Master of Science in Geology
Department of Geography & Geology
Program Review 2001-2007

Self-Study
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MGLY Self-Study 2001-2007 ii
EXECUTIVE SUMMARY

The Master of Science in geology program accepted its first class of M.S. seeking candidates in the fall semester of 1988. Between 2001 and 2007 the program has maintained an average enrollment of 26 degree-seeking students. A total of 55 students have matriculated in the program and 41 students have received degrees. The geology graduate program includes both a thesis and non-thesis option, both of which provide a foundation for employment in the environmental fields, mineral and energy industries, and government agencies. In addition, the thesis option prepares students for advanced study leading to the doctoral degree while the non-thesis option prepares students for professional licensure in geology.

Our graduate program can accommodate students with varied academic backgrounds, geological interests and career goals. We offer graduate students a diversity of research areas from which to choose within the traditional bounds of geology, as well as several non-traditional geology research programs. Our graduate program is designed to facilitate close supervision and interaction between faculty and students in research, which results in a high retention rate and timely completion of the degree. Our program places special emphasis on applied learning experiences and training combining state-of-the-art instrumentation in both field and classroom settings to prepare students for solving contemporary geologic problems and for the practice of advanced research in the geological sciences.

As the M.S. in geology program approaches its twentieth year, it continues to be a strong, quality program. The program successfully fulfills its training objectives as evidenced by the high percentage of graduates who either continue their education in Ph.D. programs or who gain employment in their field. The faculty and graduate students publish refereed articles in
internationally recognized journals and give presentations at regional, national, and international venues. The faculty is successful in securing external funding, having raised over $8.9 million in extramural funds over the past seven years.

Despite this general positive trend over the past seven years, there are significant needs and potential areas of concern that face the geology graduate program. Foremost among these is the lack of adequate space for teaching and research for geography and geology faculty and graduate students. Fourteen faculty currently share 838 sq. ft. of research laboratory space in DeLoach Hall. Over 17 graduate students are crowded into less than 575 sq. ft. of office space. The low level of graduate student support is also a concern. The dollar amount ($9500 per academic year) of graduate teaching assistantships (GTA) is inadequate given the high cost of living in Wilmington, NC. There are no GTAs and few research assistantships for geology graduate students in the summers. Our financial offers to prospective students are not competitive with other universities who offer more lucrative packages to superior students. Tuition support is inadequate both for in-state and out-of-state students. Finally, staff and technical support is insufficient to meet the needs of the department.

The following report is a summary of the geology graduate program for the period 2001-2007 and an evaluation of the strengths and weaknesses of the program. We have made great strides in our geology graduate program since its inception in 1988 and we see great potential for its growth and continued success in the coming years.
1. DEPARTMENT CHARACTERISTICS

1.1 History

The Department of Geography and Geology was established in 1970 and provided service courses in geology and geography for non-majors. In 1973, it became the Department of Earth Sciences with course offerings in earth sciences, geology, geography, and pre-engineering surveying. Between 1973 and 1981 degree programs leading to the Bachelor of Arts degree in earth sciences with concentrations in earth science, geology, and geography were offered. Programs leading to separate B.A. degrees in earth sciences, geography and geology, and the Bachelor of Science degree in geology were initiated in 1982. The B.A. degree program in earth sciences was dropped in 1984 because of low enrollments. In fall 1988, the department enrolled its first students in the Master of Science in geology program. The interdisciplinary Environmental Studies Program, which offered the B.A. degree in environmental studies and B.S. degree in environmental science, was established in 1995. In fall 2002, the non-thesis option of the M.S. in geology was implemented. It was also at this time that the environmental studies program separated from the Earth Sciences Department to become the Environmental Studies Department. In July 2006, the department was renamed the Department of Geography and Geology to increase campus awareness of the geography component of the department.

The department has grown from a faculty of two in 1970 to a faculty of 21 in 2007 that includes nine geologists, six marine scientists, and six geographers. Between 2001 and 2007 three faculty were hired, two at the assistant professor level and one full-time lecturer. Three assistant professors received tenure and were promoted to associate professor, and three associate professors were promoted to full professor. During the past seven years the department has also seen changes in the administration of the department. In summer 2003, the
department elected a new chair, and in spring 2005, appointed a new coordinator of the master’s in geology program.

The department was housed in Alderman Hall and Hoggard Hall from 1970 to 1973 and moved to the second floor of Friday Hall (former Marine Sciences Building) in 1974. The department moved to DeLoach Hall in the summer of 1997. Five faculty members moved to the Center for Marine Science (CMS) at Myrtle Grove in the fall of 1999. In summer 2003 at the end of her term, the former chair was assigned office and laboratory at CMS, and in spring 2005, a new hire was also assigned office and lab space at the center. Currently six faculty members reside at CMS and 15 in DeLoach Hall.

1.2 Department of Geography and Geology Mission Statement

In harmony with the mission of the University, the Division of Academic Affairs, and the College of Arts and Sciences, the Department of Geography and Geology is dedicated to excellence in teaching, research, and professional service. The focus areas of the department include geography, geology, and the related marine and environmental sciences. The department is committed to integrating current technologies into all of its activities to implement this mission effectively.

The Department of Geography and Geology disseminates knowledge through high quality undergraduate and graduate degree programs that emphasize field, research, internship, and international educational opportunities. Faculty members conduct vigorous, innovative research programs that involve undergraduate and graduate students and contribute to the understanding and solution of important problems in geography and geology. Through a variety of professional services, the department provides resources in geography and geology to the public and scientific communities from the local to international level. The department
endeavors to promote the application of knowledge of all geography and geology to the
betterment of humanity.

The specific goals of the department's mission are stated below:

1. Providing the highest quality undergraduate and graduate teaching geography and
geology through innovative, effective curricula that emphasize contemporary concepts
and technologies, and a variety of experiential learning opportunities.

2. Producing and disseminating new knowledge in geography and geology through
vigorous, creative research and scholarship, and to enhance student learning through
involvement in research.

3. Providing resources in geography and geology to the public and scientific communities
from a local to international level through a variety of professional services.

2. FINDINGS OF PREVIOUS REVIEWS

The previous review of the master's in geology program occurred in 2000-2001. The
major findings and recommendations of the previous review, and the responses to them are
briefly outlined below.

2.1 Findings of External Reviewers

The previous external review committee consisted of Dr. Scott Snyder, East Carolina
University and Dr. John Wehmiller, University of Delaware. These reviewers concluded that
overall the M.S. in geology program is a solid, quality program characterized by a student-
centered philosophy, strong leadership, healthy collegiality, shared governance, a realistic sense
of mission, and adequate administrative support.
The departmental response to the external review dated May 21, 2001 recognized the “thorough, honest and helpful” assessment of the program and its needs, and agreed with nearly every finding and recommendation made by the external review committee. The departmental response specifically addressed four issues prominent in the external review: 1) faculty issues, 2) curricular issues, 3) student issues, and 4) space issues.

2.1.1 Faculty Issues

The faculty issues identified by the review team generally related in some way to workload. The consultants recognized that the geography and geology faculty were doing tasks that normally would be left to technicians or non-tenure track staff at other institutions. Such activities limited the time faculty had available for research. In May 2006, the department hired a part-time technician (shared with the Department of Physics and Physical Oceanography). Her duties include the organization and maintenance of computers, peripherals and lab equipment. No additional staff or technical positions have been provided.

The reviewers noted that research productivity is not evenly distributed among faculty and advocated a more flexible approach to workload assignments and faculty evaluation, and rewarding productive faculty with reassigned time and increased return of indirect costs. The department has not had the flexibility of variable assignments because all research-active faculty are expected to carry a teaching load of nine credit hours including equivalents each semester unless they are able to buy out salary with grant monies. Until recently the College of Arts and Sciences workload policy did not allow assignment of credit hours equivalencies for grant acquisition or management. Return of indirect costs to principal investigators (PIs) was increased in 2004; however, the overall percentage remains very low (6%). Further, PIs with offices and laboratories at CMS receive only half the amount; the other half is returned to CMS.
2.1.2 Curricular Issues

The external consultants recommended that the department reevaluate the graduate curriculum and offered several specific suggestions for consideration. These suggestions included developing a geological writing course and incorporating an environmental science Initiative to increase enrollments, facilitate graduate recruitment, and complement existing research areas. The department responded by developing GLY 502: Technical Communication, which is now part of the core for the M.S. degree. Incorporating an environmental science Initiative became a moot point when the environmental studies program evolved into the Environmental Studies Department in 2002. However, in 2003 the department implemented the non-thesis option of the geology M.S. degree, which provides a foundation for employment in the environmental fields, mineral and energy industries, and government agencies and prepares students for licensure in geology.

2.1.3 Student Issues

The review process raised a number of issues relating to graduate student recruitment, training, and mentoring. Low levels of state financial support continue to restrict matriculation of competitive students. Since the last review, graduate teaching assistantships (GTA) stipends have been increased slightly (from $8500 to $9500). Limited in-state and out-of-state tuition remissions also continue to hinder recruitment efforts. The external consultants suggested that new students would benefit from a more formal orientation. In fall 2005, the department instituted such an orientation and also developed a 20-hour training workshop during the first half of the fall and spring semesters for all new graduate teaching assistants. In addition, the university's Center for Teaching Excellence now offers workshops for graduate teaching assistants during the academic year. In fall 2005, the department implemented an entrance exam
to assess student competency in the field. Results of the exam are used to identify and rectify deficiencies, and guide teaching assistant assignments. To reduce the median time to degree the department implemented two new policies: 1) to be in good standing students are required to complete a thesis prospectus and schedule the oral comprehensive exam by the beginning of the third semester; 2) students cannot register for thesis credit unless a prospectus is on file in the department. A two-year, semester-by-semester progress checklist was developed and is discussed at fall and spring graduate student meetings. In spring 2005, the department developed and executed a formal exit survey for all graduate students to assess student satisfaction with the program.

2.1.4 Space Issues

The reviewers recognized that the space available to the department was insufficient to support the teaching and research mission (with the exception of the Myrtle Grove research labs available to CMS faculty). Likewise, the on-campus space available for graduate student offices and research was deemed minimal.

Space issues continue to be at the forefront of the problems facing the geology M.S. program and to date there has been no relief. This issue has grown even more acute with the additional hires of two-tenure track faculty and one full-time lecturer, and the on-going search for a departmental chair.

3. PROGRAM DESCRIPTION

Although other M.S. geology programs exist with the University of North Carolina (UNC) system, the program at UNC-Wilmington (UNCW) is unique given its marine and environmental emphases. Formal ties to the marine and environmental programs are fostered by
3.1 Graduate Program Educational Objectives

The master's in geology program includes a thesis and non-thesis option, both of which provide a foundation for employment in the environmental fields, mineral and energy industries, and government agencies. In addition, the thesis option prepares students for advanced study leading to the doctoral degree while the non-thesis option prepares students for professional licensure in geology.

Specific goals of the program are to provide advanced research and educational opportunities in the geological sciences, and to prepare geologists for solving contemporary geologic problems. Specific objectives are: 1) to develop research competence in geology; 2) to develop professional competence in the assessment of water, energy and mineral resource potentials; 3) to develop a level of research competence in geology that encourages continued effort towards the doctoral degree; and, 4) to provide the scientific community with meaningful geological data. As described in Section 7 below, our program successfully fulfills its training objectives as evidenced by the high percentage of graduates who either continue their education in Ph.D. programs or who gain employment in their field.

3.2 Degree Requirements

3.2.1 Degree Requirements of the Thesis Option

1. The thesis program requires at least 30 semester hours of graduate credit, with a maximum of six credit hours for the thesis, three credit hours for seminars, and six
credit hours of directed independent study (GLY 591). Each student must complete
GLY 501: Research Methods and GLY 502: Technical Communications (See
Appendix III for description of core courses).

2. A maximum of six semester hours of graduate credit may be transferred from another
accredited institution. Grades earned on transfer work must be equivalent to "B" or
better. A minimum of 24 semester hours of graduate courses must be completed at
UNCW including both course work and thesis. At least 18 semester hours must be
completed in geology.

3. Each student must successfully complete a comprehensive oral examination prior to
registering for thesis hours.

4. Each student must complete an approved course of study including an approved thesis
prospectus within five years of the date of first registration for graduate study.

5. Each student must present and defend a thesis, based on original research, acceptable
to the committee, prior to graduation. The thesis defense is open to the public.

3.2.2 Degree Requirements for the Non-Thesis Option

1. The non-thesis option program requires 36 semester hours of graduate credit, with a
maximum of 3 credits for internship or final project, 3 credit hours for seminars, and 6
credit hours of directed studies.

2. A maximum of 6 semester hours of graduate credit may be transferred from another
accredited institution. Grades earned on transfer work must be equivalent to “B” or
better. A minimum of 30 semester hours of graduate courses must be completed at
UNCW including course work, internships and final project. Twenty-seven semester
hours must be completed in the department.
3. Each student must complete the following core curriculum: GLY 501, GLY 502, GLY 525, GLY 526, GLY 565, GGY 522, and GLY 597 or GLY 598 (See Appendix III for description of core courses).

4. Each student will take a written comprehensive examination after the successful completion of all required coursework with the exception of GLY 597 and GLY 598.

5. Each student must complete either GLY 597 or GLY 598, and prepare and present a scholarly paper/report acceptable to the committee, prior to graduation. A final seminar is required.

### 3.3 Grades Required

The following system is used to indicate performance of graduate students in their courses (plus (+) and (-) minus grades may be awarded at the discretion of the faculty):

- **A** Excellent
- **A-**
- **B+** Completely Satisfactory
- **B-** S - Satisfactory progress on thesis
- **C+** I - Work Incomplete
- **C** Minimally Acceptable
- **C-** U - Unsatisfactory progress on thesis
- **F** Failure
- **WP** - Withdraw Passing

Students must maintain a 3.0 "B" average to remain in good standing in the program.

Students who fall below a 3.0 grade point average are placed on probation and have three subsequent courses to raise their GPA to 3.0 or may be dismissed from the program. A student who receives any grade of "F" is ineligible to continue graduate study. In addition, a student who receives grades of "C" on three courses is ineligible for additional graduate study.

A grade of "I" is assigned if the instructor determines that exceptional circumstances justify providing additional time to complete course work. The instructor may extend the
deadline for any reasonable period not to exceed one year and shall inform the student of the
deadline in writing. A copy of this notification should be sent to the dean of the Graduate School.
The incomplete grade will automatically become an "F" unless a grade change is submitted by
the instructor to the Graduate School within 12 months. Once submitted by faculty grades can
be changed only by the dean of the Graduate School in cases of arithmetical or clerical errors or
as a result of grade protest. A graduate student who is required to take undergraduate courses
for any reason must earn a grade of "B" or better in order to maintain eligibility for graduate
study. Credit received for undergraduate courses does not contribute to the 30 hours of required
graduate coursework.

3.4 Transfer Credits and Residency Requirements

A minimum of 24 hours of graduate courses must be completed at UNCW including both
course work and thesis. A maximum of six semester hours of graduate credit may be transferred
from another accredited institution. Grades earned on transfer work must be equivalent to "B" or
better. A graduate student who wishes to obtain credit for courses taken elsewhere must obtain
prior approval from both the department and the dean of the Graduate School.

3.5 Other Requirements

A faculty committee, composed of a chair and at least two other members of the Graduate
Faculty, is established for each student. At least two committee members, including the advisor
(chair), should be from the geography and geology faculty. The committee should be formed
within the first two semesters of residence.

The elective courses taken in geology and other disciplines are mutually selected by the
student and the major advisor early in the program. The chosen courses provide the student with
a broad, basic knowledge of the field in addition to the specialty information necessary to complete his or her research program. The department currently has five informal tracks within which students typically pursue their graduate research: basin analysis and paleontology, coastal and estuarine processes, petrology and structural analysis, oceanography/marine geology and geophysics, and surface and subsurface hydrology. The program typically offers five to eight sections of graduate courses per semester, selected to meet the needs of students in each of the five research areas and the non-thesis option. Many courses are taught on an every-other-year rotating basis. Enrollment in the graduate courses typically ranges from three to 15 students (Appendix I).

### 3.6 Undergraduate Program Profile

The Department of Geography and Geology offers three undergraduate degree programs (B.S. geology, B.A. geology, and B.A. geography). In addition, undergraduate students may also obtain minors in geography, geology, or oceanography. Education majors or undergraduate students interested in K-12 teaching may complete a teacher licensure in earth sciences (geology only) as part of the UNCW teacher education program (for specifics see the Watson School of Education).

