

Maine Space Grant Consortium
Lead Institution: Maine Space Grant Consortium
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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 Maine Space Grant Consortium is a Capability Enhancement Consortium funded at a level of \$430,000 for fiscal year 2012.

PROGRAM GOALS

The mission of the Maine Space Grant Consortium (MSGC) is to (a) Improve our Affiliates research infrastructure in areas of mutual interest to NASA and the state of Maine; (b) Encourage more students to consider careers in fields of science, technology, engineering, and mathematics (STEM); and (c) Enhance NASA's presence throughout the State of Maine.

A. Goals and Objectives Relevant to NASA Education Outcome 1:

The MSGC's Research Infrastructure, Scholarships and Fellowships, Higher Education and Workforce Development goals are in alignment with activities to achieve Outcome 1. These goals are to: (a) strengthen the Affiliates' STEM research capacity in areas mutually beneficial to NASA and Maine (Research Infrastructure); and (b) to increase participation of Maine undergraduate and graduate students in STEM research conducted by the Affiliates and NASA Field Centers (Scholarships and Fellowships, Higher Education and Workforce Development).

To achieve these goals in a manner that will yield results consistent with Outcome 1, we supported the following objectives:

- a. Support Research Infrastructure Seed Grants for faculty and researchers that include undergraduate and graduate student research experiences.
- b. Support a Minority Serving Institution Collaboration Program
- c. Support scholarships and fellowships for undergraduate and graduate students at Maine's graduate institutions to conduct STEM related research.
- d. Support scholarships for Maine undergraduate students matriculating at Maine's primary undergraduate institutions to conduct STEM related research.

- e. Increase STEM student enrollment at the University of Maine, University of Southern Maine and the College of the Atlantic by augmenting institutional scholarships to attract highly qualified high school seniors.
- f. Provide undergraduate students with a 10-week research experience at NASA field centers.
- g. Support new STEM course offerings.

A. Goals and Objectives Relevant to NASA Education Outcome 2

The MSGC’s Higher Education and Pre-College goals are in alignment with activities to achieve Outcome 2. These goals are to: (a) to increase participation of Maine undergraduate and graduate students in science and engineering research conducted by the Affiliates and NASA Field Centers (Higher Education); and (b) increase participation of Maine K-12 teachers and high school students in STEM activities through professional development activities for in-service and pre-service educators, curriculum development, teacher workshops and student-based programs (Pre-College). To achieve these goals in a manner that will yield results consistent with Outcome 2, we proposed to support the following objectives:

- Support STEM research experiences for High School Juniors
- Support a pre-college Professional and Curriculum Development program
- Support existing programs designed to help teachers and school districts acquire and utilize NASA and NASA related educational programs and resources.
- Develop partnerships to leverage and expand K-12 initiatives that connect schools to science and engineering research and educations strengths of the Affiliates

B. Goals and Objectives Relevant to NASA Education Outcome 3

The MSGC’s Informal Education goal is in alignment with activities to achieve Outcome 3. The goal is to increase the public’s awareness of STEM research, education and activities that are associated with NASA and the Affiliates. To achieve this goal in a manner that will yield results consistent with Outcome 3, we proposed to implement the following objective:

- Support one innovative educational project that uses NASA themes and contents.

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

Outcome 1. Travis Wallace graduated from the Maine Maritime Academy (MMA) in 2009 with his B.S in Marine Systems Engineering. While at MMA he founded his own start-up business centered on thermoelectric technology called Thermoelectric Power Systems, LLC. He continued his studies at the University of Maine (UMaine) where he received an MSGC fellowship award to conduct work on his project titled “Thermoelectric Waste Heat Recovery”. Travis received his M.S in Mechanical Engineering at UMaine in 2012 and is currently a Ph.D. candidate student in the Mechanical Engineering Department at UMaine. Travis is also an adjunct instructor in the Engineering Department at MMA and is a Co-Investigator on an UMaine project recently funded through MSGC’s Research Infrastructure Seed Grant Program. The goals of the MSGC funded research project that Travis is working on with faculty members from UMaine and MMA are to develop theoretical and computational models for optimizing the

compositional profiles in functionally graded thermoelectric materials to achieve maximized energy conversion efficiency over a broad range of temperature and to design thermoelectric generators with optimized power output and to test the energy conversion system in a marine environment. The thermoelectric research program that Travis has been working on over the past few years has led to the development of a thermoelectric generator (TEG) design that is based on existing heat exchanger technology, but is adapted to accept the thermoelectric materials. This past year, Travis has been working with undergraduate capstone students at MMA to actively research optimal designs for the exhaust side of the TEC design. The new design is a novel one.

