

Stennis Space Center
FY 2010 Visitor Center Performance Report for
Office of Education and the StenniSphere Visitor Center
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PROJECT DESCRIPTION

NASA's Education goals are to: 1) contribute to the development of a science, technology, engineering, and mathematics (STEM) workforce that supports NASA's strategic goals, 2) attract and retain students in STEM disciplines through a progression of education opportunities for students, teachers and faculty, and 3) build strategic partnerships between formal and informal education providers.

Stennis Space Center (SSC) Office of Education and the StenniSphere Visitor Center provide educational activities and experiences for teachers, students, and the general public. All activities address one or more of the NASA Education Outcomes and align with NASA Education principles and national education standards.

PROJECT GOALS

1. Maintain existing outreach efforts while sustaining/growing partnerships.
2. Research teacher needs and methods for professional development delivery
3. Maintain/support Education Office and Visitor Center technology
4. Engage, educate, and inspire both students and the general public about NASA through exposure to STEM-focused activities

PROJECT BENEFIT TO OUTCOME

Outcome 1.0: Strengthen NASA and the Nation's future workforce

- Outcome Measure: 1.3

Outcome 2.0: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty

- Outcome Measures: 2.1 – 2.4

Outcome 3.0: Engage Americans in NASA's mission

- Outcome Measures: 3.1.2, 3.2.1, 3.2.2

PROJECT ACCOMPLISHMENTS

Educator Resource Center (ERC)

SSC's ERC has developed a reputation for delivering outstanding inquiry-based STEM workshops. The ERC has relationships with school systems and universities and colleges throughout Mississippi and Louisiana. During FY2010, the ERC staff hosted STEM-focused educator workshops and conducted special workshops on high profile NASA missions such as

the Hubble 20th Anniversary. FY2010 funds also allowed us to maintain our partnerships with the Girl Scouts and local organizations, provided professional development training for members of the ERC and Visitor Center staffs, and work with teachers to determine and utilize alternative methods of effective content delivery, including the Distance Learning Network (DLN).

- A. Educator Professional Development workshops – Provided 33 workshops for 643 educators.
- B. Hubble 20th Anniversary – Conducted teacher workshop (A View From Above: The Hubble Space Telescope) at SSC for teachers of grades 5 – 12.
- C. STS-131 April 5, 2010 – Supported the launch with hands-on activities (Extra Vehicular Activity Board, UV Beads, Solar Panel, Robotic Arm Grapple) at KSC. Approximately 2,000 children and adults enjoyed display and hands-on activities.
- D. STS-132 May 14, 2010 – Supported the launch with hands-on activities (Extra Vehicular Activity Board, UV Beads, Solar Panel, Robotic Arm Grapple) at KSC. Fifty-five (55) teachers, five hundred and forty-four (544) students, and three hundred and nineteen (319) adults participated in this event.
- E. Girl Scouts – Conducted rocket activities with sixty (60) K–5th grade Girl Scouts at summer camp in Louisiana.
- F. Professional Development for SSC Education Staff - Four education specialists attended the Space Exploration Educators Conference (SEEC) in February 2010 at Johnson Space Center; one education specialist attended the ERCN National Conference.
- G. Lauren Rogers Museum in Laurel, MS - Conducted student activities on two separate visits, reaching a total of 179 students; indirect participation of parents accompanying their children to this community event.

Technology Maintenance/Acquisition

FY 2010 funding was utilized for maintenance of existing technology and the purchase of equipment to facilitate offsite DLN presentations in rural and under-served schools.

- A. Science on a Sphere – Maintenance
- B. Magic Planet – Purchase of system, maintenance, and software; team training.
- C. Portable Star Lab Planetarium – Maintenance
- D. Distance Learning Network (DLN) – Purchase of additional Tandberg unit for increased distance learning capability.
- E. Education exhibits in StenniSphere Visitor Center – Labor for exhibit maintenance
- F. General technical maintenance and development of computer security plans for Education and exhibit systems.