The undergraduate degree programs consist of a group of core courses (26 hours – B.A. geography; 34-38 hours – B.A. geology; 64 hours – B.S. geology), which are followed by additional course work in the particular area of interest (25 hours – B.A. geography; 15 hours – B.A. geology; 7 hours – B.S. geology). All degrees require a 2.00 (‘C’) or better average on all courses taken within the department and for the required courses above the 199-level. In addition, all degree programs require an oral communication and computer competency course. The minor in geography requires a core of 13 hours with an additional nine hours in geography.
(six hours of which must be above 300-level). The minor in geology requires 20 hours of core courses with an additional three to four hours above the 300-level. The minor in oceanography requires 21-22 hours with seven courses above the 300-level. The department also offers a certificate in geographic information science, which requires a core of 12 hours with an additional 4 hours above the 300-level.

The teaching licensure in earth sciences requires completion of the teacher education program from the Watson School of Education and the completion of the degree requirements in geology (either B.A. or B.S.) with the specification of certain courses that are needed for licensure in North Carolina.

The Department of Geography and Geology offers a series of undergraduate courses (both lecture and lecture with laboratory), which are taken by non-majors as part of the Basic Studies requirement of the university. These courses, mainly at the 100-level, are used to fulfill some of the requirements in natural science and mathematical sciences as well as in the social and behavioral sciences.

3.6.1 Undergraduate Course Enrollment and Class Size

Course enrollment and class size for Fall 2001 to Fall 2007 are shown in Appendix II. In summary, the B.A. geography program serves about 711 students (average) per regular semester with an average of 36 students per summer semester. Almost 75% of these students were completing geography courses that are part of the Basic Studies requirements for undergraduate degrees at UNCW. The B.A. and B.S. geology program serves about 799 students (average) per regular semester with an average of 25 students per summer semester. Approximately 88% of these students were completing geology courses that are part of the Basic Studies requirements for undergraduate degrees at UNCW. This indicates that, in a regular semester, the Department
of Geography and Geology serves about 1510 undergraduate students or (assuming a university enrollment of 10711 students) about 14% of the undergraduate students enrolled at UNCW.

3.6.2 Profile of Current Undergraduates

Currently (fall 2006) the geography B.A. program has 38 declared majors and seven students following the minor in geography. For the geology B.A. program, there are 16 declared majors while the B.S. geology program has 13 declared majors. There are two students following the minor in geology and five students following the minor in oceanography. Thirty five percent of the undergraduate students who have declared a major or minor in the programs offered by the Department of Geography and Geology are female. There are three minority students (1 African-American, 2 Native Americans) in the department and all are geography students.

4. CERTIFICATION, INTERDISCIPLINARY, AND OTHER PROGRAMS

Various faculty members from the Department of Geography and Geology are involved in three graduate degree programs other than the geology graduate program: Master of Science in marine science, the Master of Arts in Liberal Studies, and the doctoral program in marine biology.

4.1 Master of Science in Marine Science

The College of Arts and Sciences, in conjunction with CMS, oversees an interdisciplinary program of study leading to the Master of Science degree in marine science. The educational objectives of this degree program are 1) to provide a broad interdisciplinary understanding of marine science to students having strong undergraduate training in mathematics and the sciences; and 2) to develop skills that will enable these students to utilize this knowledge to solve complex
marine environmental problems. These problem-solving skills will provide the foundation for future contributions by the graduates in marine-related industries, environmental management, teaching, research, and other marine-oriented careers. Students will also be prepared to undertake additional graduate study in a doctoral program. Thirty-six students (in fall 2006) are enrolled in the program and eleven geography and geology faculty (Grindlay, Abrams, Leonard, Cleary, Laws, Thayer, Harris, Kelley, Halls, Tobias, Gamble) teach courses that are included as part of the marine science M.S. program curriculum. Several courses offered in the geology M.S. program serve as foundations for the marine science graduate program. For example, GLY550 (Marine Geology) and GLY501 (Methods in Scientific Research) are required of all students in the marine science program who are pursuing geological studies. Six geography and geology faculty (Abrams, Cleary, Halls, Grindlay, Gamble, Tobias) are currently advising students in this program.

4.2 Master of Arts in Liberal Studies

The College of Arts and Sciences, School of Nursing, Watson School of Education and the Cameron School of Business offer a program that leads to the Master of Arts in Liberal Studies (MALS). This program is for students who wish to design a personalized curriculum of interdisciplinary graduate study. Courses are selected that will expand their interests and deepen their understanding of themselves, their society and the environment. This program reflects an older, cultural tradition of scholarship, which liberally educates the whole person, providing breadth and depth, but not applying directly to a career or vocation. The major objective of this program is to offer highly motivated, intellectually prepared adult learners an opportunity to explore the questions and issues that are important to them and society. Eighty-eight students are currently (fall 2006) enrolled in the program and three geography and geology faculty (Ainsley,
Argenbright and Hines) teach courses that are included as part of the MALS curriculum and/or advise students in this program.

4.3 Doctor of Philosophy in Marine Biology

The Department of Biology and Marine Biology at UNCW offers courses of study leading a Doctor of Philosophy degree in marine biology. Ten students (in fall 2006) are enrolled in the program. One geography and geology faculty member (Kelley) is co-advising a graduate student in this program.

5. FACILITIES

5.1 Classroom Facilities

The Department of Geography and Geology is located in DeLoach Hall. The department moved into DeLoach Hall in August 1997 after a 1.5 million-dollar renovation project. The department is assigned 42 rooms (15,570 sq. ft.). Presently there are two classrooms and five teaching laboratories utilized for graduate geology instruction. The two traditional classrooms accommodate 141 students and a seminar/meeting room accommodates approximately 16 students.

All of the rooms including the teaching laboratories in DeLoach Hall are equipped with Internet access ports. Wireless access is available to only about 60% of the lecture rooms, teaching laboratories, or faculty/staff offices due to inadequate placement of wireless routers (installed by UNCW Information Technology Systems Division). Both classrooms and two of the five teaching laboratories have multimedia projectors and dedicated Windows-based Internet capable computers. Two additional classrooms are available for graduate instruction at CMS and
accommodate approximately 45 students. These rooms are also Internet accessible. The combined teaching laboratories accommodate up to 116 students.

The teaching laboratories for graduate instruction include:

**The Spatial Analysis Laboratory**: The Spatial Analysis Laboratory, directed by Dr. Joanne Halls, was funded in 1999 and opened in January 2000. The 636 sq. ft. laboratory is housed in DeLoach Hall and is equipped with 21 workstations with an ESRI site license (ArcView 3.3 and ArcGIS-Arc/INFO 9.2), ERDAS Imagine (9.1) image processing software, IDRISI GIS software, and S-PLUS spatial statistics software. Peripherals include a large format HP 1055 plotter, HP high-resolution color printer, and high-resolution Epson color scanner. To network the SAL we have a new Dell Poweredge 2850 server that houses data, monitors the network, and runs backups.

**Mineralogy Laboratory**: The Mineralogy Laboratory is a 738 sq. ft lab located on the second floor of DeLoach Hall. The lab is equipped with workspace for a maximum of 16 students. The lab contains equipment to conduct specific gravity, density, and materials properties and investigations of minerals and rocks. There are two WINDOWS-platform computers networked to the university server. Although labeled as the mineralogy laboratory, this teaching laboratory is utilized by a variety of other courses as classroom and laboratory teaching space. Dr. David Blake and Dr. Michael S. Smith supervise the Mineralogy Laboratory.

**Sedimentology Laboratory**: The Sedimentology Laboratory is a 472 sq. ft. laboratory located on the second floor of DeLoach Hall. The lab contains equipment and supplies needed to conduct grain size and compositional analyses. Specific items include: glassware, drying ovens, top-loading and analytical balances, muffle furnaces, deionized water, sieves, sieve shakers, a Ro-Tap, centrifuge, acid hoods, hydrometers, magnetic stirrers, hotplates, vacuum pumps and
filtration apparatus. Dr. Michael Benedetti and Yvonne Marsan, departmental lab manager, supervise this laboratory.

*Structural/Stratigraphy/Paleontology Laboratory:* The Structural Geology – Stratigraphy - Paleontology Laboratory is 994 sq. ft. room on the first floor of DeLoach Hall. The lab is equipped with two Windows-platform PCs and one inkjet printer, one fume hood, one magnetic separator, several large tables and a sink. The laboratory also includes microscopes and the invertebrate paleo/petrography teaching collection. Dr. John Huntsman and Dr. William Harris supervise this laboratory.

*Petrology Laboratory:* The Petrology Laboratory (676 sq. ft.) is located on the second floor of DeLoach Hall. The lab is equipped with eleven Olympus BH-2 petrographic microscopes, three Leica Dm EP petrographic microscopes, one that is equipped with a digital camera (to connect to a laptop or desktop computer), three Olympus BX 50 petrographic microscopes, a projecting microscope, two Windows-platform computers, hundreds of thin sections, and several tons of rock samples. Additional thin sections can be made in house in the Petrology Preparation Lab (see below). Although labeled as the Petrology Laboratory, this teaching laboratory is utilized by a variety of other courses as classroom and laboratory teaching space. Dr. David Blake and Dr. Michael S. Smith supervise the Petrology Laboratory.

### 5.2 Research Facilities

The research space available to faculty in DeLoach Hall is inadequate for effective conduct of research. Research and related activities typically take place in teaching laboratories, three research laboratories, and faculty offices. The 838 sq. ft. of research laboratory space in DeLoach Hall is shared by 14 faculty (60 sq.ft. /faculty). In contrast, the research space available to faculty housed at CMS is adequate for effective conduct of research. The six
geography and geology faculty members at CMS each have access to a research laboratory of 520 sq. ft. and office space of 100 sq. ft. In addition, several general-use laboratories are available to faculty at CMS. Those most regularly used by geography and geology faculty include a Telemetry Laboratory, Isotope Ratio Mass Spectrometer Laboratory and Sediment Analysis Laboratory. Geography and geology faculty conducting marine-related research also has access to a research vessel fleet with vessels ranging in size from 13ft to 68ft.

On the main campus of UNCW and at CMS several laboratories with various research focuses have been developed and provide specific support (mainly equipment) for Geography and Geology faculty and graduate students. A description of these laboratories follows:

5.2.1 DeLoach Hall

Petrology Preparation Laboratory: A subset of geology graduate faculty teach courses and conduct research involving the petrologic evaluation of igneous, sedimentary, and metamorphic rocks. Topical interests are varied and the Petrology Preparation Laboratory contains equipment that can facilitate investigative and experiential learning methodologies on a variety of materials from surface sediments to saprolite and crystalline rocks, as well as individual fossil, mineral, and other inorganic/organic specimens. The lab has also facilitated sample preparation for faculty and students in biology and marine biology, anthropology, and CMS, as well as faculty from UNC Pembroke. The main laboratory tasks are to: 1) provide an area for detailed descriptive geometric and kinematic analyses of material specimens, 2) prepare samples for mesoscale to microscale petrographic analysis, and 3) prepare powdered samples for geochemical analysis.

Approximately 770 sq.ft. of Room 107 in the Academic Support Building on the east side of campus contains a variety of electrical equipment, work tables, and limited sample storage
space. The laboratory is located in a secure workroom in the rear of the building that has a keyed access supervised by the director, Dr. David E. Blake. The director, through the administrative staff, assigns keys to faculty and graduate students who plan to use the laboratory as part of their teaching responsibilities, thesis or individual faculty research efforts, or special needs projects. Each user must make themselves aware of the equipment capabilities, support substances such as lubricants, glues, and abrasives, and general safety procedures in order to be certified to operate the equipment, and must be made aware of the proper use and cleanup of the lab by the director or a trained assistant. A written set of policies and procedures for laboratory equipment operation is provided to each new user. A sign-up sheet registers the faculty and graduate students who utilize the lab on a daily, weekly, or monthly basis in order to monitor unusual equipment wear and collateral issues including routine maintenance and supplies. There is also a 60 sq. ft. support outbuilding (the former ROTC command center trailer) located immediately adjacent to the Academic Support Building in which graduate student theses rocks are archived. That building is currently at capacity and is in a dilapidated condition, needing either repair or replacement, especially to the flooring. This space is secured by a combination padlock on the door and a wooden exterior fence that can be locked if necessary.

The laboratory equipment includes a(n) 18" Covington slab saw, 10" Felker and Highland Park trim saws, 8" Hillquist trim saw, Buehler Isomet 4" low speed trim saw, Redlands 16" horizontal lapping unit, Buehler Ecomet I polisher/grinder, Hillquist cut-off saw and grinder, 6-Ton hydraulic rock splitter, Sepor Jaw Crusher, Spec 8510 alumino-ceramic puck shatterbox, Highland Park Vi-Bro-Lap, Fisher Scientific ultrasonic cleaner, Buehler vacuum impregnation container and Reliance vacuum pump, Gast Roc-R vacuum pump and air compressor, Speedaire 1 HP 3 Gallon air compressor, Precision Scientific Thelco General Purpose drying oven,
Thermolyne Extra-Capacity hotplate, one binocular BH-2 Olympus polarized microscope and one American Optical binocular specimen light microscope, and a variety of collateral tools and supplies. Supporting supplies are housed on benches or in a variety of cabinets that includes one flammable and one acid cabinet. In addition, two fume hoods located in the Acid Laboratory on second floor DeLoach Hall are used to facilitate hydrofluoric acid work required to stain rock samples for modal analysis. Within this facility, a spectrum of geology and marine science graduate students, and geology undergraduate students and faculty have the capability of preparing a variety of petrographic and geochemical samples for qualitative and quantitative analyses.

Soils Analysis and Acid Laboratories: The Soils Analysis and Acid Laboratories represents 502 sq. ft. space located on the second floor of DeLoach Hall that is split into two separate (and small) laboratories. This lab is intended for faculty research and supervised student research and is directed by Dr. Michael Benedetti with maintenance and operation assistance by Ms. Yvonne Marsan, departmental lab manager. The lab is equipped with an eye wash/shower station, and has access to a fire blanket mounted in room 218.

The Soil Analysis Lab (DL 217) has a double-basin sink and an attached lab bench. The lockers in this room are intended for storage of equipment and materials used by faculty in the Soils and Sedimentology Lab. The room has a distilled water boiler system, one large fume hood, a sonic sifter, pH meter, magnetic stirrer, hot plates, desiccator, one precision balance, and assorted glassware. High-cost supplies such as hydrometers and specialized glassware are stored in the faculty lockers. Student access to this room is supervised to ensure security.
The Acid Lab (DL 215) is intended for faculty and graduate student research, storage of hazardous chemicals, and loud or bulky equipment. The room houses a perchloric-rated fume hood, 2 floor-to-ceiling fume hoods, 2 regular fume hoods, a centrifuge, and a Ro-Tap sieve shaker in addition to a double-basin sink and two long lab benches. Concentrated acids and other aqueous chemicals are stored in the fume hoods, and powered chemicals are stored in two wall-mounted cabinets. This equipment is used by faculty or by students with proper training and supervision.

**Clean Room:** On first floor DeLoach Hall is a small (177 sq. ft.), single hood clean laboratory originally constructed for isotope separation work. It is a positive pressure, HEPA filtered room with a dual door storage entrance. It contains a HF rated fume hood (and vented acid storage locker) and associated safety equipment (acid eyewash station and shower). The small size of the room precludes its use as an undergraduate laboratory and it is used primarily for graduate student research and sample preparation for the Isotope Ratio Mass Spectrometer Laboratory, and occasionally for acid staining and etching using HF of thin-sections. This laboratory is not accessible to the disabled. Dr. Craig Tobias supervises this laboratory.

**Environmental Hydrogeology Laboratory:** The Environmental Hydrogeology Laboratory (DL212A) is a small room (~170 sq. ft.) that was originally a lecture preparation room for the adjacent classroom which is now heavily used for physics lecture classes. Because of the close proximity to the classroom and the fact that the wall that separates the two rooms is not soundproof, it is not possible to carry on a normal conversation or engage in noisy experimental setup in the laboratory without being heard in the lecture room. This severely limits research and teaching activities in the lab during times when class is in session. The small size of the room is another factor prohibiting the use of the room for teaching purposes. Thus, the room
is primarily used for the storage of hydrogeology field equipment such as sampling pumps, bailers, water quality meters, and soil sampling devices, as well as laboratory equipment like soil columns, a balance, soil moisture probes, time domain reflectometry equipment, dataloggers, and a pressure plate apparatus. Though the lab has limited counter space, it does have a sink so it is also used for undergraduate and graduate student research. Dr. Eric Henry supervises the laboratory.