Outcome 2. MSGC has conducted the MERITS program for five complete years, awarding a total of 73 students. We continually receive updates from students which allow us to monitor the success of our funded students and therefore the program as a whole. We should have more complete data for the first five years, after the fifth year “class” graduates from high school in June 2013. After that time, we will have more complete data on the number of students that attend college and in what disciplines. In the meantime, we have included some terrific student highlights from past classes along with student quotes about their experience in the MERITS program.

A number of students that interned at host academic institutions through our MERITS program continued on to attend the same institution, many in the same department or discipline that they participated in through MERITS. Below are a few of these students (with their participating years “class” in parenthesis). The below students are also participating in other MSGC funded projects.

Casey C. (2009) is majoring in Computer Engineering and is working with Dr. Abedi at the University of Maine. Casey has worked on a number of MSGC projects with Dr. Abedi since beginning as an undergraduate student, as well as with Professor Eason on MSGC’s funded MeSHAP (high altitude ballooning) program. He is scheduled to intern at SpaceX during the summer of 2013 and then will continue working on an MSGC funded project in the fall. Casey is scheduled to graduate in 2014.

Cody S. (2010) is majoring in Electrical Engineering and is also working with Dr. Abedi at the University of Maine on an MSGC funded project during the summer 2013. Cody also worked with Professor Eason on the MeSHAP Program. Cody is scheduled to graduate in 2015

Sonia B. (2011) is majoring in bioengineering and will begin working with Dr. Abedi in a MSGC funded project over the summer of 2013. Sonia is scheduled to graduate in 2016

Robert F. (2011) interned with Dr. Vincent Caccese in the Mechanical Engineering Department at the University of Maine through the MERITS program. Robbie received an MSGC incoming Freshman Scholarship to continue his studies at the University in the Mechanical Engineering department.

Other MERITS student successes are as follows:

Dana V. (2012) interned in the Chemistry department at Colby College. In the fall of 2012, after completion of her MERITS internship, she continued to attend a class at Colby College part time during her senior year in high school. She received an early acceptance into the Astrophysics program at the Massachusetts Institute of Technology where she will attend in the fall, 2013.

Erzsebet N. (2012) interned in the Biology department at Colby College. Erzsebet will graduate from high school in June 2013 and has been accepted in the Biology program at Middlebury College. "I am finishing my senior year, and with everything that is going on, MERITS definitely helped me to prepare for AP Biology. I also believed that the program helped me get into college, as it was an extra thing that set me apart from my peers. I feel prepared for open discussions and lab work."

Jared K. (2011) interned in the Electrical and Computing Department at the University of Maine. He now attends Worcester Polytechnic Institute, majoring in Aerospace Engineering. "I am in college now, which is one of the biggest thrills of my life. I am attending Worcester Polytechnic Institute and am on break (after our first completed term) as I write this. This past term could not have gone better and I love studying at WPI. I would have to say that participating in the MERITS program certainly strengthened my college applications and I may not have been accepted to WPI without the experience I had two summers ago. I give my thanks to MSGC and the MERITS program for getting me to where I am today"

