Education & Public Outreach

Lars Perkins
Chairman
Education and Public Outreach Committee

NASA Advisory Council
25 April 2013
Other than that Mrs. Lincoln …

He walked three miles to the woman’s house and returned the money.

Imagine that you lived at the same time as Abraham Lincoln. What would you say to him or ask him?

I’d tell him not to go to a play ever.

… how was the play?
Education Budget Decimated

<table>
<thead>
<tr>
<th>Total:</th>
<th>203 → 109</th>
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<tr>
<td></td>
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<tr>
<td>- Space Grant</td>
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<th>Non-Directed:</th>
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Topics

- Who we are
- E/PO activities since November
- Recent Activity
  - 4 March 2013
  - Recommendation
- Recommendation Status
- FY14 Budget
  - Recommendations
- Asteroid Mission
The Taxi Driver Problem
4 March 2013 Meeting

- DC, 4 In Person, 2 Call In, 55%

AGENDA

- Education Briefing: Leland Melvin
- Communication Briefing: David Weaver
- Strategic Planning: Rebecca Kaiser
- Participatory Exploration Erika Vick
NASA Education

Leland D. Melvin
NASA Associate Administrator for Education
NASA Education Vision Statement

To advance **high quality** Science, Technology, Engineering, and Mathematics (**STEM**) education using **NASA's unique capabilities**
STEM Education Framework

Operating Principles
Relevance • NASA Content • Diversity • Evaluation • Continuity • Partnership/Sustainability

Audiences
- Learners
- Educators
- Institutions

Outcomes
- Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions
- Attract and retain students in STEM disciplines along the full length of the education pipeline.
- Engage the public in NASA’s missions by providing new pathways for participation.
- Inform, engage, and inspire the public by sharing NASA’s mission, challenges, and results.
- Build strategic partnerships that promote STEM literacy through formal and informal means.

Employ
Educate
Engage
Inspire
Statutory Requirements for STEM Education

National Science and Technology Council (NSTC) Committee on STEM Education (CoSTEM) was established pursuant to the requirements of Sec. 101 of the America COMPETES Reauthorization Act of 2010.

- It requires NASA to actively engage in collaborations with other federal agencies to ensure the Agency’s programs are supportive of national STEM priorities.
- The CoSTEM will serve as part of the internal deliberative process of the NSTC and provides overall guidance and direction. The purpose of the CoSTEM is to coordinate Federal programs and activities in support of STEM education.
- In accordance with the Act, CoSTEM is currently reviewing STEM education activities and programs, and the respective assessments of each, throughout Federal agencies to ensure effectiveness; coordinating, with the Office of Management and Budget, STEM education activities and programs throughout Federal agencies; and will develop and implement through the participating agencies a 5-year STEM education strategic plan, to be updated every 5 years.
FY 2013 Federal Investments in STEM Education

Federal STEM Education Investments by Agency ($2,951 M)

- Transportation, $101, 3%
- Agriculture, $91, 3%
- Commerce, $44, 2%
- Defense, $153, 5%
- Energy, $37, 1%
- EPA, $20, 1%
- HHS, $554, 19%
- Education, $628, 21%
- NASA, $117, 4%
- DHS, $6, 0%
- NRC, $5, 0%
- Interior, $1, 0%
- NSF, $1,193, 41%

209 investments
13 agencies

Source: Executive Office of the President, Office of Science and Technology Policy, Preparing a 21st Century Workforce: Science, Technology, Engineering, and Mathematics Education in the 2013 Budget (Feb 2012)
NASA Education FY 2014 STEM Total Investments

FY 2014 NASA Office of Education Funding by Source

- STEM Education & Accountability Projects, $37, 37%
- MUREP, $30, 30%
- NASA Space Grant, $24, 24%
- ESPP, $9, 9%