**X-ray Diffraction Laboratory:** The Department of Geography and Geology houses a small (~100 sq. ft.) Radiation Safety approved research laboratory for the use of X-rays on the first floor of DeLoach Hall. The instrument is a Rigaku MiniFlex II Desktop and Portable powder X-ray diffraction system and is equipped with a six-position sample changer with sample spin that allows for unattended measurements with the option of sample rotation during measurement. This instrument has minimal power requirements and a self-contained cooling system and is used to identify and quantify minerals phases. The system is equipped with the latest Jade+ 8.0 Analysis software with profile fitting, and extensive search/match analysis software and a database with 120,000 compounds and over 95,000 inorganic phases. After radiation safety training by the campus Radiation and Biological Safety Officer and instrument training by designated department faculty members, other faculty members and graduate students use the instrument in their research. Drs. William B. Harris and Paul Thayer supervise this laboratory.

**Photographic Darkroom:** There is a small (60 sq. ft.) photographic darkroom in DeLoach Hall that is shared with the Department of Physics and Physical Oceanography. In this facility (2nd floor DeLoach Hall; available only to faculty, staff and geology graduate students) is the basic equipment of B/W film development and illustration preparation (camera stand and
color-balanced lighting). Maintenance and supplies for this laboratory are derived from the Department of Geography and Geology annual budget. This laboratory is not accessible to the disabled.

5.2.2 Center for Marine Science, Myrtle Grove

Coastal and Marine Geophysics Laboratory: The Coastal and Marine Geophysics Laboratory is housed at CMS and is supervised by Drs. Grindlay and Abrams. The laboratory includes 1040 sq. ft. of research space dedicated to coastal and marine geophysical research, including processing and analysis of seismic reflection, ground penetrating radar, sidescan sonar, topographic, gravity and magnetics data.

Major equipment: The laboratory is equipped with a Sensors and Software ground-penetrating radar, an EdgeTech DF-1000 digital sidescan sonar and a GeoAcoustics Geopulse sub-bottom profiler.

Computers: Sun Ultra 5 workstation (1), Silicon Graphics O2 workstation (1), Apple G5 (2) & G4 (1), Pentium 4 Dell PC (2), Pentium 3 Dell PC (1). Peripheral equipment includes EXABYTE, DAT, DVD, CDROM and MagnetoOptical Drives. These computers and associated tape and disk drives are linked by direct TCP/IP with access to a large format color plotter (HP-DesignJet 755CM) and laser printer (HP-LaserJet-2100TN). A large format scanner (Epson 836xl) and color printers (Tektronix Phaser 850 and HP DeskJet 930c) are also available.

Software: Seismic Processing Workshop (seismic data processing), Midland Valley 2D-Move (structural analysis) IVS3D DMagic and Fledermaus (3D visualization), Generic Mapping Tools (digital elevation model development), MBsystems (multibeam bathymetry and sidescan sonar processing), ArcGIS, MatLab, Adobe Illustrator and Photoshop.

Coastal Geology Laboratory: The Coastal Geology Laboratory includes 520 sq. ft. of
space dedicated to coastal geology research. The laboratory is housed at CMS and is supervised by Dr. William Cleary.

**Estuarine and Marine Sedimentology Laboratory:** The Estuarine and Marine Sedimentology Laboratory is housed at CMS and is supervised by Dr. Lynn Leonard. The laboratory includes 520 sq. ft of research space dedicated to estuarine and marine sedimentology research. This lab is equipped with a Beckman-Coulter LS 200 Particle Sizer, a Sontek pulse coherent acoustic doppler profiler with optical backscatter sensors, Marsh McBirney electromagnetic current meters and Campbell data loggers, petite ponar grab samplers, box cores and 11 data collection platforms containing Unidata water level sensors, conductivity sensors and cellular telemetry packages.

**Isotope Ratio Mass Spectrometer (IRMS) Laboratory:** The Isotope Ratio Mass Spectrometer (IRMS) Laboratory is administered and maintained by geography and geology faculty (Dr. Craig Tobias) in concert with CMS. The facility is built around a Thermo Delta V Plus IRMS configured with a unique 10-collector array that permits a variety of stable isotopic analyses on numerous sample matrices. The IRMS is interfaced with an Elemental Analyzer, Gas Bench, Total Organic Carbon Analyzer, and Denitrifier Kit, peripherals. It is a core facility available for use to all departments at UNCW, and a focal point for collaboration outside UNCW. As such, its existence serves to bolster the stature of UNCW in the scientific community and facilitates research by PIs, graduate students, and undergraduates. The IRMS Laboratory is currently integrated into approximately a dozen graduate research projects in the geography and geology, chemistry, and biology and marine biology departments.

**Invertebrate Paleontology Laboratory:** The Invertebrate Paleontology Laboratory contains 520 sq. ft. of space at CMS dedicated to invertebrate paleontology research. The
laboratory is supervised by Dr. Patricia Kelley. The laboratory includes sample preparation and
curation space, aquarium facilities, and houses Kelley’s research collection of Recent and fossil
molluscs from the US Coastal Plain, Mexico, and Iceland.

5.2.3 Other

Storage Building: The department also maintains approximately 200 sq. ft. of storage
space in an off-campus storage facility. The department uses departmental funds to rent this
facility from a commercial provider on an annual basis. At present, this space is filled to
capacity.

5.3 Support Facilities

Randall Library is a 132,823 sq. ft. facility holding over 468,000 bound volumes and over
700,000 items on microfiche/microfilm. The library subscribes to 4,261 journals annually, of
which approximately 133 are journals devoted to research, theory, and applications in geography
and geology. However, with increasing costs for university journal subscriptions as well as lack
of space to hold these materials, the number of actual journals in the library is decreasing. This
decrease in paper copies is offset by the recent increase in journal availability via PDF electronic
copies. The library subscribes to numerous online databases including EBSCOhost, JSTOR,
UnCover Web, Cambridge Scientific Abstracts, GEOBASE, ScienceDirect, GeoRef, WEB of
Science, WorldCat and ProQuest’s Periodical Abstracts-Research II. It also maintains a monthly
Table of Contents service for geography and geology faculty and will duplicate (or scan into
PDF format) selected articles from that monthly list at no cost to faculty. The annual Department
of Geography and Geology library allotment is approximately $4000 for books and for audio-
visual materials. Every new faculty member can request that library subscribe two new journals, not exceeding a total of $350 in subscription costs.

The library maintains 25 public computer workstations for catalog and Internet searches. It also houses a separate computer laboratory available only to graduate students. The Graduate Computer Laboratory is located on the second floor of Randall Library. Equipment and software available include: 10 Window-based IBM-compatible computers all networked to a laser printer, color inkjet printer attached to one computer, Polaroid Digital Palette for making 35 mm slides, Minolta 35 mm slide scanner for making digital copies of slides, Netscape, Microsoft Explorer, Windows 2007/Vista and Office, Endnote, SPSS, and several other programs. The Information Technology Systems Division (ITSD) manages this facility. A 24-hour accessible computer laboratory, open to both graduate and undergraduates and operated by ITSD, is also housed in Randall Library and is equipped with 49 computer stations, laser printers and a flatbed color scanner. In addition, ITSD supervises five computer laboratories on the UNCW campus, containing a total of approximately 150 computers that are open to both graduate and undergraduate students. All on-campus computer labs contain Windows-based IBM-compatible computers with Pentium III processors and from one to three printers. All computers are connected to the Internet and are equipped with word processing, spreadsheet, graphics, and web-browser software. The hours of operation of these labs range from 50 to 120 hours per week. Each lab is staffed with one or two full-time assistants. In addition, the ITSD help desk is open over 40 hours per week and is staffed with two to three technical assistants.

Geology graduate students use two small, linked rooms in DeLoach Hall (575 sq. ft.) as shared office space. This space contains 18 desks and is used by some students as a study area and to hold office hours by those serving as teaching assistants. Four Window-based IBM-
compatible computers with word-processing, graphics, presentation, and statistical software as well as a laser printer are available for their use in this space. Graduate students also have access to the Cartography Laboratory in DeLoach Hall that is equipped with 12 Window-based IBM-compatible computers with word-processing, graphics, presentation, and statistical software, a color scanner, a laser printer and a large-format color plotter. In some cases, geology graduate students also have office/desk space in individual faculty offices or research space laboratories in DeLoach Hall and at CMS.

The Department of Geography and Geology owns two TV/VCR set-ups, two multimedia units and eight slide projectors. Each of these items is modular and stored in the classrooms in which it is most regularly used. In addition, five of the teaching laboratories/lecture rooms have been set up with ceiling mounted SONY multimedia projector equipment controlled by a Window-based IBM-compatible computer with appropriate software and Internet connection. This equipment is used primarily for teaching (undergraduate and graduate) but is available to graduate students on a limited basis for oral presentations/theses defenses.

The Office of Research Services and Sponsored Programs (ORSSP) at UNCW is available to support faculty and graduate students in obtaining grants and contracts. Seed money for obtaining grants and for pilot projects is available through ORSSP, through CMS and through the College of Arts and Sciences to tenure-track faculty. In addition, the ORSSP provides assistance with internal and sponsor forms and with duplicating and binding services for grant and contract submissions.
6. PERSONNEL

6.1 Tenure Track Faculty

The Department of Geography and Geology has ten full professors, nine associate professors, and one assistant professor. All tenure track faculty in the Department of Geography and Geology are members of the Graduate Faculty (verified 11/8/07 at http://www.uncw.edu/grad_info/facultylisting.htm). Curricula vitae of geography and geology tenure track faculty are provided in Appendix VI.

Professors

W. Frank Ainsley
Ph.D. University of North Carolina at Chapel Hill
Date Hired: Fall 1973
Research Areas: Cultural-historical geography, rural landscapes, and material culture studies

William J. Cleary
Ph.D. University of South Carolina
Date Hired: Fall 1972
Research Areas: Coastal and marine geology

James A. Dockal
Ph.D. University of Iowa
Date Hired: Fall 1983
Research Areas: Petrography and natural resource exploration

Nancy Grindlay, Graduate Coordinator
Ph.D. University of Rhode Island
Date Hired: Fall 1997
Research Areas: Coastal and marine geophysics, tectonics, oceanography

William B. Harris
Ph.D. University of North Carolina at Chapel Hill
Date Hired: Fall 1975-1982, rehired Fall 1984
Research Areas: Stratigraphy, basin analysis, and radiometric dating

Patricia H. Kelley
Ph.D. Harvard University
Date Hired: Fall 1997
Research Areas: Invertebrate paleontology, paleoecology, evolution
Richard A. Laws, Chair  
Ph.D. University of California-Berkeley  
Date Hired: Fall 1983  
Research Areas: Microalgal biostratigraphy, taxonomy, and paleoecology

Lynn A. Leonard  
Ph.D. University of South Florida  
Date Hired: Fall 1994  
Research Areas: Estuarine systems, coastal processes, and wetlands

Michael Smith  
Ph.D. Washington University  
Date Hired: Fall 1992  
Research Areas: Mineralogy, petrology, geochemistry, and archaeological ceramics

Paul A. Thayer  
Ph.D. University of North Carolina at Chapel Hill  
Date Hired: Fall 1970-1982, rehired Fall 1987  
Research Areas: Sedimentology, sedimentary petrology, and hydrogeology

Associate Professors

Lewis Abrams  
Ph.D. University of Rhode Island  
Date Hired: Fall 1997  
Research Areas: Coastal and marine geophysics

Robert Argenbright  
Ph.D. University of California-Berkeley  
Date Hired: Fall 1995  
Research Areas: Historical geography of the USSR, political geography of post-Soviet Eurasia

Michael Benedetti  
Ph.D. University of Wisconsin  
Date Hired: Fall 2000  
Research Areas: Geomorphology, Quaternary Geology, Soils

David E. Blake  
Ph.D. Washington State University  
Date Hired: Fall 1990  
Research Areas: Structural geology, metamorphic petrology, and tectonics

Douglas Gamble  
Ph.D. University of Georgia  
Date Hired: Fall 2000  
Research Areas: Applied climatology, hydrology, and island environments
Joanne Halls  
Ph.D. University of South Carolina  
Date Hired: Fall 1999  
Research Areas: GIS, environmental/land use modeling, and watershed management

Eric Henry  
Ph.D. University of Arizona  
Date Hired: Spring 2002  
Research Areas: Groundwater hydrology, contaminant fate and transport

Elizabeth Hines  
Ph.D. Louisiana State University  
Date Hired: Fall 1992  
Research Areas: Historical and cultural geography, planning, and cartography

John R. Huntsman, Assistant Chair  
Ph.D. Bryn Mawr College  
Date Hired: Fall 1978  
Research Areas: Structural geology

Assistant Professor  
Craig Tobias  
Ph.D. College of William and Mary, Virginia Inst. of Marine Science  
Date Hired: Spring 2005  
Research Areas: Geochemistry, Nutrient cycling

6.2 Non-Tenure Track Faculty

Historically non-tenure track faculty were hired by the department to teach Basic Studies or degree-required courses in the department due to the unavailability of tenure-track faculty to teach the courses. This occurs when a tenure-track faculty member has left the university and the department is in the process of filling the vacancy. These positions typically were for a semester or academic year period.

During the 2004-2005 academic year Robert Argenbright took a one-year leave of absence and a temporary instructor was hired during his absence. A part-time instructor was hired to teach one course in spring 2007 to give Joanne Halls a course reduction as part of a proposal development fellowship she received. Greg Deitl was hired as a visiting assistant
research professor at CMS, with a special two-year appointment in geology, and taught/team-taught a few geology classes during 2003-2004.

Mr. Roger Shew has served intermittently as a part-time lecturer in the department since 1999. In 2005-2006 the department conducted an external search for a geoscience educator and hired Mr. Shew for the position. His current position is as a full-time, permanent lecturer with a renewable one-year contract. Mr. Shew has a M.S. degree in geology and a M.Ed. degree in geoscience education.

Graduate students teach laboratory sections in support of GGY 130 (Physical Geography), GLY 101 (Physical Geology), and GLY 120 (Environmental Geology).

6.3 Staff

Catherine F. Morris CPS
B.A. sociology, UNCW
Date Hired: June 1978

Duties: Assists department chair with department administration logistics, maintains departmental budgets, manages departmental office, assists in special projects as requested by chair and/or faculty, and coordinates with the Dean’s office.

Anne Sutter
B.S. education, Indiana University (Bloomington)
A.A.S. business administration, Cape Fear Community College
Date Hired: June 2004

Duties: Performs receptionist duties, processes University forms, maintains departmental administrative and graduate student files, provides general office support and coordinates with the Dean’s office.

Yvonne Marsan
B.A. biology, Salem College
B.S. marine biology, UNC Wilmington
Date Hired: May 2006

Duties: Assists with the facilitation of teaching and research laboratory operations for the Department of Geography and Geology, and the Department of Physics and Physical Oceanography. This includes the organization and maintenance of computers, peripherals and
lab equipment. Additional responsibilities include maintaining equipment and chemical inventories, procurement of supplies, development of laboratory preparation manuals, and running trial experiments. Serves as webmaster for the Department of Geography and Geology and the GIS websites.

7. GRADUATE STUDENTS

7.1 Student Profiles

From 2001 to 2007, the graduate program in geology received 108 applications, of which 87 were accepted into the program (81% acceptance rate)(Table 1). During that time, 55 students matriculated in the program, eight of which chose the non-thesis option.

<table>
<thead>
<tr>
<th>Year</th>
<th>Applied</th>
<th>Accepted</th>
<th>Matriculated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>15</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>2002</td>
<td>22</td>
<td>18</td>
<td>7</td>
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<td>2003</td>
<td>18</td>
<td>17</td>
<td>13</td>
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<tr>
<td>2004</td>
<td>12</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>2005</td>
<td>17</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>2006</td>
<td>15</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>2007</td>
<td>8</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Totals</td>
<td>107</td>
<td>87</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 1. Applicant pool information for academic years 2001-2007.

