EDUCATION

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Aerospace Research and Career Development	58.0	58.0	**33.0**	33.0	33.0	33.0	33.0
STEM Education and Accountability	61.0	--	**67.1**	69.1	71.1	73.2	75.3
Total Budget	**119.0**	**115.0**	**100.1**	**102.1**	**104.1**	**106.2**	**108.3**

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

EDUCATION

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	FY 2019	FY 2020	FY 2021
Aerospace Research and Career Development	58.0	58.0	**33.0**	33.0	33.0	33.0	33.0
STEM Education and Accountability	61.0	--	**67.1**	69.1	71.1	73.2	75.3
Total Budget	**119.0**	**115.0**	**100.1**	**102.1**	**104.1**	**106.2**	**108.3**
Change from FY 2016			**-14.9**				
Percentage change from FY 2016			**-13.0%**				

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

Community college students operate the rover they designed, developed, and competed during a three-day workshop at Johnson Space Center (JSC) April 12-14, 2015. The workshop followed a five-week, online engineering design opportunity for 400 students from community colleges across the U.S. including 108 from minority serving institutions. Authentic STEM experiences in the first two years of college motivate students to pursue NASA-related STEM degrees and careers.

Education is the single most important factor in determining not just whether our children can compete for the best jobs, but whether America can out-compete countries around the world. Building a robust Science, Technology, Engineering, and Mathematics (STEM) workforce for the 21st century and beyond requires the development of a stronger and more diverse pipeline for STEM, including women and individuals from underrepresented and underserved groups. 1

NASA's missions, including plans for the Journey to Mars, starts with a STEM-qualified and prepared workforce. The Administration places a high priority on STEM education at all levels, as reflected in the Five-Year Federal STEM Education Strategic Plan. NASA is committed to funding competitive, evidence-based programs in STEM education that will benefit aspiring learners, educators, and institutions.

NASA Education uses competitive processes to identify the most effective internal STEM education activities and assets across the Agency. NASA will make available its unique assets, such as the International Space Station (ISS), to STEM education programs, government-wide, on a reimbursable basis in order to enhance their effective reach to students and educators. NASA Education uses evidence-

1 https://www.whitehouse.gov/sites/default/files/docs/education_record.pdf

collection activities for performance measurement, analysis, evaluation, and reporting of NASA's activities.

NASA's education programs develop and deliver activities that support the growth of the Agency's and the Nation's STEM workforce, help develop STEM educators, engage and establish partnership with institutions, and inspire and educate the public. The Nation's economic competitiveness and the path to the American dream depends on providing all children with an education that will enable them to succeed in a global economy. The Administration continues to support ambitious national goals for preparing 100,000 new and effective STEM teachers, producing an additional one million more STEM college graduates over the next decade, and broadening participation in STEM fields for women and underrepresented minorities.

NASA Education's vision advances high quality STEM education using NASA's unique capabilities, assets, and expertise. This vision aligns to NASA's Strategic Objective 2.4: Advance the Nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers, and faculty in NASA's missions and unique assets in the Agency's 2014 Strategic Plan. NASA Education programs develop and execute strategic collaborations and partnerships with intergovernmental, academic, industrial, entrepreneurial, and international communities to achieve NASA's values, mission, and vision. Through its Education programs, NASA provides opportunities for educators, learners, and institutions that support the Five-Year Federal STEM Education Strategic Plan, prepared by the National Science and Technology Council's Committee on STEM Education (CoSTEM). NASA Education collaborates with other federal agencies in the key areas identified by CoSTEM, which include:

- improving STEM instruction and learning;
- increasing and sustaining youth and public engagement in STEM;
- enhancing the STEM experience of undergraduate students;
- providing STEM learning opportunities to groups historically underrepresented in STEM fields; and
- designing graduate education experiences for tomorrow's STEM workforce.

Through grants, cooperative agreements and Space Act agreements, NASA makes its people, resources, facilities, and discoveries available to key stakeholders and strategic partners, such as other federal agencies, educational organizations, and science museums. NASA Education uses competitive processes for allocating resources.

In FY 2017, NASA Education builds on the Administration's efforts to establish a stronger and more cohesive federal infrastructure for delivering STEM education and leveraging existing resources to expand the reach of the Agency's assets. NASA Education gives priority to two kinds of activities: 1) activities that use evidence to guide program design and implementation and 2) activities that build evidence about what works in STEM education, using appropriate metrics and improving the measurement of outcomes. NASA Education continues to implement rigorous evaluation. Impact evaluations require that:

- inferences about cause and effect are well-founded (internal validity);
- there is clarity about the populations, settings, or circumstance to which results can be generalized (external validity);

- measures accurately capture the intended information (measurement reliability and validity);
- samples are large enough for meaningful inferences; and
- evaluations are conducted with an appropriate level of independence by experts external to the program either inside or outside an agency.

Performance management and program evaluations should be aligned and complementary, where appropriate. Performance management tracks results on an ongoing basis to ensure efficiency.

NASA's STEM education expertise, as well as the Agency's unique missions and assets, make significant contributions to the Nation's STEM education portfolio. The FY 2017 request for NASA Education is $100.0 million. Additionally, the Budget provides $25.0 million to NASA's Science Mission Directorate (SMD) to support competitively selected cooperative agreements that will connect NASA-funded science to learners of all ages.

NASA continues to consolidate the education functions, assets, and efforts of the Mission Directorates, Offices, and Centers into the coordinated STEM Education and Accountability Projects (SEAP) under the auspices of NASA's Office of Education (OE). A SEAP competition conducted in FY 2015 identified and prioritized NASA-unique assets and content for execution in FY 2016 by NASA Education and in support of other Federal agencies' STEM efforts. FY 2017 activities capitalize on the excitement of NASA's missions of scientific inquiry and exploration through innovative solutions, approaches, and tools that inspire educator and learner interest and proficiency in STEM.

EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

ACHIEVEMENTS IN FY 2015

In a follow-on collaboration, NASA and the Department of Education entered into a second reimbursable Space Act Agreement increasing and sustaining youth and educator engagement in STEM. The partnership supported STEM objectives and activities within Department of Education's 21st Century Community Learning Center (21CCLC) program. NASA customized online STEM challenges and associated curriculum materials aligned to 21CCLC objectives and implemented them in 10 states: California, Colorado, Florida, New Jersey, Michigan, Montana, Oklahoma, Rhode Island, Virginia, and Wisconsin.

Between December 2014 and October 2015, NASA created ten education partnerships using NASA's Space Act authority. This brings the total number of no-exchange-of-funds partnerships to more than 40 with diverse entities around the country. For example, the U.S. Department of Agriculture and NASA signed a Youth Engagement agreement focused on joint STEM education activities such as agriculture literacy, food science, and life science. To celebrate the signing of the STEM agreement along-side NASA's Deputy Administrator Newman, local K-12 students planted seeds from romaine lettuce grown aboard the ISS in the U.S. Department of Agriculture (USDA)'s People's Garden in Washington, DC. To see the photo, go to: http://www.nasa.gov/image-feature/usda-and-nasa-plant-seeds-from-the-space-station

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NASA executed a competition across the Mission Directorates, NASA Center's Offices of Education, and the Jet Propulsion Laboratory (JPL). The Priorities Competition for SEAP used criteria in an internal-to-NASA Request for Information (i-RFI). The FY 2015-2016 i-RFI for SEAP used these broad criteria: 1) Background; 2) Focus; and 3) Evidence of Effectiveness. The SEAP i-RFI ensured all submitters answered the same items and identified the priorities for selection. For preliminary results of the SEAP process, go to: http://www.nasa.gov/offices/education/about/seap-overview.html.

The American Association of Community Colleges recognized Dr. Toby Dittrich, Associate Director for the Oregon Space Grant consortium, for providing students seamless transfers to STEM four-year programs at Oregon colleges and universities. A Denver CBS-affiliated news station highlighted three Colorado Space Grant students for overcoming extreme personal challenges, including homelessness and gang affiliation, to participate in the RockOn! launch from NASA Wallops, VA. To view the success story, go to https://www.youtube.com/watch?t=12&v=BYjy-su59n.

The Agency developed and publicly released the NASA Education Implementation Plan 2015-2017 to guide the diverse elements, including external stakeholders, of the NASA education community toward better alignment with national priorities and Agency strategy, mission, goals and values. Go to the "About NASA Education" page on NASA.gov, to choose the desired format: a 4-page brochure; a 70-page plan or an electronically enhanced version of the 70-page plan that includes engaging video offerings.

WORK IN PROGRESS IN FY 2016

The OE and SMD anticipate selecting 30 or more projects for implementation to support the Undergraduate Student Instrument Project (USIP) Student Research Flight Opportunity (SRFO) programmatic requirements, with an estimated total value of $6M for awards.

Experimental Program to Stimulate Competitive Research (EPSCoR), in collaboration with the ISS Office, will award five new ISS Flight Opportunities for the EPSCoR jurisdictions.

In November 2015, NASA Education launched the no-exchange-of-funds strategic partnerships for U.S. and international public and non-governmental entities competition to support mutually beneficial innovative education activities. In this new competition, NASA particularly sought efforts built around youth serving organizations, digital learning opportunities, STEM challenges and engagements or activities that reached underrepresented groups. For the full NASA Education partnerships criteria and competitive approach found in the NASA Announcement for High Impact/Broad Implementation STEM Education Partnerships [EDUCATION01SP16], go to http://go.nasa.gov/1RZwWCi.

