EXECUTIVE SUMMARY FOR THE SCHOOL OF SCIENCE AND MATHEMATICS ANNUAL REPORT

A. School Highlights for 2012-2013 (details follow)

For many years, Millersville has been a leader in the PA State System of Higher Education (PASSHE) and the Commonwealth in the education of students in computer science, mathematics, the sciences and nursing. The University continues to graduate among the highest number of science, mathematics and computer science students in PASSHE, in highly demanding and rigorous programs of study. Further, the number of science and mathematics majors at Millersville continues to increase, with majors in the school now accounting for more than twenty-one percent of the student population. A sampling of the outstanding achievements of students and faculty include:

B. Student Achievements (selected detail)

Undergraduate and Graduate Research and Student Awards:

- Six Biology students presented research papers at the Commonwealth of Pennsylvania University Biologists (CPUB) Annual Meeting. These included 3 posters and 3 platform presentations. Suzanne Yocom was awarded 1st place in the Ecology, Evolution & Organismal platform division.
- The Respiratory Therapy Clinical Program entered two teams in the PA Society of Respiratory Care State Sputum Bowl. The MU teams took first and second place. Our first place team went undefeated and will go to the National Competition in November. Our 2nd place team only lost to our undefeated 1st place team.
- A group of six Chemistry majors attended the American Chemical Society national meeting in New Orleans, LA to present their research.
- The American Chemical Society Student Affiliate chapter received the Honorable Mention Chapter Award for its 2012-2013 Activities, award at the 245th ACS National Meeting in New Orleans.
- A total of 43 Computer Science students attended the PACISE conference held at Millersville and nine participated in the programming contest.
- Computer Science majors Ryan Consylman, Edward Kimmel, and Wayne Treible received National Institute of Standards and Technology Research Fellowships for summer 2012 in Gaithersburg, MD.
- The MU Cyber Defense Team won the Mid-Atlantic Regional Collegiate Cyber Defense Competition and placed 8th in the National competition in San Antonio, Texas.
- Felicia Guarriello (Meteorology) was a recipient of the 2012 – 2013 NOAA Ernest Hollings Undergraduate Scholarship.
- Jordan McCormick (Meteorology) was the recipient of the 2013 – 2014 NOAA Ernest Hollings Undergraduate Scholarship.
- Marionette Calon-Munoz and Mallory Kreiser (Nursing) presented a poster of their evidence-based practice findings at the Undergraduate Research Day on Capitol Hill in Harrisburg.
• Twenty-nine undergraduate nursing students attended a legislative action day for nurses organized by the PA State Nurses Association on Capitol Hill.

• The Society of Physics Students Demo Team made a number of presentations at local high schools and middle schools.

• Karl Heldt (with Dr. Mike Nolan) gave a presentation: “Return Probabilities of Two Dimensional Lattice Random Walks”, at the 61st Annual Conference of the Central PA Section of the American Association of Physics Teachers, held at Millersville.

• Sarah Geiger (with Dr. Natalia Dushkina) presented a poster and gave a presentation: “Investigation of Surface Plasmon Resonance and its Sensor Applications” at the 61st Annual Conference of the Central PA Section of the American Association of Physics Teachers, held at Millersville.

• Zachary Schultz (with Dr. Xin Li) presented a poster: “Vortex String in Dipole Radiation Due to an Interface” at the American Physical Society Conference in Baltimore, MD.

• Daniel Long (Physics) was accepted into an REU (Interdisciplinary Materials Research) at Penn State University for summer 2013.

• Daniel Gochnauer (Physics) was accepted into an REU at the University of Washington for summer 2013.

• Kristina Laboy (MSEM), presented a paper, “Community Emergency Response Team Training: Creating a Culture of Awareness” at the PASSHE Graduate Research and Creative Projects Symposium.

• Hari Ghimire (MSEM) presented a paper, “Human Rights frameworks of Disaster Response” at the PASSHE Graduate Research and Creative Projects Symposium.