Forty two percent of the matriculating students were female (Table 2). The department has had some success attracting underrepresented minority applicants. Since 2001, the program has matriculated six minority students, representing 11% of the total (Table 2). Over 56% of the matriculated students in the Master of Science in geology program in the last seven years were from out of state (Table 2). The majority of the out-of-state students come from Atlantic seaboard states, with a few international students coming from as far away as Puerto Rico, South Africa, Algeria and Brazil. The program has enrolled students from the following NC undergraduate institutions: Western Carolina University, UNC Chapel Hill, and UNCW, and
Table 2. Demographic data for matriculated graduate students 2001-2007.

<table>
<thead>
<tr>
<th>Year</th>
<th>Out-of-state</th>
<th>In-state</th>
<th>Thesis</th>
<th>Non-Thesis</th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
<th>American</th>
<th>Other</th>
<th>M</th>
<th>F</th>
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</thead>
<tbody>
<tr>
<td>2001</td>
<td>7</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>7</td>
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<td>1</td>
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<td>2002</td>
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<td>7</td>
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<td>0</td>
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<td>0</td>
<td>4</td>
<td>3</td>
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<tr>
<td>2003</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>4</td>
<td>12</td>
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<td>2004</td>
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<tr>
<td>2005</td>
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<tr>
<td>2006</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>2</td>
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<td>2</td>
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<tr>
<td>2007</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

from the following out-of-state universities: Ohio State University, Coastal Carolina University, Georgia Southern University, Eckerd College, University Puerto Rico-Mayagüez, West Virginia University, Cornell University, Mt. Holyoke College, George Mason University, Mary Washington College, St. Lawrence University, Emory, Rutgers University, University of Mississippi, Wheaton College, College of William and Mary, Southern Connecticut State University, Salisbury University, Boston University, Heidelberg College, University of Hawaii Hilo, Northeastern University, Hanover College, James Madison University, and Fundacão Universidade Federal do Rio Grande, Brazil.

The UNCW Graduate School and the Department of Geography and Geology requires that students seeking admission to the graduate program in geology must hold a bachelor's degree from an accredited college or university in this country or its equivalent in a foreign institution based on a four-year program. In addition the applicant must have a strong overall academic record with a "B" average in the basic courses prerequisite to geology, satisfactory scores on the Graduate Record Examination, two semesters each of chemistry, calculus and physics, and a working knowledge of physical and historical geology. Exceptions to these entrance requirements have been made in extenuating circumstances such as, but not limited to,
extensive work or research experience, excellent letters of recommendation, or for students demonstrating special aptitudes or skills. Under these conditions, students may be accepted "provisionally" into the program. Provisional students are expected to remedy any deficiencies in their first year and to maintain a "B" average in all courses attempted at UNCW.

Table 3 lists the average last 60 hrs GPA and GRE scores each year for students matriculating in the geology M.S. program between 2001 and 2007. The average GPA for all matriculating students is 3.29. The average GRE scores are: verbal - 493, quantitative - 592, analytical\text{old} – 584, analytical\text{new} – 4.2. The mean verbal GRE scores for current students and graduates are in the 55-60 percentile, only slightly below the reported average score (496) for all students in the field of geology who have taken the GRE (<www.GRE.org>); the mean quantitative GRE scores are in the 44-49 percentile and are somewhat below the average score (625) for students in this field. The reported analytical GRE scores are in the 33-54 percentile and are very close to the mean reported score for similar students (4.3). In the last three years, we have seen an improvement in the GRE verbal score. This is viewed as a very positive trend, as faculty feel strong verbal/written skills as essential to the timely and successful completion of the master's degree.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>GPA</th>
<th>GRE-V</th>
<th>GRE-Q</th>
<th>GRE-A\text{old}</th>
<th>GRE-A\text{new}</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>8</td>
<td>3.35</td>
<td>468</td>
<td>615</td>
<td>550</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>7</td>
<td>3.49</td>
<td>476</td>
<td>613</td>
<td>590</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>13</td>
<td>3.15</td>
<td>479</td>
<td>522</td>
<td>600</td>
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<tr>
<td>2004</td>
<td>5</td>
<td>3.12</td>
<td>468</td>
<td>584</td>
<td></td>
<td>3.9</td>
</tr>
<tr>
<td>2005</td>
<td>10</td>
<td>3.34</td>
<td>531</td>
<td>615</td>
<td>660</td>
<td>4.5</td>
</tr>
<tr>
<td>2006</td>
<td>8</td>
<td>3.33</td>
<td>483</td>
<td>629</td>
<td></td>
<td>4.1</td>
</tr>
<tr>
<td>2007</td>
<td>4</td>
<td>3.30</td>
<td>575</td>
<td>527</td>
<td></td>
<td>4.1</td>
</tr>
<tr>
<td>2001-2007</td>
<td>55</td>
<td>3.29</td>
<td>493</td>
<td>592</td>
<td>584</td>
<td>4.2</td>
</tr>
</tbody>
</table>

Table 3. Mean GPA and GRE scores for matriculating graduate students 2001-2007.
7.2 Recruitment Efforts

The master's in geology program recruits students through maintaining a current and interesting web site (http://www.uncw.edu/earsci), which includes a page with information and photos of current students and one for graduates including their placement upon graduation. This web site describes our program and has links to individual faculty web pages and to the Graduate School for direct access to application materials. In January 2005, we requested and were granted funds from the Graduate School to cover the cost of maintaining a detailed profile of the program on the Peterson's online graduate school search provider website. This effort modestly increased the traffic of prospective students, especially those students outside of the southeast Atlantic region and international, to our web site. Unfortunately, the cost of the profile and link is high (~$2000/yr), and funds to support this service were discontinued by the Graduate School in January 2007.

In addition, we rely on traditional forms of recruiting such as the mailing of brochures and flyers to undergraduate geology departments at other southeastern colleges and universities, and to local environmental, engineering and geological firms. We continue to update and revise these brochures on a regular basis. The most recent version was designed in fall 2007.

Other recruiting efforts include advertising at regional sectional meetings of the Colonial Academic Alliance Conferences and the Geological Society of America. At the regional Geological Society of America meetings, we secure a recruiting booth that is manned throughout the meeting by faculty and graduate students. We answer questions about the program, distribute informational materials, distribute applications, and compile mailing lists. The department typically absorbs the fees associated with booth rental and advertising. In the last seven years we have recruited at the southeastern sectional meeting seven times and at the northeastern
We have recruited approximately seven students who ultimately enrolled in our program. In addition, faculty and students who attend national meetings post advertising flyers to aid our recruiting efforts.

### 7.3 Orientation

The Department of Geography and Geology has a daylong orientation program for new graduate students in its program that takes place each fall and spring term prior to the start of the academic calendar. This orientation program, administered by the graduate coordinator, addresses the academic component of graduate education including teaching assignments, duties, goals and expectations for the particular laboratory teaching assignment, as well as the goals and expectations for the undergraduate students in that laboratory.

The orientation program also addresses the more mundane aspects of the graduate program such as: contracts for teaching assistants, mail service, telephone use, office space, departmental keys, clerical support and records, use of departmental equipment, laboratory security and safety, computer access, vehicle use, funding opportunities, and university travel. All of this information is also provided in the graduate student handbook which is available on the departmental website (http://www.uncw.edu/earsci/documents/GEOgradhandbk2007.pdf).

The graduate coordinator also discusses timelines for the successful (and timely) completion of the student’s research program. A semester-by-semester progress checklist is provided to all incoming students and is also available on the departmental web page.

As part of the daylong orientation, a two-part entrance exam to test the students' knowledge of fundamental geologic principles is administered. The first part is a multiple-choice exam with physical and historical geology questions. Students must score 70% or higher.
on the exam. A score of below 70% is considered deficient and students are then required to
take and pass all exams, including the final, in an undergraduate section of GLY101
(Introduction to Physical Geology). The second part of the exam focuses on applied geology
with mineral and rock identification, geologic map interpretation and topographic profile
construction. This part of the exam is used to tailor the content of the training workshop required
of all new teaching assistants in their first term in the program.

An additional two-hour orientation for all graduate students, which is also administered
by the graduate coordinator, is held at the beginning of each fall and spring term. Important
academic deadlines, scholarship and funding opportunities, and new Graduate School policies
that impact the students are discussed. During the orientation students who have assigned
teaching assistantships meet with their respective laboratory coordinators to schedule laboratory
sections and go over teaching expectations for the semester.

7.4 Advising

In the Department of Geography and Geology, each graduate student has an individual
graduate advisor who serves as the chair of the student's graduate advisory committee. Normally,
full-time students are not admitted into the program unless a faculty member consents to serve as
their advisor. Part-time students may be admitted without prior consent of an advisor. In such
cases, the graduate coordinator serves as interim advisor until an advisor is determined. Mutual
consent between the graduate student and a faculty member in the selection of a graduate advisor
is critical to the success of the student's degree program and research. However, after beginning
graduate studies, changing interests of the student to another area of research may necessitate
selection of a new graduate advisor. A change in advisor should begin as soon as the need arises.
The graduate coordinator should be notified immediately so that appropriate changes are incorporated in the student's file and the process is expedited efficiently.

The primary role of the graduate advisor is to assist in the choice of thesis topic and the design of the research program. The graduate advisor also provides guidance during the research project and critically edits the thesis with suggestions for any improvements. The advisor, therefore, must have expertise in the area of student research and usually agrees to advise only those students wishing to pursue a research topic within his or her range of research expertise.

The graduate advisor assists in selecting two other faculty members to serve on the graduate advisory committee. Selection of committee members is normally completed during the first semester in residence and should focus on providing the student with additional expertise in the design and implementation of thesis research. Any faculty member at UNCW holding graduate faculty status is eligible if he or she provides the needed expertise. At least two committee members, including the advisor, should be from the geography and geology faculty. One other faculty member from another department may be added to the committee, if appropriate, but may not chair the committee. Qualified faculty from other universities may serve as committee members, but may not chair the committee. In order for a non-UNCW faculty member to serve on a committee, they must apply for a courtesy graduate faculty appointment at UNCW. This is accomplished by submitting a vitae and a letter of justification provided by the departmental graduate coordinator to the Graduate School. The major advisor submits the names of all committee members to the graduate advisor, who completes a Thesis Committee Appointment form that is placed in the student’s permanent file and distributed to each thesis committee member.
Each advisor has a degree audit form which supplies a complete listing of the courses taken by the student at the university, classes transferred, as well as any advanced placement examinations or waivers. In addition to the hardcopy degree audit form, the academic advisor may obtain this information by the use of the SEANET database on the university server. This documentation provides the necessary information to help define the student's academic program within the Department of Geography and Geology.

7.5 Student Support

The Department of Geography and Geology can award ten, 20hr/wk graduate teaching assistantships (GTA) each academic year ($9500). These GTAs are provided by the university and are awarded on a competitive basis. Between 2002 and 2005, eight students were funded during the academic year on GK-12 Fellowships ($27,000) as part of a National Science Foundation-funded effort to work with local middle schools to enhance science in the classrooms. In addition, approximately two to three students per year are funded on 20 hr/wk ($9500) or 10hr/wk ($4750) research assistantships (RA) during the academic year and approximately three to four receive partial support (20-30 hr/wk, $2000-$3000) during the summer months (Table 4). These assistantships are funded by individual faculty research grants. Graduate assistantships (GA) are offered through various administrative units on campus as 20hr/wk and 10hr/wk positions. Students not receiving support through the department can apply for the GA positions, which are awarded on a competitive basis. Six of out-of-state tuition remissions (9+ credit hours currently $9837 each) are provided by the university and are awarded each year to qualified students in the department. Students may receive either a complete or partial out-of-state tuition remission. One New Scholar Award ($1000) is also available to recruit highly qualified students. The department also has $9500 to award
scholarships to defray in-state tuition in fees. Currently, the department can award four complete 
(9 + credit hour) awards. At this time, 13 students receive support in the form of a GTA or RA, 
five have received out-of-state tuition remissions, and nine have received tuition scholarship 
monies. Major needs of the department are additional higher paying teaching and research 
assistantships during the academic year and summer months, and out-of-state and in-state tuition 
remissions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Enrolled</th>
<th>TA</th>
<th>GA/Other</th>
<th>RA-AY</th>
<th>RA-SU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2002</td>
<td>25</td>
<td>9 ($8500)</td>
<td>0</td>
<td>5.0</td>
<td>5</td>
</tr>
<tr>
<td>2002-2003</td>
<td>28</td>
<td>9 ($9000)</td>
<td>2</td>
<td>4.5</td>
<td>4</td>
</tr>
<tr>
<td>2003-2004</td>
<td>28</td>
<td>9 ($9000)</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2004-2005</td>
<td>26</td>
<td>9 ($9000)</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2005-2006</td>
<td>26</td>
<td>10 ($9500)</td>
<td>0.5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2006-2007</td>
<td>27</td>
<td>10 ($9500)</td>
<td>1</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td>2007</td>
<td>22</td>
<td>10 ($9500)</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4: Graduate student support. GA=Graduate Assistant, RA-AY=Research Assistant academic year, RA-SU=Research Assistant summer.

Students can apply for summer research stipends of $1000 offered by the Graduate 
School and the marine sciences graduate program. These are competitive, university-wide grants 
with funding rates of approximately 30-40%. Seven to eight stipends are awarded by each 
organization each summer.

Other support for students comes from the Graduate School and the Graduate Student 
Association. These organizations routinely provide travel grants ($250-400) to graduate students 
to attend and/or present at relevant regional, national or international conferences. Students are 
allowed to apply for one grant per year from each organization. Additional funds are available to 
graduate students in departments that have established departmental graduate student 
associations, the members of which regularly attend the Graduate Student Association monthly 
meetings. The individual departmental associations determine how these funds will be
distributed. Typically funds go toward the costs of meeting registrations, minor research equipment, seminar speaker travel, etc.

Additionally, the Geography and Geology Department sponsors a program that awards up to $500 to defray costs associated with student research. Each year students may submit a research proposal that is then evaluated by a faculty sub-committee. Five to eight awards are granted each year depending on the number of submissions and total support requested.

Graduate teaching assistants are provided modest office space (575 sq.ft. total; about 34 sq.ft. per student) in DeLoach Hall, room 209. About 17 students use the room mainly to hold office hours. Desks, bookcases, file cabinets and computer facilities are provided. In addition, computer facilities are available in the Cartography Laboratory and the Spatial Analysis Laboratory. Common laboratory space, equipment and supplies are available for student research. Major needs of the program are additional space for student offices and additional laboratory space to facilitate student and faculty research.

7.6 Student Performance Measures

The retention rate for students that matriculated between 2001 and 2007 was 90%. Of the five students that left the program, three left for personal/medical reasons, and two were unable to maintain the minimum required GPA of 3.0. During the same time interval, three students that matriculated between 2001 and 2007 requested a leave of absence; one for personal reasons, one was deployed to Iraq as a member of the National Guard, and the third for medical and financial reasons. A total of 41 students graduated between 2001 and 2007. The majority of the students elected the thesis option, six students matriculated through the non-thesis option. The time to degree for students who graduated between 2001 and 2007 ranged from 6.5 to 1.5 years. The median total time to degree was 2.75 years (Table 5).
### Table 5: Median time to degree 2001-2007

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Graduated</th>
<th>Median Time to Degree (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2002</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2003</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2004</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>2005</td>
<td>7</td>
<td>2.25</td>
</tr>
<tr>
<td>2006</td>
<td>5</td>
<td>3.25</td>
</tr>
<tr>
<td>2007</td>
<td>6</td>
<td>2.5</td>
</tr>
<tr>
<td>2001-2007</td>
<td>41</td>
<td>2.75</td>
</tr>
</tbody>
</table>

#### 7.6.1 Student Presentations and Publications

Students were very active in giving presentations, including many with published abstracts, and writing articles in peer-reviewed journals (Table 6).

#### Table 6: Student performance measures

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2001-2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of graduates</td>
<td>41</td>
</tr>
<tr>
<td>Number of refereed publications with graduate students as authors or co-authors</td>
<td>25</td>
</tr>
<tr>
<td>Number of professional presentations by graduate students</td>
<td>73</td>
</tr>
<tr>
<td>Number of published abstracts with graduate students as authors or co-authors</td>
<td>102</td>
</tr>
</tbody>
</table>

Graduate students in the Department of Geography and Geology are encouraged to present results of their research at regional, national and international meetings. Attendance at these meetings allows further interaction with their peers from other universities and the interchange of ideas with professionals in their research areas. For example, over the last seven years, our graduate students presented results of their research at the following meetings (See Appendix V for complete listing of student published abstracts):

Geological Society of America annual and regional meetings
American Society of Limnology and Oceanography meeting
American Geophysical Union fall meeting
American Geophysical Union Ocean Sciences meeting
Southeastern Estuarine Research Society meeting
An important component of our graduate program is involving the graduate students in the publication of their research. The completion of the research thesis is part of this process, but since most theses are never read outside of the university, it is important for the student to place his or her research results before the professional community. Since an abstract and proceedings volume often accompanies presentations at regional, national and international meetings, the above-mentioned meetings resulted in abstract publications of the students’ research. Students were also author or co-authors of numerous peer-reviewed articles in nationally and internationally recognized journals (See Appendix V for complete listing of student refereed publications).

