National Space Grant College and Fellowship Program

Regional Meetings
Fall 2010

National Space Grant College and Fellowship Program
NASA Headquarters

Agenda

- NASA Education Design Team Status
- U.S. Department of Education Future Impacts
- Briefing to Bolden/Garver
- Education in the new NASA Strategic Plan
- Reviewing the 2010 Proposals
- Performance Data Summary Report
- Fall Meeting in Portland, ME

NASA Education Design Team Status

Education Design Team

- Charter
  - To assist the Agency in establishing goals, structures, processes and evaluative techniques to implement a new sustainable and innovative STEM Education program
  - Established to develop a strategy to improve NASA's education offerings (Office of Education and mission directorate and center programs/projects)

Education Design Team Membership

- **Chairs:**
  - **Trish Pengra, Office of Independent Program and Cost Analysis**
  - **Leland Melvin, Astronaut, JSC**
- **Other membership expertise in:**
  - **Higher Education**
  - **K-12 Programs**
  - **Informal Education**
  - **Education Outreach**
  - **Partnerships with External organizations**
  - **Classroom teaching experience**
  - **Program evaluation, metrics and research**
  - **Systems engineering approach**
  - **Program development and implementation**
  - **Diversity and Equal Opportunity**

5

Education Design Team
External Experts

- External experts consulted:
  - **Norm Augustine (scheduled), "Rising Above the Gathering Storm"**
  - **Jan Morrison, Executive Director, Teaching Institute for Excellence in STEM, author of NASA Engagement in STEM Education**
  - **Michael Lach, Special Assistant for Science, Technology, Engineering, and Mathematics Education, U.S. Department of Education**
  - **Kumar Garg, Policy Analyst in the White House Office of Science and Technology Policy (OSTP)**
  - **Michael Horn, co-author of, "Disrupting Class; How Disruptive Innovation Will Change the Way the World Learns."**
  - **Rita Karl, Director of Education, Challenger Center for Space Science Education**
  - **Dr. Antoinette Mitchell, Interim Dean, School of Education at Trinity Washington University, discussed innovations in teacher education**
  - **Dr. David Morgan, Immaculata University, Partnership in Math and Science Project**

Education Design Team
External Experts (con't)

- **External experts consulted (continued):**
  - **Steve Barkanic, Gates Foundation**
  - **Zipporah Miller, National Science Teachers Association**
  - **Jim Shelton, Department of Education (scheduled)**
  - **Louisa Koch, National Oceanic and Atmospheric Administration**
  - **Suzanne Smith, Space Grant in Kentucky**
  - **Chris Koehler, National Council of Space Grant Directors**
  - **Claudine Brown, Smithsonian Institution**
  - **Kristen Hilf, Raytheon Outreach Manager (to be scheduled)**
  - **Dr. Carl Weiman, OSTP (not yet confirmed)**
  - **Susan Patrick, International Association for K-12 Online Learning (to be scheduled)**

Education Design Team Preliminary Findings

To Increase NASA's Impact on STEM Education

- **Highly constrained budget**
  - **Exploring flexibility to better direct mandated programs**
  - **Focusing the program and teaching resources into fewer efforts with greater impact**
- **Untapped potential to engage in strategic partnerships and STEM policy discussions**
  - **Unique inspirational content (mission, discoveries, people, capabilities)**
  - **Power of NASA brand**
- **NASA has a growing body of evaluation data on its education programs, but should rely on external education experts to identify where NASA can have the most impact on national STEM education.**

Department of Education Suggestions on STEM Goals for Other Agencies

#	Action	Distinctive Value Add? (1)	Impact (2)	Risk (3)	Net Cost	Timeframe
7	Support the building of new instructional materials and supports based on topics that are particularly motivating to students (e.g. astrobiology, global warming).	No	4	High	$$$	Medium
8	Create and enhance mechanisms to regularly connect 6-12 students and teachers to college students, scientists, technicians and engineers.	Yes	5	Medium	$$	Medium
18★	Encourage the development of state-driven college- and career-ready science standards.	Yes	5	High	$	Medium
20★	Leverage existing interagency instructional materials development efforts by other federal agencies to connect with appropriate implementation supports.	Yes	1	Low	$	Short

(1) Distinctive value add is something ED can do that others cannot.
(2) Impact is 5 high to 1 low.
(3) Risk is a measure of both implementation difficulty and political risk.

Focused need: from 4 million 9th graders, only 4% earn STEM bachelor's degrees. Most students are not proficient in STEM at the end of high school.

9th Grade

Proficient (proficient or advanced) **32%** (3)

Not Proficient (basic or below basic) **68%** (3)

4,013,000 Beginning 9th grade in 2001 (1)

12th Grade

Proficient Interested **17%** (2)

Proficient Not Interested **25%** (2)

Not Proficient Interested **15%** (2)

Not Proficient Not Interested **42%** (2)

2,799,000 Grads in class of 2005 (1)

College Grad

STEM Major **278,000** in 2005 (1)

Non-STEM Major

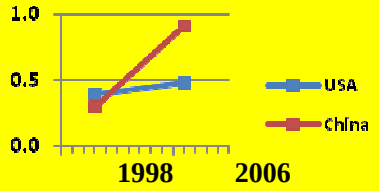
2-year College

1,170,000 Enrolled in 4-year College (1)

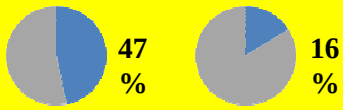
Career

Graduate With STEM Degree **167,000** Expected in 2011 (1)

S&E Degrees Awarded Per Year (Millions) (4)



Proportion of S&E of first university degrees in 2006 (4)



Sources:
(1) Gates Foundation, NCES Department of Education Statistics; Science and Engineering Indicators 2008.
(2) BHEF U. S. STEM Education Model, February 2010. Based on ACT's "College Ready" definition, which is different from NAEP proficiency.
(3) NAEP Mathematics 2009 national results, grade 8.
(4) NSF, National Science and Engineering Indicators 2010

Education Design Team

- Current Schedule
  - Draft report in October
  - Final Findings and Recommendations to NASA Education Associate Administrator in late October/early November
  - Presentation to Charlie Bolden
  - Assessment of which Recommendations to accept and implement

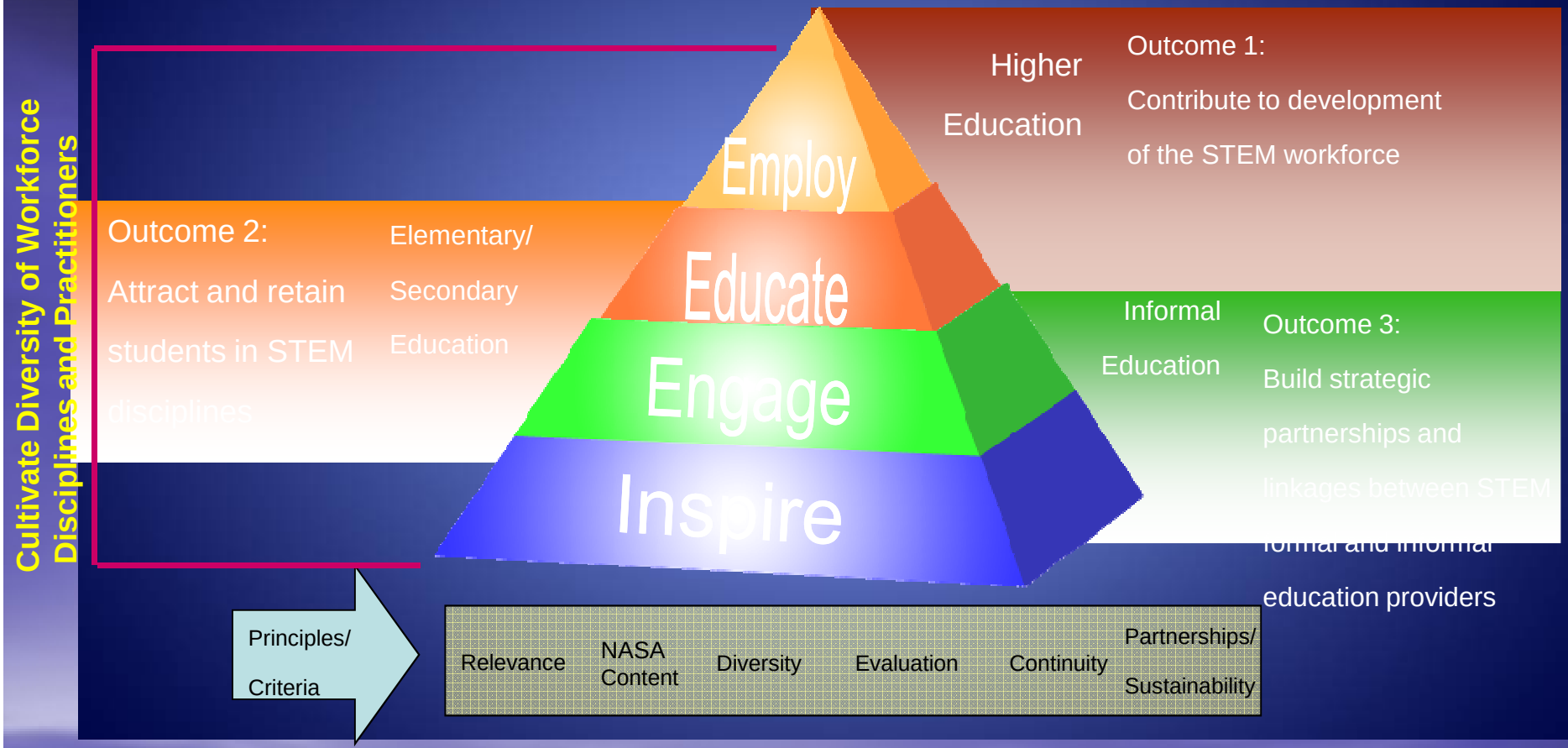
National Space Grant College and Fellowship Program

Education Design Team
July 20, 2010

Diane D. DeTroye
Manager
National Space Grant College and Fellowship Program
NASA Headquarters

Where Does Space Grant fit?

NASA Education Portfolio Strategic Framework



Federal and University Partnerships

1862 - Land Grant

1966 - Sea Grant

1978 - NSF EPSCoR

1988 - Space Grant*

1992 - NASA EPSCoR**

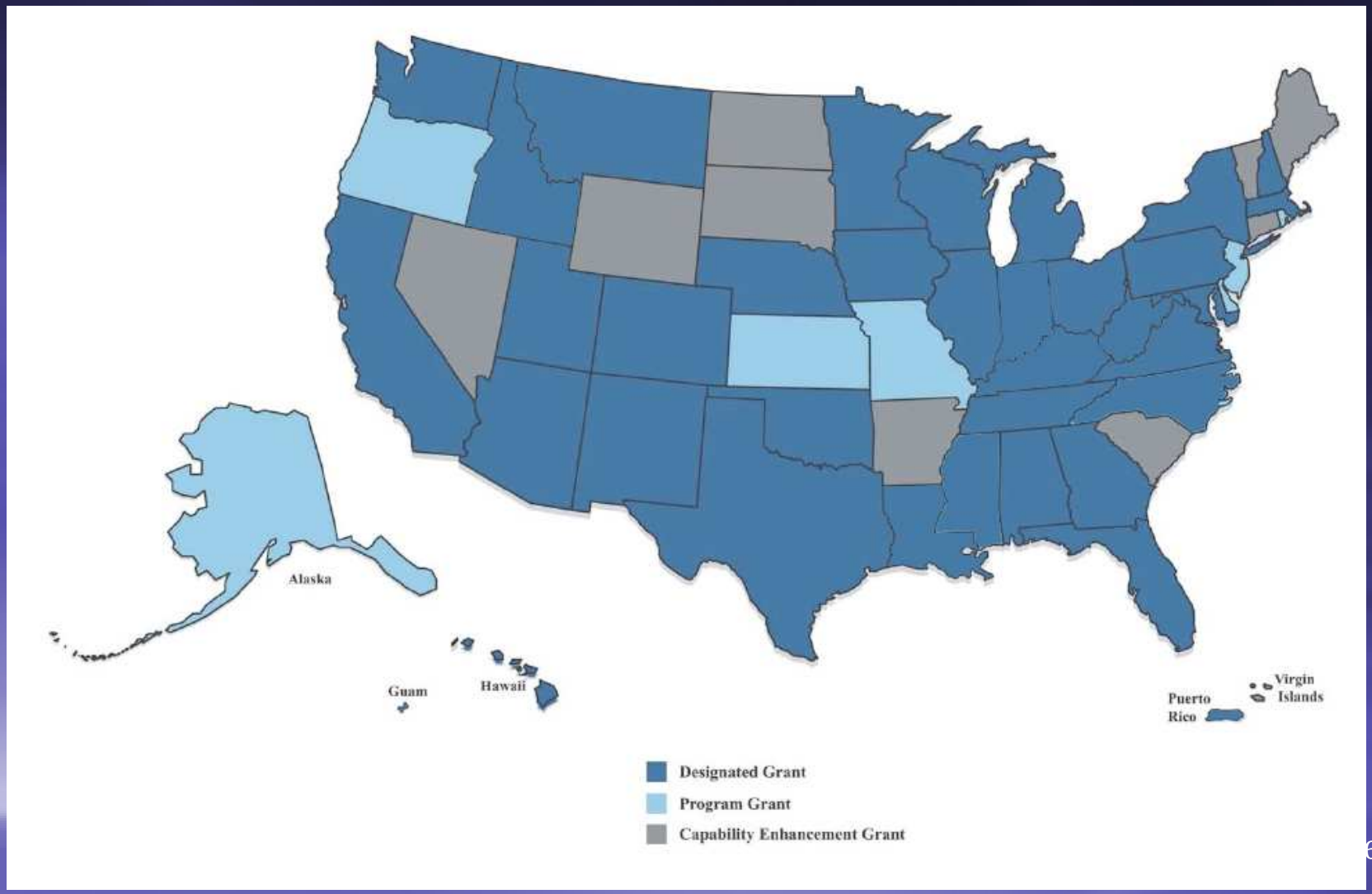
* Public Law 100-147
**Public Law 102-588

Space Grant Program

The program is comprised of 52 state-based, university-led consortia:

- Designated Space Grant Consortia which will conduct programs in to meet the above objectives and provide leadership for a national network of universities and colleges;
- Program Grant and Capability Enhancement Space Grant Consortia which will conduct programs of institutional enhancement and/or expansion in aerospace that will geographically broaden participation in Space Grant objectives and expand university capability and activity; as well as national network
- Space Grant fellowships and scholarships mandatory portion of the available funding. May also include NASA Center-based internships.

Space Grant Consortia by Grant type



The Space Grant Approach

NASA Mission And Vision

Mission Directorates

- Aeronautics Research
- Exploration Systems
- Science
- Space Operations

***The Space Grant Network*:**

* Education

* Research

* Public Engagement

State Interests and Needs

- Workforce Development priorities
- Education goals
- Economic growth
- Science and Technology goals

Space Grant Goal and Objectives

- Goal: Contribute to the nation's science enterprise by funding education, research, and public service projects through a national network of university-based Space Grant consortia.
- Objectives (from the legislation):
  1. Establish and maintain a national network of universities.
  2. Encourage cooperative programs among universities, aerospace industry, and Federal, state, and local governments.
  3. Encourage interdisciplinary education, research, and public service programs related to aerospace.
  4. Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities.
  5. Promote a strong science, mathematics, and technology education base from elementary through secondary levels.

Space Grant is primarily a Higher Education program with Elementary/Secondary and Informal Education elements

NASA Education Pipeline

Informal STEM Education

Science Centers and Museums
NASA Visitor Centers
Community Based Organizations

NASA STRATEGIES:
Partnerships and networks

K-12 STEM Education

STEM Student Opportunities

STEM Teacher Development

NASA STRATEGIES:
Educator Professional Development
Education Technology

Higher Ed STEM Education

STEM Opportunities
Space Grant
EPSCOR
MUREP

NASA STRATEGIES: Research and authentic experience, Institutional Dev.

Grad Higher Ed STEM Education

STEM Opportunities
Space Grant
EPSCOR
MUREP

NASA STRATEGIES: Research, Institutional Dev.

Public → **K-12** → **Undergrads** → **Graduate Students**

Education Pipeline

Talented, diverse, and highly-skilled science & engineering pipeline

NASA's Pipeline

NASA Civil Service

NASA Contractors

NASA P.I.'s (Universities)

Career Decisions

What does Space Grant “do”?

- Graduate Fellowships, Undergraduate Scholarships, Student Internships
- Higher Education student research experiences
- Student Involvement (competitions, challenges, etc.)
- Student-led flight projects (balloons, rockets, etc.)
- Infrastructure Development (faculty, course development, etc.)
- Educator Professional Development
- Strategic collaborations for K-12 student and informal education programs
- Communication and Dissemination
- Leveraging Partnerships

Space Grant Contributions to PART Measures – 2009 reporting

- Percent employed by NASA, aerospace contractors, universities, and other ed. institutions (≥$5,000, ≥ 160 hours, or cost-benefit)
  - Office of Education result = 57%
  - Space Grant result = 52%
  - Total Office of Education students = 811
  - Total Space Grant students = 648 (79.9% of students reported)
- Percent of students moving to advanced education (≤$5,000, ≤ 160 hours, or cost-benefit)
  - Office of Education result = 41%
  - Space Grant result = 44.6%
  - Total Office of Education students = 736
  - Total Space Grant students = 575 (78% of students reported)

Space Grant Contributions to PART Measures – 2009 reporting

- Number of underrepresented students in higher education programs
  - Total Office of Education students = 6,776
  - Total Space Grant students = 4,588
  - Space Grant result = 67.7% of the number reported
- Non-PART Measure -- Number of female students in higher education programs
  - Total Office of Education female students = 7,457
  - Total Space Grant female students = 6,066
  - Space Grant result = 81.3% of the number reported

Space Grant Contributions to PART Measures – 2009 reporting

- Number of institutions served in EPSCoR states
  - Office of Education target = 200
  - Total reported = 209
  - Space Grant result = 199 (95% of the number reported)
- Ratio of funds leveraged by NASA funding support
  - Office of Education target = 92%
  - Total reported = 83%
  - Space Grant result = 80%
- Number of new or revised courses developed with NASA support
  - Office of Education target = 60
  - Total reported = 236
  - Space Grant result = 147 (62% of the number reported)

Additional Space Grant Impacts

- Utilization of the network to satisfy NASA education needs
  - ESMD Higher Education activities
  - SMD International Year of Astronomy Ambassadors
  - Aerospace Education Services Project (AESP) (project in K-12 portfolio) mini-grants for curriculum toolkits
  - Interdisciplinary National Science Project Incorporating Research and Education (INSPIRE) (project in K-12 portfolio) Tier 2A Collegiate Experience
  - Virginia Aerospace Science and Technology Scholars (VASTS) – selection by Langley and K-12 Competitive Grants
  - Summer of Innovation – Space Grant awardees – leveraging the network to reach new partners to infuse NASA content into summer programs

Presentation on Space Grant to NASA Administrator Charlie Bolden and NASA Deputy Administrator Lori Garver

July 28, 2010

Space Grant Program

Consortium Type	Frequency	FY 10 Dollars	Programmatic Elements				
			Fellowships/ Scholarships	Research Infrastructure	Higher Education Student Involvement	Pre-College	Informal Education
Designated	35	$845K	X	X	X	X	X
Program Grant	8	$660K	X	X	X	X	X
Capability Enhancement	9	$660K	X	X	X	O	O

X = mandatory for the grant type
O = optional for the grant type

Designated Consortia: Receive the highest amount of funding, conduct programs in all programmatic areas

Program Grant Consortia: Conduct programs in all programmatic elements

Capability Enhancement Consortia: Concentrate activities at the F/S, Research, and Higher Ed programmatic elements

FY 2010 Congressional Appropriations language:

