

MES
Annual Report
2005-2006



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I. Executive Summary

The MES Program **experienced** significant development during the 2005-2006 academic year, with an enhanced and expanded curriculum, the introduction of a new speaker series, and more opportunities for student learning and outreach. MES Program Director **Dr. Michael Katuna** worked with the MES Steering Committee to reduce the size of the core courses by offering multiple sections whenever possible, and MES faculty were encouraged to provide greater curriculum diversity by offering additional elective course offerings. New courses, including **Environmental Soil Science**, **Political Ecology**, **Advanced GIS**, and a travel course entitled **Environmental Management in the American West**, were all developed and taught during the year.

In addition to **course development**, this year marked the start of a new **Environmental Speaker Series**, designed to bring nationally prominent guest speakers to campus. **David Conrad**, Senior Water Resources Specialist for the National Wildlife Federation was the inaugural speaker presenting “**Rethinking Floodplain Management in the Wake of Hurricane Katrina**” to the College and Charleston community.

Ninety-one (91) students were enrolled and/or worked on internship and thesis projects during this year. Twenty-six (26) students started the MES Program in the Fall and nine (9) students in the Spring. Out-of-state students made up fifty-one percent (51%) of the new students, marking the first time that more than half of the incoming students have come from outside of South Carolina. Nineteen (19) courses were offered in the Fall, and sixteen (16) courses in the Spring (excluding Independent Study, Internship, and Thesis hours).

Twenty-one (21) students graduated from the MES Program this year, including six (6) students during the Summer, five (5) in December, and ten (10) in May. MES graduates produced an impressive variety of theses and internship reports, with **Laxminath Tumburu** and **Jennifer Wiedower** receiving the **MES Outstanding Graduate Student** awards, and **Jenn Beck** receiving the fifth annual **Dana Beach Outstanding Service Award**.

The MES Program and the MES Student Association organized a number of activities throughout the year. Students, faculty, and alumni were brought together for the annual **Oyster Roast** in October and for a **Spring Fling** in April. MESSA continued its focus on community service, sponsoring events such as the **Move Out / Help Out** day for **Habitat for Humanity**, and the fourth annual **MESSA 8K for H₂O** which raised more than \$3000 for **LEEP (Lowcountry Environmental Education Program)**. In addition, the students participated in the **City of Charleston Earth Day Festival**, the **Beach/River/Reef Sweep**, **Adopt-A-Highway**, and the **SC Oyster Restoration and Enhancement Program**, among other activities.

The MES Steering Committee consisted of: **Dr. Deanna Caveny** (*Mathematics*), **Dr. Mitchell Colgan** (*Geology*), **Dr. Lynne Ford** (*Political Science*), **Dr. Jon Hakkila**

(*Physics*), **Dr. Mark Lazzaro** (*Biology*), and **Dr. Michael Katuna** (*Director, MES Program*).

Students graduating from the program continue to find success. **Kristan McKinne**, for example, has accepted a position with **Lowcountry Earth Force** as **Program Manager**, **Liza Johnson** has taken a position with the **NOAA Coral Reef Management Team** as part of the prestigious **John A. Knauss Marine Policy Fellowship**, and **Jenny Wiedower** has been selected as the **Executive Director** of the **Navy Yard at Noisette Community Association, Inc., and Business District Association, Inc.** Our recent alumni survey suggests that MES alumni continue to find employment within their chosen environmental field.

II. Enrollment Management

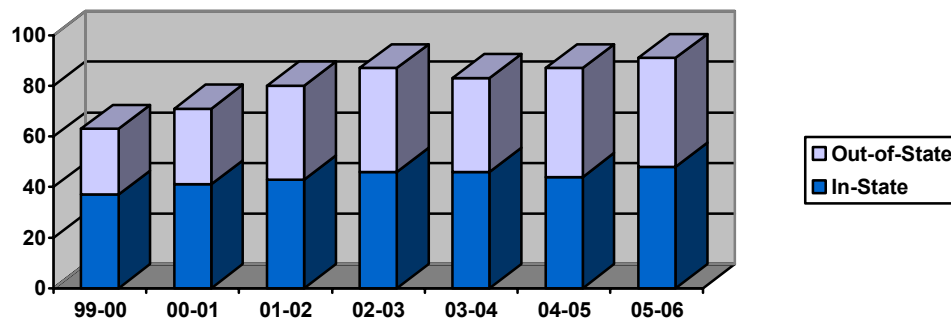
A. Enrollment History

Enrollment in the MES Program increased, with ninety-one (91) students enrolled and/or working on internship and thesis projects during the past year. The ability of the MES Program to provide students with a comprehensive background in both Policy and Science remains an attractive feature for prospective students, as does the ability of recent graduates to quickly find career positions in their areas of interest.

B. Total Student Enrollment

A total of thirty-five (35) new students enrolled in the MES program in the 2005-2006 academic year. Fifty-one percent (51%) of these new students were out-of-state students, marking the first time that more than half of the incoming students have come from outside of South Carolina. Forty-seven percent (47%) of the total number of students in the MES Program were out-of-state students during the year:

	MES Total Students	MES In-State Students	MES Out-Of-State Students	Out-Of-State as a Percentage of Total Students
1999-2000	63	37	26	41%
2000-2001	71	41	30	42%
2001-2002	80	43	37	46%
2002-2003	87	46	41	47%
2003-2004	83	46	37	45%
2004-2005	87	44	43	49%
2005-2006	91	48	43	47%



Although our total enrollment for the 2006-2007 academic year is expected to remain high, we will experience a smaller number of new students enrolling in Fall 2006. While enrollment numbers vary from year to year, we may be seeing the start of a “new reality” as the MES Program faces increased competition from other Environmental Studies programs with greater financial resources. We hope that the financial support of MES students and of the MES program will be able to keep pace with the program’s growing reputation.