### 7.6.2 Student Awards and Extramural Grants

The Department of Geography and Geology's annual spring awards banquet provides a forum to recognize outstanding achievements of the geology graduate students. One or two graduate students are recognized in each of three categories: research, teaching and service. In addition, the department awards the Victor Zullo Memorial Research Award to a geology student who has made outstanding contributions in research.

Over the past seven years, students were supported through university and Graduate School scholarships, stipends and awards. Several students won competitive scholarships (e.g. James Leutze Merit Scholarship, and Sylvia and D.B. Schwartz Fellowship), and Graduate School and
Marine Sciences summer research stipends. One student won the Graduate Teaching Assistant Excellence award (see Appendix VI for complete listing of awards and honors).

Another important component of the geology graduate program is to educate the graduate student to the intricacies of external funding for research. To this end, we encourage our graduate students to apply for a variety of awards, grants and internships that will allow them more flexibility in the pursuit of their research topics. This topic is covered in GLY501 (Methods in Scientific Research). Examples of awards and funding obtained by the graduate students from external sources over the last seven years include (see Appendix VI for complete listing of grants and internships):

- Graduate Research and Travel Grants from the Geological Society of America
- National Science Foundation Workshop Travel Grant
- Association of Applied Paleontological Sciences
- Association for Women Geoscientists
- NASA Summer Internship
- National Non-Traditional Student Association

**7.6.3 Placement of Program Graduates**

After completion of their graduate degree at UNCW, our students go on to a variety of future careers. Many go into industry (both government and private) while others continue their academic careers. The placement of our graduates in relevant employment or in Ph.D. programs is close to 95%, as listed in Table 7 below.
Table 7: Placement and location of Master's students post-graduation

Over the last seven years our students went on to attend or work with the following organizations:

**Academic (graduate school – Ph.D. programs)**
- University of Georgia
- SUNY Stony Brook
- South Florida University
- Virginia Institute of Marine Sciences
- Virginia Polytechnic Institute and State University
- University of Tennessee
- West Virginia University

**Government and Private Industry**
- MACTEC Engineering and Consulting, Wilmington NC
- MACTEC Engineering and Consulting, Washington, DC
- Land Management Group, Wilmington, NC
- Chesapeake Energy, Oklahoma City, OK (2)
- Exxon-Mobil, Houston, TX
- Hess, Houston, TX
- NC Department of Environment and Natural Resources, Wilmington, NC
- Catlin Engineers, Wilmington, NC
- Gahagan & Bryant Associates Inc., Wilmington, NC (2)
- US Army Corps of Engineers, Wilmington, NC
- Virginia State Geological Survey
- Brunswick Community College, Bolivia, NC
- Cape Fear Community College, Wilmington, NC
- URS Co, Inc., Galveston, TX
Northern Essex Community College, Haverhill, MA  
Baker and Hughes, Houston, TX  
Geological Services Corporation-Kleinfelder, New York, NY  
Mino and Moore, San Diego, CA  
Coastal Carolina University, Conway, SC  
Environmental Standards, Inc., Charlottesville, VA  
University of North Carolina Wilmington, Center for Marine Science  
Coastal Technology Corporation, Melbourne, FL  
Virginia Marine Resource Commission, Newport News, VA  
GeoDynamics Inc., Morehead City, NC  
ENSR, Raleigh, NC  
Clark Environmental Services, Castle Hayne, NC  
Ozark-St. Francis National Forest, U.S. Forest Service, AK  
US Army Corps of Engineers, MN  
Parsons, Denver, CO  
University of North Carolina Pembroke  
Kimley-Horn and Associates, Inc. Jacksonville, FL  
North Carolina State University, Dept. of Soil Science  
Environmental Standards, Inc., Charlottesville VA.  
U.S. Geological Survey Water Resources Science Center, Richmond VA.  
N.C. Division of Water Quality, Neuse River Rapid Response Team, New Bern NC.

### 7.7 Role of Teaching Assistants in the Graduate Program

All GTAs teach one, two or three undergraduate 100- or 200-level laboratories each week. Prior to the addition of a part-time laboratory coordinator, an experienced second-year GTA was appointed head TA for the physical geology laboratories. All GTAs work under the direct supervision of the appropriate course lecture instructor, a faculty laboratory coordinator or the head GTA (when applicable). Most departmental GTAs are utilized in 100-level laboratories; however, GTAs with specialized skills and training may assist in 300- and 400-level laboratories.

Geology and geography laboratories in the Department of Geography and Geology involve either two or three contact hours per week. In addition, GTAs are required to assist faculty members in classes with high enrollments by grading exams, recording attendance, setting-up video or slide presentations, etc. In addition, the department graduate coordinator receives the half-time assistance (up to 10 hours per week) of a GTA. This individual assists with...
preparation of program reports, preparation of recruiting posters, mailing lists for distribution of program brochures and posters, and other graduate program duties deemed important by the graduate coordinator.

All new GTAs are required to attend the daylong fall orientation and training session offered by the Graduate School in conjunction with the Center for Teaching Excellence. All new GTAs are also required to attend a daylong orientation given by the graduate coordinator prior to the start of the fall and spring semesters. In 2005, the Graduate School developed a comprehensive graduate teaching assistant manual. The contents of this manual are discussed during the orientation and a hard copy provided to all new GTAs. The Department of Geography and Geology graduate handbook (http://www.uncw.edu/earsci/documents/GEOgradhandbk2007.pdf), which contains written GTA instructions, is also discussed and distributed during the orientation. In addition, all new GTAs are required to attend a 20 hr departmental training workshop that meets weekly during the first half of the semester.

All geology GTAs are required to attend a two-hour long meeting at the beginning of each semester. Faculty coordinators for each laboratory section and the graduate coordinator attend this session and offer required instruction. In addition, the faculty laboratory coordinators meet each week with the GTAs who teach their laboratories to discuss forthcoming exercises, to offer suggestions to enhance teaching effectiveness, and to listen to their concerns. This process ensures that, in multiple laboratory sections, each GTA teaches the same material. Laboratory coordinators of GTAs also meet regularly with the appropriate lecture instructors to discuss laboratory content in order to ensure coordination between the laboratory and lecture material. GTAs who teach lower level 200- level labs or assist with upper level labs work directly under the appropriate lecture instructor.
8. AFFIRMATIVE ACTION

Females and underrepresented minorities, especially African Americans and Native Americans, have traditionally had low faculty representation and student enrollment numbers in physical sciences departments across the nation. Diversity studies indicate that on average women make up 15-20% of faculty in earth sciences departments and underrepresented minorities comprise <1% (Native American) - 8% (Asian) of the faculty (Nelson, 2005, http://cheminfo.ou.edu/~djn/diversity/top50.html). The overall demographics of the geography and geology faculty follow this national trend. However, when considering demographics by rank, the department is unusual in that 33% of the faculty at the rank of full professor are women, compared to the national average of 10-16% (Nelson, 2005). One of the full professors (Kelley) served as chair of the department for six years (1997-2003), and two have been graduate coordinator of the master’s in geology program (Grindlay, Leonard). Female presence in leadership roles within the department and in the classroom at the undergraduate and graduate levels provide role models and mentors to our students. This has most likely contributed to the recruitment of the relatively large number of female students enrolled in the undergraduate (35%) and graduate programs (46%).

The department is currently searching for a chair with an anticipated start date of July 2008. To ensure a diverse applicant pool, the departmental search committee has worked closely with UNCW's Human Resources to identify 25 highly qualified, “protected” individuals who will be contacted directly by the chair of the search committee and encouraged to apply for the position.
8.1 UNCW Equal Opportunity and Affirmative Action Policy

(http://www.uncw.edu/policies/02-230-eoandaa.htm, accessed 11/8/07; policy revised and reformatted July 8, 2005)

I. Purpose

The University of North Carolina Wilmington is committed to and will provide equality of educational and employment opportunity for all persons regardless of race, sex (such as gender, marital status, and pregnancy), age, color, national origin (including ethnicity), creed, religion, disability, sexual orientation, political affiliation, veteran status, or relationship to other university constituents -- except where sex, age, or ability represent bona fide educational or occupational qualifications or where marital status is a statutorily established eligibility criterion for State funded employee benefit programs.

II. Implementation

A. This affirmation is published in accordance with 41 CFR Part 60 and is implemented in accordance with Title VII and Title IX of the Civil Rights Act of 1964, as amended; Executive Order 11246; the Rehabilitation Act of 1973; the Vietnam Era Veterans' Readjustment Assistance Act of 1974; the Civil Rights Restoration Act of 1988; and NC General Statutes Chapters 116 and 126.

B. To ensure that equal educational and employment opportunity exists throughout the university, a results-oriented equal opportunity/affirmative action program has been implemented to overcome the effects of past discrimination and to eliminate any artificial barriers to educational or employment opportunities for all qualified individuals that may exist in any of our programs. The University of North Carolina Wilmington is committed to this program and is aware that with its implementation, positive benefits will be
received from the greater utilization and development of previously under-utilized human resources.

III. Violations of Policy

A. Any individual with a concern, grievance or complaint of discrimination or retaliation may utilize the procedures available under the Code of Student Life, the SPA Grievance and Appeal Procedures, the EPA Grievance and Appeal Procedures and the Faculty Grievance Procedures as appropriate. The existence of these internal procedures does not prohibit individuals from also filing claims with the Equal Employment Opportunity Commission or with the Office of Civil Rights, U.S. Department of Education.

B. No student or employee shall be subject to retaliation for bringing a good faith complaint pertaining to unlawful harassment or discrimination or for protesting such behavior directed against another member of the university community

C. Individuals may also contact the university’s EEO/AA Officer at (910) 962-3160

9. SUMMARY OF FACULTY RESEARCH AND SCHOLARSHIP

9.1 Introduction

The geography and geology faculty have an impressive record of research and scholarship. In the last seven years, faculty published more than 115 refereed articles, gave more than 144 presentations at regional, national, or international meetings, and received more than $8.9 million dollars in extramural funding. Individual accomplishments are available in the copies of the abbreviated curriculum vita appended to this document (Appendix IV). Below is a summary of the accomplishments of faculty during the period under review.
9.2 Publishing, performances, and exhibitions

In the past seven years, the geography and geology faculty produced a tangible record of publications and demonstrated a continuous pattern of dissemination and evaluation of scholarly research in a variety of forms. During this period, the faculty were author or co-author of nine books, textbooks, laboratory and/or instructor manuals, 115 refereed publications (see complete listing in Appendix VII), 296 abstracts, and multiple contributions in the form of book and textbook reviews, field guidebooks, final grant reports, encyclopedia entries, computer software, government and state survey documents, open file reports, and state map projects. The diversity in sub disciplines exemplified by the geography and geology faculty lends itself to a variety of publication outlets. The geography and geology faculty publications appeared in widely cited international journals such as Geology, Marine Geology, Journal of Coastal Research, Earth and Planetary Science Letters, Geophysics Research Letters, Limnology and Oceanography, Water Resources Research, Journal of Geophysical Research, Geochemistry, Geophysics and Geosystems, Palaeogeography, Palaeoclimatology, Palaeoecology, Physical Geography, Geomorphology, Cantena, and regional journals such as Southeastern Geology, Southeastern Geographer, and The North Carolina Geographer.

Geography and geology faculty abstracts consistently appear in such volumes as the International Geologic Congress, Geological Society of America national and sectional programs, EOS Transactions of the American Geophysical Union, Association of American Geographers, and the Estuarine Research Federation.

9.3 Funded Projects

The acquisition of extramural research funding is fundamental to the support of increased student enrollment, enhancing student and faculty research efforts, and the acquisition of needed
capital equipment. Over the past seven years the department has been quite successful in obtaining extramural and in-house funding. Since 2001, eleven faculty members in the Department of Geography and Geology were principal investigator on 74 new extramural grants worth $8,995,483 (Table 8) (See Appendix VIII for complete listing of grants). This represents nearly a four-fold increase in extramural funding from the last review cycle. The three biggest programs in terms of funding include: the NOAA-funded Coastal Ocean Research and Monitoring Program (CORMP) (Leonard PI 2005, 2006 and 2007, total = $4,922,014), NOAA/CSC fund Coastal Observation RCOOS program (Leonard PI $1,140,000) and the NSF GK-12 program (Harris PI 2002-2004 total = $1,262,882). Geography and geology faculty also received "in house" funding to support research. In-house funds typically are used to help faculty develop research projects, collect pilot data for the initiation of extramural funding proposals, and to develop new courses. These funds come primarily from four sources: The

<table>
<thead>
<tr>
<th></th>
<th># of new projects</th>
<th>Total Amount $</th>
<th>Major Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 2001</td>
<td>6</td>
<td>$143,845</td>
<td>NC Sea Grant, USGS, Western Washington</td>
</tr>
<tr>
<td>2001-2002</td>
<td>11</td>
<td>$600,892</td>
<td>NOAA, NSF, USGS, USACE</td>
</tr>
<tr>
<td>2002-2003</td>
<td>3</td>
<td>$347,840</td>
<td>NSF</td>
</tr>
<tr>
<td>2003-2004</td>
<td>12</td>
<td>$854,899</td>
<td>NSF, UPR Sea Grant, NMFS, NPS, NOAA</td>
</tr>
<tr>
<td>2004-2005</td>
<td>5</td>
<td>$2,555,565</td>
<td>NOAA, UPR Sea Grant, NPS</td>
</tr>
<tr>
<td>2005-2006</td>
<td>7</td>
<td>$2,411,241</td>
<td>NOAA, NSF</td>
</tr>
<tr>
<td>2006-2007</td>
<td>13</td>
<td>$627,344</td>
<td>NCSU, NOAA, Dauphin Is. Sea Lab</td>
</tr>
<tr>
<td>Fall 2007</td>
<td>16</td>
<td>$1,452,856</td>
<td>RTI International, NCSU, General Dynamics, Dauphin Is. Sea Lab</td>
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Table 8. Total amounts of new awards brought in each year
Charles L. Cahill Research Award, the UNCW Summer Research Initiatives Program, the Innovative Technologies Program through the UNCW Information Technology Systems Division and the CMS pilot project program. In the last seven years, geography and geology faculty received more than $260,000 from in-house sources.

9.4 Presentations at Conferences, Workshops, Symposia

Since the fall of 2001, the geography and geology faculty, representing the geology and geography disciplines, participated in a variety of local, regional, national, and international talks, discussions, meetings, and conferences that resulted in more than 144 presentations. Numerous presentations were made at regional, national, and international settings in the southeast, across the United States, and including the following countries: Portugal, Bahamas, Canada, Brazil, Spain, Netherlands, France, Chile, Jamaica, Cuba, Aruba, Dominican Republic, Puerto Rico, Nova Scotia, Czech Republic, United Kingdom, Argentina and Italy. Presentations are oral or poster in nature, although in certain conferences, combined poster and oral presentations were given. Many faculty members were sole or first author in some of these presentations, although collaborative presentations with geography and geology undergraduate and graduate students, and colleagues having national and international university, government, or industrial affiliations have been more frequently made. In addition, several faculty members were responsible for organizing and leading conferences as well as editing material, leading field excursions and panel discussions, and making presentations.

In the past seven years, a number of geology faculty made presentations both regionally at sectional meetings of the Geological Society of America and nationally at meetings of the Geological Society of America, Coastal Sediments ’03 and ’07, Ocean Sciences Meeting,
Estuarine Research Federation and the American Geophysical Union. These events represent some of the top annual meetings for the geological/marine sciences. A number of the presentations made at these meetings were invited. In geography, meetings of the Association of American Geographers, the Pioneer America Society, the Southern Conference on Slavic Studies, and the American Association for the Advancement of Slavic Studies are the primary annual conferences for presentations.