Monica T. (2011) interned in the Chemistry Department at the University of Maine. She is now attending the University of Maine, in the Pre-Med program with a double major in Biochemistry and Molecular Biology. "When I have time, I continue to volunteer in the Dr. Howard Patterson Research Group (in the Chemistry Department). I still work with my mentor from MERITS, James Killarney, and we are close to publishing. If I hadn't done MERITS, I would (not) have been selected to be a part of the Phage Genomics 2-semester course sequence, which is a research based class. Also, because of MERITS, I am much better prepared for the Tufts Early Track program to apply for Tufts Medical School next school year. I have learned how important research is, and how difficult it is to get into a research group without connections at a Division 1 State University. I have these connections because of what the MERITS program has done for me. I am trying very vehemently to get students from the high school I graduated from to apply for the MERITS program because it is a priceless opportunity." "I constantly am thankful for having applied for the MERITS program, and have gotten invited to several conferences since my internship. It is rare to have already done research at this age..I know that I wouldn't have gotten into research until my junior or senior year of college, and that would have been too late by medical school standards. I have so many connections now that I don't have time to do every opportunity that has been given to me. Once again, thank you MERITS!!"

Laura P. (2010) interned in the Chemistry Department at the University of Maine. Laura now attends the University of Maine, majoring in Civil and Environmental Engineering. “Since my participation in the MERITS program, I have started working in the Sawyer Environmental Chemistry Laboratory at my university. I feel as though my experience with the MERITS program provided great experience for this job.” Laura has presented a poster on her project from the MERITS program, at the Junior Science and Humanities Symposium, at the University of New Hampshire, titled “Rapid detection of Bisphenol A with Excitation Emission Matrix Fluorescence Spectroscopy” . She received a scholarship and the Gaillard Prize for Achievement in Science. She credits, in part, her participation in the MERITS program as a factor for these awards.

Jordan L. (2008) interned at ReVision Energy (an Alternative energy company based in Maine). “Since leaving the MSGC program, I’ve enrolled in, and will graduate from, Case Western Reserve University’s Mechanical and Aerospace Engineering program. In the time that I’ve been here, I’ve interned with the Timken Company, one of the world’s largest bearing and steel manufacturers. I’ve also completed a seven month Co-Op with GE Aviation in Cincinnati, OH where I worked with the jet engine dynamics team.”

PROGRAM ACCOMPLISHMENTS

In early 2013, MSGC submitted an improvement plan that addressed deficiencies described in our mid-Course Assessment review. The plan accounts for improvements to programs going forward, beginning in year four. Improvements include the support for minority-Serving Institution collaborations, steps to meet our diversity metrics (our diversity target was originally 4.4% but was increased to 8%), the reinstatement of our K-12 Professional and Curriculum Development program to reach our target teacher metrics, and to provide more detailed progress information on program areas. In addition, MSGC, as part of our strategic planning process, will convene an Affiliates Working Group to design, develop, implement, monitor and refine strategies to meet the proposed improvements stated above. A few minor changes to our original metrics are italicized and bolded in each section below.

Outcome 1: “*Contribute to the development of the STEM workforce in disciplines needed to achieve NASA’s strategic goals*”

MSGC Goal for Scholarships and Fellowships: Increase the participation of Maine undergraduate and graduate students in STEM research conducted by the Affiliates and NASA Field Centers.

Objectives:

1. On an annual basis, at least 38 undergraduate and graduate students (31 tracked and 7 non-tracked) will receive scholarships and fellowships to participate in NASA-related STEM research conducted by the Affiliates and NASA field centers.

Accomplishments: 45 undergraduates and graduate students (30 tracked and 15 non-tracked) have received scholarships and fellowships.

Students are enrolled in the following institutions: Six students from Bowdoin College, eight students from College of the Atlantic, two students from Maine Maritime Academy, two student from our new affiliate, Saint Joseph's College, 16 students from the University of Maine, nine students from the University of Southern Maine and two students from the University of New England.

MSGC Goal for Research Infrastructure: Strengthen the Affiliates science and engineering research capacity in areas mutually beneficial to Maine and NASA.

MSGC conducts two Research Infrastructure Programs, a Research Seed Grant Program and a Minority Serving Institution Collaboration. Two Seed Grants have been awarded to the University of Maine (UMaine). The first award is to faculty in the Department of Molecular & Biomedical Sciences. The project aims to understand the risks in space travel due to irradiation-induced effects on inflammation and immunity, with potential impact on resistance to cancer and infectious agents. The second award is to faculty in the Mechanical Engineering Department who are collaborating with the Maine Maritime Academy working on a project titled "Thermoelectric Materials and Devices: Modeling, Design and Testing. Both projects include Graduate and/or Undergraduate students.