• At the 2013 School of Science and Mathematics Research Recognition Symposium, 97 students were recognized for 106 student-faculty research projects, along with students who received internships, grants and awards. In addition, the Departments of Biology, Earth Sciences and Mathematics all have their own departmental Honors and Awards ceremonies to recognize top academic achievers in their departments.

• The School of Science and Mathematics continued its emphasis on capstone research experiences, with the School’s Spring 2013 Research Poster Display, showcasing seventeen posters with joint faculty/student authors; the Fall 2012 Homecoming Poster Display included twenty-one posters with joint faculty/student authors.

• Twenty-four (24) nursing graduate students completed Scholarly Projects in 2012 – 2013.

• Thirty-three (33) SCMA students completed co-ops during 2012 – 2013.

• Twenty-seven (27) SCMA students gave presentations on their research at regional, national or international professional meetings during 2012 – 2013. In addition, many students presented research papers at the Millersville Student Research Conference and at other venues on campus, including departmental colloquia.

• Seventeen (17) SCMA students were selected for internships with various agencies in 2012 – 2013, including Los Alamos National Laboratory, WGAL-TV, NOAA National Severe Storms Lab, Norman, OK, PA Department of Environmental Protection, Hampton University, Lancaster Inter-Municipal Committee, Lamont Doherty Earth Observatory, Palisades, NY, University of Alabama- Huntsville, AccuWeather, State College, PA, University of Delaware, University of California at Davis, Pennsylvania Geological Survey, Cooperative Institute for Research in the Atmosphere, Colorado State
Graduate and Professional School Placements:

Graduate Schools: In Fall 2013, SCMA graduates will be starting their graduate studies at the following universities: University of Delaware, Virginia Tech, University of West Virginia, University of Georgia, University of New Hampshire, Penn State Hershey Medical School, University of Washington, University of Kentucky, American University, University of Michigan, University of California at Davis, University of Rochester, Ohio State University, Millersville University, University of Wyoming, University of Maryland, Penn State University, Lehigh University, University of North Carolina at Charlotte, University of Oregon and New Jersey Institute of Technology.

Professional Schools: In Fall, 2013, SCMA graduates will be beginning their medical studies at Jefferson University College of Medicine, University of Pennsylvania Dental School.

Testing Results

External testing provides a measure of the quality of the School’s academic programs, and the School’s graduates have performed very well against national standards. There is a **100% pass rate on both the AACN Family Nurse Practitioner Certification Exam and the respiratory therapy licensure examinations.** There is a **100% pass rate on the Praxis content exams for science and mathematics education majors.**

C. Faculty Achievements (selected detail)

Millersville science and mathematics faculty and staff members are active scholars, and their scholarly endeavors help to make them better teachers. In 2012 – 2013, SCMA faculty members **published 4 books, with 3 additional books currently in press** and **44 articles, with 33 additional papers submitted.** SCMA faculty presented **70 papers** at professional meetings and attended **117 professional conferences or seminars**. It is noteworthy that much of the faculty research is conducted collaboratively with Millersville students.

External Grants

SCMA faculty members submitted twelve (16) external grant or contract proposals in 2012 – 2013, representing requests in excess of $1.2M. Altogether, thirteen external grants were funded during 2012 – 2013, representing more than $1.08M in awards; several grant applications are still pending at this time. The above amounts do not include a number of grants carried over from previous years.

Selected new grants awarded in 2012 – 2013 include:
$386,039 awarded by NSF to Dr. Richard Clark (ESCI) for “Collaborative Research: Ontario Winter (OW) Lake-effect Systems (LeS): Surface and Atmospheric Influences on LeS (SAIL)”.

$184,700 awarded by NASA to Dr. Richard Clark (ESCI) for Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality (DISCOVER-AQ)-HOUSTON.

$158,585 awarded by NASA to Dr. Richard Clark (ESCI) for DISCOVER-AQ-California

$30,033 awarded by NASA to Dr. Richard Clark (ESCI) for DISCOVER-AQ-California (Analysis Phase).