All of the geography and geology faculty are also dedicated to presenting their research at other significant meetings and conferences that are nationally or internationally focused upon their specific sub disciplines. The presentation forums listed in Appendix IX represent the breadth and scope of faculty research interests, productivity, and participation in the past seven years of the geology and geography faculty. Geography and geology faculty made presentations at one or more these individually important meetings, some of which are by invitation-only.

9.5 Leadership Roles

The geography and geology faculty were/are elected officers, board members, or campus representatives to more than 22 professional organizations. Leadership positions held by geography and geology faculty between 2001 to present include: secretary-treasurer of the Pioneer America Society, vice president of the North Carolina Geographic Society, president and past-president of the Paleontological Society, president of Board of Trustees of Paleontological Research Institution, secretary-treasurer of the southeastern section of the Society of Economic Paleontologists and Mineralogists, and president and treasurer of the local chapter of Sigma Xi. Several faculty members are campus representatives for organizations such as the Geological Society of America, the North Carolina Geographic Alliance, and the Society for Sedimentary Geology.
In the last seven years, geography and geology faculty convened or co-convened at least 14 technical sessions at professional meetings including Coastal Sediments ’03, 8th International Coastal Symposium, American Geophysical Union annual meeting, International Congress on Ichnology, the Geological Society of America national and regional meetings, North American Paleontological Convention, and the Estuarine Research Federation meeting. Numerous other faculty led or co-led field trips sponsored by organizations such as the Geological Society of America, the Carolina Geological Society, the Pioneer America Society, the Seismological Society of America and the North Carolina Geographical Society. Several faculty were chair and organizer/co-organizer of regional and national workshops, symposia and meetings including the First Annual North Carolina Climatologist meeting, the 12th Symposium on the Geology of the Bahamas and Other Carbonate Regions, Pardee Keynote Symposium, North Carolina Geographical Society annual meeting, North Carolina Conference for Geographic Information Systems, and National Science Foundation Geography Faculty Development Alliance Workshop.

In the last seven years, three faculty members served as members of National Science Foundation grant review panels. One of these faculty members also served on a National Undersea Research Program grant review panel. Numerous other faculty reviewed proposals for various agencies including, but not limited to: the National Science Foundation, Petroleum Research Fund, Cooperative Institute for Coastal and Estuarine Environmental Technology, Natural Environmental Research Council, Environmental Protection Agency, Sea Grant (TX, SC, WI, NY, GA), the American Chemical Society, the Natural Sciences and Engineering Research Council of Canada, USGS National Institute for Water Resources and the Department of Energy.

9.6 Honors and Awards

Several faculty members in the Department of Geography and Geology were recognized for their contributions to both research and teaching both within and beyond the university. In the last seven years, one faculty member (Kelley) was the recipient of the 2005 UNCW Faculty Scholarship Award, which recognizes outstanding scholarship. The same faculty member was elected fellow of the American Association for the Advancement of Science in 2004 and elected Centennial Fellow of the Paleontological Society in 2006. Another faculty member (Harris) was elected Fellow of the Geological Society of America in 2002.

Over the past seven years our faculty continued a long and distinguished record of teaching excellence. One faculty member (Ainsley) received the 2003 North Carolina Geography Educator of the Year Award, the 2004 UNC Board of Governor's Award for Teaching Excellence, as well as the 2007 UNCW Chancellor's Teaching Excellence Award. Our faculty has also been recognized at the national level for teaching excellence. One faculty member (Kelley) received the Association for Women Geoscientists Outstanding Educator Award in 2003 and was chosen to be one of the 2006-2007 National Geosciences Teacher
Association Distinguished Lecturers, and another faculty member (Gamble) received the Distinguished Teaching Achievement Award from the National Council for Geographic Education in 2005.

Two geography and geology faculty were recognized for outstanding service to the profession. One faculty member (Ainsley) received the 2003 H.H. Douglas Distinguished Service Award, and most recently a faculty member (Hines) was presented the 2006 African American Heritage Foundation of Wilmington, Inc.’s President’s Award.

9.7 Community Service Related to Program Goals

One goal of the Geography and Geology Department's mission is to serve as a resource, catalyst, and example to local and global communities by providing a wide variety of professional services. To this end, geography and geology faculty participate in several activities that serve the community at large. In a typical year, three to five of our faculty work in local public schools as lecturers and tutors. Approximately three to four faculty per year serve as judges for events such as the North Carolina Geography Bee, Oceans Bowl and science fairs at the local, regional, and state levels. Currently, one faculty member is directing the Evolution Learning Community Program, which has a large outreach component (seminars and courses on Evolution) through Continuing Studies at UNCW.

The Geography and Geology Department actively participates in the Summer Ventures in Science and Mathematics program offered each summer at UNCW by the Science Math Education Center. This program is a state funded, intensive, four-week in-residence program in science and math for rising juniors and seniors who attend North Carolina public high schools. One to two geography and geology faculty instruct in the program each summer. The
Geography and Geology Department provides laboratory space and computers when the program is in session.

10. GOALS AND OBJECTIVES: STRENGTHS AND CHALLENGES

10.1 Program Strengths

1. Our graduate program can accommodate students with varied academic backgrounds, geological interests and career goals. We offer graduate students a diversity of research areas from which to choose within the traditional bounds of geology as well as several non-traditional geology research programs. The traditional areas of geology include paleontology, structural geology, petrology, and stratigraphy. We also offer students the opportunity to conduct research in several exciting, cutting edge research programs including research in marine geology and geophysics, stable isotope geochemistry, paleoecology, estuarine and coastal processes, basin analysis and contaminant hydrology.

2. Our graduate program is designed to facilitate close supervision and interaction between faculty and students in research. A relatively large percentage of females at the rank of full professor, and in leadership positions within the department, provide optimal role models for female undergraduate and graduate students entering the program. The result of this close supervision and mentoring of students by faculty is a high retention rate and graduates who are well trained and capable of being successful in both Ph.D. programs and employment in public and private sectors.

3. Our program places special emphasis on applied learning experiences and training combining state-of-the-art instrumentation in both field and classroom settings to prepare students for solving contemporary geologic problems and for the practice of advanced research in the geological sciences. These field experiences have ranged from deep-towed
camera work and water sampling offshore northern Puerto Rico, fossil hunting in Iceland and Baja California, mapping deformation zones in Idaho and the North Carolina Piedmont Province, hydrologic modeling in San Salvador, Bahamas, swathmapping and dredging survey of the Puna Ridge offshore Hawaii, seismic reflection and sidescan sonar survey offshore SE North Carolina and western Puerto Rico, and participating in a workshop to study the Oman Ophiolite in Cyprus. Non-thesis option students have encountered numerous applied experiences with internships and final project work. These include wetland delineation, environmental site assessments, GIS-related data regarding assessments, assisting with installation and data reduction of ground water monitoring wells, engineering geology associated with environmental assessments, and field studies using magnetometers to test and improve reliabilities and detection of unexploded ordnance.

10.2 Intermediate and Long-range Challenges and Needs

The most significant and immediate problems facing the graduate program are inadequate office, research and storage space, quantity and quality of student recruitment, low-levels of student support, and insufficient staff/technical support. Essential needs associated with each of these are described below.

10.2.1 Office, Research and Storage Space

As with many programs and departments on campus, the Department of Geography and Geology has outgrown its designated space. Short-term efforts to alleviate this problem have included housing faculty and resources in other buildings on campus and maintaining an off campus storage facility.
**Office Space:** At present, graduate students holding teaching assistant appointments are provided with very modest office space. Currently, 17 students share two small, interconnected offices (575 sq. ft. total; about 34 sq. ft. per student). In addition, research assistants are not guaranteed office space in the department. Office space is available at CMS for research assistants working with geography and geology faculty housed at CMS.

Faculty office space is also an immediate concern to the department. There has been no additional office (or research space) allocated on campus for use by the department since the last graduate review. In addition, the department has grown by two full time faculty members (Tobias, Henry), one full time lecturer (Shew), and one shared technician (Marsan). This has resulted in several faculty members doubling up in an office, as well as the use of the conference seminar room (514 sq. ft.) for teaching, meeting, and storage space. The department is actively searching for a chair who will join the department in fall 2008. At present all of the faculty offices in DeLoach Hall are occupied; therefore, any new tenure track faculty cannot be housed in the department given current space allocations.

**Research Space:** Another immediate problem is the lack of research space for faculty and graduate students unless they are housed at CMS. Graduate student offices are often located in areas also dedicated to research. Even at CMS, many student offices are located in research laboratories. These office arrangements are unsatisfactory as they compromise research efforts and, in some instances, raise questions about student safety. In addition, the CMS facility is located approximately eight miles from main campus, thereby rendering offices located there unacceptable for graduate students or faculty who must hold office hours for undergraduate students.
In DeLoach Hall, there is no space solely dedicated to graduate student research. Students conducting research must share extremely limited faculty research space (which is usually the faculty members office space) or work in laboratories designed and used for teaching. In the case of the latter, the graduate students are essentially competing with undergraduate and graduate courses for laboratory space. The net result is that graduate students lack access to a secure area where they can store their samples and supplies and work on samples over an extended period of time. In addition, consumable supplies purchased by research grants undergo high rates of attrition when they are used by classes sharing the labs and vice versa. Similarly, teaching equipment stored in the lab is subject to greater wear and tear when it is also used for research.

Another problem associated with shared teaching/research space is safety. Student and faculty research often requires the use of specialized equipment or caustic chemicals that require safety training. The combination of potentially dangerous equipment and supplies and introductory level undergraduates in the same laboratory is a recipe for disaster. DeLoach Hall has a number of safety issues that have been brought to the attention of the administration (lack of overhead fire suppression sprinklers, exposed and peeling paint and insulation, as well as an inadequate air handling unit) but no substantial repairs or renovations have been accomplished. The combination of teaching and research in the same physical location was one problem area noted in the previous graduate program review that has not been remedied. This problem would have been alleviated had the department received access to all of DeLoach Hall, as originally planned. However, because plans to move the Department of Physics and Physical Oceanography out of DeLoach Hall did not materialize, departmental space remains inadequate.
As is the case for office space, research space is divided among several different research locations. The most ample space is contained at CMS; however, this facility is approximately eight miles away from the main campus. In addition, use of the CMS facility is largely limited to those faculty conducting marine-related research. Another facility used by geography and geology faculty is the Petrology Preparation Laboratory ("rock lab"). Like CMS, this facility is housed in a different building that is located on the other side of campus. Because students and faculty must spend time traveling back and forth between their offices and the "rock lab", less time is available for research. In addition, the separation of this facility from the department hinders faculty/student interactions and makes it extremely difficult for faculty to adequately supervise students who must use the facility for their research. The net result is that both the teaching and research mission suffer.

**Storage Space:** In 1997, the Department of Geography and Geology was promised a 5000 sq. ft. building to be used as an archive facility for cores and as a sample preparation facility. Because the end of the fiscal year was approaching, time was not adequate to obtain the storage building that Academic Affairs had agreed to provide. Therefore, the Department of Geography and Geology paid some start-up costs for three new faculty with the provision that Academic Affairs would provide the storage building the following year. Although the department has included a reminder of this agreement in the last three annual expansion budgets, and we were notified two years ago that Academic Affairs was allocating funds to this project, no support was actually received. There is absolutely no space available to store samples needed to maintain a vigorous research program. The lack of storage space became even more critical in fall 2001 when the department lost access to limited storage and laboratory space in Friday Hall.
(~100 sq.ft.) and samples currently housed there needed to be relocated to paid off campus storage or placed in already overcrowded teaching and laboratory space.

10.2.2 Student Recruitment

During the past seven years the geology graduate program has maintained an average enrollment of 26 degree-seeking students. Given the size of the faculty we would like to modestly increase size of the program to 33. This increase in enrollment, however, would require additional space (see sections above) and financial support.

Recruitment efforts for our program have been hindered by the amount of financial support available. To be more competitive other with in-state and out-of-state geology programs, the geology graduate program requires GTAs be funded at a significantly higher amount. Additional out-of-state tuition remissions, and in-state tuition scholarships are also needed. The large in-state research universities, North Carolina State University and the UNC Chapel Hill, with which we have the greatest competition for students, offer 9-month teaching assistant stipends of $13,000 or more, and waive all tuition and fees.

The ideal solution would be a complete waiver of all tuition and fees, for both in-state and out-of-state students, who are funded on either teaching or research assistantships. In addition, recruiting efforts would be significantly enhanced if UNCW offered a health care package to students on assistantships.

Other challenges to recruitment are a changing job environment in the public and private sector. The introduction of the non-thesis option in 2003 was timely and resulted in good job placement for our graduates. However, local geological, environmental and engineering companies are now looking for expertise in environmental issues such as wetlands delineation, as more emphasis is placed on mitigating impacts of coastal development. Moreover, the initiation
of a M.A. degree in environmental studies in fall 2008 has the potential to draw students that
would otherwise apply to the geology M.S. non-thesis option.

10.2.3 Student Support

Even the most frugal graduate student cannot support him/herself on the current 9-month
stipend of $9500 in Wilmington, NC. Although located in a relatively small county of ~183,000
inhabitants, the resort nature, rapid development and escalation of real estate values in the
Wilmington area over the past five years has increased the cost of living significantly. According
to the 2007 American Chamber of Commerce's nationwide survey, Wilmington ranks as the most
expensive North Carolina city to live in. The effective graduate student stipend is closer to
$6000 as most of the students must pay taxes, health insurance, parking fees, and in-state tuition
and fees (the later three of which come out of post-tax income). As a result, the majority of our
students are forced to assume some form of financial aid, either from federal loans and/or
parental support.

Additional research assistantships are also needed. Typically only one or two students
are supported on research assistantships during the academic year in the geology M.S. program.
Academic-year research assistantships allow students the flexibility to conduct research and
complete coursework without the obligations associated with teaching. Research assistantship
support during the summer is critical to the timely completion of the degree. During the summer,
however, on average only three or four students receive research assistantship support. In some
instances, Graduate School and Marine Sciences summer research stipends provide limited
support ($1000 per student); however, many students are forced to seek employment outside of
the university, often unrelated to the discipline, to make ends meet.
10.2.4 Staff and Technical Support

The department is in dire need of additional support staff. As mentioned above, the department currently has 20 tenure track faculty, one full-time lecturer, and will be hiring one additional position in 2008. University policy states that one full-time office staff member should be provided for every eight full-time faculty positions. At present, the department has only two full-time office staff positions. Clearly, the department is understaffed and in desperate need of at least a part-time position to assist faculty with course material preparation, proposal preparation, grant budgeting and requisitions, and travel. Moreover, in 2008 the senior office administrator will have served 30 years with the department, and has indicated that she is planning to retire. Her wealth of experience and knowledge of departmental operation are unparalleled. She is an invaluable departmental resource who will be sorely missed. To ensure the smoothest possible transition, serious consideration must be given to finding and training a suitable replacement.

In spring 2006, the department hired a half-time (shared with the Department of Physics and Physical Oceanography) technician. This technician has assisted with management of department facilities such as the Spatial Analysis Laboratory, the rock and mineral teaching collections, and the Cartography Laboratory. She also serves as webmaster for the Department of Geography and Geology and the GIS websites. However, given the recent acquisition of a X-ray diffractometer and an isotope ratio mass spectrometer, coupled with the reduction in computer support from the university technical support division due to organizational restructuring, there is still a need of additional technical support within the department.

10.3 Current Regional, National and International Needs

With global population increasing, demand for energy will continue to rise. For the
immediate future, energy sources will continue to be nonrenewable earth resources - coal, hydrocarbons, and uranium. Increasing numbers of geoscientists will be needed to research, explore and manage such resources. With population increase there is also an accompanying local, national and worldwide increase in environmentally related problems, including water quantity and quality and the importance of natural hazards. Enormous personal and financial losses due to phenomena such as hurricanes, earthquakes, volcanic eruptions, landslides, tsunamis and floods have caused concern for both the public and insurance companies. Geoscientists will be needed to study both long-term and short-term aspects of the environment, water resources and natural hazards. Interdisciplinary cooperation with engineers and social scientists will enable geoscientists to mitigate the impact of extracting earth resources as well as potential natural disasters.

The rapid population growth and urban development of southeastern North Carolina will impose an increasingly negative stress on the local environment. Further, given its low elevation and exposure to the Atlantic Ocean, global warming and accompanying rising sea level and increased tropical storm frequency have the potential to have a disastrous impact on southeastern North Carolina. This impact will lead to increased coastal erosion problems and drastic changes in coastal and near coastal environments. Geoscientists will be needed to address regional problems of limited water supply, contamination of surface and subsurface waters, saltwater intrusion, and beach and coastal zone management.