Total Investments - $100M
Agency FY 2014 STEM Education Total Investments

FY 2014 NASA Education Funding by Source

- Science, $42, 25%
- Education, $100, 59%
- Space Technology, $15, 9%
- Aeronautics Research, $3, 2%
- Cross Agency Support, $4, 2%
- HEO, $4, 3%

Agency Total Investments - $169M
**Inputs** | **Audience** | **Outputs** | **FY 13 Annual Performance Goals** | **Performance Goals** | **Objectives** | **Outcomes** | **Goals**
---|---|---|---|---|---|---|---
--- | --- | --- | **APG 1:** Provide significant, direct student awards in higher education to (1) racially or ethnically underrepresented students, (2) females, and (3) persons with disabilities at percentages that meet or exceed national STEM enrollment percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the three categories. | **5.1.2.1** Assure that students participating in NASA higher education projects are representative of the diversity of the nation, based on student enrollment data maintained by the U.S. Department of Education’s National Center for Educational Statistics. | **5.1** Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions. | Goal 5: Enable program and institutional capabilities to conduct NASA’s aeronautics and space activities. | 
--- | --- | --- | **APG 2:** Maintain no fewer than 1,000 online STEM-based teaching tools for K-12 and informal educators and higher education faculty. | **6.1.2.1** Focus resources, including content, facilities, and personnel, to improve the impact of NASA’s STEM education efforts on areas of greatest national need as identified in the 2011 NASA Education Design Team report, ensuring that NASA-unique assets are leveraged when conducting direct-service student activities. | **6.1** Improve retention of students in STEM disciplines by providing opportunities and activities along the full length of the education pipeline. | Goal 6: Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy. | 
--- | --- | --- | **APG 3:** Conduc no fewer than 200 interactive K-12 student activities that leverage the unique assets of NASA’s missions. | **6.1.2.2** Increase NASA’s engagement in national STEM education policy discussions to improve curricula, inform national standards in STEM subjects, and to ensure coordination and sharing of best practices across federal STEM agencies to avoid duplication, overlap, or fragmentation. | **6.2** Promote STEM literacy through strategic partnerships with formal and informal organizations. | 
--- | --- | --- | **APG 4:** Participate in no fewer than 20 STEM education advisory boards, STEM-related committees, or other events or activities related to national STEM education policy. | **6.2.1.1** Develop NASA’s leadership role in national STEM improvements efforts, as demonstrated by provision of meaningful educator professional development and students experiences, adoption of education technologies, and contributions to STEM education policies and strategies. | **6.4** Inform, engage and inspire the public by sharing NASA’s mission, challenges, and results. | 
--- | --- | --- | **APG 5:** Maintain the NASA Museum Alliance in no fewer than 30 states, U.S. territories and/or the District of Columbia. | **6.4.1.1** Continue to provide opportunities for learners to engage in STEM education through NASA content provided to informal education institutions. | **6.4.1** Use strategic partnerships with formal and informal educational organizations to provide NASA content to promote interest in STEM. | 
--- | --- | --- | **Guidance through Congressional Authorizations** | **Experiences** | **Access** | **Assumptions** | **Challenges** | **External Factors** | Evaluation (throughout Programs)
http://nasawavelength.org/
The first four Airborne Astronomy Ambassador (AAA) educators: (from left) Constance Gartner, Vince Washington, Ira Hardin and Chelen Johnson at the educators’ work station aboard the SOFIA observatory during a flight on the night of Feb. 12-13, 2013.
Citizen explorers address global challenges...

The International Space Apps Challenge is a two-day technology development event during which citizens from around the world will work together to address current challenges relevant to both space exploration and social need.

NASA believes that mass collaboration is key to creating and discovering state-of-the-art technology. The International Space Apps Challenge aims to engage YOU in developing innovative solutions to our toughest challenges.

Join us on April 20-21, 2013, as we join together cities around the world to be part of pioneering the future. Sign up to be notified when registration opens in early 2013!
Communicating NASA’s Story – Recent work and accomplishments

**SpaceX (CRS-2) – March 1, 2013**
- Second commercial flight to ISS
- Communications directed KSC launch viewing opportunities and contingency activities including live NASA TV coverage, critical web and social media updates, and media teleconference.
- Successful berthing on March 3

**FY ‘14 Budget Announcement – April 10, 2013**
- Fully integrated and strategic rollout across all projects and programs
- Full suite of multimedia support (video, stills, social media)
- Special interactive features:
  - [www.nasa.gov/budget](http://www.nasa.gov/budget)
  - [www.nasa.gov/asteroidinitiative](http://www.nasa.gov/asteroidinitiative)

**Antares – Wallops Flight Facility**
- Successful opening of NASA’s next spaceport
- Significant center collaboration to provide live NASA TV coverage (MSFC, GSFC, LaRC, WFF, HQ, JSC, etc).
- Planned guest viewing opportunities at Wallops for future Antares launches; more on scale with VAFB than KSC
Communicating NASA’s Story – NASA in the Web and Social Media

Google+ Hangout – March 22, 2013

- ISS Commander Suni Williams and JAXA’s Aki Hoshide
  - 3,322 viewers and a total of 17,866 minutes watched
  - 211 questions/comments on YouTube alone
  - Participants included students, public questions, and even one airline passenger in midflight
- Hangout still available online:

First HQ Reddit AMA – April 17, 2013

- Deputy Administrator Lori Garver launched new activity
  - After first 24 hours, it was more popular than Game of Thrones with higher favorability ratings than Elon Musk and President Obama
- Reddit AMA available online at:

More Awards for Industry Excellence – 2013

- Second consecutive Shorty Award for @NASA
  - Account has nearly 3.9 million followers, the most in government (including the White House)
- @MarsCuriosity also honored
- Sixth consecutive Webby Award recognition for NASA.gov
Strategic Planning Cycle

- Rebecca Kaiser
- 4 Year Process
- Input from all stakeholders
- Last time around “Vision Statement”:
  “To reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind.”
Example Visions

“Dare Mighty Things”

“Inventing The Future”

“We Reach Farther”

“Invent. Discover. Explore”

“We Explore the Universe. So Can You.”
Separation of Vision and Mission

**Recommendation**

- NASA should, as part of its strategic planning process, create a short inspirational “vision statement” that embodies NASA’s aspirational goals. In addition, NASA should rewrite the current vision statement to be clearer, more focused, and reposition it as the “mission statement”

**Reason**

- The current vision, is long, unmemorable, generic, and does not resonate with or inspire the public. Even as such a longer articulation of NASA’s goals may be appropriate for internal dissemination, but a shorter, inspiring vision will be more effective in increasing awareness of NASA.

**Consequences of No Action**

- Continuing public confusing about the overarching theme which binds all NASA programs together.
And then something bad happened …

“Would you please elaborate on ‘then something bad happened’?”
"Effective immediately, all education and public outreach activities should be suspended, pending further review. In terms of scope, this includes all public engagement and outreach events, programs, activities, and products developed and implemented by Headquarters, Mission Directorates, and Centers across the Agency, including all education and public outreach efforts conducted by programs and projects.

The scope comprises activities intended to communicate, connect with, and engage a wide and diverse set of audiences to raise awareness and involvement in NASA, its goals, missions and programs, and to develop an appreciation for, exposure to, and involvement in STEM. Audiences include employees, partners, educators, students, and members of the general public. The scope encompasses, but is not limited to:
- Programs, events, and workshops.
- Permanent and traveling exhibits, signage, and other materials.
- Speeches, presentations, and appearances, with the exception of technical presentations by researchers at scientific and technical symposia.
- Video and multimedia products in development (and renewal of existing products).
- Web and social media sites in development (excludes operational sites).
- External and internal publications, with the exception of Scientific and Technical Information as defined by NPD 2200.1B.
- Any other activity whose goal is to reach out to external and internal stakeholders and the public concerning NASA, its programs, and activities."

March 22, 2013
FY 2014 NASA Education Approach

Advancing high quality STEM education using NASA’s unique capabilities

Lars Perkins
NASA Advisory Committee
April 2013
NASA Education Roles in STEM Reorganization

- Fund the best education programs from across the Agency.
- Provide evidence-based approaches and results to support the NASA Education activities.
- Ensure NASA's unique facilities, assets and workforce are integrated into federal coordination effort.
- Lead development of CoSTEM Strategic Plan with the National Science Foundation.
- Execute a unified, systematic, and standardized approach to data collection and performance assessment across NASA Education.
- Leverage NASA investments in STEM infrastructure to scale up dissemination of NASA content through coordinated efforts.
<table>
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<th>$ in Millions</th>
<th>FY 2012 Budget Estimate</th>
<th>Changes</th>
<th>FY 2014 Budget Request</th>
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<td><strong>Total</strong></td>
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<td><strong>Education</strong></td>
<td>138.4</td>
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<td>Aerospace Research and Career Development</td>
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<td>NASA Space Grant</td>
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<td>ESPCoR</td>
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<td>STEM Education and Accountability</td>
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<td>(18.8)</td>
<td>61.2</td>
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<td>MUREP</td>
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<td>30.0</td>
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<td>STEM Education and Accountability Projects</td>
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<td>(8.8)</td>
<td>31.2</td>
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<tr>
<td>Formal and Informal Education</td>
<td>10.0</td>
<td>(10.0)</td>
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<td>Innovation in Education</td>
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<td>Evaluation, Performance, Monitoring, &amp; Accountability</td>
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<tr>
<td>Informal STEM Education</td>
<td>10.0</td>
<td>(10.0)</td>
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<td>GLOBE</td>
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<td><strong>Mission Directorates Subtotal</strong></td>
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<td>Cross Agency Support</td>
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So where does the EPO $ Come from?

### Science Mission Directorate Policy

#### Policy and Requirements for the

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<tr>
<th>Para #</th>
<th>NPR 7120.5 Requirement Statement</th>
<th>Requirement Owner</th>
<th>Tailor</th>
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<td>Tabl I-1</td>
<td>11. Security Plan [Baseline at SDR] [per NPD 1600.2 and NPRs 1600.1, 1040.1, and 2810.1]</td>
<td>OPS OCIO</td>
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<td>13. Technology Transfer (formerly Export) Control Plan [Baseline at SDR] [per NPR 2190.1]</td>
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<td>Tabl I-1</td>
<td>15. Communications Plan [Baseline at SDR]</td>
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- SMD missions must have an E/PO program that supports NASA’s strategic goals and objectives for education and outreach, contributes to NASA’s education portfolio, and is aligned with SMD’s E/PO portfolio.

- SMD missions must have an E/PO program that is funded with at least 1% of the total prime mission cost excluding launch vehicle.

- SMD missions will designate an E/PO Lead who has the qualifications and experience necessary to successfully implement the mission’s E/PO program.

- SMD missions will partner with NASA and non-NASA organizations as appropriate in order to increase the quality and reach of the E/PO program.

### 1.2 Rationale for Mission E/PO Requirements

The SMD E/PO lead is required to report on the SMD E/PO portfolio and show that it aligns with the NASA Education portfolio. The Lead is responsible for reporting E/PO metrics for
Education and Public Outreach (EPO) Activities Under Sequestration

- Guidance issued by NASA Chief of Staff and Chief Financial Officer March 22, 2013 regarding EPO Activities Under Sequestration
  - Suspended EPO activities pending further review
  - Established waiver process for activities prior to May 1, 2013
  - Formally requested EPO Activity Summaries from Mission Directorates and Centers identifying planned activities for remainder of FY2013
- As of Friday, April 19, Office of Communications has reviewed 153 waivers
  - Approved: 118
  - Conditionally approved: 21
  - Denied: 9
  - Out of scope (no need for approval/denial): 5
- Joint Office of Communications and Office of Education review of EPO Activity Summaries in process.
  - EPO Activity Summaries received from Mission Directorates and Centers April 15
  - Data compilation and integration completed April 23
  - Review of planned May activities to be completed by April 30
  - Analysis and review of remaining FY2013 activities to be completed by May 31
CCC continues implementation of strategies for 2013

- Utilize CCC-defined strategic communications priorities via campaigns, beginning with budget rollout to effectively deliver the overarching story about NASA
  - Implement new approaches to tell the ISS story
  - Convey a powerful story about what NASA does to benefit life on Earth
  - Convey NASA’s role in leading the world in Mars exploration and extending human presence into deep space
  - Deliver compelling results from our endeavors exploring our solar system and beyond

- Continue our work to Implement an effective operational model and governance structure
  - Obtain approval of NPD for Communications to establish scope, roles and accountabilities for Communications function agency-wide. Initial review has been completed and is undergoing final stages of approval.
  - Initiate development of NPR for Communications, to define and establish policies and procedures for the overall Communications function.
  - Further operate the Communications Coordinating Council (CCC) as a governing body, which includes decisional authority over strategic communications efforts and issues.

  • Establish a Digital Services strategy, structure and policies in response to OMB directive and in concert with OCIO to govern web infrastructure and content
### Education Budget Decimated

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- EPSCOR
- MUREP
- Space Technology Fellowship
Websites ...
EPO Activities

Administrator

“Silver Bullets”

EPO COMMITTEE

ECC

CCC

AAs

Public
## Actionable at the Level of the Administrator

<table>
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<tr>
<th>Up (Context)</th>
<th>Administrator (Define)</th>
<th>AA’s (Implement)</th>
</tr>
</thead>
</table>
| • Ambitious and inspiring directorate goals  
• Goals must be realistic and durable  
• Goals must be funded | • Define the “Why” Message | • Consolidate web, social, video, apps |
| | • Create the unifying framework to communicate the “How” | • Top down message integration |
| | • Ensure E/PO activities are funded | • Advertise via Education |
| • Clarify NASA’s role in national STEM initiatives | • Ensure E/PO activities are integrated in directorate activities | |
| • Acknowledge NASA’s strategic assets | • Implement Organizational design to support | |
One Message

Recommendation

- NASA should develop one overarching message under which all NASA activities and programs (e.g. Aeronautics) can be integrated and presented to the public. All NASA websites, videos, apps, and social media should consolidated and be organized thematically under this message and exposed via WWW.NASA.GOV.

Reason

- The public is exposed to NASA activities through various channels and without a unifying conceptual framework, leading to confusion about NASA's identity and purpose. Some activities (ARMD) have little public awareness.

Consequences of No Action

- Continuing public confusion about NASA’s mission and direction leading to eroding public support and marginalization of NASA’s societal value.
EPO C of E

Recommendation

- NASA should identify and/or develop “centers of excellence” for EPO activities to whom project teams can reach out when developing their EPO programs. These should include (but not be limited to): social media, web site design, app development, data visualization, and video production.

Reason

- Lower costs, reduce duplication of effort, share best practices, move towards consistency in communication style and usability.

Consequences of No Action

- NASA will overspend as it continues to “reinvent the wheel” as each project/mission develops its own online, mobile and social presence. These various implementations may “speak with different voices” and not be aligned with NASA’s overall strategic goals.
Elevation of CCC

Recommendation

Building on the success of the ECC, the Communications Coordinating Committee (CCC) should be elevated to a Council, moving it from a coordination role to strategic and decisional function.

Reason

The ECC has been successful in bringing together Center education resources to coordinate their activities and present a higher profile, integrated presence to the public. A similar opportunity exists now for communications.

Consequences of No Action

Duplicative messaging to public lack of message coordination, less “wood” behind more “arrows”, leading to public confusion.
EPO Subgroups

- Social Media, Crowdsourced PR / Education
  - Matthew Chamberlin, Peter Shankman
- Museums & Visitor Centers
  - Doug King, Steve Pearse
- Schools
  - Dwayne McKay, Pilar Montoya
- Professional Societies
  - Pilar Montaya
- Hollywood
  - Michael Bostick
- Strategic Messaging, Website
  - Lars Perkins, Richard Garriott
SORRY, WHAT WAS THAT ABOUT A GOLD MEDAL?

I COULDN'T HEAR YOU OVER OUR ROCET-POWERED HOVER CRANE!
Mars fans make viral video

"We're NASA and We Know It" celebrates NASA's latest Mars mission.
So we all know about NASA's Mars Curiosity rover landing safely on the surface of Mars last night, but who we are really curious about is the Internet sensation the Mars landing created—Mohawk Guy.

Bobak Ferdowski—the astronaut with red and black mohawk with yellow stars dyed into the sides sitting behind the control desk—became an instant Internet celebrity. His hairstyle now has a dedicated Tumblr page, and, according to the Atlantic, Ferdowski's own Twitter page went from nearly 200 followers to over 8,000 in the span of a few hours.
NASA's Mars Rover Team: Spacemen of the Year 2012

By Paul Kvinta | Photographs by Dan Winters

November 2012
See the bigger picture...

at www.nasa.gov/KnowYourEarth

See the bigger picture...

of shrinking Arctic sea ice
Integrated infant / H2O risk mitigation

- **Recommendation**
  - Don’t throw baby out with bathwater.

- **Reason**
  - Baby dies or is severely injured.

- **Consequences of No Action**
  - Baby lives.
FY14 Transitional Year For EPO

Recommendation
- Rather than halting most all EPO programs immediately, fund and recast FY14 as a transitional year where existing programs can be evaluated, and slated for shutdown, transfer to other agencies, or continuance in an orderly fashion.

Reason
- NASA EPO Programs are arguably the most inspirational and successful infusion of science into the public consciousness. In a time of austerity we recognize it is important to consolidate education efforts and eliminate redundancies. NASA programs built around missions such as Hubble and Curiosity are, however, unique and NASA specific, as they are built around dynamic missions, not textbook knowledge. We feel thoughtful deliberation is necessary to develop a transition plan which preserves NASA’s unique capabilities, eliminates redundancies, and best serves the interests and strategic vision of our nation.

Consequences of No Action
- Immediate shutdown will prematurely terminate programs in progress, cause loss of NASA’s educational institutional knowledge, and dramatically disrupt the continuity of public messaging at a time when NASA’s popularity and inspirational impact are at a decades-high level. We also feel this change in NASA’s ability to execute educational programs will significantly degrade the nation’s STEM education capability during this critical time.
Remove Restriction on Center EPO Spending

Recommendation

If the mission team, along with the office of education, determine that an educational initiative is in the best interests of the mission, and can identify funding from non-educational budget funds, they should have the authority to spend those funds for that purpose.

Reason

Citizen science, participatory exploration, and public engagement are often critical mission components of a mission. If funds can be identified within the confines of the budget, mission teams (in coordination with the office Education) should be able to spend their budgeted funds on the activities that they feel best support the mission.

Consequences of No Action

Prohibition on the use of available non-education budget funds for public outreach activities unnecessarily further cripples the ability of NASA to engage the public in the way that it uniquely can.
NASA Asteroid Initiative

- **Planetary Defense**
  - “the first step on a journey of 1,000 miles”
  - Detection is the first step
  - Don’t oversell
  - Full defense capability may not exist for decades

- **Stepping Stone to Mars**
  - Mars is our ultimate goal
  - Presidential Commitment in the 2030s
  - Asteroid is an affordable “stepping stone”

- **Technological Advancement and global leadership**
  - Testing of numerous new technologies
  - Object detect, capture, relocate
  - Deep space EVA
  - Solar electric
  - Bulk Xenon purchasing skills