$33,900 awarded by National RTAP c/o TransAction Associates, Inc. to Drs. Sepideh Yalda (ESCI) and Duane Hagelgans (ESCI) for Emergency Management for Transit Facilities.

$79,292 awarded by Science Systems and Applications, Inc. to Dr. Richard Clark (ESCI) to provide tethered balloon observations of boundary layer meteorological structure as well as near gradients in trace gases and aerosols (Additional/final funding).

$4,960 awarded by Sun Dog Science, LLC to Dr. Richard Clark to expand the capabilities of the GEOpod software.

$14,991 awarded by NSF:Advanced Learning Technologies to Drs. Richard Clark (ESCI) and Gary Zoppetti (CSCI), for Additional Funding for GEOPOD: Geosciences Probe of Discovery.

$55,379 awarded by the LI-COR Biosciences GEMF Program to Drs. Carol Hepfer (BIOL) and Susan DiBartolomeis (BIOL) for a DNA Analysis System.

$42,200 awarded by NSF through Georgia State University to Dr. Pat Hill (CHEM) for Chemistry of Arts Workshops.

$9,500 awarded by Hunterdon County, NJ, to Dr. John Wallace (BIOL) for Black Fly Surveillance in the County of Hunterdon.

$5,399 awarded by NSF through Shippensburg University to Dr. Erin Moss (MATH) for Mobile Math Applications (consultation services).

Continuing grant awards include:

$1,200,000 awarded by NSF to Drs. Janet White (MATH), Delray Schultz (MATH), Robert Smith (SCMA Dean’s Office), John Ward (EDFN) and Jane Bray (SOE Dean’s Office) to develop a program for training mathematics teachers for high-need (rural or urban) school districts.

$36,828 awarded to Mr. Eric Horst (ESCI) by the Pennsylvania Department of Transportation, for winter storm forecasting.

$24,000 awarded by the US Department of Education through the Lancaster-Lebanon IU-13 to Dr. Robert Smith (SCMA Dean’s Office), to develop and present a pair of summer workshops (one in science and one in mathematics) to local middle and high school teachers.

$235,199 awarded by NSF to Dr. Gary Zoppetti (CSCI) for a collaborative research project to develop the SoCS - ExSciTech: an interactive, easy-to-use volunteer computing system to explore science, technology and health.

$52,349 awarded to Dr. Dominique Dagit (BIOL) by the NSF, to fund a five-year collaborative research project on jaws and backbones: chondrichthyan phylogeny and a spine for the tree of life. This was part of a larger $2.8M grant awarded to a consortium of faculty at a number of institutions.

$104,857 awarded to Dr. Stephanie Elzer (CSCI) by the NSF, to fund a collaborative research project on exploiting information graphics in digital libraries.
• $585,000 NSF S-STEM grant awarded to Drs. Whisenton, Dagit, Shane, Smith, Dushkina, and Elzer, which continues to provide scholarship support to financially needy mathematics, computer science and science students.

• $350,000 NSF grant awarded to Drs. Gary Zoppetti (CSCI), Richard Clark (ESCI) and Sepi Yalda (ESCI), “GEOPOD: GEOscience Probe of Discovery”.

• $123,134 awarded by the NSF to Dr. Jason Price (ESCI) for study of the influence on radiation damage on the solubility of epidote-group minerals during chemical weathering.

• $134,951 awarded to a team of SCMA and SOE faculty and staff (Drs. Smith, Boal, Ambler, Dagit, Kumar, Bray, Dreon and Dietrich) to develop a program supporting education at the Marine Science Consortium.

• $52,580 from the PA Department of Environmental Protection awarded to Dr. Richard Clark (ESCI) for continuing work on the Millersville Acid Rain Monitoring Site Project.

Faculty Awards and Leadership Roles (selected):

• Dr. Dominique Dagit (BIOL) serves as the Chair of the Academic Advisory Council for the Marine Science Consortium.

• Dr. Ryan Wagner (BIOL) was recently elected to a second term as President of the Commonwealth of Pennsylvania University Biologists (CPUB).