C. Graduates

This year, twenty-one (21) students graduated from the MES program. Of these twenty-one (21) graduates, twelve (12) completed theses and nine (9) completed internships. Graduating students receiving awards and honors this year included **Laxminath Tumburu** and **Jennifer Wiedower**, recipients of the **MES Outstanding Graduate Student** awards, and **Jenn Beck**, who received the fifth annual **Dana Beach Outstanding Service Award**.

III. Program Activities

A. Administrative Activities

Dr. Michael Katuna served as Program Director for 2005-2006, with Mark McConnel as Program Coordinator.

B. Campus & Public Service

This year marked the start of a new **Environmental Speaker Series**, designed to bring nationally prominent guest speakers to campus. **David Conrad**, Senior Water Resources Specialist for the National Wildlife Federation, inaugurated the event by presenting **“Rethinking Floodplain Management in the Wake of Hurricane Katrina”** to the College and Charleston community.

David Conrad has been a water resources policy analyst and conservation advocate in the nation's capitol for more than a quarter century. Under David's leadership, in July of 1998 the Federation published an award-winning report on the nation's repetitive flood loss problems and the potential for greater use of non-structural approaches to reducing flood risk: **“Higher Ground - A Report on Voluntary Buyouts in the Nation's Floodplains - A Common Ground Solution Serving People At Risk, Taxpayers and the Environment.”**

David also served on a panel formed by the H. John Heinz Center for Science, Economics and the Environment that issued a report on the **“Hidden Costs of Coastal Hazards,”** which used South Carolina's Hurricane Hugo as a case study to identify many of the economic and environmental impacts of coastal storms that are seldom chronicled in basic reporting on such events. More recently David was a principal author of another report (in 2004) produced with the organization Taxpayers for Common Sense called **“Crossroads: Congress, the Corps of Engineers and the Future of America's Water Resources.”** The report identifies policy concerns and major reforms needed in managing the nation's largest water resource development agency.

This and other activities are described in further detail in the MES Fall newsletter (Appendix B) and the MES Spring newsletter (Appendix C). The MES Calendars of Events for 2005-2006 can be found online at www.cofc.edu/~environ/calendar057.htm (Fall Semester) and www.cofc.edu/~environ/calendar061.htm (Spring Semester).

C. Recruiting Activities

In addition to the standard mailings of the MES recruitment brochures and the distribution of MES recruiting posters to colleges and universities across the country, the MES Program's recruiting efforts continue to include targeted trips to schools with large minority populations. The recruitment of minority students is a stated goal of the MES Program, and our strategy for meeting this goal includes recruiting trips to Historically Black Colleges and Universities.

This year we participated in the Atlanta University Center Consortium graduate school fair, an event that includes Spelman College, Morehouse College, and Clark Atlanta University. In addition to the AUC Consortium fair, we attended the graduate school fair at Paine College in Augusta for the second time. This is a smaller event, with a setting that encourages more interaction with students.

Through our participation in these events, we are able to raise the profile of the College of Charleston and the MES Program. We spoke with a number of students and distributed literature, and gathered requests for information (an increase of 10% over the previous year).

D. Assessment

Following the comprehensive review of the MES Program in 2004-2005 in coordination with the Graduate School Office, the MES Steering Committee, and the Deans of Graduate Studies, Humanities and Social Sciences, and Science and Mathematics, Dr. Katuna **implemented many of the recommendations suggested by the two outside reviewers:** Dr. Rosina Bierbaum, Dean of the School of Natural Resources and Environment at the University of Michigan, and Dr. Walter A. Rosenbaum, Department of Political Science at the University of Florida.

The reviewers set out eight recommendations for immediate action, which are being addressed as follows:

1. During the Fall 2005 semester, Dr. Katuna codified the MES organizational structure and operational procedures (i.e., faculty roles, assigned FTE lines, assigned assistantships, departmental teaching responsibility and other contributions to the program, and school responsibilities), and presented it to the Deans with the approval of the MES Steering Committee.
2. Guidelines for the selection and rotation of the MES Program Director between schools were developed by Dr. Katuna and the Deans, and forwarded to the Provost. According to the policy, the next MES Director will be from the School of Humanities and Social Sciences.
3. In order to clarify the allocation of funds to provide predictable financial support to the program, such as a funding procedure to request adjunct faculty funding to teach in the program, the Graduate Dean will conduct a cost/benefit analysis, and the MES Program Director will propose a procedure to the Deans.
4. Dr. Katuna and the Steering Committee are developing procedures for curriculum growth, including incorporating new coursework and additional departments into the program. An initial component of this process, the review and rationalization of existing courses, was completed during the 2004-2005 academic year.

