NASA Aerospace Education Services Project

FY 13 Annual Report

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PROJECT DESCRIPTION

The NASA Aerospace Education Services Project (AESP) connected STEM educators to the work of NASA and helped them make their teaching more hands-on and connected to science and engineering by applying classroom knowledge to real-world applications. AESP was NASA's longest-running K-12 education project, and the AESP Education Specialists were experienced educators who were broadly knowledgeable about NASA's missions, programs, and education resources. AESP Education Specialists worked alongside NASA engineers, scientists, and educators to bring the current work of NASA to the education community.

AESP Education Specialists also worked with educators in schools, colleges, science centers, museums, and other sites to deliver on-site and/or online professional development to in-service teachers, pre-service teachers and other educators in all states and U.S. territories. AESP provided professional development based on research of effective professional development for teachers. To best serve educators, AESP offered a variety of onsite and virtual programs, including custom workshops and webshops, open enrollment webinars, the NASA Educators Online Network (NEON), the AESP Resource Repository, and Teacher Learning Journeys, innovative individualized approaches to teacher professional development.

Due to budget cuts and travel restrictions, AESP work in 2013 was accomplished, to a larger extent than ever before, through online interactions with educators.

PROJECT GOALS

The AESP Project Goals for FY 2013 were negotiated in October of 2012. They were based on the assumption of ten Education Specialists and $105,000 of travel funding. Goals were negotiated with the understanding that changes to the number of Education Specialists available or to the travel funding would require a re-examination of goals. AESP was able to keep ten Education Specialists onboard until the end of the agreement, losing only a few months of effort due to attrition. However, a combination of project budget constraints, federal budget sequestration, and subsequent restrictions on travel gave the project only 87% of the projected $105,000 of travel funding. This diminished productivity, as face-to-face events were the primary source to bring new educators to the project for online services.

The Goals established for 2013 were as follows:

Goal 1: Improve processes to increase efficiency and effectiveness of implementing STEM Educator Professional Development (PD). (Supported FY 13 APG 2, EDT 1.1, EDT 1.1.2)

- Meet the following targets for Educator PD:
    - 3,000 pre-service educators reached. Focus efforts on 5 states (NY, FL, TX, PA, CA) with greatest pre-service population.
    - 20,000 direct interactions
    - 10,000 unique direct interactions
    - At least 4,500 long term PD relationships
- Increase AESP support to educators that work primarily with underserved populations (rural schools, HBCUs, tribal schools, and schools serving primarily minority populations).
- Increase distance-learning events by 10% over FY 12. (Expanded capabilities through Specialist PD then grew from 228 to over 250 distance-learning events.)
- Increase scalability and efficiency by implementing a train the trainer strategy.
    - Collaborate with Solar System Ambassadors, Messenger Fellows, and other volunteer organizations within the “NASA Nationwide” network.

Goal 2: Improve processes to increase efficiency and effectiveness of implementing STEM activities to reach middle school students. Supports FY 13 APG 3, and ETD 1.1

- Utilize site-based and virtual interactive events to reach 15,000 unique K-12 students
- Conduct no fewer than 20 interactive student activities that leverage the unique assets of NASA's mission.

Goal 3: Build strategic partnerships with national PD providers/stakeholders that promote STEM literacy. Supports EDT 1.1.1, EDT 1.1.3, EDT 2.1.1, and EDT 2.4

- Establish and quantify relationship of AESP collaborations with NSTA, TFA, and Department of Education

Goal 4: Provide increased support for Agency education priorities. Supports FY 13 APG 2 and 4, EDT 1.4, EDT 2.5

- 100Kin10
- STEM Master Teacher Corp
- 21CCLC
- Military efforts
- Participate in STEM education advisory boards
- Provide curriculum development and PD support for SoI

PROJECT BENEFIT TO STRATEGIC GOAL 6 AND OUTCOME 2

NASA's Goal 6, Outcome 2 is **to promote STEM literacy through strategic partnerships with formal and informal organization**. In the past three years, AESP developed and/or extended partnerships with the National Science Teachers Association, the National Middle Schools Association, Teach for America, and the following member organizations of the NASA AESP Professional Development Alliance:

- Arizona Science Center
- Arizona State University
- Arkansas Center for Mathematics and Science Education, University of Central Arkansas
- Buehler Challenger and Science Center
- Cal Poly Pomona