• Dr. Christopher Hardy (BIOL) is the Chair of the Vascular Plants Technical Committee of the Pennsylvania Biological Survey.

• Dr. John Wallace (BIOL) is a member of the Research Working Group of the World Health Organization’s Buruli Ulcer Initiative and Secretary of the American Board of Forensic Entomology.

• Dr. Steven Bonser serves as Millersville University’s Institutional Liaison to the Council on Undergraduate Research (CUR), a Member-at-Large of the Southeastern Section of the Pennsylvania American Chemical Society, an Associate Member of the Committee on Science of the American Chemical Society and a member of the Science & Technology Subcommittee of ComSci (American Chemical Society).

• Dr. Jeremiah Mbindyo (CHEM) is a member of the Academic Advisory Board of the Nanotechnology Institute. He also serves as a member and lead faculty for the Program Design and Implementation Taskforce of the Pennsylvania Collaborative for Applied Nanotechnology and as a member of the Editorial Advisory Board for 2 journals: Proteus and Scientific Journals International.

• Dr. Aimee Miller (CHEM) is a member of the Committee on Computers in Chemical Education, Division of Chemical Education, American Chemical Society.

• Dr. David Hutchens served on the PACISE editorial board.

• Dr. Blaise Liffick (Computer Science) serves on the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

• Dr. Stephanie Elzer serves as a member of the Diagrams Steering Committee and the Graduate Symposium Chair for International Conference on Theory and Application of Diagrams, Australia, 2014.

• Dr. Richard Clark (ESCI) is in his second term on the Board of Trustees of the University Corporation for Atmospheric Research, which he also serves on several committees, including the Executive Committee, the Budget and Programs Committee and the Nominating Committee.
Dr. Clark is also a member of the Advisory Board for the National Center for Atmospheric Research High Altitude Observatory and has been appointed to several advisory committees of the American Meteorological Society.

- Dr. Alex DeCaria (ESCI) is a member of the Science Standing Committee for the National Assessment of Education Progress.
- Dr. Duane Hagelgans (MSEM/ESCI) is a member of the Advisory Board and the Foundation Board for the Lancaster County Public Safety Training Center, serves as Vice Chair of the Lancaster County Local Emergency Planning Committee, is the EM Coordinator for Millersville Borough and Manor Township, the Public Information Officer for the Lancaster County Emergency Management Agency and is a member of the South-Central Task Force.
- Dr. L. Lynn Marquez (ESCI) is an invited member of the Section Meeting Organizing Team for the Northeast Section Geological Society of America and a member of the Proposal Review Panel for the National Resource Center First-Year Experience and Students in Transition.
- Dr. Jason Price (ESCI) was a co-guest editor for a special volume of the Journal *Aquatic Geochemistry*.
- Dr. Todd Sikora (ESCI) is an Associate Editor for the *Journal of Applied Meteorology and Climatology*. Dr. Sikora is also a member of two committees of the University Corporation for Atmospheric Research.
- Dr. Sepideh Yalda (ESCI) was appointed as a member of the UCAR Advisory Committee on Governance, by the University Corporation for Atmospheric Research. Dr. Yalda was also appointed to the American Meteorological Society’s AMS Teaching Excellence Award Committee. She is also a member of the Eyes on the Environment Advisory Committee, for the National Environmental Education Foundation (NEEF) and is a UCAR Academic Affiliate Representative and is a member for the International Activities Committee of the Natural Hazard Mitigation Association, as well as an invited member of the Pennsylvania State All-Hazard Mitigation Planning Team of the Pennsylvania State Emergency Management Association.
- Dr. Ximena Catepillán (MATH) serves on the editorial board of Revista Latinoamericana de Etnomatemática and as a referee for the *Journal of Mathematics and Culture*. She also serves as a Member-at-Large on the Executive Committee of the Eastern PA and Delaware Section of the Mathematical Association of America, on the EPaDel Governor’s Nominating Committee and as the Fall 2012 EPaDel conference organizing committee chair.
- Dr. Erin Moss (MATH) is the co-editor of problem-solving department for the journal *Teaching Children Mathematics*, a monthly publication of the National Council of Teachers of Mathematics.
- Dr. Kevin Robinson (MATH) serves as the President of the Harrisburg Chapter of the American Statistical Association, as the vice-chair of PASSHE-MA and as an Associate Editor for both the *Journal of Statistics Education* and for the *Journal of Probability and Statistical Science*. He also served as a proposal reviewer for courses to be offered at the annual Joint Statistics Meetings.
- Dr. Delray Schultz (MATH) serves as the Vice Chair for District 3 of the American Statistical Association’s Council of Chapters and as a Question Leader for the national AP Statistics exam reading. He reviewed course proposals for courses to be offered at the annual Joint Statistics Meetings.
Dr. Robert T. Smith (Dean’s Office) serves as Chair of the Advisory Board for the Innovation Transfer Network (ITN) and serves as a member of the statewide Transfer Articulation Oversight Committee (TAOC).