NASA's OE coordinates with Headquarters' Offices of Communications, Diversity and Equal Opportunity, Chief Scientist, and Chief Technologist, and the Mission Directorates for the selection of proposals from the Competitive Program for Science Museums, Planetariums, and NASA Visitor Plus Other Opportunities (NASA Research Announcement (NRA) NNH15ZHA001N). In December 2015, about 70 youth-serving organizations, museums, planetariums, and NASA visitor centers in more than 25 states, Puerto Rico, and the Virgin Islands submitted proposals that are now under review with public announcement of selections expected in the last quarter of FY 2016 and/or first quarter FY 2017.

EDUCATION

KEY ACHIEVEMENTS PLANNED FOR FY 2017

NASA Education will focus on three main areas:

- continue to refine the technology infrastructure that provides support tools applicable to evidence-based program management and policy-making:
- conduct broad data collection and statistical analysis that reflect patterns, relationships, and anomalies in administrative and performance data sets: and
- perform internal and external program evaluation that assess and compare effectiveness of policy choices.

NASA Education will continue to provide a unified systematic and standardized approach to data collection and performance assessment. Objective and verifiable performance metrics, internal and external review processes, valid and reliable data collection instruments, and evaluation studies will assess progress and performance across the portfolio. To effectively monitor educational investments across the agency, NASA Education will collect and report performance data on all investments using the Office of Education Performance Measurement system. In addition to collecting data on activity outputs, such as counts of participants, NASA Education will develop and test new data collection instruments to assess short-term outcomes. NASA will actively participate in CoSTEM discussions on common metrics and instruments used across the federal government to monitor and assess the impact of federal STEM investments.

NASA Education will continue a robust, coordinated, and targeted evaluation process, which is essential for the Agency to measure and monitor program performance, make decisions for programmatic adjustments and changes, document program impact, identify best practices and lessons learned, help assess return on investment, provide inputs for policy, planning and budget decisions, and assure accountability to the American people.

Programs

AEROSPACE RESEARCH AND CAREER DEVELOPMENT

The Aerospace Research and Career Development (ARCD) program strengthens the research capabilities of the Nation's colleges and universities and provides opportunities that attract and prepare an increasing number of students for NASA-related careers. These institutions conduct research that contributes to NASA's Mission Directorate research needs and further the Nation's scientific and technology innovation agendas. These programs will continue to build, sustain, and effectively deploy the skilled, knowledgeable, diverse, and high-performing workforce needed to meet the current and emerging needs of NASA and the Nation.

The projects in the ARCD program are the National Space Grant College and Fellowship Program (Space Grant) and Experimental Program to Stimulate Competitive Research (EPSCoR).

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

The SEA program provides unique NASA assets, including its people, resources, and facilities to support the Nation's STEM education priorities. The projects within the SEA program are the Minority University Research and Education Project (MUREP) and SEAP.

The SEA program currently funds competitive grants, cooperative agreements, and professional development at NASA Centers for high school and college students, K-12 educators, and higher education faculty. The program enhances the education and research, academic, and technology capabilities of Historically Black Colleges and Universities (HBCU), Hispanic-Serving Institutions (HSI), Tribal Colleges and Universities (TCU), other Minority-Serving Institutions (MSIs), and the Nation's non-profit informal education institutions. It also provides opportunities for underrepresented and underserved learners to participate in research and education opportunities through internships, scholarships, and fellowships including opportunities for minority institutions to improve the quality of their faculty preparation programs, thereby improving the quality and diversity of future STEM leaders.

AEROSPACE RESEARCH AND CAREER DEVELOPMENT

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
National Space Grant College and Fellowship Program (Space Grant)	40.0	40.0	**24.0**	24.0	24.0	24.0	24.0
Experimental Program to Stimulate Competitive Research (EPSCoR)	18.0	18.0	**9.0**	9.0	9.0	9.0	9.0
Total Budget	**58.0**	**58.0**	**33.0**	**33.0**	**33.0**	**33.0**	**33.0**
Change from FY 2016			**-25.0**				
Percentage change from FY 2016			**-43.1%**				

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

The Montana Space Grant Consortium, established in 1991 as a component of NASA's National Space Grant College and Fellowship Program, supports various high altitude ballooning projects. Student Marty Seymour from Chief Dull Knife College prepares to launch a tethered balloon that proudly displays the Northern Cheyenne word for balloon along with the school's logo.

ARCD supports national STEM efforts through Space Grant and EPSCoR.

The NASA Authorization Act of 1988 (P.L. 100-147) established Space Grant with a goal of enhancing the Nation's science enterprise by funding education, research, and public service projects through a national network of university-based Space Grant consortia. In 1992, the NASA Authorization Act, FY 1993 (P.L. 102-588) established EPSCoR to strengthen the research capability of jurisdictions that had not previously participated equitably in competitive aerospace research activities. The goal of the NASA EPSCoR is to provide seed funding that will enable jurisdictions to develop an academic research enterprise directed toward long-term, self-sustaining, nationally competitive capabilities in aerospace and aerospace-related research. This capability will, in turn, contribute to the jurisdiction's economic viability and expand the Nation's base for aerospace research and development.

These national projects enable NASA to advance STEM literacy more strategically by enhancing science and engineering education and research efforts in higher education, K-12, and informal education. In addition to fellowships, scholarships and internships with NASA Centers and STEM industry, ARCD promotes research and technology development opportunities for faculty and research teams that advance the Agency's scientific and technical priorities.

EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Total Budget	**40.0**	**40.0**	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**
Change from FY 2016			**-16.0**				
Percentage change from FY 2016			**-40.0%**				

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

South Dakota Space Grant student, Steven Hamman, participates in commencement activities with President Obama at the Lake Area Technical Institute. Mr. Hamman is a recipient of a $5,000 Space Grant award and is currently weighing two employment opportunities with Fortune 500 companies.

Space Grant is a competitive grant opportunity that enables the active involvement of 52 consortia in 50 States, the District of Columbia, and the Commonwealth of Puerto Rico. Space Grant supports and enhances science and engineering education, and research efforts for educators and learners by leveraging the resource capabilities and technologies of over 900 affiliates from universities, colleges, industry, museums, science centers, and State and local agencies. Training grants with each consortium align their work with the Nation's STEM education priorities and the annual performance goals of the Agency.

Space Grant utilizes key NASA resources in order to provide students access to research and hands-on STEM experiences. Some of these activities include: high-altitude balloons, sounding rockets, aircraft, and space satellites. In order to maximize resources for these STEM investments, Space Grant leverages agency resources in STEM education through strategic collaborations with NASA Mission Directorates, Centers and subject matter experts.

In FY2015, Space Grant consortia received a new three-year training grant, titled Space Grant Opportunities in NASA STEM. All activities conducted by the 52 consortia are in alignment with agency goals, the OE lines of business, and the NSTC CoSTEM priority areas. Space Grant awards consist of scholarships, fellowships, or internships in support of higher education, research infrastructure, precollege, and informal education. Space Grant consortia also supported flight project activities led by student teams. Some of those flight activities included, but are not limited to:

- RockOn! Workshop

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

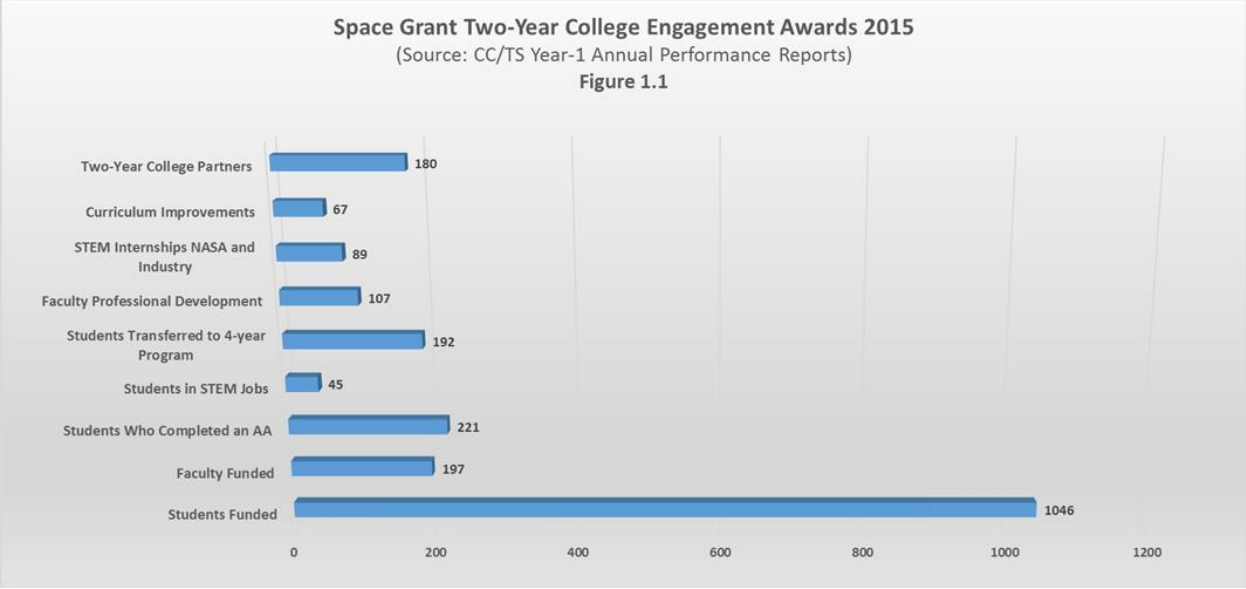
- RockSat-C
- RockSat-X
- DemoSat
- High Altitude Student Platform (HASP)

EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

ACHIEVEMENTS IN FY 2015

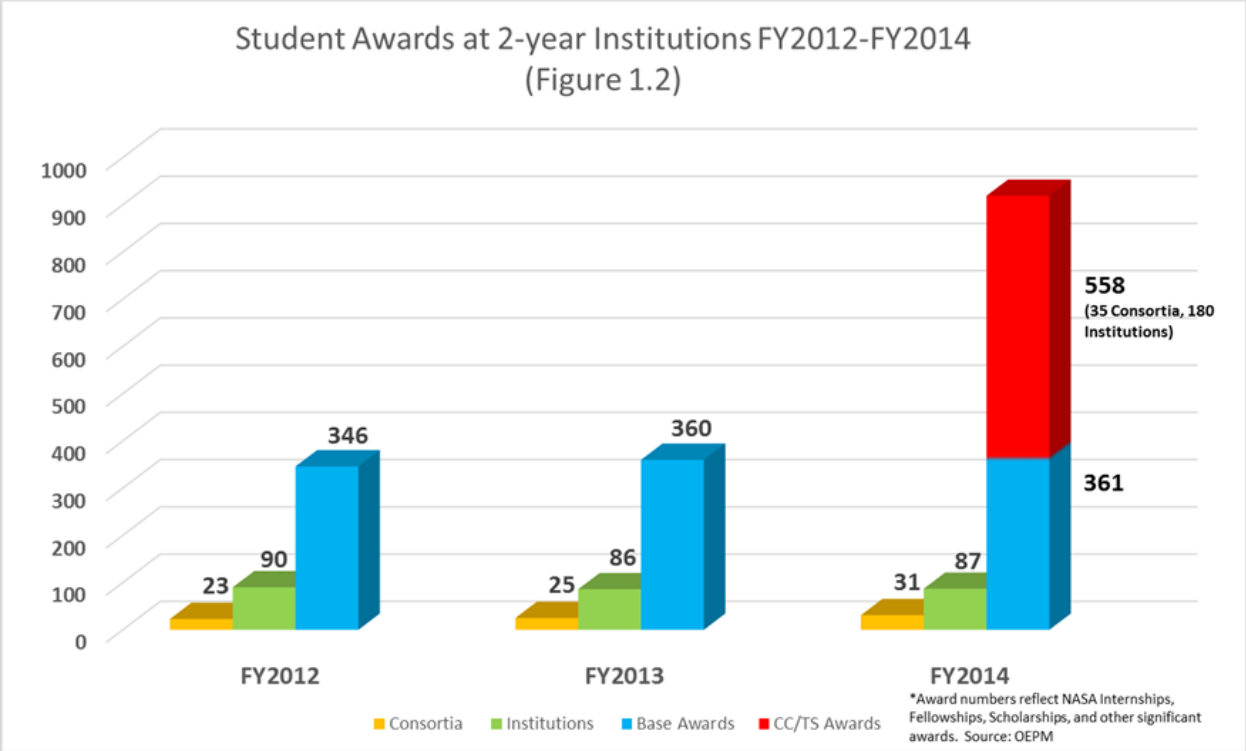
NASA Space Grant awarded 35 Community Colleges and Technical Schools (CC/TS) partnerships grants to increase students and faculty engagement in STEM across the U.S. The selected awards outlined innovative ways to attract and retain more STEM students from CC/TS through competitive STEM scholarships, distance learning STEM courses for students and faculty, and internship opportunities at NASA Centers. Figure 1.1 shows a total of 1,046 CC/TS students received funding and 221 students received their Associates of Arts (AA) degree.



The following Figure 1.2 shows the data trend of CC/TS students who received NASA Internship, Fellowship, Scholarship, and other significant awards through the Space Grant program during 2012-2014. Significant Awards = ≥ $5,000 or ≥ 160 or contact hours.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

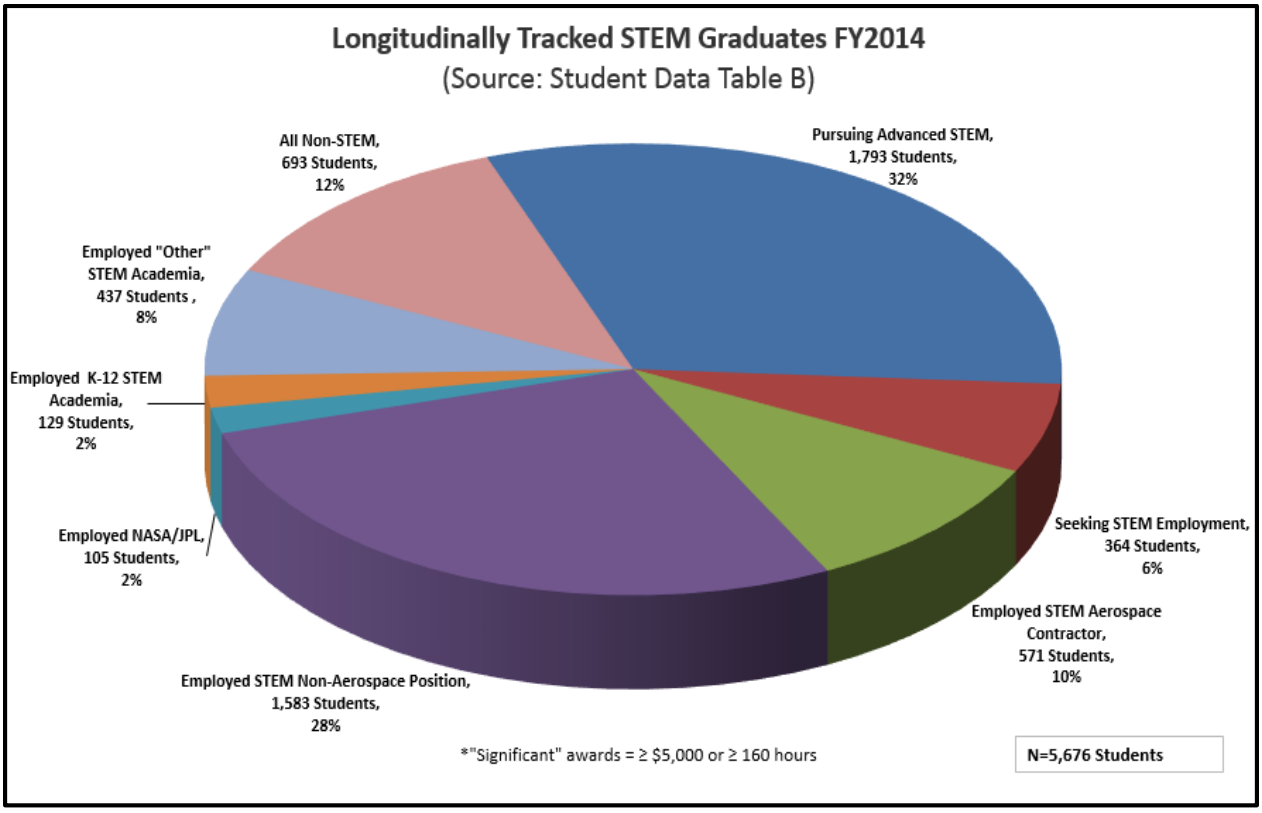


- As noted in Figure 1.2 above, the total involvement of NASA Internship, Fellowship, Scholarship, and other significantly awarded CC/TS students in 2012 was about 350 students and 90 CC/TS institutions in 23 out of the 52 Space Grant Consortia.
- In 2014, the number of NASA Internship, Fellowship, Scholarship, and other significantly awarded CC/TS students increased to 361 students with participation from 87 CC/TS institutions in 31 Space Grant Consortia.
- Of the 1,046 funded students who participated in the CC/TS award, 558 of these were students who received NASA Internships, Fellowships, Scholarships greater than or equal to $5,000 or at least 160 contact hours, resulting in a 61 percent increase over a two-year period.
- Another indicator of the CC/TS program's impact is that 235 students have moved on to four-year institutions and STEM employment. Since this is only the first year of the two-year award program, this number will increase next year.
- In an effort to increase the sustainability of these programs, initiatives include developing articulation agreements with four-year institutions, curricular development, or improvement, as well as cultivating opportunities for additional industry internships. For more information on the 35 community colleges and technical schools awards, please visit http://go.nasa.gov/1svsrWD.
- The American Association of Community Colleges recognized Dr. Toby Dittrich, Associate Director for the Oregon Space Grant consortium, for providing students seamless transfers to STEM four-year programs at Oregon colleges and universities.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

- A Denver CBS affiliated news station highlighted three Colorado Space Grant students for overcoming extreme personal challenges, such as homelessness and gang affiliation to participate in the RockOn! launch from NASA Wallops, VA. To view this success story, please visit https://www.youtube.com/watch?t=12&v=BYjy-su59n4.
- In the final year of the 2010-2014 Space Grant Training Grant, more than 4,500 undergraduate and graduate students through scholarships, fellowships, internships and authentic hands-on research and engineering challenges received awards. The program achieved 26 percent participation among underrepresented students and 40 percent participation among female students in Space Grant activities.
- Space Grant targeted elementary and secondary students through NASA informal education activities, web-based activities, and other instructional and enrichment activities; reaching more than 152,000 precollege students and more than more than 17,900 educators.