Under our Minority Serving Institution Collaboration, Dr. David Feldman and Ms. Anna Demeo from the College of the Atlantic continue to explore a potential collaboration with faculty at the Johnson C. Smith University (JCSU), a historically black university in Charlotte NC. The project will be an extension of a previously funded MSGC project through its Higher Education and Research Infrastructure Seed Grant program. Specifically Dr. Feldman and Ms. Demeo are hoping to work with faculty at JCSU to use renewable energy to teach STEM concepts at the undergraduate level, and engage the families of middle and high schools that JCSU currently works with.

Objectives:

1. On an annual basis, at least two research collaborations between affiliates and NASA Centers will be seeded.
 - a. Accomplishments: Two research collaborations between affiliates and NASA centers. The collaborations are with the UMaine, MMA, NASA Langley Research Center and NASA Johnson Space Center through our Research Seed Grant Program.
2. On an annual basis, at least four faculty will be supported in research collaborations between affiliates and NASA centers.
 - a. Accomplishments: Four faculty were supported in research collaborations between affiliates and NASA centers. Two male faculty members at UMaine, one male faculty member at MMA and one female faculty member at UMaine are supported through the Research Seed Grant Program.

3. On an annual basis, at least four undergraduates and graduate students (two tracked and two not-tracked) will participate in NASA-related STEM research conducted by affiliates
 - a. Accomplishments: 10 undergraduate and graduate students (5 tracked, 5 not-tracked) participated in NASA-related STEM research conducted by affiliates through the Seed Research Grant Program.

4. On an annual basis, at least one new research collaboration between an Affiliate and Minority Serving Institution will be seeded
 - a. Accomplishments: No new collaborations were conducted as of yet, but one is still being developed with the hopes of confirmation soon, see explanation above.

5. On an annual basis, at least two faculty will be supported in the research collaborative between an affiliate and a Minority Serving Institution.
 - a. Accomplishments: No faculty have been supported in this year (see number four above)

6. On an annual basis, at least two *three* undergraduate and graduate students will participate in a collaboration with a Minority Serving Institution *at least one student will be tracked*
 - a. Accomplishments: No students have participated in a collaboration with a Minority Serving Institution in this year (see number four above)

MSGC Goal for Higher Education: Increase participation of Maine undergraduate and graduate students in science and engineering research conducted by the affiliates and NASA Centers

Programs under Higher Education include 1) Our Maine Aerospace Workforce Development Program where we fund undergraduate students with a 10-week research experience at a NASA field center, 2) Maine Student High Altitude Platform (MeSHAP) Program which includes High-Altitude Ballooning and Rocketry projects, and 3) a Higher Education Other program which allows us to fund projects that don't align well in the first two projects, but are important to both NASA and Maine. Projects/activities that fit into this category include (but are not limited to) senior design courses, new course development or revisions.

Objectives:

1. On an annual basis, at least five undergraduate and graduate students (three tracked and two not-tracked) will participate in NASA-related STEM research conducted by the affiliates.
 - a. Accomplishments: 24 students participated (0 tracked, 24 not-tracked) in NASA-related STEM research conducted by affiliates. Students participated in the MeSHAP program at UMaine and the University of Southern Maine (USM). At this time MMA had not reported their student numbers.

2. On an annual basis, at least two courses that integrate NASA-related resources into STEM disciplines will be developed or improved
 - a. Accomplishments: 2 courses have been improved. Funding was provided for a research project under our Research Infrastructure Seed Grant Program. The result of the research allowed for two courses to be improved.

3. On an annual basis, at least four undergraduate students (all tracked) will participate in summer research experiences in NASA-related STEM research conducted at Maine Technology-based companies and/or NASA Field Centers
 - a. Accomplishments: Five student participants (3 tracked, 2 non-tracked) have been placed in research experiences at NASA Field Centers through our Maine Aerospace Workforce Development Program. Four male students and one female student have been accepted to NASA Goddard Space Flight Center, Jet Propulsion Laboratory, Marshall Space Flight Center and Glenn Research Center. The students are enrolled at Bowdoin College, UMaine and USM.