10.4 Long Range Goals and Strategic Plan

The department’s strengths lie in two main areas: (1) Coastal and Marine Studies, including the study of physical, biological, and geochemical systems, human-environment interactions, natural resources and hazards as they apply to coastal and estuarine environments,
the ocean basins, and continental margins; (2) Global Change Studies, including large-scale environmental change over geologic to modern time scales, anthropogenic impacts including climate change, and the impacts of globalization on social and environmental systems. It is our vision to build on these areas of emphasis while providing a comprehensive and powerful learning experience for students, maintaining a faculty of outstanding scholars, strengthening regional engagement and outreach, preparing students to be global citizens, and encouraging and enhancing diversity.

10.4.1 Additional/Replacement Faculty Hires

To achieve our vision, within the next two years we plan to maintain or add the following disciplines by additional faculty hires:

Coastal Processes / Marine Geology: Because of rising sea level associated with global warming and the increasing demand for beach renourishment sand and hydrocarbon resources found offshore, the university would benefit by strengthening and expanding research programs in coastal and marine geology. These fields are vital to the environmental and economic interests of southeastern North Carolina.

In recent years the majority of the graduate students who have matriculated in the M.S. geology program have done so to pursue marine or coastal research. Currently, all of the geography and geology faculty with expertise in coastal and marine geology are at, or near maximum advising capacity. They are supervising two to three (sometimes up to five!) students, and sitting on numerous theses committees in the geology, marine biology and marine science graduate programs. The department typically offers three to four graduate classes per semester with a coastal/marine emphasis that attract students from within and outside of our department. In the next three years, two faculty members will retire (one (Cleary) is currently in phased-
Remote Sensing: Remote sensing is one component of the rapidly growing field of GIScience. The rapid pace of development in southeastern North Carolina has created new opportunities for UNCW graduates in planning offices, environmental consulting firms, and public regulatory agencies many of which require skills in GIScience. Currently, we have one faculty member with expertise in GIS, but we do not have expertise in remote sensing. Given the increasing demand in this field, it is necessary to hire at least one more GIScientist to reach a critical mass that will meet enrollment and employment demands, increase our research productivity, as well as attracting quality graduate students.

Within the next five years, an additional one to two faculty members are anticipated to retire. Potential hires for our longer term needs include expertise in global climate dynamics, paleoceanography and paleoclimatology. These disciplines would complement the proposed B.S. in oceanography program (see below) and the master's in marine science program.

10.4.2 Curriculum Development

New Graduate Degree Programs: In spring 2008, the department plans to explore the possibility of offering a combined B.S./M.S. geology non-thesis option that leads to awarding of both degrees in as little as five years (three-plus-two program). This program can utilize the university policy that permits graduate courses to count as credit toward completion of both
degree programs, and therefore potentially bolster enrollment numbers in both the undergraduate and graduate degree programs. Few additional resources would be needed to implement this program. Three-plus-two programs have been successful in other science departments across campus, e.g. chemistry and mathematics.

The department is also considering the possibility of offering a M.A. degree in geography. This option, however, would require much more careful planning and additional resources in terms of faculty, space and graduate student support. Exploring this option is part of the department's five-year strategic plan.

**New Undergraduate Degree Programs:** In fall 2005, the Geography and Geology Department implemented a minor in oceanography to gauge student interest in a possible degree program. The minor has been very popular with enrollment more than doubling in the two years since it was first offered. In fall 2007, the Geography and Geology Department submitted a request for permission to plan a B.S. degree in oceanography. The proposal, which outlines a very interdisciplinary degree that involves faculty from several departments including chemistry, biology and marine biology and physics and physical oceanography, has been approved by the College of Arts and Sciences Curriculum Committee and the University Curriculum Committee, and awaits final approval with the Faculty Senate. The immediate benefit of this program would be an increased enrollment in the department (and the university). Over the long-term, as the enrollment numbers continue to grow, additional GTAs will be necessary to teach multiple laboratory sections of the introductory courses associated with the degree. Further, there will be the potential to establish a three-plus-two program between the B.S. in oceanography and M.S. in marine science.
In spring 2008, the department also plans to revisit the B.A. in geology to examine the possibility of revising the degree to better meet the needs of undergraduate and graduate students enrolled in the Watson School of Education who are seeking teaching licensure in earth sciences.

**10.4.3 Increased Research Profile**

Publications, presentations and grantsmanship are needed to raise the visibility of the program, attract high-quality students, and provide support for students (as well as equipment, faculty summer salaries, etc.). During the last seven years, the geography and geology faculty achieved an impressive record of research and scholarship. The faculty published numerous refereed articles in internationally recognized journals, gave presentations at regional, national, or international meetings, and received more than $8.9 million dollars in extramural funding (nearly quadrupling the amount of the previous review period). The number of faculty involved in seeking extramural funds grew since the last review, and several of the newly funded projects were to junior faculty members as first-time grants.

This increased research productivity has occurred despite a prolonged and acute lack of research space (see section above) and the heavy workloads due to high teaching demands and insufficient staff and technical support. The department's concerns for the future: how do we continue our trend toward research excellence and increasing external support without adequate research space and release time to fulfill grant obligations? Frankly, our current level of research productivity will be difficult to sustain, and we are likely at or near a ceiling based on our resources and workloads.

The UNCW administration indicated in November 2007 that the Department of Geography and Geology will not be moving into the new science building (estimated completion date of 2010) as originally planned. A remaining option to alleviate the space crunch is to
allocate all of DeLoach Hall to the department. This option, however, does not address the woeful condition of the 50-year old building. Significant renovation of DeLoach Hall will be necessary to ensure it meets the health and safety standards necessary for laboratory sciences.

More flexibility in determining faculty workload at the departmental level could also help to maximize research productivity. The department recognizes that faculty vary in their interests and talents and that variation in research and teaching assignments could benefit individual faculty, as well as the department as a whole.
## APPENDIX I
### GRADUATE GEOLOGY COURSE ENROLLMENTS (2001-2007)

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APPENDIX III
DESCRIPTION OF GEOLOGY GRADUATE CORE COURSES

GLY 501 Research Methods in Geology (2) Scientific proposal preparation, experimental design, scientific ethics, library use, safety, project management, data analysis, quality assurance and computer applications. One lecture and two laboratory hours per week.

GLY 502 Technical Communications in Geology (2) Scientific manuscript preparation and communication techniques: writing techniques, manuscript format, abstracts, oral and poster presentations. One lecture and two laboratory hours per week.

GLY 525 Engineering Geology (3) Prerequisite: Consent of instructor. Properties, uses, and engineering significance of solid earth materials and water. Properties of stress and strain and related material responses. Methods, techniques, and instrumentation of engineering geologic investigations. Three lecture hours per week.

GLY 526 Geohydrology (4) Prerequisites: Two semester hours of college calculus and petrology, or permission of instructor. Geology of ground waters and related aspects of surface waters. Methods of groundwater resource evaluation, protection exploitation, and contaminant remediation. Three lecture and three laboratory hours per week.

GLY 565 Introduction to Geophysics (3) Prerequisite: Consent of instructor. Integrated application of geophysical models to solve environmental and geologic problems.
Includes discussion of reflection/refraction seismology, ground penetrating radar and gravity. Two lectures and three laboratory hours each week.

GGY 522 (422) Remote Sensing in Environmental Analysis (3) Prerequisite: GGY 130 or 205, or GLY 101, or consent of instructor. Use and interpretation of aerial photography and other remote sensing techniques in environmental analysis. The course emphasizes problem identification, digital image analysis, and interpretation of images through laboratory exercises.

GLY 597 Final Project in Geology (3) Permission of instructor. Focused study of a research topic in the practical application of geology. Topics are selected by the student with appropriate faculty and graduate coordinator approval. Students work with a faculty committee. Written analysis and oral presentation of the project is required.

GLY 598 Internship (3) Prerequisite: Permission of instructor. Participation in field experience with an organization involved in the practice of geology. Students work with a licensed professional geologist focusing on the linkage between course work and practical application. Students complete a final report based on their activities. Final presentation required.

GLY 599 Thesis (1-6)
APPENDIX IV
GEOGRAPHY & GEOLOGY FACULTY CURRICULA VITAE
**Lewis J. Abrams** (five page CV for the past 5 years, 2002-2007)

University of North Carolina  
Department of Geography and Geology  
Center for Marine Science  
5600 Marvin Moss Lane  
Wilmington, NC, 28409

Tel: (910) 962-2350  
FAX (910) 962-2410  
Email: abramsl@uncw.edu  
Web: http://people.uncw.edu/abramsl/

---

**Education**


1986 **M.S. Oceanography**, Graduate School of Oceanography, University of Rhode Island, Marine Geology and Geophysics program, Thesis Title: *Morphology and Crustal Structure of the Kane Fracture Zone Transverse Ridge*, R. S. Detrick advisor.


---

**Professional History**

2000 - **Associate Professor**, with tenure, University of North Carolina, Wilmington, Department of Geography and Geology

1997 - 2000 **Associate Professor**, University of North Carolina, Wilmington, Department of Earth Sciences

1993 - 97 **Assistant Professor** of Geology, University of Puerto Rico, Department of Geology, Mayagüez, Puerto Rico

1993 **Postdoctoral Fellow**, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI.

1987-91 **Graduate Research Assistant**, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI. (Doctoral Dissertation)


1989 **Visiting Scientist**, UTIG, University of Texas, Austin, Texas, U.S.A.

1983-86 **Graduate Research Assistant**, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI. (M.S. thesis)


---

**Current Research Interests**

- Tectonic, volcanic and sedimentary history of the southern and western Pacific from marine geophysical investigations and scientific drilling.
- Use of downhole geochemical and geophysical logging data and physical properties data to detect changes in the physical/chemical properties of marine sediments that reflect paleoclimatic and volcanic cycles.
- Use of geophysical methods for shallow subsurface exploration pertaining to pyroclastic deposits, environmental and archeological studies.
Lewis J. Abrams (2002-2007)

Oceanographic and Geophysical Expeditions 2002-2007

Dec.-Jan. 2006-07 **R/V Revelle** (Scripps) – Multibeam bathymetry, Multichannel Seismic, Piston and multi coring to investigate life in sub-seafloor sediments of the South Pacific, National Science Foundation (NSF).


July-Sept. 2004 Ground penetrating radar-archeological investigation of the 1815 eruption of Tambora, Tambora Volcano, Sumbawa, Indonesia, Discovery Channel.


Mar-Apr 2002 **R/V Melville** (Scripps) - Multibeam bathymetry, gravity and magnetics, tectonic evolution of the Nova Canton Trough and Tongareva triple junction, southwest Pacific, NSF.

Publications  (refereed articles 2002-2007)


2002 Abrams, L.J., Correlation between core, logging, and seismic data at Site 1149 in the
Lewis J. Abrams (2002-2007)


Manuscripts (in review 2007)


2005 A Collaborative U.S./Indonesian Geophysical and Archeological Investigation of the Great Tambora Eruption of 1815, Charles Cahill Award for faculty research and development, UNCW $2,500.

2004 Use of high-resolution seismic and sidescan sonar to locate historic and ancient oyster beds in southeastern North Carolina, Center for Marine Science-UNCW, Pilot Project, $30,589.


Pending Proposals (2007)


University Courses Taught (University of North Carolina, Wilmington - UNCW)

GLY 592 - Introduction to Seafloor Mapping. New lecture course and computer lab
GLY 592 - Seismic Stratigraphy. New lecture course and computer lab
GLY 450/550 - Marine Geology. Core Course and Lab for MS Marine Science program.
GLY 491 - Visualization of Scientific Data, “flyover” of Tambora Volcano
GLY 101 - Physical Geology
GLY 120 - Environmental Geology.
GLY 120L - Environmental Geology Lab.
GLY 495 - Senior Seminar.
GLY 150 - Introduction to Oceanography
GLY 150H – Honors, Introduction to Oceanography
GLY 591 – Processing Seismic Refraction Data
GLY 591 – Arcview GIS: Application to Geophysical Data
GLY 591 – Seismic Processing (Reflection Data)
GLY 591 – Generic Mapping Tools Software
GLY 591 – Ground Penetrating Radar

Undergraduate Honors Student Research Projects Advised (2002-2007)

Laura Bagge, Committee Member, UNCW Honors Thesis, TBA.
Sheila Kitchen, Committee Member, UNCW Honors Thesis Microscopic Investigation on the Innervation of Dorso-Ventral Muscles in the Pteropod Mollusc, Clione Limacina
Kelly Roberts, Committee Member, UNCW Honors Thesis A morphotectonic analysis of the Mona and Yuma rifts in the Mona Passage northeastern Caribbean.

Graduate Student Research Projects Advised (MS-Geology or MS-Marine Science 2002-2007)

Steve Mondziel, Structural Analysis of Mona Canyon offshore NW Puerto Rico: Implications for seismic and tsunami hazards, co-major advisor.
Jennie Mancinone, Seamounts as a proxy for lithospheric strength, accretion style and magma supply along the ultraslow SW Indian Ridge, committee member
Kassy Rodriguez, Use of high-resolution sidescan sonar and seismics to map historic oyster reefs in the Lower Cape Fear River, co-major advisor.
Michael Murphy, Geophysical Investigation of the Tectonic History of the Nauru Basin, Western Pacific, major advisor.
Meghan Hearne, Investigation of submarine landslides along the northern Puerto Rico-Virgin Islands margin, committee member.
Luke Del Greco, Identification of Recent Faulting on the Shallow Insular Shelf of Puerto Rico: Implications for Seismic Hazards, major advisor
Karen Olschesky, Upper Miocene to Recent Diatom biostratigraphy of ODP Hole 1149A, committee member.
W. Frank Ainsley
VITAE (February, 2007)

Professor
A.B. in Biblical Studies, University of North Carolina, 1966
Master of Divinity, Southeastern Baptist Theological Seminary, 1969
M.A. in Geography, University North Carolina, 1972
Ph.D. in Geography, University North Carolina, 1977
Telephone (910) 962-3493
E-mail: ainsleyf@uncw.edu

PERSONAL DATA
Office Address: Department of Geography & Geology
University of North Carolina
Wilmington, NC 28403-5944
Office Phone: (910) 962-3493
Fax: (910) 962-7077
E-mail address: ainsleyf@uncw.edu

EDUCATIONAL DATA
Degrees Earned:
- A.B. in Biblical Studies, University of North Carolina, Chapel Hill, NC, 1966
- Master of Divinity, Southeastern Baptist Theological Seminary, Wake Forest, NC, 1969
- M.A. in Geography, University North Carolina, Chapel Hill, North Carolina, 1972
- Ph.D. in Geography, University North Carolina, Chapel Hill, North Carolina, 1977
Thesis Title: "The North Carolina Piedmont: An Island of Religious Diversity"
Dissertation Title: "Changing Land Use in Downtown Norfolk, Virginia, 1680-1930"

PROFESSIONAL EXPERIENCE
Teaching:
- 1969-1972 - Geography Teaching Assistant, UNC-CH
- 1972-1973 - Physical Geography Instructor, UNC-CH
- 1973-1977 - Instructor in Human Geography, UNC-W
- 1977-1982 - Assistant Professor of Human Geography, UNC-W
- 1982-1988 - Associate Professor of Human Geography, UNC-W
- 1988-Present - Professor of Human Geography, UNC-W

ACADEMIC RESEARCH INTERESTS AND SPECIALTIES
- Historical-Cultural Geography;
- Vernacular Architecture of Anglo-America, Europe, and the Caribbean;
- Rural Settlement Landscapes (North Carolina, Barbados, Norway, Alpine Italy);
- Ethnic Landscapes;
- Geography of Religions;
- Historic Preservation;
- Regional interests in Southeastern United States, Colorado Plateau, British Isles, Scandinavia, Barbados, Middle East

PROFESSIONAL SOCIETIES
- Association of American Geographers;
- Southeast Division, Association of American Geographers;
- American Geographical Society
- North Carolina Geographical Society;
- Pioneer America Society;
- National Trust for Historic Preservation
- Vernacular Architecture Forum;
- Virginia Geographical Society;
- North Carolina Geographic Alliance

CONTRIBUTIONS TO TEACHING
For the past 34 years, I have taught over 27 different courses at UNC-W, averaging seven separate courses per year. I am in charge of the general area of human, or cultural geography, and have initiated and developed departmental courses in this area and in the area of planning, including rural planning, land use planning, and historic preservation planning. In addition, I have directed more than 80 students in Directed Individual Studies, five students in Honors Projects, seven graduate theses, and have served on many honors and Master’s committees. I have also taught numerous classes for the general public as a service to the community and region.
Graduate student committees

Kim Sims (MA in History) “The History of Jewry in Wilmington, 1739-1900.” I was a member of Ms. Sims’s thesis committee. The oral defense was held on April 27, 1999.