5. An Environmental Speaker program was established by Dr. Katuna, with the support of the Office of Academic Affairs, the Graduate School Office, the School of Humanities and Social Sciences, and the School of Sciences and Mathematics. As described above, **David Conrad**, Senior Water Resources Specialist for the National Wildlife Federation, inaugurated the event during the Spring semester with the presentation of “**Rethinking Floodplain Management in the Wake of Hurricane Katrina**” to the College and Charleston community.
6. Although the reviewers saw the provision of an attractive, convenient and suitable physical location for students and faculty needs as an area of immediate concern, the logistics of providing such a space have not yet been worked out.
7. In our ongoing efforts to improve minority recruitment efforts, we participated in the Atlanta University Center Consortium graduate school fair, an event that includes **Spelman College**, **Morehouse College**, and **Clark Atlanta University**, and we attended the graduate school fair at **Paine College** in Augusta. We experienced a 10% increase in minority student interest over the previous year.
8. A final area for immediate action was the provision of additional market competitive assistantships and scholarships for students. This is an ongoing process and this year a proposal generated by the Graduate Dean and developed and endorsed by the Graduate Council was sent to the President and the Provost for their consideration.

IV. Student Activities and Achievements

A. Student Government

The **MES Student Association (MESSA)** provided outstanding service to the MES Program, the campus, and the community throughout the year. MESSA encourages its members to participate in service activities as a way to promote public service throughout the community. By doing so MESSA hopes to serve as a role model for the College of Charleston, as well as for citizens and organizations around the, city, county, and state, MESSA works to build a foundation of community service by setting a positive example and by raising community awareness about environmental issues through direct action. Among their many activities and accomplishments, the students:

- Participated in **SCORE (South Carolina Oyster Restoration and Enhancement Program)** by monitoring the water quality at one of 100 constructed reef sites. Volunteers from MESSA visit the Bowen's Island reef each week to measure such variables as water and air temperature, pH, salinity, turbidity and dissolved oxygen. This data is entered and submitted online in order to track these variables throughout the year and to evaluate the health of the reefs.
- Joined with the **Charleston Clean City Commission** in environmental cleanup activities.
- Volunteered on the **Adopt-A-Highway** project, maintaining a stretch of Highway 61 from where it leaves Highway 17 after crossing the Ashley River, to its intersection with Wesley Drive.
- Maintained a student chapter of the **American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE)**, and met with the local Charleston chapter of the professional society on a regular basis.
- Recruited students for the **South Carolina Beach Sweep/River Sweep**, the largest day of cleanup in South Carolina, in coordination with the **Marine Biology Masters Program**, the **Masters of Public Administration** program, and local high school students.
- Helped organize the fourth annual **Move Out, Help Out** event, a **Clothing/Book Drive for Habitat for Humanity**
- Handed out informational material on many environmentally related topics during **Earth Day** events around the Charleston area.
- Participated in **Lowcountry EarthForce's Youth Summit**.
- Volunteered at the **Save the Light Foundation** race.

In all of these activities, MESSA worked closely with undergraduate environmental groups on campus. MESSA also brought faculty, alumni, and students together at the annual **Oyster Roast** in the Fall, and at the annual **Spring Fling** in April, held this year at **James Island County Park**.

In February, MESSA produced the fourth annual **8K for H₂O** at Folly Beach. The event was a great success, with 133 participants raising over **\$3000** for charity. The proceeds were donated to a local non profit organization, **LEEP (Lowcountry Environmental**

Education Program), a group devoted to ensuring that all students in and around Charleston County have the opportunity to enjoy hands-on environmental education, regardless of ethnic or socioeconomic background.

MESSA elected new officers in December:

President:	Alan Moore
Vice President:	Reggie Reeves
Secretary:	Josh Young
Treasurer:	Joe Hyatt
Social Chair:	Jessica Rowland
Public Liaison:	Bree Tomlinson
Volunteer Coordinator:	Jess Barton

B. Theses and Internships

Students in the Environmental Studies Graduate Program may choose to complete either a thesis or an internship. Students choosing the thesis option are required to write a thesis that demonstrates their familiarity and competency with basic scientific methodology. The thesis is designed to document the student's ability to conceive, implement, analyze and report on his/her original individual or collaborative research.

Students may also perform an internship as part of their academic course of study. Students completing an internship work in an applied setting under the direct supervision of an approved mentor. As part of his/her internship experience, the student works six-hundred (600) hours or more in the internship setting and is expected to complete an academic assignment, approved by his/her Program of Study Advisory Committee. Completion of the academic assignment and six-hundred (600) work hours transfers to six (6) credit hours.

This year, twelve (12) theses were completed, and nine (9) students completed internship projects. The student's names, project titles, and supervising faculty members are listed below.

Theses

Dave Burdick: Top-down Experimental Manipulation of Bahamian Patch Reef Communities: Macroalgal Reduction and *Diadema antillarum* Additions (advisor: Phillip Dustan) Date of Graduation: May, 2006.

Roman Crumpton: Determination of the Effects of Temperature and Time of Day on the Intensity of Otolith Marks of Juvenile Red Drum (*Sciaenops Ocellatus*) Induced by OTC Immersion (advisor: Theodore Smith) Date of Graduation: December, 2005.

Sadie Drescher: Capacity of Nitrogen Processing in Watersheds Surrounding Detention Ponds in Kiawah Island, SC (advisor: Marianne Burke) Date of Graduation: August, 2005.