Outcome 2: *“Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers and faculty”*

MSGC Goal for Pre-College: Increase participation of Maine K-12 teachers and high school students in STEM activities:

Our programs that correspond with these goals and objectives for this year are our Maine Research Internships for Teachers and Students (MERITS), Space Day Maine, and a K-12 Other program that incorporates activities that are important to NASA and the State of Maine, but don't fit in the above projects.

In 2012, MSGC made the decision to discontinue the teacher portion of the MERITS program (teacher internships), when it became apparent that the current budget constraints would not allow us to allocate sufficient funding to support seven-week internships for teachers. The student portion of the MERITS program has been strong and continues to grow. As stated in our improvement plan, year four and five we plan to reinstate our pre-college K-12 Professional and Curriculum Development program to support an annual competition for middle and high school teachers. The goal of the program is to enhance the interests and enthusiasm of middle and high school students and teachers in STEM. We plan to invite teachers, schools or non-profit organizations to design and implement professional development projects or new curricula for the 2013-2014 and 2014-2015 academic years and we will emphasize teacher development, not class activities in this program.

Objectives:

1. On an annual basis, at least six middle and high school teachers will participate in summer research experiences in NASA-related STEM research. ***This program has been discontinued***
 - a. Accomplishments: 0 teacher participants. ***this program has been discontinued***

2. On an annual basis, at least four high school juniors will participate in summer research experiences in NASA-related STEM research
 - a. Accomplishments: 8 high school juniors will participate in summer research experiences through our MERITS program. **NOTE: We continue to finalize this program at the time this report was submitted. We are confident that eleven students will be placed at host organizations when the program is finished. We are only counting the eight students at this time, since these student's placements have already been finalized.**
3. On an annual basis, at least two new or improved curricula that uses NASA themes and content will be introduced in Maine K-12 schools
 - a. Accomplishments: No new curricula have been developed. Because of changes in programs we did not conduct this program in this year. We intend to reinstate this program for the 2013-2014 academic year.
4. On an annual basis, at least two middle school *and/or high school* teachers will use NASA contents and themes to enhance their STEM curricula
 - a. Accomplishments: Two teachers will use NASA content. We funded two teachers travel to NASA funded workshops, one to the Space Exploration Educators Conference and the other to an EarthKAM exhibition
5. On an annual basis, at least 40 middle school *and/or high school* students will be exposed to NASA-mission related activities, STEM disciplines and careers
 - a. Accomplishments: Over 2,000 middle and high school students have been exposed to NASA related activities through our Space Day Maine program. Space Day was held at the Winthrop High School, the Challenger Learning Center of Maine, Mt. Blue High School, 4H Club through the University of Southern Maine, East Corinth Middle School, the Riverview Foundation, Willard School, and the Sebassticook Middle School.

Outcome 3: *“Build strategic partnerships and linkages between STEM formal and informal education providers that promote STEM literacy and awareness of NASA’s mission”*

MSGC Goal for Informal Education: Increase the public’s awareness of STEM research, education and activities that are associated with NASA and the affiliates

We did not support an informal education activity in this year. As stated in our Improvement Plan, in May of 2013 as part of our strategic planning process the Affiliates Working Group will convene to provide input into the design and implementation of some of our programs, including the Informal Education competition.

Objectives:

1. On an annual basis, at least one informal education activity that uses NASA themes and content will be supported
 - a. Accomplishments: 0 informal education activity has been supported.

2. On an annual basis at least 50 **100** students *and/or members of the public* will have a better appreciation of STEM and NASA
 - a. Accomplishments: 0 students and/or members of the public were impacted.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Student Data and Longitudinal Tracking:** Number of student participants who are:

Employed by NASA	5
Employed by Aerospace Contractors	6
Employed by Universities	1
Employed by other education institutions	8
Employed in other STEM fields	49
Pursuing advanced education in NASA-related disciplines	54
Underrepresented	20

MSGC longitudinally tracks students that receive a significant award or benefit from the award/experience. Notices are sent out to these students twice annually requesting information on their academic and workforce status as well as data on publications, presentations, and proposals submitted to other funding agencies, as a result of their Space Grant award.