FY 2014 data is the most current data. FY 2015 Data is not available until June 2016.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

WORK IN PROGRESS IN FY 2016

Space Grant consortia are currently implementing activities outlined in their three-year strategic plans. In addition to those activities, the Space Grant program office at NASA Headquarters is planning to release a solicitation that augments the three-year awards. The consortia also continues to implement their community college/technical school awards during this fiscal year.

Finally, the consortia are currently developing proposals for the USIP SFRO, a partnership between Space Grant and the NASA SMD. The USIP SRFO proposals are specifically for an undergraduate student team to design, develop, and fly a science and/or technology investigation relevant to NASA strategic goals and objectives on a sounding rocket, balloon, aircraft, suborbital reusable launch vehicle (sRLV), other commercial suborbital vehicle, or CubeSat launched as a secondary payload on an orbital vehicle. The two goals of the USIP SRFO are:

- To provide a hands-on flight project experience to enhance the science, technical, leadership, and project skills for the selected undergraduate student team.
- To fly a science and/or technology investigation relevant to NASA strategic goals and objectives on a suborbital-class platform.
- The Space Grant program office at NASA Headquarters continues to prepare for an independent external evaluation of the national program, incorporating the results from the external evaluation into strategic planning for the Space Grant program.

KEY ACHIEVEMENTS PLANNED FOR FY 2017

The budget supports base awards for the 52 consortia to do the following:

- Provide hands-on experiences for U.S. graduate and undergraduate students to prepare them for the future workforce and/or academic careers;
- Conduct programs and projects that align with the NASA Education priorities, CoSTEM, missions, and State-specific needs to build upon the education pipeline in higher education, research infrastructure, precollege and informal education;
- Promote a strong STEM education base from elementary through secondary levels while preparing teachers in these grade levels to become more effective at improving student academic outcomes;
- Build upon and maintain the existing national network of universities with interests and capabilities in aeronautics, space, and related fields; and
- Leverage the opportunities emerging from the NASA Education strategy to develop high-impact, nationwide partnerships.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

Project Schedule

Date	Significant Event
Q1 FY 2017	Release of Solicitations
Q2 FY 2017	Proposals Due and Review Process
Q3 FY 2017	Selection and Awards
Q4 FY 2017	Prior Fiscal Years' Performance Data Due

Project Management & Commitments

The Space Grant Project Manager at NASA Headquarters provides management responsibility for day-to-day Space Grant operations. Civil servants at NASA centers actively engage with regional space grant consortia, providing direction, oversight, and integration with Center and Mission Directorate activities.

Acquisition Strategy

NASA solicits through full and open competition for proposals accepted from Space Grant 52 consortia in 50 States, District of Columbia, and the Commonwealth of Puerto Rico. Each consortium program or project must align with the Administration's and NASA's Strategic Plans for education. All award selections undergo rigorous peer reviews by internal/external panels that evaluate technical merit, assess content, feasibility, and alignment to Agency education, research, and technology goals. Awards are typically multi-year.

MAJOR CONTRACTS/AWARDS

None.

INDEPENDENT REVIEWS

The OE Evaluation Manager and the Space Grant Program office are engaged in community consultation and planning to support the next evaluation. Paragon TEC, the technical assistance provider was tasked with the following:

- Document the current Space Grant program model, including inputs, strategies/activities, outputs, and short-, intermediate-, and long-term outcomes in consultation with the Space Grant community

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations

- Conduct an assessment of performance data, reporting and program documentation held by Space Grant consortia and the NASA OE to ensure that appropriate, valid and reliable data are collected to document program activities, outputs, and outcomes; and
- Prepare a design and plan for an external evaluation study and make formal recommendations to improve NASA's performance monitoring.

Key technical findings and recommendations to NASA included the following:

- Prioritize data collection required for agency-level performance reporting because the data quality assessment found that a limited number of data elements were comparable across Space Grant consortia to capture program activity, outputs and outcomes;
- Consider consolidating tracking of students at NASA and use a professional service to conduct employment and enrollment verification; and
- Publish a program-level annual performance report in order to inform consortia about the status of the program and data quality.

For additional information, please visit:
http://www.nasa.gov/sites/default/files/atoms/files/spacegrant_final_oct-2015.pdf.

Review Type	Performer	Date of Review	Purpose	Outcome	Next Review
Independent/External	TBD	Apr 2016	To provide an independent review by an external organization to assess the accomplishments and strategy of the Space Grant Program	A 6-month preliminary interim report expected by September 2016. The report will also provide recommendations for the new 5-year Space Grant solicitation, which will be released during Quarter 1 of FY 2017	Apr 2017

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

Formulation	Development	Operations

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Total Budget	**18.0**	**18.0**	**9.0**	**9.0**	**9.0**	**9.0**	**9.0**
Change from FY 2016			**-9.0**				
Percentage change from FY 2016			**-50.0%**				

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

NASA EPSCoR project researcher, Dr. Jordi Cristóbal training undergraduate student Patrick Graham in setting up field equipment used to collect calibration and validation (CalVal) data. Airborne and satellite missions, as well as local and regional scale surface energy balance models that use input data from NASA satellite missions require such CalVal data for quality control and for quantitative studies.

The EPSCoR provides cooperative agreement opportunities designed to establish partnerships between government, higher education, and industry in an effort to build stronger research and development capabilities in the 27 jurisdictions (states or regions). The program strives to improve a jurisdiction's research infrastructure to a level such that its research and development programs contribute to its economic development. EPSCoR funds research in jurisdictions with modest research infrastructure to help establish a long-term, self-sustaining, and nationally competitive program so that they become more competitive in attracting non-EPSCoR funding.

National Science Foundation (NSF) uses the latest eligibility tables to determine overall jurisdiction eligibility for NASA EPSCoR. The NSF 2015 eligibility table is available at: http://www.nsf.gov/od/iia/programs/epscor/Eligibility_Tables/FY2015_Eligibility.pdf.

EPSCoR supports competitively funded awards and provides research and technology development opportunities for faculty and research teams. NASA actively seeks to integrate the research conducted by EPSCoR jurisdictions with the scientific and technical priorities pursued by the Agency.

EXPLANATION OF MAJOR CHANGES IN FY 2017

None

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

Formulation	Development	Operations

ACHIEVEMENTS IN FY 2015

NASA EPSCoR funded academic research has provided benefits in the following four areas:

- Increased competitive research capacity within targeted jurisdictions. All NASA 2014-2015 EPSCoR status reports are in an on-line document titled Stimuli at http://go.nasa.gov/1YakIhf. This document highlights EPSCoR-funded research accomplishments around the country.
- The University of North Dakota (UND) developed a Multi-Purpose Research Station in North Dakota designed to expand NASA space exploration-relevant research and help our next generation of explorers reach new worlds beyond Earth. The UND research resulted in:
    - 39 published papers
    - 74 talks and presentations
    - 63 new grants valued at $5,452,405 from agencies such as the Department of Energy, the Office of Naval Research, the NSF, the USDA, and the U.S. Environmental Protection Agency.
- Generation of advanced technology as evidenced by the awarding of patents.
    - Patent US 08695156 B2 developed by the University of Vermont for an aero-acoustic duster invention that provides for particle removal from surfaces using less energy than competing vacuum-cleaner devices. The complete details of the patent are at http://www.patentorg.com/aeroacoustic-duster-details-187386.
    - Researchers from University of Puerto Rico patented an approach to diamond induction by employing iron nanoparticles to induce the synthesis of diamond on molybdenum, silicon, and quartz substrates. (Patent #: US 8,784,766 B1–Issue Date – July 22, 2014). This is a spin-off patent to several earlier patents. The complete details of the patent are at https://www.google.com/patents/US8784766?dq=US8784766B1&hl=en&sa=X&ved=0ahUKEwj-0d_n5rvKAhWEJR4KHZOCBRoQ6AEIHDAA.
    - Researchers from the South Dakota School of Mines and Technology (SDSMT) patented "Alignment of carbon nanotubes comprising magnetically sensitive metal oxides in nanofluids," Patent Number: US 8,652,386 B2, issued: Feb 18, 2014. The complete details of the patent are at http://www.google.com/patents/US8652386.
- Demonstrated research productivity among EPSCoR funded faculty and postdoc researchers.
    - A total of 636 faculty and postdoc researchers participated in a total of 536 talks/presentations at professional meetings. Additionally, 307 peer reviewed publications were accepted or published, and 169 other publications were accepted or published.

WORK IN PROGRESS IN FY 2016

EPSCoR will make new research awards based on availability of funding. Each funded proposal will establish research activities with the potential to make significant contributions to NASA's strategic research and technology development priorities and contribute to the overall research infrastructure, science and technology capabilities, higher education, and economic development within the EPSCoR jurisdiction.

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

Formulation	Development	Operations

EPSCoR, in cooperation with the ISS Program Office, will award five new ISS Flight Opportunities for the EPSCoR jurisdictions. Additionally, EPSCoR uses its collaboration with the nine NASA centers and JPL to provide workshops aimed at increasing the jurisdiction's knowledge of NASA's unique and innovative capabilities, resources, and facilities.