Liza Johnson: Hydrologic Assessment of a Shallow Coastal Aquifer: Dixie Plantation, SC (advisor: Tim Callahan) Date of Graduation: December, 2005.

Gabriella Kirby: Ecological Restoration of South Carolina Piedmont Plant Communities: A Soil Seed Bank Assessment (advisor: Jean Everett) Date of Graduation: May, 2006.

Jeanette Klopchin: Environmental Impacts of the Free-Ranging Rhesus Monkey Colony (advisor: *Macca mulatta*) on Morgan Island, SC (advisor: Paul Sandifer) Date of Graduation: December, 2005.

Kristan McKinne: Coordinating Sustainable Environmental Volunteerism on a College Campus: The College of Charleston Native Species Garden (advisor: Angela Halfacre-Hitchcock) Date of Graduation: August, 2005.

Bill Strosnider: Design for Nitrogen Reduction in Estuarine Systems: Retrofitting Coastal Ponds with Stormwater Wetands (advisor: Marianne Burke) Date of Graduation: August, 2005.

Bob Swarthout: Method Development for Organohalogen Contaminant Analysis in Sea Turtle Whole Blood, Serum and Plasma (advisor: John Kucklick) Date of Graduation: May, 2006.

Laxminath Tumburu: Effects of Endosulfan Contamination and Taura Syndrome Virus Infection on Survival and Molting of the Marine Penaeid Shrimp *Litopenaeus vannamei* (advisor: Craig Browdy) Date of Graduation: August, 2005.

Lisa Vandiver Hayes: Characterizing Pollutant Transport through a Coastal, Residential Lawn of Vegetated Buffer (advisor: Fred Holland) Date of Graduation: December, 2005.

Andrew Wunderly: The Public Trust Doctrine and Coastal Zone Management in South Carolina (advisor: Lindeke Mills) Date of Graduation: August, 2005.

Internships

Jeremy Conkle: Remediation of Hog Island Inlet: Site Overview and Assessment of Factors Influencing Site Cleanup (advisor: Lindeke Mills) Date of Graduation: May, 2006.

Sean Heath: The Application of NEPA within the Navy and Design of a Small Animal Survey at MCAS Beaufort (advisor: Dennis Forsythe) Date of Graduation: May, 2006.

Angela Jones: GIS Applications of Shoreline Data for Coastal Resource Managers (advisor: Norman Levine) Date of Graduation: December, 2005.

Brooke Pehr: Evaluation of a Field and Lab-Based Research Experience for Undergraduates: The Transects Program (advisor: Leslie Sautter) Date of Graduation: May, 2006.

Lana Pinera-Pasquino: Patterns of Antibiotic Resistance in Bacteria Isolated from Marine Turtles (advisor: David Owens) Date of Graduation: May, 2006.

Laura Seraydarian: Bridging the Gap between Formal and Informal Education: An Earth System Science Curriculum Prepared for Ecotourism (advisor: Lindeke Mills) Date of Graduation: May, 2006.

Adam Sine: Stewardship Coordinator Project (advisor: Lindeke Mills) Date of Graduation: May, 2006.

Rachel Teller: Enhancing Environmental Science Education: Online Educational Resource and Classroom and Field Experiences (advisor: Leslie Sautter) Date of Graduation: August, 2005.

Jenny Wiedower: Cultivating a Statewide Network of Land Use Planning Leaders: Coordination of a South Carolina District Council of the Urban Land Institute (advisor: Lindeke Mills) Date of Graduation: May, 2006.

C. Departmental and Grant Funded Assistantships

Three of the five departments that make up the MES Program offer a limited number of Teaching Assistantships for MES students: Biology provides at least (4), Geology and Environmental Geosciences provides at least (2), and Physics and Astronomy provides at least two (2). Students are reviewed, considered, and awarded these positions at the departments' discretion. In addition to these guaranteed Teaching Assistantships, more TAs can become available each semester as the individual departments determine their teaching needs on a term-by-term basis, and as TAs guaranteed to other programs, such as Marine Biology, go unused. While these additional assistantships are a welcome source of funding for the MES students, their unreliability does not allow the MES Program to use them as recruiting tools, or to provide a solid basis of funding for existing students in the program.

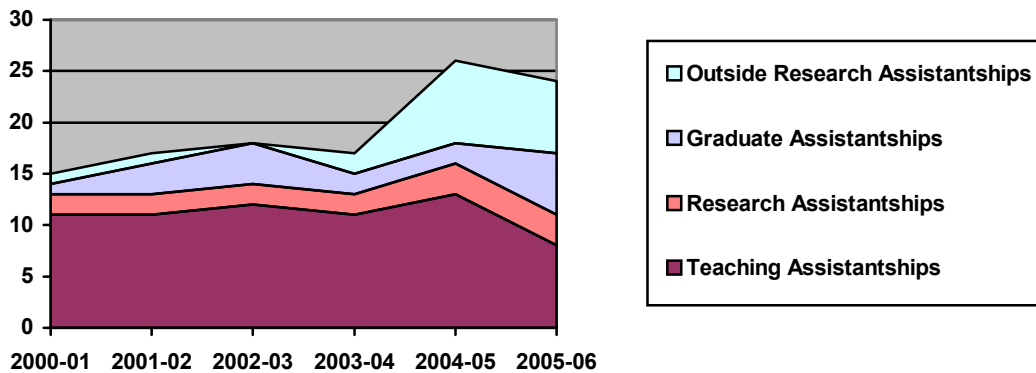
Individual faculty members also provide Research Assistantships acquired from external grants to fund MES students who are working with them on research projects. While these awards are not a guaranteed source of funding, they are appreciated as an additional source of student financial support. Typically, students start the MES Program and by their second semester are working on research projects with faculty who may be able to provide them with Research Assistantships.

