacturing web e-museum for undergraduate seniors and entry-level graduate students.* The goal of this curriculum development is to better prepare students for advanced biomedical manufacturing challenges including those from the tissue engineering and regenerative medicine-based space exploration applications. The PI expects that this new biomedical manufacturing curriculum development will attract more high school and college students to choose/continue engineering as their career interest.
- **Matching Funds:** The ratio of NASA funds to matching funds is 1 to 0.86 (\$590K to \$508,454), a small increase from Year 16. 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. The University of the Virgin Islands has been reinstated to our program and is now off of probation.

### IMPROVEMENTS MADE IN THE PAST YEAR

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

-Francis Marion University and Claflin University joined in 2006 and Lander University in 2008 and are all participating. At the end of this year, the University of the Virgin Islands is no longer on probation and will be an active participant in our SCSGC.

-In the past year, 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, specifically with our graduate and undergraduate programs. All of our campuses requested that this become an annual event.

#### 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