- **Diversity:** Data for 2012:
 - For all students:*
 - Three underrepresented students (in our scholarships and Fellowship program), which constitutes 4% of total student participation
 - 32 female participants (combination of all programs), which constitutes 38% of the total student participation.
 - Five disabled student participants (combination of all programs), which constitutes 6% of the total student participation
 - For ONLY tracked students:*
 - Two underrepresented students, which constitutes 5% of the total tracked student participation
 - 17 female participants, which constitutes 45% of the total tracked student participation
 - Two disabled student participants, which constitutes 5% of the total tracked student participation

- **Minority-Serving Institution Collaboration:** The state of Maine does not have any minority-serving institutions. MSGC implemented and continued a collaborating program

with California State Long Beach (CSLB), Department of Mechanical and Aerospace Engineering (minority serving institution) and the University of Maine (UMaine), Department of Electrical and Computer Engineering from 2008-2010. This collaboration resulted in a proposal submitted to the NASA EPSCoR MSI program by UMaine (lead institution) with CSLB as the minority serving institution, which was awarded. In 2011-2012 we promoted this opportunity to our affiliate members. Currently, Dr. David Feldman and Ms. Anna Demeo from the College of the Atlantic are exploring a potential collaboration with faculty at the Johnson C. Smith University (JCSU), a historically black university in Charlotte NC. As reported above, their potential project will be an extension of a previously funded project by the Consortium through its Higher Education and Research Infrastructure Seed Grant program. Specifically Dr. Feldman and Ms. Demeo are hoping to work with faculty at JCSU to use renewable energy to teach STEM concepts at the undergraduate level, and engage the families of middle and high schools that JCSU currently works with.

- **NASA 2010 Education Priorities:** “Accomplishments related to the “Current areas of emphasis” stated in the 2010 solicitation.
 1. Authentic, hands-on student experiences in science and engineering disciplines...
 - *MSGC’s Scholarship and Fellowship Program (pages 5-6), Research Infrastructure (pages 6-7), Higher Education (pages 7-8) and MERITS program (pages 8-9 under pre-college programs) apply to this priority area*
 2. Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise..
 - *The Consortium’s Pre-college other program (pages 8-9 under pre-college programs) apply to this priority area. When we reinstate the K-12 Professional and Curriculum Development program beginning in the 2013 academic year, this program will also apply to this priority area.*
 3. Summer opportunities for secondary students on college campuses with the objective of increased enrollment in STEM disciplines or interest in STEM careers
 - *MSGC’s MERITS program (pages 8-9 under pre-college programs) apply to this priority area*
 4. Community Colleges – develop new relationships as well as sustain and strengthen existing institutional relationships with community colleges.
 - *The Consortium has recruited Southern Maine Community College as an affiliate.*
 5. Aeronautics research – research in traditional aeronautics disciplines; research in areas that are appropriate to NASA’s unique capabilities; directly address the fundamental research needs of the Next Generation Air Transportation System (NextGen):
 - *MSGC’s Research Infrastructure Program (pages 6-7) apply to this priority area*

6. Environmental Science and Global Climate Change – research and activities to better understand Earth's environments.
 - *No direct activity yet or in 2012, although MSGC Research Infrastructure Program could potentially apply to this priority area IF faculty in this discipline applied to our Seed Grant program.*
7. Diversity of institutions, faculty, and student participants.
 - *The Consortium has diverse group of Affiliates representing higher education, non-profit research and education institutions, and private sector. This mix has been further strengthened with the addition of Southern Maine Community College and Saint Joseph's College (see next section). Diversity of faculty and student participants is an issue and will be addressed as outlined in the Maine Space Grant Mid-Course Improvement Plan which was submitted to the Program Office on March 13, 2013.*
8. Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research towards NASA priorities.
 - *MSGC's Research Infrastructure Program (pages 6-7) apply to this priority area*

IMPROVEMENTS MADE IN THE PAST YEAR

In 2012, after a review of our MERITS program, MSGC found that the student portion of the program was extremely successful. The quantity and quality of student applications were growing each year, along with the number of satisfied host mentors. We are successfully tracking awarded students and have some nice preliminary data on what (and where) our students are doing and going after they graduate from high school. Unfortunately, we have not been as successful recruiting teachers to this program. Because of budget constraints and apparent low interest in the teacher portion of the program, we made the decision to discontinue the teacher portion of the MERITS program (teacher internships).