Boy Scout Jamboree

SSC supported the National Boy Scout Jamboree in Fort Hill, VA for eight days in July/August 2010. NASA Headquarters requested Astro Camp support for this event. SSC worked with the MSFC Outreach Coordinator to plan activities and exhibits for event; support included labor, travel, and materials.

- A. Approximately 6,000 direct contacts resulted from the NASA hands-on Stomp Rocket and Star Life Cycle activities.

USA Science and Engineering Festival

SSC supported the USA Science & Engineering Festival, which took place from October 10-24, 2010. SSC supported at the Headquarters level by sending its team to the National Mall for the

Expo on October 23-24 to conduct hands-on educational activities (star life cycle, UV beads, shuttle docking station and moon phasers) and provide exhibits and demonstrations.

- A. Approximately 3,000 children and adults participated in hand-on activities; over 15,000 visited the booth and viewed the exhibit.

FIRST Robotics

SSC's Education Office continued to provide support for the FIRST Robotics Bayou Regional Competition in New Orleans, LA. Annually, this event reaches at least 25 underserved, under-represented schools in Mississippi and Louisiana. Sponsorship of this event enables schools in high-poverty areas to attend a robotics competition locally (without the added expense of travel). NASA engineers serve as team mentors, event judges, referees, and inspectors. NASA also provides a machine shop for robot repair and hosts an education booth and exhibit. Parents, siblings, and the general public also attended the event and were exposed to NASA STEM content.

- A. SSC hosted the 2010 FIRST Robotics Competition (FRC) kickoff for ten Mississippi teams, sixteen Louisiana teams, and two Florida teams on Jan 9, 2010. Students learned the mission and received their kits. The Stennis Space Center overview video was presented and teachers received a high school educator packet of NASA resources. Approximately 300 students and adults were in attendance.
- B. The Bayou Regional FRC competition took place in Louisiana; over 30 SSC employees supported the event by setting up the field, participating in the game, manning the education booth, supplying education materials, working the machine shop, registration and special events throughout the four days. Over 500 students and adults visited the education booth.
- C. The FRC championship took place in Atlanta, Georgia; many NASA employees supported this event as mentors and key game positions. SSC manned the NASA booth and handed out NASA education materials. 3,000+ students and adults (of the estimated 20,000 in attendance) visited the NASA booth.

Spaced Out Sports

SSC worked with the Teaching from Space project office to develop a national design challenge for middle school students. The challenge required understanding Newton's Three Laws of Motion and applying them to a sports game created uniquely for the ISS. The winning game will be played aboard the ISS. Components of the activity included teacher workshops, development of hands-on activities and an instructional wall sheet, and a careers video. In order to engage underserved and underrepresented students in the challenge and inspire them to pursue STEM careers, the careers video included female and/or minority NASA engineers and celebrity sports figures explaining/demonstrating the "science behind games" in relation to microgravity. Teachers from schools with high populations of underserved students were invited to workshops that introduces/beta-tested activities, in order to provide feedback on how to best engage these populations.

- A. The FY2010 Spaced Out Sports challenge curriculum was completed. The design challenge resides on the Stennis Education web site <http://education.ssc.nasa.gov/spacedoutsports.asp>.
- B. Project components include a Spaced Out Sports fact-sheet, poster, bookmark, career video, curriculum guide, and DLN Modules. Spaced Out Sports exhibits provided

information and displayed NASA astronauts and celebrity sports figures involved in the project.

- C. Six hands-on activities were developed: Hovering on a Cushion of Air, Center of All Things, Let's Do the Twist, Crazy Balloons, Javelin Rockets, and Space Helmet.
- D. Work will continue in FY2011.

DEVELOP

SSC supported the Science Mission Directorate's DEVELOP program for high school and college students. DEVELOP is a NASA Science Mission Directorate Applied Sciences Program that fosters human capital development to extend NASA science research to local communities. SSC's Education Office utilized Visitor Center funding for DEVELOP presentations at offsite events, including the Southern Growth Policies Board Conference and the American Geophysical Union Fall Conference.

- A. The DEVELOP program registered and completed activities with 26 students in 2010.
- B. August 3, 2010: DEVELOP students attended the Gulf of Mexico Alliance workshop in Biloxi to demonstrate the current project being conducted by the Oil Spill Response team to an audience of 2,000.
- C. August 10, 2010: DEVELOP students attended the close out presentations at NASA HQ. Summer highlight projects and posters were presented to program managers. 40 people attended this event.
- D. The DEVELOP Gulf of Mexico Oil Spill Response team presented their Oil Spill in the Gulf of Mexico project at 6 locations to demonstrate NASA Applied Sciences and DEVELOP's role in oil spill response:
 - August 25, 2010 - University of New Orleans, audience of 20
 - August 31, 2010 - University of South Alabama, audience of 15
 - Sept 3, 2010 - University of West Florida, audience of 20
 - Sept 14, 2010 - Mobile, AL Lion's Club, audience of 30
 - Sept 14, 2010 - University of Southern Mississippi, audience of 50
 - Sept 17, 2010 - Spatial Technologies (MAST) meeting held at the University of Southern Mississippi, audience of 40

Exhibits and Materials

SSC updated traveling and static exhibits for the StenniSphere Visitor Center and purchased a limited amount of materials and giveaways.

- A. Purchased materials, including workshop supplies, soft astronauts, NASA backpacks, ice cream, lithos, pins, robotics kits for teacher workshops, CORE materials, etc.
- B. StenniSphere Visitor Center replaced a number of outdoor displays.
- C. Purchased, including labor for design and graphics, four popup traveling displays and one outdoor banner stand.

Sea Perch

Astro STARS (13-15 year olds) featured the Sea Perch robotics activity. This activity was supported by SSC and included partnerships with the Naval Research Laboratory and the Naval Oceanographic Office. In addition to weeklong hands-on education activities, 21 students worked two days to complete the Sea Perch robot construction and programming. The event culminated with underwater robotics activities.

PROBLEMS ENCOUNTERED

In addition to the activities described under Program Accomplishments, three additional activities were planned during FY2010 but were not completed due to technical issues; they have been rescheduled to occur during FY2011.

STS-134 Launch and KARS Camp

Kennedy Space Center requested help from all Center Education Offices for staffing of the Kennedy Athletic, Recreation, and Social (KARS) Park Launch events. KARS Park planned to open its gates for a special 3-day event for all NASA, civil service and contractor employees (current, retired, alumni) and their families to camp, mingle, and celebrate the last shuttle launches. This event includes planned activities for children, an astronaut photo opportunity, and education events.

- The launch of STS-134 launch was delayed until Spring 2011; SSC will support the event at that time.

International Space Station Downlink

SSC planned to host an ISS downlink on September 1, 2010, the first ever for Stennis, as part of the Teaching from Space “Mass vs. Weight” activity. Students and teachers from six south Mississippi schools were scheduled to participate. For the schools to be selected for the downlink, teachers were required to attend an SSC ERC professional development workshop on “Mass vs. Weight” and to use the curriculum in the classroom. An “ISS Day” was scheduled to occur around the downlink to provide the students with hands-on activities focused on the concepts of mass, weight, and microgravity.

- The ISS downlink event was delayed until Spring 2011 due to ISS issues that occurred during Fall 2010.

Portable Test Stand to Enable Education Activities on Rocket Engine Testing

SSC’s Technology Development group is actively involved in Integrated System Health Management (ISHM), and has a small rocket engine test stand. This test stand is the perfect platform for teachers and students to gain hands-on experience with the systems and technologies associated with propulsion testing. With minor upgrades, the stand can be converted to a learning platform. For this platform, the Education Office proposed to develop a credit-bearing professional development educator workshop to connect classroom learning to authentic engineering activities; the course will meet all applicable national and state education standards. During the summer, the Education Office worked with the Mississippi State University and Jackson State University industry-education partnership programs. We planned to use the test stand to conduct short-duration workshops or demonstrations for these groups to see and understand the processes associated with propulsion testing.

