



*NASA SCIENCE, ENGINEERING,
MATHEMATICS AND AEROSPACE
ACADEMY (SEMMAA)*

**FY 2013
Annual Performance Report**

Type of Agreement: Contract

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John H. Glenn Research Center

PROJECT DESCRIPTION

NASA SEMAA is a national education project designed to increase the participation and retention of historically underserved and underrepresented K-12 youth in the areas of science, technology, engineering, and mathematics (STEM).

SEMAA targets students in grades K-12 and their parents/adult caregivers, and offers three core components:

- A NASA-designed, hands on, inquiry based curriculum aligned to national science, math, and technology standards at each grade level, K-12, and connected to research from the NASA mission directorates
- An Aerospace Education Laboratory (AEL), featuring cutting edge aerospace technology that gives students experience with aeronautical and reduced gravity simulations
- A Family Café to promote sustained parental involvement in their child's STEM education

The NASA SEMAA project currently operates at 15 sites located in 14 states across the nation. Site locations include community colleges, four-year colleges/universities, Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs), Tribal Colleges and Universities (TCUs), primary/secondary schools, science centers and museums.

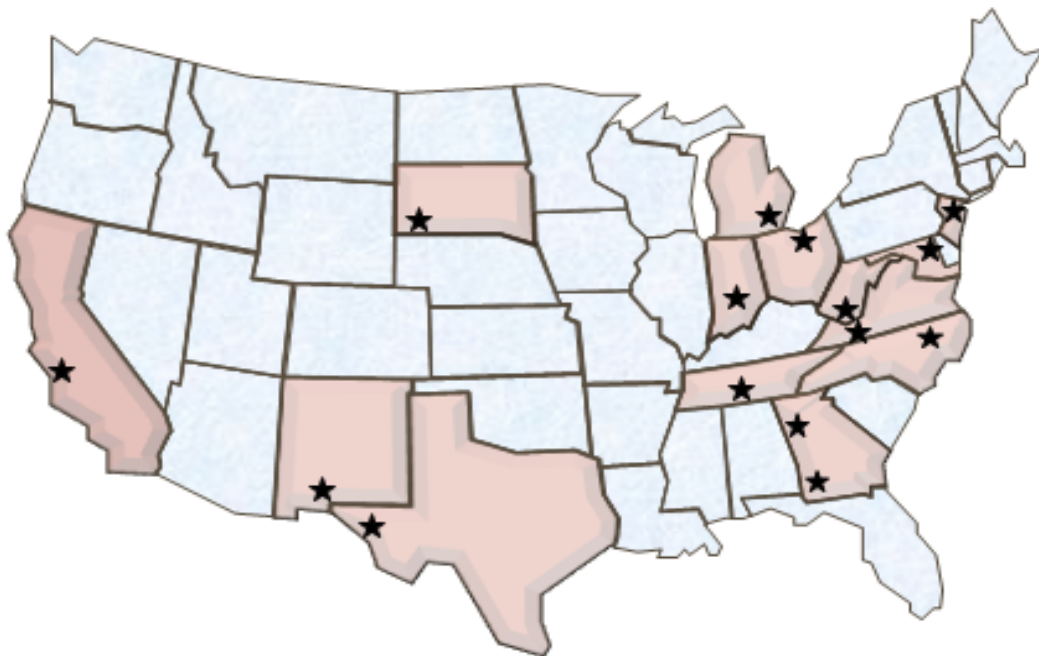
PROJECT GOALS

The goals of SEMAA are to:

- **INSPIRE** a more diverse student population to pursue careers in stem related fields
- **ENGAGE** students, parents and teachers by incorporating emerging technologies
- **EDUCATE** students by utilizing rigorous STEM curriculum enhancement activities that meet national math, science and technology standards and encompass the research and technology of NASA's four Mission Directorates

NASA's SEMAA project is administered at the following locations:

1. Albany State University
Albany, Georgia
2. Cuyahoga Community College
Cleveland, Ohio
3. Fernbank Science Center
Atlanta, Georgia
4. Hartnell College
Salinas, California
5. Martin University
Indianapolis, Indiana
6. Martinsville City Public Schools
Martinsville, Virginia
7. Morgan State University
Baltimore, Maryland
8. New Mexico State University
Las Cruces, New Mexico
9. Oglala Lakota College
Kyle, South Dakota
10. Tennessee State University
Nashville, Tennessee
11. The University of Texas
at El Paso
El Paso, Texas
12. Warren County High School
Warrenton, North Carolina
13. Wayne State University
Detroit, Michigan
14. West Virginia State University
Institute, West Virginia
15. York College/CUNY
Jamaica, New York



PROJECT BENEFITS TO OUTCOME 2

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

SEMAA is the only K-12 STEM project in the NASA Elementary and Secondary Program education portfolio providing a seamless NASA pipeline for elementary and secondary age students, families and teachers.

In FY 2013, the SEMAA project contributed to Outcome II with the following accomplishments:

- A total of 55,572 students, parents/adult caregivers, teachers and outreach participants were served in FY 2013
 - SEMAA served 28,886 total students
 - 17,548 direct student participants
 - 11,338 indirect student participants
 - Forty-eight percent of direct SEMAA students were females
 - The project served 221 students with special needs

PROJECT CONTRIBUTIONS to ANNUAL PERFORMANCE INDICATORS (API)

APG	Description	SEMAA Contribution
6.2.1.: ED-13-3	Conduct no fewer than 200 interactive K-12 student activities that leverage the unique assets of NASA's missions.	In FY 2013, the NASA SEMAA project conducted a total of 57 long-duration K-12 student activities engaging 17,548 direct student participants. Activities were conducted at the 15 SEMAA sites leveraging the unique assets of NASA's missions.
6.4.1.1: ED-13-5	Maintain the NASA Museum Alliance and/or other STEM Education strategic partnerships in no fewer than 30 states, U.S. Territories and/or the District of Columbia.	In FY 2013, the NASA SEMAA project contributed to this APG by maintaining education partnerships in 14 states across the country.