Mike Keane (MA in Liberal Studies) “The Cultural Geography of Homelessness in Wilmington,” I was a member of Mr. Keane’s thesis committee. Spring, 2001.

James Burke (MA in Liberal Studies) “Cultural Patterns in the Lisbon Community, Bladen County, North Carolina.” I was a member of Mr. Burke’s thesis committee. Spring, 2001.

Jimmy Tate (MA in Liberal Studies) “Historic Preservation in the Watha-Willard Area of Pender County, North Carolina.” I was the chair of Mr. Tate’s thesis committee. Fall, 2001.

Rodney Franz (MA in English) “The Writing Conference in 2001.” I was the Graduate School representative on Mr. Franz’s thesis committee. Fall, 2001.


LuAnn Mims (MA in History) “Southeastern North Carolina Farmers and Markets: The Martindale Farm as a Case Study for Preservation,” I was a member of Ms. Mims’ thesis committee, Spring, 2005.

James Burke (Certificate in Historic Preservation, UNC-Greensboro) “Diffusion of Virginia Vernacular Architectural Types into the Inner Coastal Plain of North Carolina.” I was the supervisor for this survey-type final project that Mr. Burke conducted in Spring, 2004.

Leah Wetzler (M.A. in Liberal Studies, UNC-Wilmington) “Geographic Roots of Blues Music in the Mississippi Delta.” I was first reader on Ms. Wetzler’s committee, Spring, 2004.

Laura Taylor (M.A. in Creative Writing, UNC-Wilmington) “Old Barns: Their Story in Literature.” I acted as advisor to Ms. Taylor on this project, Summer, 2004.

Jennifer Lancaster Pena (MA in History) “Chinquia-Penn Plantation: A Permanent, Practical House.” I was a member of Ms. Pena’s thesis committee, Spring, 2005.


James Burke (Ph.D. Candidate in Geography, UNC-Greensboro) “Historical Geography of the Atlantic Coast Line Rail Road in North Carolina.” I serve as second reader on Mr. Burke’s dissertation committee.

Virginia Baysden (MALS program, UNCW) “Bogue Banks: An Exploration by Car, Camera, Conversation, and Collective Memories.” I served as Project Director for Ms. Baysden’s project.

Harvey J. Tate (MALS program, UNCW) “The Social and Economic Impact of I-40 on the Small Towns of Duplin and Pender Counties, NC.” I served as Project Director for Mr. Tate’s project.

Sharon A. Bundick (MALS program, UNCW) “An Ethnographic Study of Homelessness in Wilmington, North Carolina.” I served as second reader for Ms. Bundick’s project.

New Courses Developed

Historical Geography of the United States
Population Geography
Urban Geography
Research in Earth Sciences
Geography of the Bible
Historic Preservation Planning
Historical Geography of the Middle East
Geography of North Carolina
Principles of Land Use Planning
Rural Planning
The World's Oceans: Human Activities—Honors course
World Geography I—Europe, North America, South America
World Geography II—Africa, Asia, Australia, Oceania
Reading the American Landscape—Graduate MALS course
Reading the American Landscape: Explorations into the American Lifestyle—Univ. of Wales, Swansea course
Physical and Cultural Landscapes of Wales—Honors course taught at Univ. of Wales, Swansea
Special Topics in Geography—Graduate course
Historical/Cultural Geography—Graduate course
Historical Preservation Planning—Graduate course
Vernacular Architecture—Graduate MALS course
Geography of the British Isles
Geography of Scandinavia

Continuing Education Courses (since 2002)
Taught a class on “Ethnic Farm Colonies in Southeastern North Carolina,” for the College of Arts and Sciences College Day, November, 2002.

RESEARCH AND SCHOLARSHIP
A. Publications (since 2002)


B. Research Projects

- The Refour Housebarn: From the Alps to Valdese
- European Waldensian Antecedents for the Rock Structures of Valdese
- Waldensian Housebarns of North Carolina and Northern Italy
- Chattel Houses and Settlement Patterns in Barbados
- Tourism Images and Reality: Perceptions of Barbados
- Isolated Rural Farm Settlement Patterns in Scandinavia
- Clearing the Land: A Comparative Study of James A. Brown's Sunny South Colony and Hugh MacRae's Immigrant Colonies
- Clarkton, North Carolina: An Inventory of Historic Resources
- Ten Acres Enough? Hugh MacRae and Agrarian Change in the South
From the Netherlands to North Carolina: The Dutch Experience in the Cape Fear Region.
The Historical Geography of the Wrightsville Sound Area and Wrightsville Beach
Material Culture along the Old Post Road: Ramblings along U.S. 17 from Virginia to South Carolina.

C. Papers Presented at Professional Meetings (since 2002)

“From the Mountains to the Sea: North Carolina Geography and Migration Patterns,” at the Augusta Genealogical Society’s 23rd Annual Homecoming/Seminar held in Augusta, Georgia on August 17, 2002.

“Folk Architecture of the Southeastern United States,” at the Augusta Genealogical Society’s 23rd Annual Homecoming/Seminar held in Augusta, Georgia on August 17, 2002.


PROFESSIONAL HONORS AND AWARDS (since 2002)

Certificate of Appreciation, 2002, from the National Geographic Society for service to the profession.

Recipient of the 2003 H. H. Douglas Distinguished Service Award, presented by the Pioneer America Society for very significant contributions through the years in furthering the goals of the Society. Presented at the 35th Annual Conference of the Pioneer America Society, on October 14th, 2003.


UNCW Recipient of the 2004 UNCW University of North Carolina Board of Governors Award for Excellence in Teaching, presented by President Molly Broad at a ceremonial luncheon held in Chapel Hill, NC, on May 14, 2004. This award included a stipend of $7,500.

Awarded a Faculty Research Reassignment for the Fall semester, 2004, in order to spend time in the Alps of northern Italy to research and do field reconnaissance of Waldensian folk architecture in Val Pellice and Val Germanasca. “European Antecedents of North Carolina Folk Architecture: Searching Out the Roots of Rural Housestyles.”

Travel grant of $500 awarded by the Office of International Studies to help defray a fraction of the costs of traveling and living in Italy for six weeks.

$7,500 award from the UNC Board of Governors for the Award for Teaching Excellence, awarded on May 14, 2004.

Asked by Chancellor DePaulo to serve as the chief faculty marshal and lead the academic procession carrying the university mace for both the May and December commencement ceremonies.

Invited by Chancellor DePaulo and Provost Hosier to attend the UNCW Board of Trustees meeting on October 29, 2004 to be officially introduced to the trustees as the recipient of the Board of Governors’ Award for Excellence in Teaching.

Awarded a Summer Research Initiative for June, 2005 of $3,000 for the project Ten Acres Enough: Beginning Anew in North Carolina, Preparation of a Pictorial/Historical Geography of Hugh MacRae’s European Farm Colonies.
ROBERT THOMAS ARGENBRIGHT

Associate Professor
Department of Geography and Geology
University of North Carolina at Wilmington
Wilmington, North Carolina 28403-3297
Phone: 910-962-3498 e-mail: argenbrightr@uncw.edu Fax: 910-962-7077

Educational History

Doctor of Philosophy, Geography University of California, Berkeley 1990
Master of Arts in Geography University of California, Berkeley 1984
Bachelor of Arts in Geography University of California, Berkeley 1981

Honors

Postdoctoral Fellow Hoover Institution, Stanford University 1990-91
Chancellor's Certificate of Distinction University of California, Berkeley 1981
Geography Departmental Citation University of California, Berkeley 1981

Doctoral Dissertation:

“The Russian Railroad System and the Founding of the Communist State, 1917-1922.”
   Dissertation committee: David J. M. Hooson (chair), Allan Pred, Reginald Zelnik.

Master’s Thesis:

“The Bowman’s New World: World Power and Political Geography.”

Publications

Articles (Refereed):

   1941, in Jeremy Smith, ed., Beyond the Limits: the Concept of Space in Russian History
   and Culture (Studia Historica 62) Finnish Historical Society: 207-239.
   89 (1), January: 1-22.
   Revolutionary Russia 11(1), June: 45-66.
   Political Geography 17 (3): 253-272.


**Other Publications**


**Book Reviews:**


**Research in Progress**

*Moscow Under Construction* (provisional title), a book about the transformation of urban space in the Russian capital. I will discuss the city’s changing morphology, the city government’s development strategy, socio-spatial change, and the emergence of opposition to the urban transformation program.


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<th>Role</th>
<th>Years</th>
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<tr>
<td>University of North Carolina</td>
<td>Associate Professor</td>
<td>2001-present</td>
<td>Directed Independent Studies, Economic Geography, Historical Geography of Capitalism (Graduate Seminar)</td>
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<td>at Wilmington</td>
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<td>1995-2001, Political Geography, Population Geography, Regional and Environmental Land-Use Planning, Regional Geography of Post-Soviet Eurasia, Resources, Population, and Environment, Russia, Senior Seminar, Tourism Geography, Transportation Geography, Urban Geography, World Regional Geography 1, World Regional Geography 2</td>
</tr>
<tr>
<td>Miami University</td>
<td>Visiting Assistant Professor</td>
<td>2004-5</td>
<td>Global Forces, Local Diversity, Transportation Geography, Introduction to International Studies, Global Cities, World Economy</td>
</tr>
<tr>
<td>Simon Fraser University</td>
<td>Visiting Instructor</td>
<td>1991-1995</td>
<td>Introduction to Human Geography, Geography of the Newly Independent States of the Former USSR, World Problems in Geographic Perspective</td>
</tr>
<tr>
<td>Burnaby, B.C.</td>
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<tr>
<td>Western Washington University</td>
<td>Visiting Instructor</td>
<td>1993-1994</td>
<td>Introduction to Human Geography, Economic Geography, Geography and World Affairs</td>
</tr>
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Coquitlam College                        Visiting Instructor                      Weather and Climate
                                      Coquitlam, B.C.                             1993-1994                     Geomorphology and
University of British Columbia        Visiting Instructor                      Biogeography
                                      Vancouver                                      1993                          Political Geography
Columbia College                      Visiting Instructor                      Introductory Physical
                                      Burnaby, B.C.                                  1993                          Geography
University of California              Teaching Associate                     Geography of the USSR
                                      Berkeley                                     1985-1986

Enforceable in Chechnya?” Successfully defended, 28 November 2005.

Papers Delivered at Professional Meetings (past 5 years)

2007 “Red Star on the Volga: Agitation, Surveillance, and Governance in the Russian Civil
War,” presented at the Midwest Slavic Conference, 13 April, Columbus, Ohio.
2006 “Automobility and Citizenship in Moscow: Sustainability or Avtomobilshchina?,” paper
presented at the National Convention of the American Association for the Advancement
of Slavic Studies, 18 November, Washington, D.C.
2006 “Avtomobilshchina? Issues of Cultural, Geographical and Social Sustainability in the
Automobilization of Moscow,” paper presented at the 4th International Conference on the
History of Transport, Traffic and Mobility, Paris, 30 September.
2006 “Soviet Agitational Vehicles: Between Moscow and ‘Bears’ Corners,” paper presented
at the conference “Politics, Space, and Power in Modern Russian History, at The Watson
Institute for International Studies, Brown University, Providence, RI.
2006 “Place-Based Opposition to Redevelopment in Moscow,” paper presented at the Annual
Meeting of the Association of American Geographers, 9 March, Chicago.
presented at the 3rd International Conference on the History of Transport, Traffic and
Mobility, 8 October, York, UK.
2005 “The Friction of Relic Spaces: The Transformation of Moscow at Ground Level,” paper
presented at the 43rd Annual Southern Conference on Slavic Studies, 16 April, Nashville.
2005 “Socialism vs. the Louse: Typhus and Trains in Russia, 1918-1922,” paper presented and
discussed at the Midwest Russian History Workshop, March 4-5, Columbus, Ohio.
2004 “Postindustrializing Moscow, City and Oblast’,” presented at the National Convention of the
American Association for the Advancement of Slavic Studies in Boston, 5 December.
2004 “Moscow's Relic Spaces: Where Redevelopment Bogs Down,” International Young
Researchers Conference, Havighurst Center for Russian and Post-Soviet Studies, Miami
University, 6 November.
Annual Southern Conference on Slavic Studies, 19 March, Roanoke, VA.
2003 "Bolshevik Colonization of Space," presented at the National Convention of the
American Association for the Advancement of Slavic Studies in Toronto, 22 November.
EDUCATION

Ph.D., Geography, University of Wisconsin-Madison, 2000
- Emphasis on fluvial geomorphology and Quaternary geology. Minor in soil science.
- Dissertation: Recent Floods and Sediment Transport in the Upper Mississippi River.

M. S., Geography, University of Wisconsin-Madison, 1993
- Emphasis on physical geography and fluvial geomorphology.

A. B., Geography (Honors), University of Chicago, 1991
- Emphasis on urban, historical, and environmental geography.

APPOINTMENTS
- 2006-2007: Associate Professor with tenure, Geography & Geology, UNC-Wilmington.
- 2000-2006: Assistant Professor, Earth Sciences, University of North Carolina Wilmington.
- 1997-2000: Lecturer, Geography, University of Wisconsin-Madison.

PROFESSIONAL AFFILIATIONS
- Association of American Geographers (Geomorphology Specialty Group, SEDAAG)
- Geological Society of America (Quaternary Geology & Geomorphology Division)
- American Quaternary Association
- North Carolina Geographical Society

PUBLICATIONS (* student co-author)

In Preparation
Peer-Reviewed Journal Articles


Other Publications


ABSTRACTS AND PRESENTATIONS

Association of American Geographers

Other Conferences


AWARDS AND GRANTS

In Preparation

- National Geographic Society, Research & Exploration Grant. Late Quaternary environmental change in central Portugal reflected by coastal dune expansion at the time of Neanderthal extinction. Requesting ~$20,000 for 2009 field season.
- National Science Foundation, Geography & Regional Science Program and Archaeology Program. Late Quaternary geomorphology, paleogeography, and archaeology of a coastal dune field in central Portugal. Requesting ~$150,000 for 2009-2011.

External Sources


UNCW Sources

- Charles Cahill Award, UNCW Graduate School, 2006. Field and laboratory analysis of Bh horizons in sandy soils of New Hanover County, North Carolina. $2,500.
- Charles Cahill Award, UNCW Graduate School, 2000. Quaternary environments of the lower Cape Fear River valley. $2,500.
ADVISING

Undergraduate Students
- Primary advisor, B.A. Honors (Geography). Carla Gray, current. Post-settlement deposition and buried soils on the Cape Fear River floodplain, Bladen County, NC.
- Committee member, B.A. Honors (Geography). Sara Beth Jenkins, 2006. Effects of local weather patterns on nitrogen analyte rainwater concentrations in Wilmington, NC.

Graduate Students
- Primary advisor, M.S. (Geology). Carolyn Gomes, current. Genesis and distribution of Bh (humate) horizons in soils of a pine flatwood environment, New Hanover County, NC.
- Committee member, M.S. (Geology). Jesse Baldwin, current. Large-scale coastal behavior of Oak Island, NC as determined by beach profile and wave climate analysis.
- Committee member, M.S. (Geology). Devon Olivola, current. Short-term sediment deposition rates in riparian marshes and swamps along the lower Cape Fear River, NC.
- Committee member, M.S. (Geology). Lauren Saal, 2005. The impact of rainfall on suspended sediment concentrations in an urbanized tidal creek, Bradley Creek, NC.

SERVICE

Professional Service
UNCW and Community Service

- Chair, Scholarships and Awards Committee, UNCW Geography & Geology (2004-07).
- Faculty Advisor, UNCW Geography Club (2001-02, 2005-06).
- Volunteer admissions interviews: Univ. of Chicago, Alumni Schools Committee (2001-07).
DAVID EDWARD BLAKE

**Business:** