Massachusetts Space Grant Consortium
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Consortium URL: www.maspacegrant.org
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PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The Massachusetts Space Grant Consortium is a Designated, Consortium funded at a level of $575K for fiscal year 2012.

PROGRAM GOALS

The following are the Consortium's goals for the three NASA education outcomes:

NASA Education Outcome 1 – Educate and Employ

a. Diversity

MASGC Goal – Extend Space Grant programs and opportunities to the broadest possible cross-section of the Massachusetts population, particularly encouraging participation by women, minorities, and students with disabilities.

b. Fellowship/Scholarship Program

MASGC Goal - Provide NASA competency-building education and research opportunities to develop qualified undergraduate and graduate students who are prepared for employment in STEM disciplines at NASA, the aerospace industry, and higher education.

c. Research Infrastructure Program

MASGC Goal – Provide research fellowships to as many Massachusetts students as possible to enable them to work with faculty members and/or researchers during the academic year and during the summer.

d. Higher Education Program

MASGC Goal – Recruit the best students from our consortium to participate in NASA programs, including the Academies, and in internships with aerospace companies involved in NASA-related work

NASA Education Outcome 2 - Educate and Engage

Precollege Education

MASGC Goals –

- Encourage teachers to incorporate STEM instruction in their classrooms, using NASA content as much as possible.
- Provide continuing in-service opportunities to help teachers maintain competency in STEM instruction and results in deeper content understanding and/or competence and confidence in teaching STEM disciplines.

NASA Education Outcome 3 – Engage and Inspire

Informal Education and outreach

MASGC Goals –

- Enhance interest and proficiency in STEM disciplines.
- Inform the public about NASA's mission activities.
- Develop a pool of qualified presenters to communicate significant aerospace and climate-related issues to large audiences.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, & 3)

The following are examples and anecdotes of NASA competency-building education and research opportunities, which MASGC funding has enabled.

Scholarships and Fellowships to undergraduate underrepresented minorities, and the Boston University satellite program benefit our goals for NASA Educate and Employ Outcome 1, supporting education, research and higher education for skills related directly to NASA missions. The Rocketry program at the Science Club for Girls benefits our goals of diversity in Outcome 1, since all the girls in the program are underrepresented minorities in inner city middle and high schools.

1. Fellowships for space research

My name is Kirsten Blancato and I am a current class of 2015 Astrophysics major at Wellesley College. This past semester, the Massachusetts Space Grant enabled me to work as a service observer at Wellesley's Whitin Observatory, thus allowing me to contribute to my professor's collaboration with the KELT project. The funding your grant provided was valuable in a multitude of ways.

First, the grant allowed me to continue to work on my observational skills. Wellesley's 24- inch telescope not only contributes to my professor's research projects, but also serves the purpose of training astronomy students to be capable observers. As a service observer, I have the responsibility of opening up the telescope, taking calibration frames, and taking the appropriate science frames for a program. From many nights of observing, I am beginning to learn about the

nuances of observing and how to prevent problems and fix them when they occur. The only way to become a good observer is through continued practice, and the Massachusetts Space Grant played a pivotal role in allowing me to develop my skills as an observer this semester.

In addition to practicing my observational skills, I was able to contribute to my professor's exciting collaboration with the KELT project. Recently, Wellesley has been contributing to KELT: a ground based search for transiting exoplanets. On my assigned observing nights, my professor would have me observe a KELT transit of interest. Our data were then sent to KELT as follow- up observations used to determine whether or not the transit candidate was a true exoplanet. All of my observations from the semester have already been submitted to KELT.

My work as a service observer has been one of my favorite and most valuable activities at Wellesley. The Space Grant has allowed me to earn money doing something I thoroughly enjoy, which is rare for college students, who typically work jobs such as waitressing or washing dishes in order to support themselves. Not only was I able to make money being an observer, but was able to gain experience directly related to my major and desired career. This summer, I have the exciting privilege of being an REU student for the National Optical Astronomy Observatory at Kitt Peak National Observatory in Arizona. My experience as a service observer certainly played a large role in my acceptance into the prestigious Kitt Peak REU program.

2. Boston University Satellite for Applications and student Training (BUSAT)
Thanks to Mass Space Grant for providing support for student travel to a couple of venues this summer. Boston University has a student team of more than 20 students who are designing a small satellite called BUSAT, the Boston University Satellite for Applications and student Training. It is part of a competition sponsored by the US Air Force known as the University Nanosat Program (UNP). The BUSAT satellite project has been a part of two cycles of this competition, UNP5 and now UNP7. In each cycle the Air Force accepts proposals from universities to design and fabricate a small satellite in competition with ten other universities. In each cycle BU received $110K from the Air Force over two years, which covered the hardware costs and procurements for BUSAT. The students on the BUSAT team were very proactive, convincing me to submit proposals for two NASA provided opportunities. The first of these was a high altitude balloon program known as HASP, which is administered by the Louisiana Space Grant through LSU (http://laspace.lsu.edu/hasp/). These proposals are competitively evaluated, and the BU proposal was selected, permitting the team to fly a portion of the BUSAT data system to the edge of space. Once selected as a HASP participant, student teams are not charged for the flight. However, student teams must provide their own funding to support payload development and integration, and there are a few document "deliverables" that the teams must supply. This has successfully occurred during the summer, and two of the BUSAT students traveled to Palestine, TX this past week qualifying the BU payload and integrating it onto the "space test platform" that the balloon will carry aloft. The actual flight will occur from the Columbia Scientific Balloon Facility (CSBF) base in Fort Sumner, New Mexico, during the last week of August. The second of these NASA-provided proposal opportunities will permit seven students to participate in a series of NASA airplane flights that provide a zero-g environment. Quoting from their web site: "This year NASA's Flight Opportunities Program has selected 24 cutting-edge space technology payloads for flights on commercial reusable launch vehicles, balloons and a commercial parabolic aircraft. Sixteen of the payloads will ride on parabolic

aircraft flights, which provide brief periods of weightlessness…". One of these payloads will be the "Boston University Student Proposal for Deployable Solar and Antenna Array Microgravity Testing,"
(http://www.nasa.gov/home/hqnews/2012/mar/HQ_12089_Experimental_Payloads_Flight_Opportunities.html). These flights will be used to test a solar panel deployment system that one of the Mechanical Engineering senior design teams developed during the past academic year for BUSAT. These flights will occur for the BUSAT team in the middle of August from Houston, TX and a portion of the BUSAT satellite structure has been fabricated and will fly multiple times. Without travel support from MASGC, our students would not have been able to participate in all of these valuable activities.

3. Science Club for Girls

Our Rocket Team is among the top 100 qualified for the national competition !!!
We are so proud of our Rocket Team members Dina, Tatevick, Alyssa, Hyei In, Jameelah, Marriana, Beverly and Mystique!
One of their two rockets, the Teckorette (points for how they came up with the name) did so well during a qualifying flight that the team is amongst the top 100 in the nation that has been invited to travel to The Plains, Virginia, to participate in the Team America Rocketry Challenge GRAND FINALS on May 11th!
"In a competition where the lowest score wins, the 2013 cut-off to make the finals was a meager 16.12", said the TARC folks. So how well did Teckorette and the team do? Their score was 4. Yes, you read that right. F.O.U.R. !!!
How's the score calculated?
The competition requires that the rocket remain in the air for 48-50 seconds from launch till landing, acheive a height of 750 feet, while carrying a raw egg. Any cracks or breakage of the egg disqualifies the flight. The score is derived from a formula, and increases with the deviation from the time and height requirement.
Teckorette was right on in terms of flight duration, and flew to 754 feet during the qualifying flight. Of course, the team had to design and build a rocket that also fulfills these other requirements.
The 2013 Team America Rocketry Challenge offers a new challenge to the student teams. Here are some of the highlights for the 2013 contest:

1. *Target altitude of 750 feet*
2. *Duration of flight should be between 48-50 seconds*
3. *Payload is one raw egg placed horizontally*
4. *External diameter of rocket must be no less than 60 millimeters*
5. *Recovery by a 15-inch diameter parachute*
6. *Gross liftoff weight of no more than 650 grams*
7. *Rocket motor total impulse limit of 80 N-sec*

Thanks to Aurora and the Massachusetts Space Grant Consortium for financial support of our all-girls Rocket Team!

PROGRAM ACCOMPLISHMENTS

A. The consortium has exceeded each of the goals in Outcome 1, i.e. "Contribute to the

development of the STEM workforce in disciplines needed to achieve NASA's strategic goals", except for supporting students at NASA Centers. The consortium has reduced this number because of the large number of students engaged in aerospace related research within the state who are benefitting from the supported internships on campuses of our members.
Further, the JOI program at the Kennedy Space center could not be held because of changes in personnel at KSC and the retirement of the shuttle program around which the JOI program had

MASGC Objectives	Proposed Metrics	Outcome	Achievement

been developed. The consortium is looking into possibilities of developing a similar program around the Commercial Space program at KSC.

B. The results for Outcome 2, " Attract and retain students in STEM disciplines through a progression of educational opportunities for pre-college students and teachers" are satisfactory, because we have deliberately shifted some of the programs to NASA's Summer of Innovation (MA SOI). The MA SOI initiative, starting from 2010, was solely for pre-college students and teachers, and, it is being conducted in partnership with our consortium members. The management and participants of both NASA grants, Space Grant and Summer of Innovation, in MA is essentially the same. Therefore, the consortium has shifted some of the Space Grant funding from pre-college to higher education, in response to the needs of our members and the state.
Of note in this outcome is that MASGC has arranged for the first Northeast regional collaboration in teacher professional development and will be hosting a robotics workshop for teachers. We expect 2 teachers from each Northeast Region state to participate in the workshop this summer.

In addition, the consortium has participated in numerous high profile STEM initiatives in the state. The Co-Director serves on the Governor's STEM Summit planning Committee and has also participated in the Cambridge Mayor's STEM Roundtable. These efforts enable the consortium to provide publicity for the NASA education mission at every level of STEM education establishment in the state.

C. The consortium has also exceeded each of its goals in Outcome 3, i.e., "Build strategic partnerships and linkages between STEM formal and informal education providers that promotes STEM literacy and awareness."

Outcome 1: Contribute to the development of the STEM workforce in disciplines needed to achieve NASA's strategic goal Educate and Employ

Diversity	1. Offer at least 25 student fellowships for higher education and research.	1. Awarded 79 student fellowships for higher education & research	1. Exceeded metrics
Scholarships Fellowships	2. Maintain minority participation at ≥15%.	2. Increased minority participation to 20.3%	2. Exceeded metrics
Higher Education	3. Involve at least 8 academic affiliates including Western MA.	3. Awards made to 16 academic affiliates	3. Exceeded metrics
Research Infra-structure	4. Expose at least 15 undergraduates to space- or climate- related research .	4. Provided 56 fellowships to undergraduates to work on space-related research.	4. Exceeded metrics
Aerospace STEM	5. Place at least 10 students at NASA or JPL centers .	5. Supported 5 students at NASA Centers.	5. Reached 50% of proposed metrics. (See A above.)
	6. Send 8 Massachusetts students to KSC for the JOIE program.	6. Program temporarily suspended	6. See A above
	7. Integrate NASA resources into at least 1 STEM project.	7. Supported launch of student experiment to ISS	7. Reached metrics

Outcome 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for pre-college students and teachers to achieve NASA's strategic goal Educate and Employ.

Teacher Professional Develop-ment	1. Support at least one workshop targeting teachers from underserved areas in the state or teachers for students with disabilities.	1. Supported a teacher workshop at Tufts University	1. MASGC has arranged a SG Regional workshop for all 7 North East SG consortia each of which is sponsoring 2 teachers form each state.
Hands-on activities for K-12 students	2. Support the participation of at least 10 schools in the Space Explorers program.	2. Discontinued program	2. See B above
	3. Bring at least 25 inner-city students to the Challenger Learning Center who would normally not be able to attend.	3. Brought 58 inner-city students from Worcester to the Challenger Center. 95% of the students receive free or reduced lunch	3. Exceeded metrics
	4. Expose at least 200 K-12 students to NASA-related research.	4. Exposed 415 K-12 students.	4. Exceeded metrics
	5. Conduct at least one scientific ballooning launch.	5. The ballooning program at Kuss is dormant.	5. Instead MASGC is funding a program at Monty Tech to conduct experiments on the ISS.
	6. Engage at least 5 students in rocketry competitions or similar hands-on activities.	6. Engaged 8 girls from the Science Club for girls in rocketry.	6. Exceeded metrics
	7. Include the Perkins School for the Blind as a consortium member.	7. The school is unable to meet the obligations needed to become a full member.	7. After discussion with the school decided to continue having the school participate in MASGC activities.

1. Outcome 3: Build strategic partnerships and linkages between STEM formal and informal education providers that promotes STEM literacy and awareness to achieve NASA's strategic goal to Engage and Inspire.

Support Inforı STEM educat Organize ever using NASA themes and co	1. Have at least 200 students and teachers attend Space Day.	1. Over 1000 teachers and STEM education stakeholders attended the STEM Summit where Astronaut Cady Coleman was keynote speaker.	1. Exceeded metrics
Increase awar about aerospa and NASA	2. Have at least 100 people attend the annual Space Grant Distinguished Lecturer presentation.	2. Over 100 people attended the Annual Public Lecture given by former NASA Astronaut John Grunsfeld currently, Associate administrator of NASA's Science Mission Directorate.	2. Exceeded metrics
Inform public about NASA' mission.	3. At least 5 Massachusetts informal educators should participate in McAuliffe Challenger Center.	3. Arranged for 7 informal educators and parents to attend the Challenger Center.	3. Exceeded metrics
Develop quali presenters to interact with the public on aerospace and climate relate	4. At least 10 Museum of Science informal educatior staff should attend the annual Space Day activitie	4. Held Teacher Training workshop at the Museum of Science to which 25 informal educators/teachers attended	4. Exceeded metrics

PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

Student data and Longitudinal Tracking:

Starting in 2006, MASGC has carried out longitudinal tracking of students who have participated in the Consortium's programs. We have added extra time for support staff in our budget to support this activity. So far, most of our awardees are still in school. However, we have been tracking our students' career plans to get an estimate of whether they have plans for research, education or employment in aerospace or other STEM-related areas.

Of the 458 students who have graduated, 219 are pursuing advanced STEM-related degrees, 34 are actively seeking STEM employment, 57 are employed by aerospace contractors, 51 are employed in non-aerospace STEM positions, 9 are employed by NASA/JPL, 8 are employed in K-12 STEM, 28 are employed in "other" STEM academic fields and 52 in non-STEM employment.

Minority-Serving Institutions:

The Consortium's members include Roxbury Community College, the state's only designated "minority-serving institution". Attracting community college students to aerospace-related activities is challenging, because aerospace is a field of endeavor most of the students have not thought about. Therefore, MASGC offered fellowships and a STEM seminar series to community college students, to encourage them to enter the aerospace workforce pipeline. It is, in effect, a "Scholarship for Service" program for the inner city minority population in Massachusetts. We have continued our annual funding for at least one Roxbury Community College student to spend the summer at MIT or Draper Lab. This summer, we have two students: one is working in the nanomaterials laboratory, and the other is working with the Zero Robotics program. All students who have participated in this program over the past three years have gone on for a 4-year college program in engineering.

NASA Education Priorities:

Hands-on learning

The consortium is engaged in and enables various hands-on student experiences in science and engineering disciplines examples of which, in addition to the Boston University Satellite program and Rocket Team at the Science Club for Girls described in the highlights above, are:

The Belmont Community School in Worcester is an inner-city school in Western Massachusetts with over 95% of the students receiving free/reduced lunch. The consortium worked with the Challenger Center to enable 58 middle school students, 28 females and 30 males, to attend the McAuliffe Center Program "Voyage to Mars", along with a Planetarium production. In a simulated space shuttle mission, students engaged in a cooperative learning environment involving the challenges of teamwork and problem solving to land a probe on Mars. Students also attended a planetarium presentation, The Tilt, which explores the changing seasons on Earth. In addition to being a hands-on program, this met may of the state's science and math standards.

The consortium has offered a number of hands-on activities conducted by the space grant network such as:

- Rock-on Workshop at Wallops – Aeronautics engineering students from the Worcester Polytechnic Institute were recruited and funded to attend the workshop.
- Helicopter/UAV workshop in Connecticut – The workshop provides students education on aerodynamics, rotorcraft principles, wind tunnel testing, control theory, Vertical Take-Off and Landing (VTOL) RC aircraft, etc. is offered each year to our community college partners. MASGC recruits and funds the attendance at the workshop, which includes a tour of KAMAN Aerospace and Sikorsky Aircraft as well as taking a helicopter flight and receiving a CX 2 Coaxial RC helicopter or equivalent.

Curriculum Enhancement for middle school teachers

In an effort to engage middle school teachers in curriculum enhancement capabilities through exposure to NASA scientific and technical expertise, MASGC has been working for over a year with the Museum of Science, a MASGC affiliate, to organize a STEM teacher training activity using the Museum's newly refurbished Planetarium.
The initial activity, a "test program", was held in the spring. The theme was the expansion of our concept of our universe through the increasing power of our telescopes, with special emphasis on the Hubble Space Telescope. Planetarium School Coordinator and Presenter Amanda Thompson led an hour-long Planetarium presentation in which she transported eighteen K-12 teachers and seven guests, from the near-Earth orbit of the Hubble Space Telescope to the farthest reaches of the universe that Hubble has been able to penetrate. Special commentary was given by MIT Professor Jeffrey Hoffman, Director of the Massachusetts Space Grant, which paid for the use of the Planetarium for this activity. Dr. Hoffman is a former NASA Astronaut, whose spacewalks on Shuttle mission STS-61 in December, 1993 helped correct the HST's initially flawed optics and turned it into the incredible scientific success that it has become. Following the presentations the teachers worked with members of the Museum's teacher enrichment team to determine what parts of the morning's subjects could be worked into their curricula. The program received excellent reviews. One of the numerous comments:
"I have not stopped talking about this program since attending. When I was in third grade, I refused to believe that there was anything outside our world. I still find it hard to believe, but through presentations and hearing first-hand experiences from astronauts, such as Jeff Hoffman, my understanding increases on Climate Change/Global Warming. "The Hubble" presentation was great. Thank you for finding ways to enlighten me. I loved the class!!!!!"

Summer Internships
Higher education is at the top of MASGC's priorities, and summer opportunities for students received the largest allocation in our budget. We award almost all higher education funding as fellowships, given directly to students, which avoids institutional overhead charges. The Consortium funded 40 summer internships at 12 institutions.

Community Colleges
The consortium helped develop and provided speakers and funding for a 12-part STEM series at the Roxbury Community College, which was attended on the average by 30 minority students to expose them to various STEM disciplines including aerospace. The consortium also funds a helicopter/UAV workshop for community college students.

Aerospace Research
MASGC sponsors a course to introduce students to contemporary space research. The presentations deal both with the important scientific questions involved in the research and at the same time with the engineering challenges that must be met in order to carry out the research in the environment of outer space. The course is open to all consortium members and approximately 280 students attended the seminars.
Presentations were made by:

1. Prof. Larry Young, MIT Aero/Astro – "Artificial Gravity and Human Missions to Mars"
2. Prof. Jeffrey Hoffman, MIT Aero/Astro – "EVA – Walking and Working in the Vacuum of Space"

3. Prof. Thomas Herring, MIT EAPS – "Geodesy from Space"
4. Dr. Richard Scheuring, NASA JSC – "Injuries to Astronauts during EVA"
5. Dr. Dave Finkleman – "The Physics and Statistics of Satellite Close Approaches and Space Debris"
6. Prof. Richard Binzel, MIT EAPS and Ms. Rebecca Masterson, MIT SSL – "Exploring Asteroids"
7. Professor Tom Filburn, Department of Mechanical Engineering University of Hartford, Formerly with Hamilton Sundstrand "Advanced Environmental Control and Life Support Systems for Long-Duration Human Space Flight"
8. Prof. Paulo Lozano, MIT, "Electric Propulsion for Deep Space Exploration"
9. Prof. Joshua Winn, MIT EAPS – "Exoplanets (Results from Kepler)"
10. Dr. Leslie Young, Southwest Research Institute – "NASA's New Horizons Mission to Pluto – Countdown to Encounter"
11. Dean Cheng, The Heritage Foundation (DC), "Chinese Space Program"