Graduate Assistantships are another source of funding for the MES students. These assistantships are provided for non-research related tasks, and are funded through individual programs. The MES Program currently awards two (2) full Graduate Assistantships each year.

Full-time Assistantships are established as 20-hour / week positions through the academic year. Assistantships may also be awarded as half-time or as quarter-time positions. During the past five years, the overall number of assistantships reported by the Graduate School for the MES Program has stayed relatively stable, although the past few years have seen a larger number of outside student Research Assistantships sponsored by the South Carolina Department of Natural Resources. However, this year (2005-2006) we experienced a decline in the number of teaching assistantships that we could award through the Biology Department due to the increase in student enrollment within the graduate Marine Biology program.

MES Student Assistantships:

	00-01	01-02	02-03	03-04	04-05	05-06
Teaching Assistantships	11	11	12	11	13	8
Research Assistantships	2	2	2	2	3	3
Graduate Assistantships	1	3	4	2	2	6
Outside Research Assistantships	1	1	0	2	8	7



D. Student Conference Participation

Each year the MES Program provides some financial support for students who participate in field-related conferences, a vital component in the professional development of graduate students. MES students are encouraged to attend conferences in their discipline. Due to the diverse nature of the MES Program, first and second year students attend a wide variety of conferences. This year, for example:

- **Sarah Goldman** attended the annual joint meeting of the **South Carolina Fishery Worker's Association** and the **South Carolina Chapter of the**

- American Fisheries Society.** Sarah presented her thesis work entitled *Feeding Habits of Several Deep Water Reef Fish on the Continental Slope off the Southeastern United States: Preliminary Analysis*, and she received the **2006 Best Student Paper** award. Sarah's presentation was selected by a 4-person professional panel as the most outstanding of a total of eight student presentations. This award has been given annually since 1990 by the South Carolina Fishery Worker's Association to honor distinctive work by a student enrolled in a South Carolina college or university focused on an aquatic curriculum.
- **Jennifer Beck** received funding to present her research at the **Southeastern Estuarine Research Society (SEERS) Semiannual Meeting** in St. Augustine, FL, and received the “**Best Graduate Student Poster Presentation**” award for her poster *Plant Source Influence on Survivorship and Vegetative Reproduction of Spartina alterniflora in South Carolina Marshes*.
 - **Alan Flemming** also received funding to present his thesis work, entitled *Distribution of Polycyclic Aromatic Hydrocarbons in a Stormwater Retention Pond on Kiawah Island, South Carolina*, at the **Southeastern Estuarine Research Society (SEERS)** meeting in St. Augustine, GA.
 - **Mark Messersmith** received funding to attend the **Southeastern Estuarine Research Society (SEERS)** meeting as well, where he presented a poster on water quality and the efficiencies of stormwater holding ponds.
 - **Emily Batts** and **Charles Kaufman** received funding to attend the **Geological Society of America Southeastern Section Meeting** in Knoxville, TN, where they made an oral presentation of their research.
 - **Reginald Reeves** also received funding to attend the **Geological Society of America Southeastern Section Meeting** in Knoxville, TN, where he presented his research in a poster session.
 - **Emily Batts** received funding to attend the annual meeting of the **Geological Society of America** in Salt Lake City, UT, where she presented her research at a poster session.
 - **Charles Kaufman** received funding to attend the annual meeting of the **Geological Society of America** in Salt Lake City, UT, as well, where he presented at a poster session.
 - **Sarah Goldman** received funding to attend the **2006 Ocean Science Meeting** in Honolulu, HI, where she presented her thesis research on *Feeding Habits of Several Deep Water Reef Fish on the Continental Slope off the Southeastern United States: Preliminary Analysis*

E. Scholarships and Awards

Two College of Charleston scholarships, the **Barbara Lindstedt Trust Award** and the **Environmental Protection Agency Fellowship**, are awarded each year to MES students. For the 2005-2006 academic year, the **Barbara Lindstedt Trust Award** was awarded to first-year student **Mary Davis**. The **EPA Fellowship** was awarded to first-year students **Albert Plan**, **Blaik Pulley** and **Jessi Adair Shuler**.

In addition to these scholarships, 2005-2006 marked the third year that **Summer Research Awards in Environmental Studies** were offered through the Graduate School at the College of Charleston. These awards provide MES students with much needed research support during the summer terms. Available funding provided summer support for second year students **Charles Kaufman** and **Emily Batts**, and for first-year recipients **Gwendolyn Burns**, **Elizabeth Haley**, and **Alan Moore**.

V. Faculty

A. Participating Faculty

The MES faculty consists both of roster members of the College of Charleston faculty and of individuals who are reviewed by a Faculty Review Committee, approved by the Dean of Graduate Studies, and accepted for participation in the program. Currently, there are fifty-six (56) roster faculty members and ninety-three (93) adjunct faculty members who actively teach and advise in the MES Program. Adjunct faculty members are affiliated with a wide variety of institutions, including:

- Center for Coastal Environmental Health & Biomolecular Research
- Center for Forested Wetlands Research
- The Citadel
- Grice Marine Laboratory
- International Paper
- MUSC
- NOAA National Ocean Service
- NOAA Coastal Services Center
- SC Department of Natural Resources
- SC Sea Grant Consortium
- South Carolina Aquarium
- Southern Division Naval Facilities Engineering Command
- USDA Forest Service
- USDA Vegetable Laboratory

A complete list of the MES Program faculty is located on the program web site at <http://www.cofc.edu/~environ/faculty.htm>

B. Teaching Evaluation

All MES Program instructors are evaluated through the College of Charleston student evaluation process. These evaluations are kept on file at the MES Program office.

C. Faculty Research

Information on the research activities of faculty members participating in the MES program is available in the faculty/staff section of the MES Program web site at: www.cofc.edu/~environ/faculty.htm

VI. Curriculum

A. Curricular Changes

The MES Program saw significant development during the 2005-2006 academic year, with an enhanced and expanded curriculum playing a key role in the further development of the program. Dr. Katuna worked with the MES Steering Committee to reduce the size of the core courses by offering multiple sections whenever possible, and MES faculty were encouraged to bring additional diversity to the elective offerings. New courses, including **Environmental Soil Science**, **Political Ecology**, **Advanced GIS**, and a travel course entitled **Environmental Management in the American West**, were all developed and taught during the year. With the 2006-2007 academic year, a Fall section will be opened for a Core class that previously had been offered only in the Spring semester: **Economic Theory for Policy Analysis**.

In addition to this expansion of offerings, Dr. Katuna worked with the MES Steering Committee to streamline a number of outdated course offerings. These courses were removed from the catalog, which now more accurately reflects the classes offered by the MES Program.

B. Course Offerings – Fall 2005

CORE COURSES			INSTRUCTOR	MES ENROLLMENT
EVSS 602.001	<i>Public Policy</i>	3 hrs	A. Halfacre-Hitchcock	18
EVSS 602.090	<i>Public Policy</i>	3 hrs	Mark Tompkins	5
EVSS 602.091	<i>Public Policy</i>	3 hrs	A. Halfacre-Hitchcock	7
EVSS 640.090	<i>Earth Systems Science</i>	3 hrs	Mitchell Colgan	17
EVSS 641.001	<i>Aqueous Geochemistry</i>	4 hrs	Timothy Callahan	8
EVSS 646.090	<i>Graduate Core Seminar</i>	1 hr	Kem Fronabarger	16
EVSS 650.090	<i>Energy Prod. & Resource Mgmt.</i>	3 hrs	Jeff Wragg	10
EVSS 680.090	<i>Case Studies on Environmental Issues</i>	4 hrs	S. Jaume / Linde Mills	16
ELECTIVE COURSES				
EVSS 605.090	<i>Environmental Law & Reg. Policy</i>	3 hrs	Lindeke Mills	21
EVSS 622.001	<i>Ecology of Marine Organisms</i>	4 hrs	Craig Plante	1
EVSS 626.001	<i>Environmental Immunology</i>	3 hrs	Karen Burnett	6
EVSS 633.001	<i>Urban Planning</i>	3 hrs	Patrick Hurley	17
EVSS 649.001	<i>Geographic Information Systems</i>	4 hrs	Norman Levine	11
EVSS 649.002	<i>Geographic Information Systems</i>	4 hrs	Norman Levine	9
EVSS 657.001	<i>Satellite Meteorology</i>	4 hrs	B. Lee Lindner	3
EVSS 695.001	<i>Tetrapod Adaptations</i>	4 hrs	David Owens	5
EVSS 695.090	<i>Environmental Soil Science</i>	4 hrs	Charles Everett	5
EVSS 720.001	<i>Aquatic Toxicology</i>	4 hrs	Marie DeLorenzo	2
EVSS 724.001	<i>Ichthyology</i>	4 hrs	Tony Harold	4

EVSS 602 PUBLIC POLICY

This course seeks to develop a firm understanding of the public policy making process in the United States. Students study policy making through various perspectives on implementation. The roles of major institutions including the Executive, Legislative, and Judicial branches of government, the bureaucracy and interest groups in this process are addressed. Integrated within this study of the process are various perspectives and interpretations of policy making, including incrementalism, rationalism, pluralism and elitism. Selected areas of public policy, including transportation, poverty, energy and the environment are used to illustrate both the process and the different perspectives.

EVSS 605 ENVIRONMENTAL LAW & REGULATORY POLICY

This course concentrates on the development of environmental laws and regulations in this country. The course is taught by an attorney and will help students develop an understanding of the scope and substance of environmental laws and the methods by which these statutes address environmental issues using different regulatory techniques.

EVSS 633 URBAN PLANNING

This course analyzes contemporary issues/problems in the urban arena and the role of planning in implementing solutions to them. An overview of urbanization and the planning process is given to begin the semester. The majority of the time, however, is spent on studying a variety of issues from economic development through the environment to homelessness. The emphasis is on connecting planning and what planners do with ideas and events in the larger society; less time is spent on dates and names of federal programs and specifics of the planning process. Students are expected to achieve knowledge of contemporary urban issues, potential planning solutions, and apply this information to an empirical study in the metropolitan Charleston area.

EVSS 622 ECOLOGY OF MARINE ORGANISMS

The study of living organisms in the marine environment - population and community ecology, reproduction and life histories, productivity, evolution and biogeography. A broad overview of these elements is followed by detailed consideration of major coastal and oceanic ecosystems around the world.

EVSS 626 ENVIRONMENTAL IMMUNOLOGY

This course provides an introduction to the field of basic immunology, an understanding of scientific approaches and techniques used for assessing the effects

of environmental stressors on human and wildlife populations, and training in the critical review and presentation of literature in the areas of immunotoxicology, clinical and comparative immunology.

EVSS 640 EARTH SYSTEMS SCIENCE

This course investigates the interactions among the atmosphere, ocean, ice, solid-Earth and biological systems. Students will study the evolution of solid-Earth, the formation of the atmosphere and oceans, and the origin of life. Rate and scale of changes of the Earth's environment will be examined through an analysis of changing climates. Finally, the course examines human evolution and technological development to gain an understanding of human impacts on the global environment.

EVSS 641 AQUEOUS GEOCHEMISTRY

A detailed examination of the chemical processes that affect ground-and-surface waters, especially those that control the migration of common water contaminants. Topics include mass transport, equilibria, chemical retardation, Eh-pH stability, stable isotopes and geochemical cycles.

EVSS 646 GRADUATE CORE SEMINAR

Seminars on contemporary topics in environmental studies acquaint students with the variety of disciplines and techniques available to natural, physical, and policy scientists working in the environmental field. Designed especially to stimulate new-to-the-program students to choose their thesis topics and/or to determine the focus of their program of study.

EVSS 649 GEOGRAPHIC INFORMATION SYSTEMS

This course will covers spatial types and quality, data input operations, database management, data analysis, and software design concerns. We will also examine institutional and political concerns for using GIS. Computer-based GIS software (Unix, PC, and Mac) will be used throughout the course.

EVSS 650 ENERGY PRODUCTION AND RESOURCE MANAGEMENT

A study of the nature of energy and scientific issues relating to its production, storage, distribution and use from a physics perspective. Production methods to be studied include: Hydroelectric, fossil fuel, fission, fusion, wind, photovoltaic, biomass and solar-dynamic. Scientific issues will be related to the cultural and philosophical framework surrounding energy infrastructure and policy.

EVSS 657 SATELLITE METEOROLOGY

Satellite meteorology is the measurement of weather by sensors aboard Earth-orbiting satellites. Topics include satellite orbits and navigation; electromagnetic radiation; instrumentation; image interpretation; atmospheric temperature; wind, clouds, precipitation, and radiation.

EVSS 680 CASE STUDIES IN ENVIRONMENTAL ISSUES

This course investigates specific case studies. Case studies impart a unique opportunity to explore basic principles of biology, chemistry, geology and physics through practical applications. This approach to problems will be similar to that used by the practitioners of science and public policy.

EVSS 695 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES: TETRAPOD ADAPTATIONS**EVSS 695 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES:
ENVIRONMENTAL SOIL SCIENCE****EVSS 720 AQUATIC TOXICOLOGY**

An introduction to assessing the effects of toxic substances on aquatic organisms and ecosystems. Topics include general principles of toxicology, fate and transport models, quantitative structure-activity relationships, single-species and community-level toxicity measures, regulatory issues, and career opportunities. Examples will be drawn from marine, freshwater and brackish-water systems.

EVSS 724 ICTHYOLOGY

A study of fishes, emphasizing diversity and evolution, morphology, physiology, ecology, life histories, behavior, systematics and biogeography. Laboratory work will focus on groups important in the local fauna.

C. Course Offerings – Spring 2006

CORE COURSES			INSTRUCTOR	MES ENROLLMENT
EVSS 601.090	<i>Economic Theory for Policy Analysis</i>	3 hrs	Calvin Blackwell	34
EVSS 610.090	<i>Environmental Biology</i>	3 hrs	Matthew Rutter	6
EVSS 647.090	<i>Graduate Core Seminar</i>	1 hr	Kem Fronabarger	18
EVSS 659.090	<i>Environmental Statistics</i>	3 hrs	Martin Jones	38
EVSS 680.090	<i>Case Studies on Environmental Issues</i>	4 hrs	D. Hitchcock/Linde Mills	15
ELECTIVE COURSES				
EVSS 624.001	<i>Biometry</i>	4 hrs	Courtney Murren	1
EVSS 629.001	<i>Conservation Biology</i>	3 hrs	David Owens	15
EVSS 637.001	<i>Wetlands Policy</i>	3 hrs	A. Halfacre-Hitchcock	14
EVSS 638.001	<i>Introductory Hydrogeology</i>	4 hrs	Timothy Callahan	3
EVSS 645.001	<i>Coastal Issues and Processes</i>	3 hrs	Michael Katuna	14
EVSS 649.001	<i>Geographic Information Systems</i>	4 hrs	Norman Levine	10
EVSS 670.001	<i>Environmental Chemistry</i>	4 hrs	Frank Kinard	1
EVSS 695.001	<i>Political Ecology</i>	3 hrs	Patrick Hurley	5
EVSS 695.003	<i>Advanced Geographic Info Systems</i>	4 hrs	Norman Levine	12
EVSS 695.090	<i>Natural Resource Law and Policy</i>	3 hrs	Lindeke Mills	12
EVSS 722.001	<i>Marine Invertebrate Zoology</i>	4 hrs	Erik Sotka	1

EVSS 601 ECONOMIC THEORY FOR POLICY ANALYSIS

This course develops and applies microeconomic models and theories to the analysis of contemporary public sector issues. Attention is given to the conceptual and practical problems associated with resource allocation decisions when there is conflict among efficiency, equity and limited information in policy making. The foundations of welfare economy and techniques and applications of cost-benefit analysis as they relate to specific policy areas and programs are examined as well.