In the summer of 2012 the Consortium had its annual affiliate meeting and began its strategic planning process which is scheduled to be completed in the summer of 2013.

In addition, we brought on a new affiliate member, Saint Joseph's College. We were able to implement a new scholarship and fellowship program within this institution. Our affiliate representative awarded two student and has expressed interest in participating in other ways as a new affiliate member. Saint Joseph's College is a liberal arts college and has has a history of collaborating with other Consortium affiliate members such as the University of New England.

We also recruited Southern Maine Community College into our affiliate family and will begin a new scholarship and fellowship program at this institution. More information on this partnership will be reported on in 2013.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Higher Education Affiliates

- Bates College, 4-year or above, Private, Baccalaureate College-Liberal Arts. Participates (faculty and students) and volunteers in multiple MSGC programs and activities.
- Bowdoin College, 4-year or above, Private, Baccalaureate College-Liberal Arts. Conducts scholarship/fellowship program, participates and volunteers in multiple MSGC program and activities.
- Colby College, Waterville, 4-year or above, Private, Baccalaureate College-Liberal Arts. Participates (faculty and students) and volunteers in multiple MSGC programs and activities
- College of the Atlantic, Bar Harbor, 4-year or above, private, Baccalaureate College-Liberal Arts. Conducts scholarship programs, participates and volunteers in multiple MSGC program and activities.
- Saint Joseph's College, Standish, 4-year, Private, Baccalaureate College-Liberal Arts. Conducts scholarship/fellowship program. Anticipate participation and volunteer in multiple MSGC programs and activities.
- University of Maine, Orono, 4-year or above, Public, Doctoral/Research-Extensive, member of the Board of Directors, conducts scholarship and fellowship programs, participates and volunteers in multiple MSGC program and activities
- University of Southern Maine, Portland, 4-year or above, Public, Master's Colleges and Universities II, member of the Board of Directors, conducts scholarship and fellowship programs, participates and volunteers in multiple MSGC program and activities
- University of New England, Biddeford, 4-year or above, Private, Master's Colleges and Universities II. Conducts Scholarship/Fellowship Program, participates (faculty and students) and volunteers in multiple MSGC programs and activities.
- Maine Maritime Academy, Castine, 4-year or above, Public, Specialized Institutions. Conducts Scholarship/Fellowship Program, participates (faculty and students) and volunteers in multiple MSGC programs and activities.
- Southern Maine Community College, South Portland, 2-year, Public, Associate Degree granting institution. Scholarship and Fellowship Program to be initiated in Fall 2013. Anticipate participation and volunteer in multiple MSGC programs and activities.

Non-Higher Education Affiliates

- Bigelow Laboratory for Ocean Sciences, Boothbay Harbor, Marine Research and Education, member of the Board of Directors. Participates and volunteers in multiple MSGC program and activities.

- Gulf of Maine Research Institute, Portland, Private not-for-profit, Marine Research and Education
- Maine Manufacturing Extension Partnership, Augusta, Private not-for-profit, Manufacturing Extension, member of the Board of Directors. Participates and volunteers in multiple MSGC program and activities.
- Applied Thermal Sciences, Sanford, High Tech Small Business, member of the Board of Directors. Participates and volunteers in multiple MSGC program and activities.
- Maine Mathematics and Science Alliance, Augusta, Private not-for-profit, Education, member of the Board of Directors. Participates and volunteers in multiple MSGC program and activities
- The Challenger Learning Center of Maine, Bangor, Private not-for-Profit, Education. Participates and volunteers in multiple MSGC program and activities
- BioAnalyte, Portland, Industry. Participates and volunteers in multiple MSGC program and activities
- Island Astronomy Institute, Private not-for-Profit, Education. Participates and volunteers in multiple MSGC program and activities
- Lockheed Martin, Industry. Participates and volunteers in multiple MSGC program and activities

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.