IMPROVEMENTS MADE IN THE PAST YEAR

MASGC has made the following adjustments to maximize the benefits from reduced funding, changes in programs and increase the consortium's involvement in the state's education system:

Speaker support: The line item in MASGC's budget supporting speakers for public lectures has been underutilized over the past few years. We reemphasized the availability of this support at our last two annual consortium meetings, and this past year three consortium members used MASGC funding to support outside lecturers giving space-related talks at their institutions. All such talks are open to the public and are advertised as MASGC-supported events. We will continue to encourage more affiliates to hold MASGC-supported public lectures.

STEM development: In addition to being a member of the statewide Massachusetts STEM Council, MASGC's Co-Director has joined the local Cambridge city STEM initiative.

STEM Teacher Training: After a prolonged planning period, MASGC and the Museum of Science held a K-12 teacher training workshop, utilizing the Museums newly refurbished Planetarium and featuring results from the Hubble Space Telescope. We hope to make such workshops annual events.

Student Space Experiments Program: MASGC has provided support for several ISS experiments carried out by students from the Monty Tech Regional High School in Fitchburg, MA. In order to provide continuity for this program and make it sustainable, MASGC has now incorporated funding for this program as a line item in the annual budget. This means that Monty Tech can count on being able to conduct one experiment every year and can start planning for this much earlier than if they had to wait until financing was secured. MASGC funding serves as a catalyst for additional community funding, which is critical to this activity. Jeff Goldstein, the director of the SSEP, told us that he is using MASGC's support as a model to try to develop sustainable programs in other states.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Currently, the Massachusetts Space Grant Consortium has 19 academic affiliates and 3 institutional (outreach) affiliates, covering the entire state from Cape Cod to the Berkshires. Members are listed below, together with the name of each affiliate's representative to MASGC:

Academic Affiliates

Massachusetts Institute of Technology, Lead	Professor Jeffrey Hoffman
Boston University (Boston)	Professor John Clarke
Bridgewater State University (Bridgewater)	Professor Martina Arndt
College of the Holy Cross (Worcester)	Professor Matthew Koss
Framingham State University	Ms Mary Linscombe
Five College Astronomy Department	Dr. Alexandra Pope*
Harvard University (Cambridge)	Professor Jonathan Grindlay
Massachusetts College of Liberal Arts	Professor Michael West
Mount Holyoke College (South Hadley)	Professor Darby Dyar
Northeastern University (Boston)	Professor Alain Karma
Olin College (Needham)	Professor Christopher Lee
Roxbury Community College (Boston)	Dr. Tala Khudairi
Tufts University (Somerville)	Professors Chris Rogers and Danilo Marchsini
University of Massachusetts (Amherst)	Professor Robert Hyers
University of Massachusetts (Dartmouth)	Professor Robert Fisher
Wellesley College (Wellesley)	Professor Kim McLeod
Williams College (Williamstown)	Professor Jay Pasachoff
Worcester Polytechnic Institute (Worcester)	Professor Nikolaos Gatsonis
Worcester State University (Worcester)	Professors Sudha Swaminathan and Frank Lamelas

* Five-College Astronomy Department, which in addition to Amherst, Mount Holyoke and UMass, also includes Hampshire and Smith Colleges.

Institutional Affiliates (Outreach)

Museum of Science (Boston)	Mr. Paul Fontaine
Christa McAuliffe Center (Framingham)	Ms Mary Liscombe

The representative of each organization acts as a liaison for MASGC at their institution, which includes publicizing Space Grant activities and helping to screen and nominate students and programs for MASGC funding.

The National Space Grant Office requires two annual reports, this Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.