EVSS 610 ENVIRONMENTAL BIOLOGY

This course emphasizes the application of fundamental toxicological and microbiological concepts to problems that exist in the real world. The course should prepare the student interested in environmental problems with the necessary practical information to make sound judgments in assessing meaningful solutions to existing environmental problems.

EVSS 624 BIOMETRY

This course is intended to provide a broad treatment of statistics concentrating on specific statistical techniques used in biological research. Topics covered include

sampling procedures and analysis of distributions (binomial, poisson, and normal), hypothesis testing and estimation with emphasis on analysis of frequencies, regression and correlation. Several nonparametric and multivariate methods are also discussed. Emphasis is on application of statistical techniques and not theory; knowledge of mathematics through calculus is expected.

EVSS 629 CONSERVATION BIOLOGY

A course exploring the origin, maintenance, and preservation of biodiversity at all levels: genetic, population, community, ecosystem and biosphere. The focus will be on applying ecological, genetic, and evolutionary principles to problems in conservation. Optional field trips will make use of the rich biota of the Charleston area.

EVSS 637 WETLANDS POLICY

This course is intended to provide the student with a broad understanding of the social origins, philosophies, and political, economic, and cultural impacts of wetlands protection in the United States. Topics address the goals of and policymakers' approaches to wetlands protection.

EVSS 638 INTRODUCTORY HYDROGEOLOGY

Course provides introduction to quantitative nature of water flow within geologic media. Discuss significance of water flow theory and the dynamics of many natural flow systems in geologic settings. Quantitative analysis of water resources in a decision making format.

EVSS 645 COASTAL ISSUES AND PROCESSES

This course will provide an in-depth understanding of the coastal environment, including coastal policies and environmental issues that result from the activity of humans. Subjects that will be covered include: origin of coastlines, physical processes, coastal hazards, and coastal zone management.

EVSS 647 GRADUATE CORE SEMINAR

Seminars on contemporary topics in environmental studies acquaint students with the variety of disciplines and techniques available to natural, physical, and policy scientists working in the environmental field. Designed especially to stimulate new-to-the-program students to choose their thesis topics and/or to determine the focus of their program of study.

EVSS 649 GEOGRAPHIC INFORMATION SYSTEMS

This course will covers spatial types and quality, data input operations, database management, data analysis, and software design concerns. We will also examine institutional and political concerns for using GIS. Computer-based GIS software (Unix, PC, and Mac) will be used throughout the course.

EVSS 659 ENVIRONMENTAL STATISTICS

This course provides an introduction to environmental statistics and risk assessment. Topics include probability, correlation, regression, hypothesis testing, analysis of variance, model testing, residual analysis, and non parametric models. Environmental applications will be provided throughout the course.

EVSS 670 ENVIRONMENTAL CHEMISTRY

This course is an introduction to the chemistry of natural systems with an emphasis on marine and coastal problems. The cycling of chemical species, the effect of man-made inputs and environmental analytical methodology will be stressed.

EVSS 680 CASE STUDIES IN ENVIRONMENTAL ISSUES

This course investigates specific case studies. Case studies impart a unique opportunity to explore basic principles of biology, chemistry, geology and physics through practical applications. This approach to problems will be similar to that used by the practitioners of science and public policy.

EVSS 695 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES:
POLITICAL ECOLOGY

Political ecology is an interdisciplinary social science (drawing on research from anthropology, geography, and environmental history, among others) that examines the politics—broadly defined—of the environment.

EVSS 695 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES:
ADVANCED GEOGRAPHIC INFORMATION SYSTEMS

EVSS 695 SPECIAL TOPICS IN ENVIRONMENTAL STUDIES: NATURAL
RESOURCE LAW AND POLICY

This course is about the laws and policy that regulate and affect the use of natural resources including: (1) air, water, and sensitive ecosystems; (2) range land, wilderness areas, endangered species, fish and wildlife; (3) gold, silver, iron, copper and other "hard rock" minerals; (4) forest land and timber; (5) water in rivers, lakes, marshes and underground reservoirs; (6) energy sources such as oil, gas, coal, uranium and falling waters; (7) alternative energy sources such as geothermal

resources, wind and biomass; and (8) most importantly, land. This survey/overview course will include an introduction to the administrative law of federal agencies that regulate the use of public lands and resources.

EVSS 722 MARINE INVERTEBRATE ZOOLOGY

A study of the functional morphology, life history, taxonomy, and other selected aspects of the biology of marine invertebrates.

VII. Needs and Priorities

As discussed above (Section III, Part D), a number of needs and priorities were laid out by the comprehensive review of the MES Program in 2004-2005. A full copy of this **Ten-Year Quality Review** report, with the recommendations of the reviewers, has been attached as Appendix A.