- This activity was not completed due to a delay in test stand scheduling. SSC still hopes to build the portable test stand for upcoming education activities.

**PROJECT PARTNERS TECHNICAL POINT OF CONTACT INFORMATION/ROLE
OF PARTNERS IN PROJECT EXECUTION**

Educator Resource Center partners:

Mississippi State University
Center for Science and Mathematics Education
118 College Dr. Box 5087
Hattiesburg, MS 39406

Mississippi State University
Advance Teachers of Middle School Science
PO Box 309B, Box 9662
Mississippi State, MS 39762

Jackson State University
Joseph E. Jackson School of Education Room 102
1400 J.R. Lynch Street
Jackson, MS 39217

University of Southern Mississippi
Center for Science and Mathematics Education
118 College Drive, Box 5087
Hattiesburg, MS 39406

Louisiana State University
Gordon A. Cain Center
222 Prescott Hall
Louisiana State University
Baton Rouge, LA 70803

Delta State University
Division of Teacher Education
DSU Box 3112
1003 W Sunflower Road
Cleveland, MS 38733

Louisiana Department of Education
1201 North Third Street
Baton Rouge, LA 70802

Girl Scouts Camp
16013 Million Dollar Road
Covington, LA 70453

Lauren Rogers Museum of Art

565 North 5th Avenue
Laurel, MS 39440

Technology Maintenance partners:

National Oceanographic and Atmospheric Administration
B1002
Stennis Space Center, MS 39522,

Digital Learning Network
Oklahoma State University
B1200 Rm202
Stennis Space Center, MS 39529

Boy Scout Jamboree partners:

NASA Headquarters

NASA Marshall Space Flight Center

Boy Scouts of America
1325 W. Walnut Hill Lane
Irving, TX 75038

Boy Scouts of America Southeast Louisiana Council
4200 S. I-10 Service Rd. West
Metairie, Louisiana 70001

Boy Scouts of America
1614 25th Avenue
Gulfport, MS 39501

US Science and Engineering Festival:

NASA Headquarters

NASA Marshall Space Flight Center

FIRST Robotics:

NASA Ames Research Center

FIRST (For Recognition and Inspiration of Science and Technology)
200 Bedford Street
Manchester, New Hampshire 03101

BLAST (Building Louisiana Science and Technology)
3421 N. Causeway Blvd. Suite 701

Metairie, LA 70002

Naval Research Laboratory
1005 Balch Blvd
Stennis Space Center 39522

Naval Oceanographic Office
1003 Balch Blvd
Stennis Space Center, MS 39522

Spaced Out Sports partners:

NASA Johnson Space Center
Teaching from Space.

New Orleans Saints
5800 Airline Drive
Metairie, LA 70003.

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DEVELOP:

NASA Langley Research Center

Exhibits and Materials:

NASA Stennis Space Center Stennisphere
B1200 Rm205A
Stennis Space Center, MS 39529

Sea Perch:

Naval Research Laboratory (funded by the National Defense Education Program NDEP)
1005 Balch Blvd
Stennis Space Center 39522

BUDGET:

Activity	Funding
Educator Resource Center	\$225k
Technology Maintenance/Acquisition	\$ 85k
Boy Scout Jamboree	\$ 35k
USA Science and Engineering Festival	\$ 30k
FIRST Robotics	\$ 50k
Spaced Out Sports	\$ 15k
DEVELOP	\$ 40k
Exhibits and Materials	\$ 50k
STS-134 Launch and KARS Camp	\$ 30k
International Space Station Downlink Event	\$ 10k
Portable Test Stand for Education Activities	\$ 50k
TOTAL	\$620k