KEY ACHIEVEMENTS PLANNED FOR FY 2017

NASA EPSCoR will issue a competitive call for extramural Research Infrastructure Development (RID) and ISS Flight Opportunity proposals, and support Space Technology Mission Directorate/EPSCoR workshops. NASA EPSCoR research priorities are defined by the Mission Directorates (Aeronautics Research, Human Exploration & Operations, SMD, and Space Technology), and NASA's ten Centers. Each funded NASA EPSCoR proposal establishes research activities that will make significant contributions to the strategic research and technology development priorities of one or more of the Mission Directorates, and contribute to the overall research infrastructure, science and technology capabilities, higher education, and economic development of the jurisdiction. For example, one of the Aeronautics Research Mission Directorate research priority is green aviation: enabling fuel-efficient flight planning, reductions in aircraft fuel consumption, emissions, and noise. For additional information on NASA research NSPIRES solicitations, please visit http://nspires.nasaprs.com (select "Solicitations" and then "Open Solicitations"). Appendix A provides a summary of Research priorities for each of the Mission Directorates and Centers.

Project Schedule

Date	Significant Event
Q1 FY 2017	Release of Solicitations (Research and Research Infrastructure Development Opportunities)
Q2 FY 2017	Proposals Due and Review Process (Research and Research Infrastructure Development Opportunities)
Q3 & Q4 FY 2017	Selection and Awards (Research and Research Infrastructure Development Opportunities)

Project Management & Commitments

The program manager for NASA EPSCoR resides at NASA Headquarters and is responsible for overall administrative duties of this national project. The project manager is located at Kennedy Space Center (KSC) and provides management responsibility for day-to-day operations. Contractor staff and representatives from each NASA Mission Directorate work closely with EPSCoR project management to ensure that current and future research requirements are in EPSCoR solicitations. The Mission Directorate

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

Formulation	Development	Operations

representatives serve as the proposal selection committee, further ensuring that the selected work contributes to NASA priorities. Technical monitors at the NASA centers and Headquarters monitor and assess the progress of each award. They provide scientific guidance and technical advice as required throughout the year regarding the overall progress of the proposed effort, and review all progress reports. Additional involvement may occur, depending upon the nature of the collaboration already established or desired. This includes integrating the EPSCoR research into ongoing activities or research efforts, and increasing the principal investigator's and his or her team's awareness of other related or relevant research in NASA. NASA is a member of the Federal EPSCoR Interagency Coordinating Committee (EICC), chaired by the NSF. The committee works to improve the leveraging of Federal EPSCoR investments. NASA EPSCoR continues to develop strategies to adhere to the guidance within the America COMPETES Act.

Acquisition Strategy

NASA solicits and awards EPSCoR grants through a competition among institutions from designated EPSCoR States. Each jurisdiction's proposal must align with the Administration's and NASA's strategic plans for education. All award selections undergo rigorous peer reviews by internal/external panels that evaluate technical merit, assess content, feasibility, and alignment to Agency education, research, and technology goals. Awards are typically multi-year.

MAJOR CONTRACTS/AWARDS

None.

EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCOR)

Formulation	Development	Operations

INDEPENDENT REVIEWS

Review Type	Performer	Date of Review	Purpose	Outcome	Next Review
Independ-ent	National Academy of Sciences	Nov 2013	Cross-agency evaluation of EPSCoR and other Federal EPSCoR-like programs and accomplishments per H.R. 5116 America COMPETES Reauthorization of 2010.	NASA incorporated the findings of the November 2013 report of the National Academy of Sciences on the EPSCoR program into its FY 2017 budget request. NASA continues to participate in the Federal EICC, meetings in FY 2017.	N/A

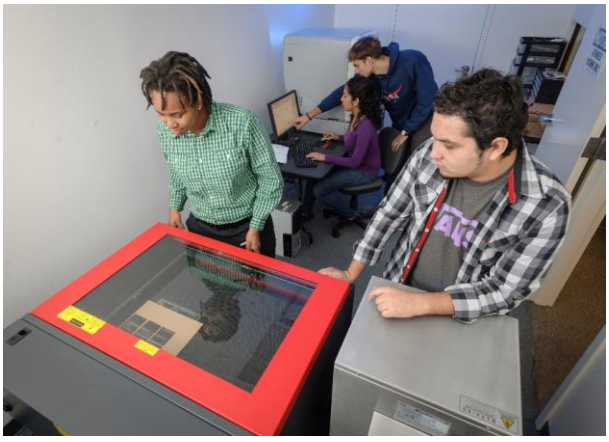
STEM EDUCATION AND ACCOUNTABILITY

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Minority University Research Education Project	32.0	--	**30.0**	30.0	30.0	30.0	30.0
STEM Education and Accountability Projects	29.0	--	**37.1**	39.1	41.1	43.2	45.3
Total Budget	**61.0**	**--**	**67.1**	**69.1**	**71.1**	**73.2**	**75.3**

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.



SEAP funded students work to develop models using 3D printing to demonstrate the effects of air currents on a unique wing design.

The SEA program provides unique NASA assets, including people, resources, and facilities to support the Nation's STEM education priorities. Through the competitive award of federal domestic assistance funds and collaboration with other Federal agencies such as the Department of Education, the NSF, and Smithsonian Institution, the program provides students and educators with access to NASA assets and content. It connects NASA's partners, including higher education institutions, minority-serving institutions, community colleges, NASA visitor centers, museums, planetariums, and other youth serving organizations to the exciting and compelling content emanating from NASA's scientific discoveries, aeronautics research, and exploration endeavors.

NASA provides multi-year grants and cooperative agreements to the Nation's HBCUs, HSIs, TCUs, and other MSIs through MUREP. MUREP awardees provide internships, scholarships, fellowships, mentoring, and tutoring for underserved and underrepresented learners in K-12, informal, and higher education settings, (including community colleges, particularly those serving a high proportion of minority and underserved students, persons with disabilities, and women).

EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

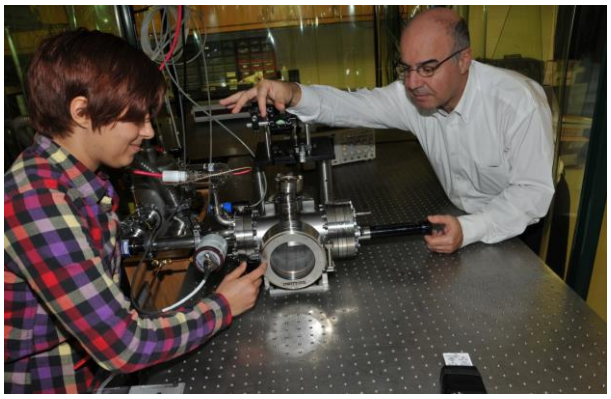
Formulation	Development	Operations

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Total Budget	32.0	--	30.0	30.0	30.0	30.0	30.0

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.



Ms. Alissa Mezzacappa, NASA Minority University Research and Education Opportunity (MIRO) Scholar and PhD Candidate in Applied Optics and Dr. Noureddine Melikechi, NASA MIRO Principal Investigator at Delaware State University aligning optical set-up and preparing to take measurements of samples. This PhD program is the first of its kind among HBCUs.

NASA provides financial assistance (grants and cooperative agreements) to the Nation's HBCUs, HSIs, Asian American and Native American Pacific Islander-Serving Institutions (AANAPISI), TCUs, American Indian and Alaskan Native Serving Institutions (AIANSI), Predominantly Black Institutions (PBI) and eligible community colleges. The Administration recognizes the valuable role that these institutions play in educating our citizens, as reflected in the five MSIs focused Executive Orders signed by the President. These institutions recruit and retain underrepresented and underserved students, including women and girls, and persons with disabilities into STEM fields. Participation in NASA projects and research has the potential to stimulate increasing numbers of learners to continue and complete their studies at all education levels and encourages students to earn advanced degrees in STEM fields that are critical to NASA and the Nation.

NASA's MUREP investments enhance the research, academic, and technology capabilities of MSIs through multi-year awards. Awards assist faculty and students in research and provide authentic STEM engagement related to NASA missions. These competitive awards provide NASA specific knowledge and skills to historically underrepresented and underserved learners in STEM. MUREP investments also assist NASA in meeting the goal of a diverse workforce through student participation in internships, scholarships, and fellowships at NASA Centers and JPL. MUREP provides financial assistance via competitive awards to MSIs and eligible community colleges, consistent with the goals of the five MSI focused Executive Orders. These institutions recruit and retain underrepresented and underserved students, including women and girls, and person with disabilities, into STEM fields.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

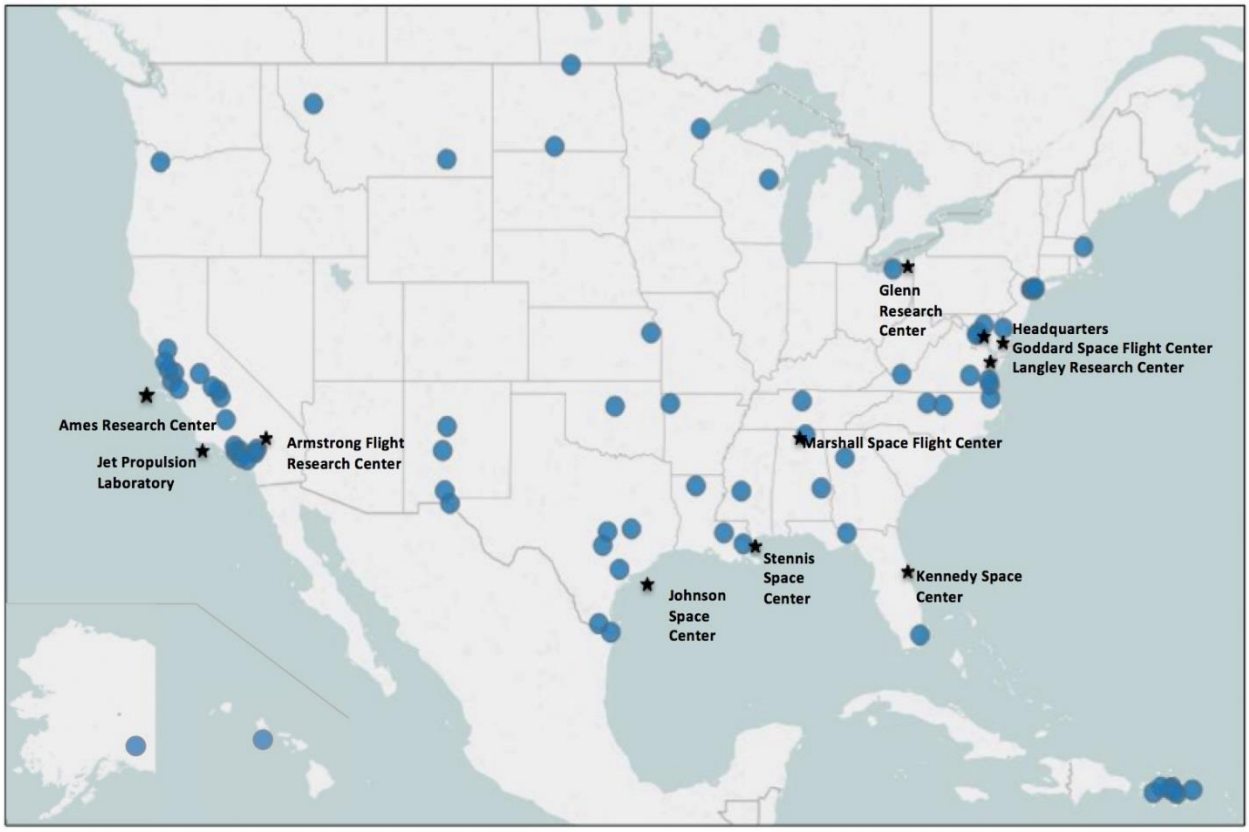
EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

ACHIEVEMENTS IN FY 2015

MUREP provided oversight to 111 active MSI awards across the United States. MUREP informs faculty and students about NASA's competitive research and education opportunities with the focus of increasing retention rates and degree completion at each educational level at MSIs in NASA-related fields. In addition, these awards also provide opportunities for MSIs to improve educators' professional development and thereby better serve groups historically underrepresented and underserved in STEM.

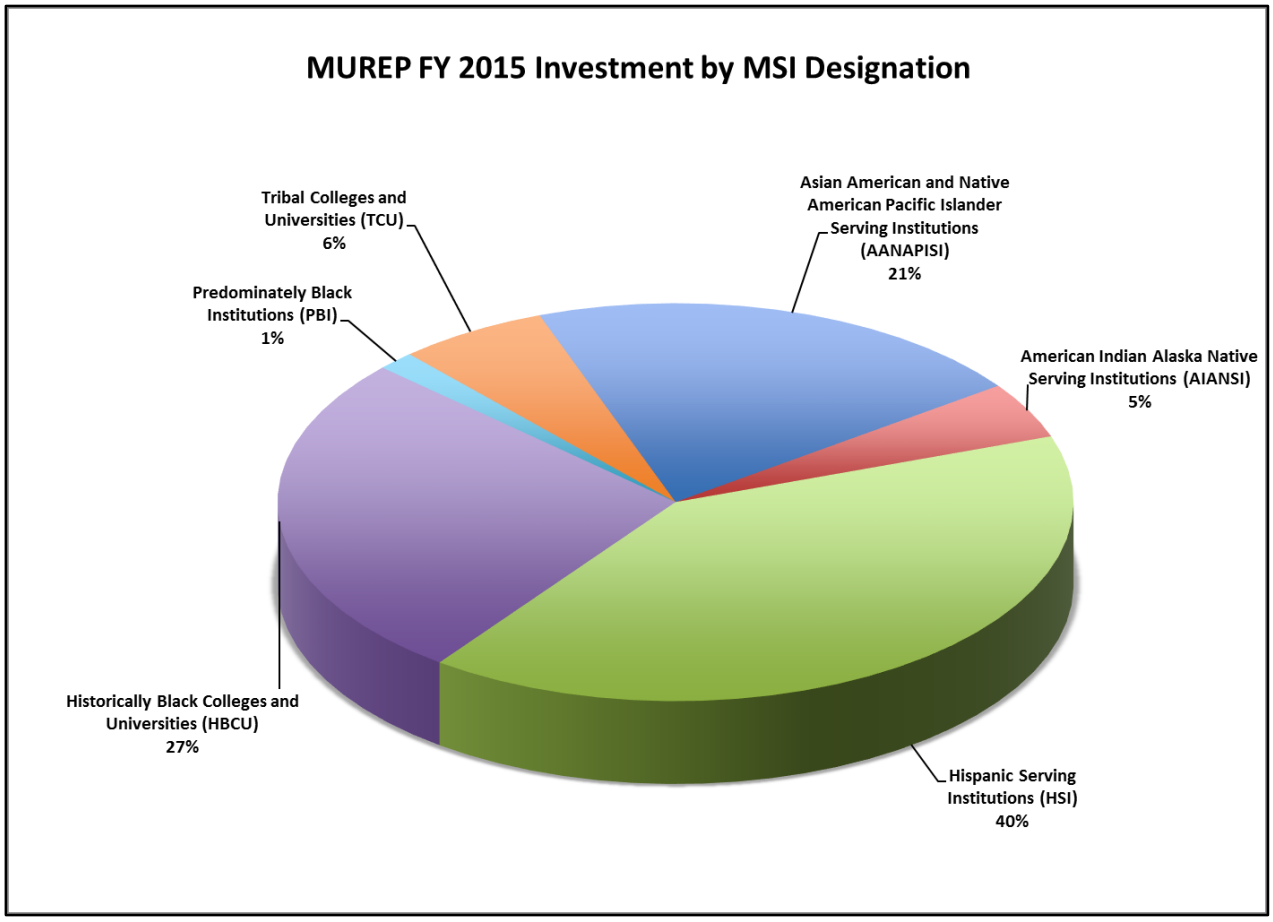
FY2015 MUREP Awards by Location



****Note: Some dots may represent more than one Institution for Institutions located in the same city.**

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations



****Note: Some Institutions have dual MSI designations.**

In FY 2015, MUREP received an additional $2M that was distributed through a competitive solicitation entitled MUREP Other Opportunities (MOO). MOO selected four universities to receive awards, which provide up to a total of $500,000 to each school for a three-year performance period. The solicitation challenged schools to propose innovative ways to create and implement STEM activities, with a goal of increasing the number of historically underserved students studying STEM fields relevant to NASA's diverse exploration mission. For more information on this selection, please review the NASA Press Release. (https://www.nasa.gov/press-release/nasa-awards-grants-to-broaden-stem-education-for-underserved-students)

MUREP's Earth Systems, Technology, and Energy Education for MUREP (ESTEEM) is a competitive project designed to increase the climate literacy and level of engagement of the United States public. The goal is to create a diverse, highly skilled, and motivated future workforce in climate-related sciences. Awardees from 33 states across the nation and Washington, DC have participated in this project activity, with a key priority to collaborate with MSIs. ESTEEM operates in a collaborative partnership with NASA's SMD, NSF, and National Oceanic and Atmospheric Administration (NOAA). A few FY 2015 achievements of ESTEEM include:

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

- ESTEEM served 730 undergraduate and graduate students, 617 elementary and secondary students, 165 higher education faculty, 52 teachers, and 190 administrators and members of the general public directly participated in activities developed by the awardees. Examples of ESTEEM's engagement:
    - Ask Useful Science (Ask US) Google+ Hangout series designed to expand learning for Educators on a virtual platform and to extend the reach of NASA's unique content to audiences throughout the nation reached over 1400 educators. For additional information, please visit: http://esteem.larc.nasa.gov/ask-us/.
    - ESTEEM continues the development and implementation of the Tri-Agency Climate Education (TrACE) catalog, a comprehensive online catalog of educational resources developed by members of the tri-agency community (NASA, NSF, and NOAA). TrACE is an interactive, searchable web interface that contains a wide spectrum of project information to help users find relevant earth system science and climate change education resources. Currently, the TrACE catalog contains over 200 climate education resources, submitted by 86 tri-agency funded projects. For additional information, please visit: https://trace.larc.nasa.gov.
- The MUREP Institutional Research Opportunity (MIRO) aims to promote literacy in STEM at MSIs and to enhance the sustainable capabilities of institutions to perform research and education aligned to NASA's mission. In 2015, the MIRO Optical Science Center for Applied Research (OSCAR) at Delaware State University awarded its first PhD. in Applied Optics to Dr. Leon Taleh. Delaware State is one of only about a dozen institutions nationwide to offer a PhD. in Optics and the only HBCU.
- Ms. Alissa Mezzacappa, the second PhD. in Optics funded by the MIRO award at Delaware State, graduated December 2015. Alissa is a member of the MARS Science Laboratory, ChemCam Instrument Development & Science Team that received the NASA Group Achievement Award in 2014.

WORK IN PROGRESS IN FY 2016

MUREP continues to fund efforts to help prepare historically underrepresented and underserved students in NASA specific STEM disciplines and careers. MUREP funding will be used to maintain active agreements and awards for HBCUs, HSIs, TCUs, AANAPISIs, AIANSIs, PBIs other MSIs, and non-profit organizations that contribute to the Agency's workforce diversity and MUREP's goals. For NASA's full report of accomplishments in MUREP, go to http://www.nasa.gov/offices/education/performance/index.html.

MUREP provides competitive funding opportunities to MSIs through an omnibus solicitation called Educational Opportunities in NASA STEM (EONS). EONS can be located at the NASA Solicitation and Proposal Integrated Review and Evaluation System website. MUREP will release EONS 2016 in preparation for FY 2017 awards. For more information, go to http://nspires.nasaprs.com.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

KEY ACHIEVEMENTS PLANNED FOR FY 2017

According to the Science and Engineering Indicators 2014, the proportion of students planning to major in science and engineering are lower for women in every racial and ethnic underrepresented group in STEM. The White House Executive Order 13506 echoes the lack of women and girls in STEM fields including women of color and those with disabilities. In FY 2017, MUREP will support efforts to increase retention and graduation rates for women of color in STEM fields. Likewise, in February 2014, the administration launched the "My Brother's Keeper Initiative" to build ladders of opportunity for boys and young men of color. MUREP will leverage strategic efforts to reach boys and young men of color with opportunities in STEM. All MUREP activities map to the annual performance indicators. MUREP investments assist NASA in meeting the goal of a diverse future workforce through student participation in NASA-related internships, fellowships, and scholarships at NASA Centers. MUREP contributes to the diversity of activities in NASA Education. NASA targets recruitment and retention of underrepresented and underserved students, including women and girls, and persons with disabilities, into the STEM fields in all education programs.

MUREP investments enhance the research, academic, and technology capabilities of MSIs through multi-year awards. MUREP funding will be used to maintain active agreements and awards for HBCUs, HSIs, TCUs, AANAPISIs, AIANSIs, PBIs other MSIs, and non-profit organizations that contribute to the Agency's workforce diversity and MUREP's goals.

Project Schedule

MUREP implements a consolidated investment through the NRA EONS. NASA plans to release a new EONS opportunity no later than the last quarter of FY 2017 with a rolling schedule of opportunities through FY 2018.

Date	Significant Event
Q1 FY 2017	Release of Solicitations (EONS Appendix Opportunities)
Q2 FY 2017	Proposals Due and Review Process (EONS Appendix Opportunities)
Q3 & Q4 FY 2017	Selection and Awards (EONS Appendix Opportunities)

Project Management & Commitments

The MUREP project manager is located at NASA Headquarters and provides management and oversight for overall activity operations. NASA centers manage significant investments in project activity elements. The current MUREP elements are as follows:

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

Element	Description	Provider Details	Change from Formulation Agreement
MIRO	MIRO is designed to establish significant, multi-disciplinary, scientific, engineering, and/or commercial research centers at the host MSI, that contribute substantially to the programs of one or more of the NASA Mission Directorates as described in the 2014 NASA Strategic Plan.	Provider: All NASA Centers Lead Center: Armstrong Flight Research Center Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	
MUREP Community College Curriculum Improvement (MC3I)	MCI is designed to strengthen STEM curricula and curricular pathways at two-year MSIs; Strengthen and diversify the STEM pipeline through high school partnerships.	Provider: All NASA Centers Lead Center: Headquarters Performing Center(s) All NASA Centers: Cost Share Partner(s): N/A	
MUREP NASA Internship, Fellowship, and Scholarship (NIFS)	MUREP NIFS provides historically underrepresented groups in STEM fields and students at MSIs the opportunity to use NASA facilities and assets to provide work experiences and research and educational opportunities to improve retention in STEM and prepare students for employment in NASA STEM jobs.	Provider: All NASA Centers Lead Center: JSC, Ames Research Center Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	
MUREP for American Indian and Alaskan Native STEM Engagement (MAIANSE)	MAIANSE provides opportunities for TCU students, faculty and staff; and high school students who are likely to matriculate at TCUs, to engage in NASA-related STEM scientific research and engineering activities.	Provider: All NASA Centers Lead Center: Goddard Space Flight Center Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

Element	Description	Provider Details	Change from Formulation Agreement
MUREP Educator Institutes (MEI)	MEI is designed to develop, promote, or utilize new, innovative, and replicable approaches to improving STEM learning and instruction; Provide experiences and activities that are grounded in education research or use evidence-supported approaches, techniques, and tools; and build linkages and connections to and from secondary education, elementary education, middle school education, and higher education.	Provider: All NASA Centers Lead Center: Stennis Space Center Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	
MUREP STEM Engagement (MSE)	MSE gives MSIs the opportunity to design, develop, and implement a NASA-related STEM challenge targeted for MSI and community college STEM-enrolled students. All challenges align with the NASA mission and a specific NASA program or project. MSIs develop and implement processes to capture the impact of activities and strategies implemented through this challenge participation.	Provider: All NASA Centers Lead Center: KSC Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	
ESTEEM	ESTEEM increases the level of climate literacy and engagement of the United States public; advance the understanding of how to effectively teach global climate change concepts; and create a diverse, highly skilled, and motivated future workforce in climate-related sciences.	Provider: All NASA Centers Lead Center: LaRC Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations

Element	Description	Provider Details	Change from Formulation Agreement
MUREP Aerospace Academy (MAA)	MAA educates students using a STEM curriculum that meets national math, science, and technology standards aligned to NASA's Mission Directorates.	Provider: All NASA Centers Lead Center: GRC Performing Center(s): All NASA Centers Cost Share Partner(s): N/A	

Acquisition Strategy

MUREP solicits new and innovative education products, tools, and services from qualified MSIs and nonprofit organizations. This occurs in response to changes in STEM education trends, identified gaps, or opportunities in the education portfolio of investments, demonstrated customer need or demand, or when the Administration or Congress identifies new priorities. NASA awards education cooperative agreements, grants and contracts through full and open competition.

MAJOR CONTRACTS/AWARDS

None.

INDEPENDENT REVIEWS

All MUREP activities document performance through either external evaluations or internal reviews conducted by NASA staff. For example, a Technical Review Committee, made up of NASA and industry engineers and scientists, review each research awardee annually during the five-year performance period. Renewal packages for individual grantees include all relevant reports.

In 2015, MUREP reviewed two elements of the portfolio using the techniques of social network analysis. An evaluator at Science Systems and Applications, Inc., in Hampton, VA, under a contract through NASA LaRC conducted the review. The first review focused on identifying collaborations and partnerships across the portfolio of MUREP awardee institutions that received funding support in fiscal years 2011 through 2014. This process identified 366 institutions or organizations contributing to MUREP activities during that period, including 149 minority-serving institutions. The second review focused specifically on MUREP's student support activities, currently part of the NASA OE's NIFS line of business. This review compared student opportunities through MUREP funding in academic years 2010-2011, 2011-2012, and 2012-2013 to similar opportunities in 2013-2014, 2014-2015, and 2015-2016. In particular, this review focused on MUREP's reach to students who attend eligible minority serving institutions and identified a striking increase in participation beginning in academic year 2014-2015. These reviews highlighted a need for greater communication and knowledge transfer between and among MUREP activities in order to better leverage partner contributions. It also identified MSI types MUREP activities could target (HSIs, AIANSIs, and PBIs).

STEM EDUCATION AND ACCOUNTABILITY PROJECTS

Formulation	Development	Operations

FY 2017 Budget

Budget Authority (in $ millions)	Actual FY 2015	Enacted FY 2016	Request FY 2017	Notional FY 2018	Notional FY 2019	Notional FY 2020	Notional FY 2021
Total Budget	29.0	--	37.1	39.1	41.1	43.2	45.3

FY 2015 reflects funding amounts specified in the September 2015 Operating Plan per Public Law 113-235.

FY 2016 reflects only funding amounts specified in Public Law 114-113, Consolidated Appropriations Act, 2016. FY 2016 funding levels are subject to change pending finalization of the FY 2016 Operating Plan.

Mike Foreman signed autographs at GRC's third annual National Lab Day on May 22, 2015. He gave a thrilling presentation about his experiences as Space Shuttle Astronaut to a group of 300 middle school students. Additionally, Mike made the day for one excited young fan (pictured in front) who is anxious to show off the autograph she just received. National Lab Day engaged students in presentations, research demonstrations, hands-on activities, and lab tours throughout the day.

SEAP uses competition to support only the most meritorious education functions, assets, and efforts of the Offices of Education at NASA Centers and JPL, Aeronautics Research Mission Directorate and Human Exploration and Operations Mission Directorate.

SEAP enhances coordination with other agencies that focus on those areas of STEM education where the Federal government can have maximum impact, including innovations in performance monitoring, evaluation and formal and informal education. The STEM Education and Accountability Projects portfolio of diverse activities directly responds to NASA's Strategic Objective 2.4: Advance the Nation's STEM education and workforce pipeline by working collaboratively with other agencies to engage students, teachers, and faculty in NASA's missions and unique assets. Specific activities funded by SEAP have goals designed to advance the Federal STEM Education five-year Strategic Plan prepared by the National Science and Technology Council's CoSTEM, addressing one or more STEM Education Priority Investment Area(s) and/or Implementation of the Coordination Objective(s).

SEAP is the result of NASA continuing to streamline and competitively consolidate its STEM education activities, consistent with Congressional and Administration direction. Working in collaboration with other Federal agencies, particularly the USDA, NSF, Smithsonian Institution, and Department of Education, NASA continues to support STEM activities across four lines of business: 1) educator professional development, 2) STEM engagement, 3) institutional engagement, and 4) internships, fellowships and scholarships. NASA's business lines provide opportunities to educators and learners, including women, minorities, and persons with disabilities.

STEM EDUCATION AND ACCOUNTABILITY PROJECTS

Formulation	Development	Operations

EXPLANATION OF MAJOR CHANGES IN FY 2017

None.

ACHIEVEMENTS IN FY 2015

- Approximately 828,000 elementary and secondary students participated in NASA instructional and enrichment activities.
    - Of those students, NASA engaged more than 39,000 in the fifth and final year of the Summer of Innovation pilot, launched in 2010 to support the President's "Educate to Innovate" initiative.
- In September 2015, after competitive selection in June as SEAP's top institutional engagement priority, NASA's OE, in cooperation with Headquarters' Offices of Communications, Diversity and Equal Opportunity, Chief Scientist, and Chief Technologist, and all the agency's Mission Directorates issued the Competitive Program for Science Museums, Planetariums, and NASA Visitor Plus Other Opportunities (NRA NNH15ZHA001N). The NRA fully aligns to the NASA and Federal STEM five-year Strategic Plan; and sets new, minimum standards for NASA recipients' evaluation activities. Proposers must describe the conduct of an independent evaluation in order to improve or assess the effectiveness of proposed strategies that advance the Nation's STEM education or workforce, including a dedicated budget.
    - More than 105 youth-serving organizations, museums, planetariums, NASA visitor centers, and other potential proposers from the District of Columbia, Puerto Rico and 36 states dialed into the NRA's pre-proposal telecon.
- The One-Stop Shopping Initiative received more than 33,000 undergraduate, graduate, and high school student applications for NASA-unique internships, fellowships, and scholarships. From this pool of exceptional talent, NASA Education was able to support 1,717 students via a NASA-unique fellowship, internship, or scholarship opportunity.
- In addition to the 40 Education no-exchange-of-funds Space Act agreements, NASA Education also supported education-related partnerships made by other NASA organizations, including Headquarters' Communications. One such agreement with Fox US Productions 38, Inc. supported the feature film The Martian. In September 2015, NASA Education's Digital Learning Network reached over 12,000 students and teachers from around the United States and seven countries for an interactive visit with The Martian's author Andy Weir, NASA experts and movie actors.

WORK IN PROGRESS IN FY 2016

NASA continues to implement the results of a competition across the Mission Directorates, NASA Offices of Education at the Centers, and JPL. The 2015-2016 Priorities Competition for SEAP used criteria in an i-RFI. The initial i-RFI for SEAP used the following broad criteria: 1) Background; 2) Focus; and 3) Evidence of Effectiveness. The SEAP i-RFI ensured all submitters answered the same items and identified the priorities for selection. For a copy of the i-RFI, go to http://www.nasa.gov/sites/default/files/atoms/files/nasa_fy15_fy16_seap_priorities_competitionfinal.pdf.

STEM EDUCATION AND ACCOUNTABILITY PROJECTS

Formulation	Development	Operations

The i-RFI determined the universe of priorities SEAP should select for FY 2016 funds. In brief, the selected activities most directly align to four of the five Federal STEM Education Five-Year Strategic Plan Priority Investment Area(s):

- Increase and Sustain Youth and Public Engagement in STEM
- Improve STEM Instruction
- Enhance STEM Experience of Undergraduate Students
- Better Serve Groups Historically Underrepresented in STEM Fields

SEAP selections also respond to the Federal STEM Education's Five-Year Strategic Plan's Implementation of the Coordination Objectives:

- Build New Models for Leveraging Assets and Expertise
- Build and Use Evidence-based Approaches

KEY ACHIEVEMENTS PLANNED FOR FY 2017

In 2017, NASA will make new commitments based on the competitive acquisition strategy described below. SEAP will execute a new internal-to-NASA competition in FY 2017. Education Offices at NASA Centers, including Jet Propulsion Laboratory, and previously funded evidence-based activities will be eligible to compete for new or follow-on SEAP funding. The winners of the SEAP competition reflect the best that NASA has to offer to the Nation's STEM enterprise. For SEAP's most current competitive achievements aligned to NASA Education's four business lines and the CoSTEM Plan, go to http://www.nasa.gov/offices/education/about/seap-activities.html.

Project Schedule

- Over the past three years, NASA worked with CoSTEM to finalize criteria for success, develop common evidence standards, identify evaluation and research toolkits, and pursue efficiencies and collaborative opportunities consistent with the NSTC five-year Federal STEM Education Strategic Plan.
- In years four and five of the NSTC five-year Federal STEM Education Strategic Plan, the Agency continues to increase alignment with the adopted criteria.

The FY 2017 SEAP competition will identify, prioritize, and select activities that are evidence-based, show evidence of effectiveness, and capitalize on the excitement of NASA's STEM, including problem based learning. The results may be available as early as the second quarter of FY 2017. As of the date of this document, the NASA's Education Coordinating Council began preliminary deliberations regarding a second SEAP competition and how to improve Centers and NASA Mission Directorates coordination in the development of concepts, logic models, and estimated price reports.

STEM EDUCATION AND ACCOUNTABILITY PROJECTS

Formulation	Development	Operations

Date	Significant Event
On-going throughout FY 2018	NSTC Committee on STEM Meetings

Project Management & Commitments

The lines of business managers (LOBs) for educator professional development, internships, fellowships and scholarships, STEM engagement and institutional engagement are located at NASA Headquarters and provide oversight for strategic activities and operations. The table below illustrates some cooperative agreements or contracts awarded in prior years.

Element	Description	Provider Details	Change from Formulation Agreement
Cooperative Agreement Number: NNX13AJ37A	Cooperative Agreement Selection Under the Cooperative Agreement Notice issued by OE NASA Internships Solicitation number: NNJ13ZBR001C	Provider: Universities Space Research Association Lead Center: Headquarters Performing Center(s): All Cost Share Partner(s): Not Applicable	No change Cooperative Agreement expires May 2018 Performance start date: May 2013
Contract Number: C13-012	The NASA Glenn Education Support Services contract will help advance high-quality STEM education in Cleveland, NASA Headquarters in Washington, and other NASA centers, as necessary.	Provider: Paragon-TEC, Inc. of Cleveland Lead Center: GRC Performing Center(s): All Cost Share Partner(s): Not Applicable	No Change Contract expires March 2018 Performance start date: April 2013

Acquisition Strategy

Consistent with existing NASA practices, NASA uses cooperative agreements, grants, and contracts through full and open competitions when necessary. External and internal experts base selections in part on peer reviews, In FY 2016 NASA selected activities via the FY 2015 internal-to-NASA SEAP competition.

MAJOR CONTRACTS/AWARDS

None.

STEM EDUCATION AND ACCOUNTABILITY PROJECTS

Formulation	Development	Operations

INDEPENDENT REVIEWS

NASA's primary approach to independent reviews is informed by the five-year Federal Strategic Plan and reports from the NSTC CoSTEM (Progress Report on Coordinating Federal STEM Education, March 2015) (For more information, go to https://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_ed_budget_supplement_fy16-march-2015.pdf. NASA also relies on third-party reports conducted by the agency's Office of Inspector General and the Government Accountability Office.

NASA embeds evaluation and accountability requirements within SEA activities as appropriate for performance monitoring. In October 2015 the NASA Office of Inspector General issued its report No. IG-16-001 measuring the performance of NASA's Education Program. The OIG's report states that they "initiated this audit to examine NASA's education activities and determine whether the Agency was effectively implementing its education objective and Federal STEM education priorities." The OIG found that "NASA's OE has taken steps to improve its management of the Agency's diverse education portfolio by restructuring several programs and projects to better align with Federal guidance." The OIG also found that: "the OE has developed a competitive process for identifying effective STEM education activities that deserve funding, NASA can further improve its processes and procedures to collaborate and consolidate education activities. In response to an OMB requirement that NASA's internal projects and activities compete with one another for education funding, in FY 2015 the OE initiated an internal, criteria-based competition as the basis for its funding prioritization process." NASA agreed to corrective actions related to five OIG recommendations and the agency's response noted: "NASA recognizes this audit as a progress report on the agency's on-going restructure of its Education portfolio, including performance measurement reporting conducted by the OE. NASA also appreciates that the OIG's draft report documents NASA's education investment and ways that investment contributes to Federal STEM Education Five-Year Strategic Plan, a priority for the Obama Administration." (For the full report and agency response, go to https://oig.nasa.gov/audits/reports/FY16/IG-16-001.pdf.).

The contractor, Paragon TEC, conducted a study of the FY 2015 collaboration between NASA and the Department of Education as explained below. For a full copy of this study entitled, STEM Design Challenges for 21st Century Community Learning Centers (21CCLC) Final Evaluation Report, go to http://www.nasa.gov/sites/default/files/atoms/files/21cclc-middle_school-final-report.pdf.

Review Type	Performer	Date of Review	Purpose	Outcome	Next Review
Implementation evaluation study	Paragon TEC	Jan – May 2014	Conduct a third-party formative evaluation that documents implementation and preliminary impacts of NASA STEM Challenges within Department of Education's 21CCLC program	The report provides 12 evidence-based observations for how new NASA STEM Challenges within Department of Education's 21CCLC program could be improved.	No further action due to the expiration of the reimbursable Space Act Agreement with the Department of Education.