- California State University
- California State University, Fullerton
- California State University, Long Beach
- CEISMC - Georgia Institute of Technology
- Chester County Intermediate Unit
- Columbia Memorial Space Center
- Daytona State College
- Discovery Museum and Planetarium
- Dryden Flight Research Center Educator Research Centre at Aero Institute
- Eastern Kentucky University, College of Education
- EIRC
- Framingham State University
- George Bush Presidential Library and Museum
- Glenn Research Center - Educator Resource Center
- Gordon Cooper Technology Center
- Greater Manchester Professional Development Center
- GSFC ERC
- Idaho Dept of Education
- Integrated Science Multi-use Laboratory (IsMuL)
- Jet Propulsion Laboratory Educator Resource Center
- Kremen School of Education and Human Development, Fresno State
- Langley Research Center Educator Research Center
- Marshall Space Flight Center Educator Resource Center
- Marymount University
- MathScience Innovation Center
- McAuliffe-Shephard Discovery Center
- McREL (Mid-continent Research for Education and Learning)
- Montana State University

- Murray State University
- Museum of Flight
- NASA Educator resource Center Utah State University ERC and Learning Center
- NASA Educator Resource Center, UNC-Charlotte
- NASA IV & V Facility
- NASA Puerto Rico Education Resource Center, University of Puerto Rico at Mayaguez
- NASA Regional Educator Resource Center, Center for Educational Technologies
- NASA Regional Educator Resource Center, College of Southern Nevada
- NASA Regional Educator Resource Center, Georgian Court University
- NASA Regional Educator Resource Center, Museum of Aviation at Robins Air Force Base
- NASA-ERC at KSC
- NASA-Regional Educator Resource Center - Murray State University
- New Mexico State University
- NJ School Boards Association
- North Dakota State College of Science
- Northern Kentucky University
- Palm Beach Atlantic University
- Providence Museum of Natural History & Planetarium
- Saint Petersburg College
- San Diego Air & Space Museum
- Science Center of Pinellas County
- Science Central
- Seaborg Center, Northern Michigan University
- Southern Oregon University
- Space Foundation Discovery Institute
- Space Science Center at Morehead State University
- STEM Center for Mathematics and Science Education - UArk Fayetteville
- Stennis Space Center Educator Resource Center

- Texas A&M University
- Three Rivers College
- Universidad Metropolitana
- University of Central Missouri
- University of Central Oklahoma
- University of Houston, Clear Lake campus
- University of Nebraska at Omaha
- University of Sioux Falls
- University of Tennessee, Chattanooga
- University of Texas at San Antonio
- University of Texas at Tyler
- University of West Georgia
- Vanderbilt University Dyer Observatory
- Wings of Eagles
- Wiregrass Math and Science Consortium Troy University, Dothan
- Worcester State University
- Wyoming NASA Space Grant Consortium

Through these strategic partnerships, AESP helped NASA Education leverage the resources and expertise of our partners, maximizing NASA's investments to reach new audiences. Because 2013 was the end of the AESP agreement, this network could not be used to its maximum extent. However, on December 5, 2013, Paragon Tech (the contractor operating the bridge contract for NASA STEM Teacher PD) reactivated the network so the benefits that AESP created by creating this group continue to benefit NASA and Goal 6 Outcome 2 into the next fiscal year.

PROJECT ACCOMPLISHMENTS

As mentioned above, the AESP Project Goals for FY 2013 were negotiated in October of 2012, and were based on the assumption of ten Education Specialists and $105,000 of travel funding. The goals were negotiated with the understanding that changes to the number of Education Specialists available or to the travel funding would require a re-examination of goals. A

reduction in travel allotment (13% reduction) impacted AESP's ability to meet a few targets. Given the circumstances, the numbers of educators served is commendable. In the section below, the productivity and annual goals comparison is described.

Major project accomplishments in 2013 include:

- AESP provided high-quality professional development services to 2,515 pre-service and 26,941 inservice educators, in direct interactions with 22,108 unique educators. AESP targets were 3,000 preservice teachers, 20,000 direct interactions, and 10,000 unique interactions. The project fell 16% short of the original preservice educator goal (which is very close to the 13% reduction in travel), largely because the ability to travel ended before the fall semester began. However, **a total of 29,456 preservice and inservice educators in direct interactions were served, which is 147% of the 2013 goal**. **In terms of unique contacts, the 22,108 served are 227% of the stated goal of 10,000 unique educators served**.
- AESP developed and sustained **3,864 long-term PD relationships, which is 14% below our original 2013 goal**. The 14% matches the reduction in travel funds and the reduced use of the NASA AESP Professional Development Network due to the end of the agreement.
- AESP increased support to educators that worked primarily with underserved populations (rural schools, HBCUs, tribal schools, and schools serving primarily minority populations).
- AESP increased the percentage of distance learning events by providing professional development to the Education Specialists and providing a new vehicle (Teacher Learning Journeys) to enable repeated work with STEM educators.
- AESP increased the scalability and efficiency of its work by implementing the "Teacher Learning Journeys" system for individualized STEM teacher professional development, in collaboration with the National Science Teachers' Association.
- Despite a focus on teachers, AESP produced or attended **106 student oriented events, during which touched 19,702 unique K-12 students. This is 131% of our targeted 15,000 students, and more than five times the number of events targeted**. It should

also be noted that the **106 events is more than half of NASA Education's annual target**.

- AESP extended relationships with the National Science Teachers' Association and Teach for America.
- AESP participated in several STEM education advisory boards.
- AESP provided curriculum development and PD support for Summer of Innovation.
- AESP collaborated with many NASA programs, projects, centers, and mission directorates.

PROJECT CONTRIBUTIONS TO ANNUAL PERFORMANCE GOALS

In support of NASA's FY 13 APG 2, EDT 1.1, and EDT 1.1.2, AESP

- Provided professional development services to 2,515 pre-service and 26,941 inservice educators, in direct interactions with 22,108 unique educators.
- Developed and sustained 3,864 long term PD relationships
- Increased AESP support to educators that work primarily with underserved populations (rural schools, HBCUs, tribal schools, and schools serving primarily minority populations). **Approximately 66.2% of all (unique) contacts were with educators in settings serving a majority of students from underrepresented populations.**
- Increased distance learning events and created "Teacher Learning Journeys," and worked with STEM educators, developing long-term PD relationships
- Increased the scalability and efficiency of our work by implementing the "Teacher Learning Journeys" system for individualized STEM teacher professional development, in collaboration with the National Science Teachers' Association.

In support of NASA's FY 13 APG 3 and ETD 1.1, AESP:

- Served 19,702 unique K-12 students
- Conducted 106 interactive student activities that leveraged NASA-specific resources

In support of NASA's EDT 1.1.1, EDT 1.1.3, EDT 2.1.1, and EDT 2.4, AESP:

- Extended our relationships with the National Science Teachers Association and Teach for America

In support of NASA's FY 13 APG 2 and 4, EDT 1.4, EDT 2.5, AESP:

- Participated in STEM education advisory boards
- Provided curriculum development and PD support for SoI
- Provided assistance with the Space Shuttle "Final Resting Place" Program which included conducting educator professional development sessions at the Udvar-Hazy National Air and Space Museum Annex and the Intrepid Sea, Air, and Space Museum during their "Educator Day" activities.
- Provided services to other NASA programs, including Teaching from Space events including Puerto Rico, the Global Climate Change Education Grants, Summer of Innovation, Space Grant, Human Exploration Operations, the Aeronautics Research Mission Directorate and numerous mission E/PO programs in the the Science Mission Directorate
- Exhibited and presented at the NSTA national conferences and organized and facilitated a NASA exhibit room for presentations from AESP and many other NASA educators, significantly increasing NASA's profile at the conferences.
- Connected with Goddard Scientific Visualization Studio to organize videos for educators.
- Collaborated with Queens College on a Global Climate Education (now called NICE) grant.
- Collaborated on ROSES EPOESS proposals with the ARES Program and Heliophysics EPO Forum/Lawrence Hall of Science
- Revised Aeronautics Research Mission Directorate curriculum to streamline, update, and align with new national STEM standards.

IMPROVEMENTS

In 2013, AESP continued to find new ways to "do more with less." Faced with declining budget and corresponding reductions in personnel and travel funding, AESP focused on efforts to serve STEM educators via online vehicles. The project continued the growth of the NASA Educators' Online Network (NEON) and refined and expanded participation in "Teacher Learning Journeys. AESP also focused on working through partners to extend NASA's reach, resulting in the collaborations and the efficiencies documented below.

Collaborations:

In addition to the partnerships listed below, AESP continued its history of collaboration both within NASA (NES, ePDN, NEAT, NASA Edge, INSPIRE, ERNC) and beyond. Collaborators included:

- Teaching from Space
- Global Climate Change Education Grants
- NSTA Conference
- Goddard Scientific Visualization Studio
- Queens College
- NASA Science Mission Directorate, and
- Lawrence Hall of Science

Efficiencies:

In 2013, AESP continued to move toward online methods of serving STEM teachers, which continued to increase efficiency, serving thousands of educators while reducing the funding required. Over the six years of the contract, AESP tripled the number of educators served per Education Specialist and did so at one third of the cost per educator.

Diversity:

Despite personnel and travel limitations, in 2013, AESP increased support to educators that work primarily with underserved populations (rural schools, HBCUs, tribal schools, and schools serving primarily minority populations). Approximately 66.2% of all unique contacts were with educators in settings serving a majority of students from underrepresented populations.