Dr. Cynthia Taylor (MATH) served as a member at large of the Pennsylvania Association of Mathematics Teacher Educators (PAMTE).

Dr. Janet White (MATH) serves as President of the Pennsylvania Association of Mathematics Teacher Educators and coordinated the AP Calculus and AP Statistics simulations held for IU-13 in Lancaster, as well as the calculus simulations for Harford County, Maryland teachers and students.

Dr. Michael Wismer (MATH) was a member of the faculty planning team responsible for planning content and developing presentations for the ARansom 2012 Summer Mathematics Institute sponsored by IU-13.

Dr. Ruth Davis (NURS) served as a Peer Reviewer for the journal, *Qualitative Health Research*.

Dr. Kelly Kuhns (NURS) is the President of District 15 of the PA State Nurses Association and is on the Board of Directors of the PA State Nurses Association. Dr. Kuhns is Member of the Editorial Board of the peer-reviewed journal *The Pennsylvania Nurse*. She is also the Program Committee Chair for the South Central Pennsylvania Evidence-Based Practice Consortium and is an NLN Faculty Ambassador.

Dr. Natalia Dushkina (PHYS) is a consultant to the Educational Policy Improvement Committee of the College Board.

Dr. Mehmet Goksu (PHYS) serves as the Vice President of the Central PA Section of the American Association of Physics Teachers and was recently elected as President. He also serves on the grant review committees for the Electrical, Electronics & Computer Technology and Construction divisions of the Association of Technology, Management, and Applied Engineering (ATMAE). Dr. Goksu also served as the Site-Director to organize the 6th Annual Central PA Regional Science Olympiad, hosted by Millersville.

**Special Activities of Note:**

The School of Science and Mathematics maintains a long-standing emphasis on undergraduate research and each year, scores of our students are involved in undergraduate research projects with our faculty. In particular, in the past year, 97 students completed 106 research projects with our faculty. Further, twenty-seven of these students gave presentations of their research at professional meetings. In particular, Dr. Judy Cebra-Thomas (BIOL), with 2 undergraduate students (Gulnar Mangat ’12 and Kayla Branyan ’13) presented a poster on their research titled “Characterization of the Bone-Forming Cells of the Turtle Plastron”, at the 71st Annual Meeting of the Society for Developmental Biology in Montreal, Canada in July 2012. Chemistry undergraduate Thi Nguyen presented his poster, “The Synthesis and Chemistry of Novel Diaziridines” at the American Chemical Society National Meeting & Exposition in New Orleans, LA. Four MATH majors, Benjamin Baer, David Brown, Faheem Gilani and Joshua Pavonecillo presented the results of their research project, “Period Orbits on a 120-Isosceles Triangular Billiards Table”, at the Moravian College Student Mathematics Conference. Physics major Sarah Geiger, together with Dr. Natalia Dushkina presented their research results in the poster, “Investigation of Surface Plasmon Resonance and its Sensor Applications”, at the 61st Annual Conference of the CPS-AAPT, held in March 2013 at Millersville University. Physics major Karl Heldt (together with Dr. Mike Nolan) gave a presentation, “Return Probabilities of Two Dimensional Lattice Random Walks” at the 61st Annual Conference of the CPS-AAPT, held in March 2013 at MU. Physics
major Zachary Schultz (together with Dr. Xin Li) presented a poster, “Vortex String in Dipole Radiation Due to an Interface” at the American Physical Society Conference in Baltimore, MD in March 2013.

Drs. Christopher Hardy (BIOL) and John Wallace (BIOL) co-authored a chapter, entitled “Algae in Forensic Investigations”, which was published in Forensic Botany: A Practical Guide. Dr. Stephanie Schwartz (CSCI) co-authored a book chapter, “Information Graphics in Multimodal Documents”, published in Multimedia Information Extraction. Dr. Alex DeCaria (ESCI) is preparing a textbook A First Course in Atmospheric Numerical Modeling, which will be published by Sundog Publishing in fall 2013. Dr. J. Robert Buchanan (MATH) had the third edition of his textbook, An Undergraduate Introduction to Financial Mathematics published by World Scientific Publishing. Dr. Ronald Umble (MATH) has his textbook, Transformational Plane Geometry, under review for publication by CRC Press. Dr. Natalia Dushkina co-authored a book chapter, “Structural Colors”, in the book, Engineering Biomimicry: Bioinspiration, Biomimetics, and Bioreplication, which will be published by Elsevier Inc. in 2013.

School of Science and Mathematics Outreach Programs:

A total of 660 students and dozens of teachers from 44 middle schools and high schools attended the Central PA Science Olympiad that was held for the sixth time at Millersville University in spring 2013. Thanks to the ongoing efforts of Advancement staff, the Olympiad continues to be partially funded for the next few years through the generous support of Phoenix Contact, Inc. The reviews from participants were uniformly excellent. The Grossman Science Lectureship attracted approximately 950 elementary, middle school and high school students and members of the community to two presentations by Yale University engineering professor Dr. Ainissa Ramirez, related to her work in materials science. The Women in Mathematics and Science Conference was attended by a capacity crowd of 250 students from 50 area middle and high schools, who attended the keynote address by Dr. M. Bernardine Dias, an expert in computer science and robotics and Associate Research Professor at Carnegie Mellon University; students also participated in a number of breakout sessions led by successful women in mathematics and science careers, including several led by MU faculty and others led by MU alumni. One hundred and four students from twenty-five high schools in South-Central PA participated in the annual High School Mathematics Contest. The AP Calculus simulation offered by the Department of Mathematics in collaboration with IU-13 (including separate AB and BC simulations) included a total of 325 students and 28 teachers. Likewise, the AP Statistics simulation attracted 300 students and 18 teachers. Another 215 students and 21 teachers participated in an AP Calculus simulation offered to Harford County, Maryland students by MU faculty, while 108 students and 20 teachers participated in an AP Statistics simulation there. A Nursing Lectureship was hosted at Millersville for area nurses, and the Department of Computer Science offered two public Computer Science ‘Social Issues’ lectures. A number of SCMA faculty members spoke at area elementary, middle, and high schools as part of the School’s Spotlight on Science (SOS) program. The annual Summer Science Training Program (SSTP) offered a series of science and mathematics workshops to 38 middle and high school students from around the region over 9 days in summer 2012; five of these students were supported by scholarships. The Department of Physics hosted the 61st Annual Conference of the Central PA Section of the American Association of Physics Teachers on March 8, 2013. The Department of Mathematics hosted the Fall 2012 conference of the Eastern Pennsylvania and Delaware section of the Mathematical Association of America on October 27, 2012.
D. Significant School Achievements

In August 2012, we welcomed the first cohort for the new Master of Science in Integrated Scientific Applications, developed by the Department of Earth Sciences. The Department of Chemistry has developed a 3+4 program in cooperation with Lake Erie College of Medicine (LECOM), which will allow students to spend three years at Millersville before transferring to LECOM, leading to a bachelor’s degree in Chemistry from MU and a Pharm.D. degree from LECOM. The program is currently going through the approval process at MU. The Department of Nursing implemented a new dual-admission program with Harrisburg Area Community College (HACC); under this program, HACC students will transition seamlessly into the MU BSN program, which is being taught partially onsite at HACC’s Harrisburg campus and partially online. The first group of students at HACC began their studies in January 2013 and classes at this location are already at or close to capacity. The Department of Nursing also wound down the on-site BSN program at the Coatesville Veterans Administration Medical Center during 2012 – 2013. Finally, the department began development of a Doctoral program in Nursing Practice. Through greatly improved recruitment and thanks to the increased flexibility due to the advent of the BS in Allied Health Technologies program, the joint MU/Lancaster Regional Medical Center Respiratory Therapy program is now operating at between 85% and 100% of its maximum capacity (after we successfully petitioned the accrediting agency to increase the maximum number of students allowed in a cohort). This is a significant change, after many years of cohorts that were well below capacity.

The Earth Sciences and Physics Departments have jointly developed an interdepartmental minor in Helio-Physics and Space Weather; this is currently working its way through the university approval process. The Department of Physics has developed a cooperative 3+2 program with the University of Delaware, which is currently working its way through the approval process at Delaware.

In Fall 2011, the School also renewed its prior 3+2 cooperative engineering academic affiliation agreement with Penn State, which allows students to transfer to Penn State in Engineering, after three years at MU and at the end of five years, students receive both a BA degree in Physics from MU and a BS in Engineering degree from Penn State. Physics faculty have developed a similar arrangement with the University of Delaware. Under the terms of the draft agreement, students in this program would study for 3 years at MU and transfer to Delaware for two years. At the end of these five years, students would earn a BA degree in Physics from MU and a Master’s degree from UD in Materials Science and Engineering. The program has the support of the administration at UD and we are optimistic that the program will be approved by their Faculty Senate in Fall 2013. In Fall 2012, the Department of Mathematics implemented a new UNIV 103 course for its majors, intended to better acquaint new students with the discipline and to increase retention in the major. During 2012 – 2013, four additional departments (Chemistry, Computer Science, Earth Sciences and Physics) developed majors-based UNIV 103 courses, all of which will be offered for the first time in Fall 2013. The CDRE is currently developing an Emergency Management program under the rubric of the new BA program in Multi-Disciplinary Studies. This new program is based around the existing Environmental Hazards and Emergency Management (EHEM) minor. During 2012 – 2013, MSEM/CDRE faculty developed several new general education courses, which will support both the existing minor and the new program. It is expected that the new program will be approved early in 2013 – 2014. The MSEM program also developed plans during the past year intended to increase international enrollments in the MSEM program. These have been approved by the Provost and will be implemented beginning in Summer 2013.
SCMA faculty and MU administration continue to be very involved in developing and implementing reforms and new initiatives at the Marine Science Consortium, of which MU is a senior full member. In the past year, this included making refinements to the new online pre-registration system, which was developed to allow students to pre-register for MSC courses beginning in the late fall, instead of waiting until the various members’ online registration systems open up for summer courses (generally in March or April). This has made it easier for marine biology and oceanography students to register well in advance for required courses, as well as to allow faculty to ensure that seniors get the required courses they need and to allow the MSC to respond well in advance of when additional sections of courses are needed, thereby improving the efficiency of the registration system. Dr. Dominique Dagıt (BIOL) continues to chair the MSC’s Academic Advisory Committee. In March 2013, Drs. Ajoy Kumar and Robert Smith participated in a strategic planning conference for the MSC, resulting in a new draft strategic plan, with an emphasis on making more efficient use of MSC.