42 consortia @ $900K

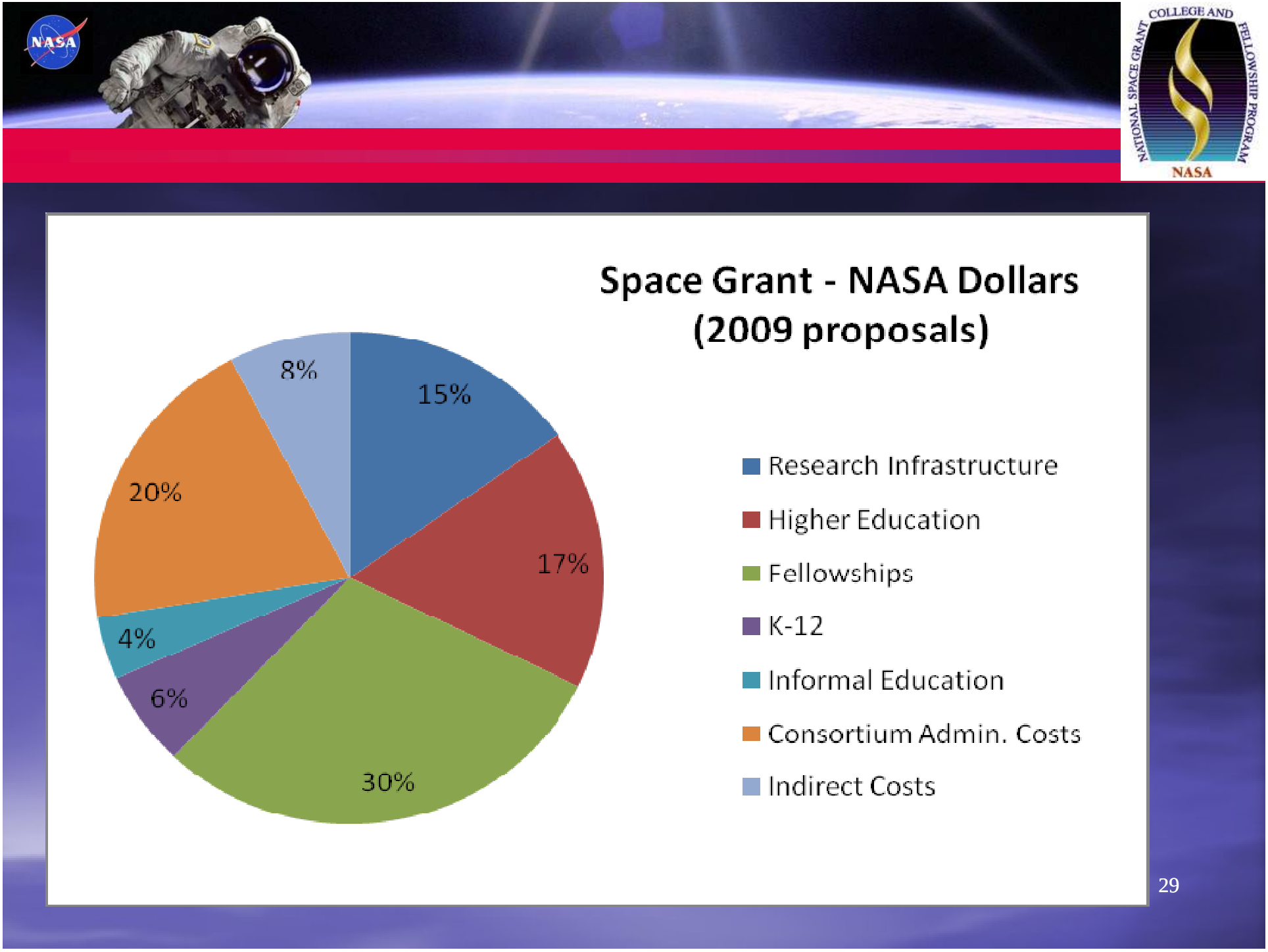
10 consortia @ $700K

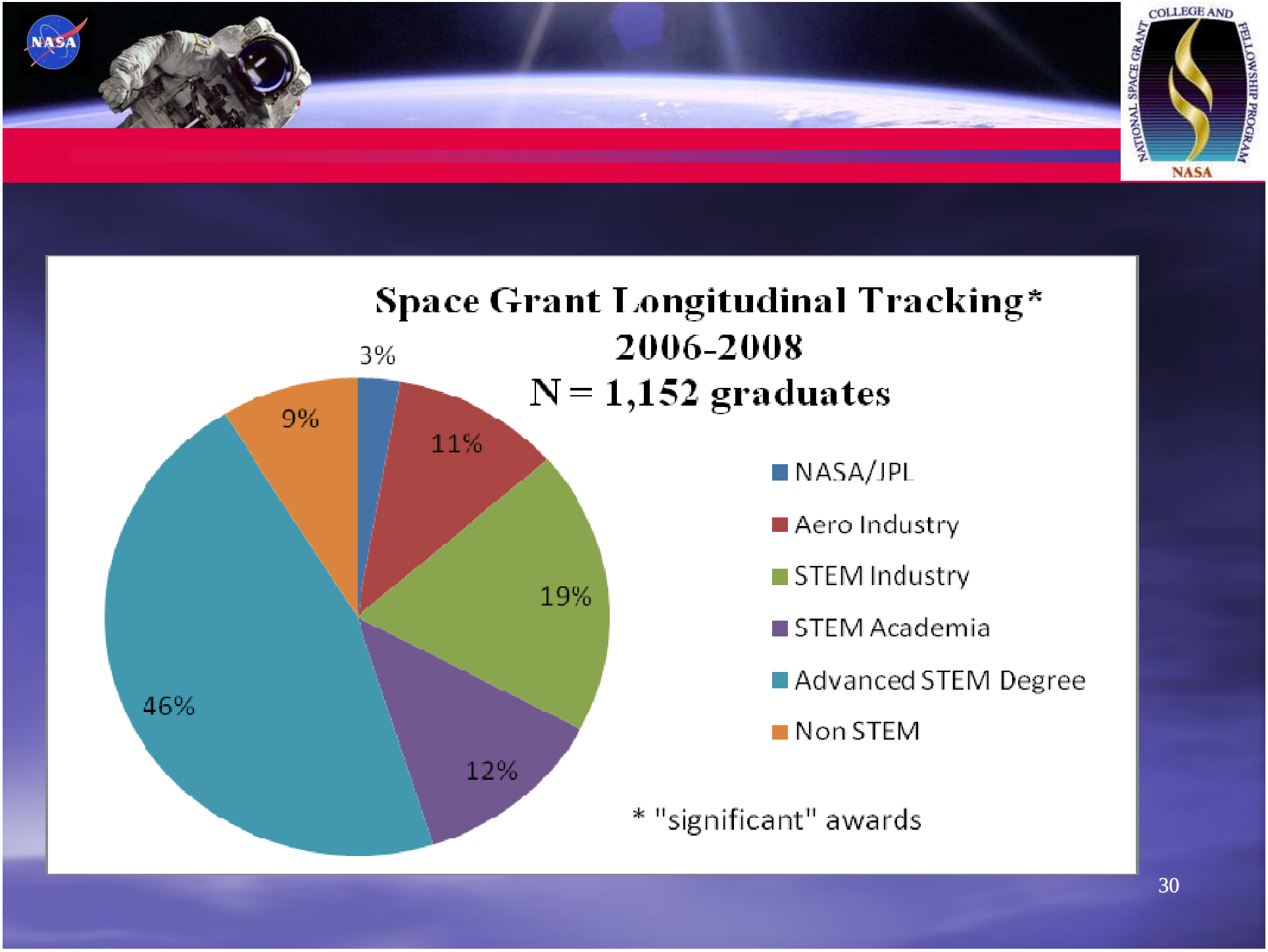
Mapping to the Department of Education Strategies

	1	2	3
DEPT. of ED GOAL	**Increase Capacity of Teachers, Leaders, and Schools**	**Inspire, Focus, and Motivate Around STEM**	**Enhance Partnerships, Build Networks**
DEPT. of ED STRATEGY	Develop and deploy tools and supports to increase the capacity of teachers, principals, LEAs, and SEAs	Motivate, inspire, support, and excite students and adults to focus on STEM disciplines	Build capability to link SEAs and LEAs more tightly with STEM-focused businesses and IHEs
NASA PROVIDES	* Educator professional development * Educator certificates * Research experiences * Pre-service education materials * NASA STEM content training * Institutional research and training capacity	* Scholarships, fellowships, internships * Hands-on opportunities * Curricular support materials * Contests & competitions * Education technologies * Career information * Public exhibits	* Networks supporting HE, K-12, informal education organizations * NASA builds federal, school, state, and academia linkages * Industry partnerships to address workforce needs * Linkages building capacity at MSIs
SPACE GRANT IMPLEMENTS (examples)	* Workshops for teachers and students * Insight into state-based education needs * Connects teachers and students with scientists and engineers	* Scholarships, fellowships, internships: 3,000+ annually * Workforce Development * Student-led flight projects opportunities: 44 consortia * NASA-focused content in higher ed courses * Support to student teams for contests & competitions * Geographic Diversity	* State-based network -- 800 affiliates: 500 academia, 300 industry, gov't, informal * Formal and informal linkages federal, state, and academia * Creates industry partnerships to address workforce needs * Fosters engagement and participation of MSIs

Beyond Implementing Programmatic Requirements, the Space Grant network

- Supports state-based implementation of Mission Directorate Education activities
- Builds network/state infrastructure to compete for federal funds
- Collaborates to create regional and discipline-specific communities
- Provides mentoring and professional development for students and practitioners
- Disseminates information on NASA and Office of Ed
- Partners with NASA on special events and activities
- Is often seen as the “Face of NASA” in a state, particularly in those without a NASA Center


Space Grant - NASA Dollars
(2009 proposals)
15%
17%
30%
6%
4%
20%
8%
Research Infrastructure
Higher Education
Fellowships
K-12
Informal Education
Consortium Admin. Costs
Indirect Costs


Space Grant Longitudinal Tracking*
2006-2008
N = 1,152 graduates
3%
11%
19%
12%
46%
9%
NASA/JPL
Aero Industry
STEM Industry
STEM Academia
Advanced STEM Degree
Non STEM
* "significant" awards

Highlights and Success Stories

- Student –led Flight Project Example
  - Rock On!
- Workforce Development Example
  - NASA UTC Summer 2010 Space Grant Internship Program

- Pre-College Student Involvement Example
  - PA Space Grant Support of the Summer Middle School National AeroSpace Training and Research Center (NASTAR)

NASA Strategic Plan Alignment

- NASA's Education investments align with the draft Agency Strategic Plan: Goals 5 and 6
  - Goal 5: Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.
    - Outcome 5.1: Identify, cultivate, and sustain the workforce needed to conduct NASA missions.
  - 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.
    - Outcome 6.1: Attract and retain students in STEM disciplines along the full length of the education pipeline.
    - Outcome 6.2: Build strategic partnerships that promote STEM literacy through formal and informal means.

Key Areas of Concern in Proposals Base and Augmentation

- Lack of sufficient rigor and detail in the description of programs, projects, and activities
- Missing items/non-responsive to required elements of the solicitation
- Inconsistencies between the proposal narrative, budget narrative and details, and 2010 Budget Forms
- Lack of sufficient detail and clarity in the budget narrative and detail
- References to carryover, reduced funding, supplemental funding
- Failure to address diversity in all programmatic areas

Key Areas of Concern in Proposals Base and Augmentation

- Failure to clearly depict Fellowship/Scholarship expenditures
- Failure to describe competitive approach for Fellowships/Scholarships
- Failure to clearly justify and explain cost share
- Missing Director Vita
- Lack of travel details
- Failure to align Outcome 3 activities with the definition of Informal Education (vs. Outreach)
- Missing Summary budgets for Years 2-5
- Lack of “innovative” projects or programs – many consortia did not consider the Augmentation guidelines regarding innovation and creativity

Performance Data Summary Report

What should you do with your FY2009 Performance Data Summary Report?

- Check your data carefully for errors; ask yourself if the numbers make sense
- Double check the math when you see the data tables
- Look for potential typos and transposed numbers
- Compare your FY08 Performance Report to the FY09 Performance Report
- Make all corrections in red and bold in the word document
- Make sure the Expenditure Table accurately reflects the total grant plus cost share
- Verify that the “cost share” is not inflated

Fall Meeting in Portland, ME

- NASA Direction -- Acting AA for Education Jim Stofan
- 2009 Data Reporting and PART Results
- CDC/MSIPDC Results and Findings
- Directions and Opportunities for 2011
- One Stop Shopping Initiative Update
- OEPM Update
- Overall Summer of Innovation Program