PROJECT ACCOMPLISHMENTS

- SEMAA at Hartnell College, CA acquired partnership funding from two newly established community partners totaling \$50,000 to ensure SEMAA's reach to students in the community. The Rudy E. Futer Fund for Human & Humane Needs of the Community Foundation for Monterey County awarded the site \$30,000; and the Nancy Buck Ramson Foundation awarded the site \$20,000.
- SEMAA at New Mexico State University (NMSU) hosted the 5th Annual Southwest Math and Science Conference attended by more than 200 teachers and 37 presenters.
- New Mexico State University SEMAA Schools, Las Cruces Public Schools and Gadsden Independent Schools, were awarded \$1.2 Million for 21st Century Learning Centers Grant which was co-written by New Mexico State University SEMAA staff. Gadsden Independent received \$900,000 and Las Cruces Public Schools was awarded \$315,000. A significant portion of the award to each school district will be used to fund instructor trainings and stipends, and expand the SEMAA afterschool sessions at various schools in each district over the next four years. The grant will enable SEMAA to be used in six additional schools in the Gadsden and Las Cruces Public Schools .
- During 4th Qtr., FY 2013, SEMAA at NMSU received \$45,000.00 in partnership funds from existing partners to ensure an innovative summer session which included building underwater rovers at NASA's JSC.
- In FY 2013, SEMAA at Cuyahoga Community College celebrated the site's 20th anniversary. Key speaker for this event was Astronaut Doug Wheelock. The event also marked 20 years of the NASA SEMAA project delivering NASA-related STEM content to historically underserved and underrepresented K-12 youth and their families.
- SEMAA at Morgan State University hosted it's annual SEMAA Day STEM Extravaganza that included exhibits from the NASA Glenn Research Center, American Institute of Aeronautics and Astronautics (AIAA), NASA Goddard Space Flight Center, CAN Manufacturers Institute, Maryland Space Grant Consortium, Team America Rocketry, Maryland Science Center, National Oceanic and Atmospheric Administration (NOAA), US Coast Guard, Space Telescope Science Institute, and the Federal Aviation Administration (FAA). More than 442 students, parents, partners, and members of the community

attended the event which delivered NASA-related STEM activities and outreach to the Baltimore area communities.

IMPROVEMENTS MADE IN THE PAST YEAR

- During FY13, SEMAA sites expanded their operations to off-site locations to ensure that students had access to the grade level curriculum activities. Expansion opportunities included:
 - SEMAA at Hartnell College, CA provided instruction to migrant students of Salinas, CA
 - SEMAA at the University of Texas at El Paso provided instruction and outreach to students at an El Paso Homeless Shelter
 - SEMAA at Morgan State University partnered with a local charter school to offer SEMAA lessons during the school day.
 - SEMAA at Oglala Lakota College and SEMAA at West Virginia State University expanded their operations to increase the emphasis on after school instruction of SEMAA activities.
- In FY 2013 the concept of a portable AEL was developed to make the AEL more scalable and affordable. To that end, prototypes of key AEL components such as the Wind Tunnel, Drop Tower, and Advanced Flight Simulator were developed to verify these components could perform adequately in a mobile configuration. Additionally, computer tablets were tested to ensure the functionality of existing AEL applications. Finally, to ensure the AEL continues to utilize the most advanced technology available, research was conducted to identify applications to support a virtual environment at minimal or no cost.
- In FY 2013, Virtual AEL Site Assessments were conducted for all SEMAA sites. Site Directors successfully provided detailed video documentation of all AEL Hardware at the respective sites to provide confirmation of the operational status of all SEMAA AEL's.

PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

SEMAA sites are required to develop partnerships annually that will both enhance and sustain STEM project services beyond NASA funding. During Fiscal Year 2013, SEMAA leveraged over \$1.7 Million in partnership funds (including both financial and in-kind support) for K-12 STEM education, constituting more than a 100% match to the

total project budget provided by NASA. SEMAA has leveraged over \$29.3 Million in funding for K-12 STEM education from 2004 – 2013.

ROLES AND RESPONSIBILITIES OF SEMAA STAKEHOLDERS AND PARTNERS

Organization	Responsibility
NASA HQ	Provides funding for the SEMAA Project
NASA Glenn Educational Programs Office	Serves as the SEMAA Project Manager providing guidance and overall project management. Leads the expansion process of the project.
NASA Glenn – On Site Contractors, ES2 Contractors, Paragon TEC, Inc. /SGT, Inc.	<p>Supports overall project management efforts of the NASA SEMAA project, providing guidance to the NASA SEMAA sites and supports expansion processes of the project.</p> <p>Monitors day-to-day operations of the SEMAA sites, as well as the establishment of new SEMAA sites which includes training and installation of AELs and assists with all aspects of the expansion process.</p>
NASA Center Education Offices	Support the SEMAA sites in their region
SEMAA Sites	Deliver the SEMAA project to students, families, and teachers. Key personnel at the SEMAA Sites include the Site Director and the AEL Coordinator
Partners/Stakeholders	Provide financial and/or in-kind contributions to enhance and sustain SEMAA beyond NASA funding