Recruitment of underrepresented students has significantly increased in the School of Science and Mathematics over the last five years. Notably, the total number of underrepresented students majoring in one of the school’s programs has increased from 175 in 2008 to 325 in 2011 (based on Fall official enrollments). Overall, this represents an 86% increase over this period of time. Specifically, during the past several years, enrollment of underrepresented students in SCMA majors increased by 19% from Fall 2008 to Fall 2009, by 24% from 2009 to 2010, by 19% from 2010 to 2011 and by 6.6% from 2011 to 2012. These increases significantly outpaced the overall growth in SCMA majors, which increased by a total of 25% from 2008 to 2012. Specifically, SCMA enrollments increased by 6.5% from Fall 2008 to Fall 2009, by 7.3% from 2009 to 2010, by 7.7% from 2010 to 2011 and by 1.7% from 2011 to 2012.

After initiating discussion with staff at the Lancaster-Lebanon Intermediate Unit 13 (IU-13) in Summer 2011, MU science faculty, supported by the dean’s office, offered a two-week intensive, hands-on workshop during Summer 2012 at MU for about 30 area secondary science teachers, as part of project ARRMS, an IU-13 initiative funded by a US Department of Education grant. In previous years, this workshop had been held at area private colleges. Similarly, MU mathematics faculty developed and taught one week of the corresponding two-week summer IU-13 ARRMS workshop for area mathematics teachers. These workshops were funded through contracts with IU-13 totaling approximately $24,000. During spring 2012, SCMA and School of Education faculty and administration supported IU-13 staff in developing a new grant proposal that was submitted to the US Department of Education, which would fund several years of follow-up workshops (project PULSE) for area science and mathematics teachers, following a similar model. In late spring, the grant was funded and MU faculty worked quickly to plan for a workshop to be offered on the MU campus during summer 2013.

E. Summary

Despite facing ongoing budgetary challenges, 2012 – 2013 was another highly productive year for the students and faculty of the School of Science and Mathematics. No doubt our greatest challenge continues to be meeting the increasing demands for seats in our courses, with no increase in staffing or operating budget. The increased demand for our courses has been driven by long-term and steep increases in the number of science and mathematics majors over the past six years, along with increased demand from non-majors, notably from students enrolled in the middle level teacher certification
science and mathematics emphasis. It is notable that with a loosening of complement restrictions in 2012 – 2013, the school was able to reinstate the laboratory sections of BIOL 100 (General Biology) and ESCI 109 (The Atmosphere), which had been eliminated during 2011 – 2012.

Science and mathematics faculty members continued their record of actively engaging undergraduate students in research projects and successful publication and presentation (often together with their students). Our students continue to experience success in gaining admission to top graduate and professional schools, upon their graduation from MU. Faculty and staff continue to be very active in writing successful proposals for extramural funding of research projects. Most notably, the Department of Earth Sciences has been awarded a series of sizeable grants by NASA, which have funded MU faculty and student participation in NASA’s Discover AQ (Air Quality) project. During 2012 – 2013, this involved a group of MU undergraduate Meteorology majors, who spent four weeks in California’s Central Valley using the MU tethered balloon facility to launch instruments as part of a large, coordinated study of air quality in this area of the country. These students participated in hands-on research generally only afforded to graduate students. In 2012 – 2013, we selected the first cohort of students funded under our $1.2M NSF Noyce grant, developed to increase the number of mathematics teachers working in high need (urban or rural) school districts. These students participated in a number of activities, including the Philadelphia Urban Semester, in Spring 2013. SCMA faculty and students continue to earn recognition at the regional and national level for their scholarly accomplishments and for service to their professional communities. During 2012 – 2013, SCMA faculty pressed forward with numerous curricular developments, including the development of courses for the newly-implemented MS program in Integrated Scientific Applications. As the Nursing faculty wound-down the on-site at the Coatesville VA Medical Center, they implemented a new onsite BSN program at Harrisburg Area Community College. We have also been working to expand our existing academic affiliation agreements with Lake Erie College of Medicine for post-graduate study in pharmacy, dentistry and osteopathic medicine and we are pursuing similar agreements with additional post-graduate programs. The School also increased its visibility and service to the community, by working in partnership with the IU-13 to deliver a pair of federally-funded summer workshops for area science and mathematics teachers that were taught at Millersville in Summer 2012 and by working to develop a similar new two-week workshop at MU for area STEM teachers, beginning in Summer 2013.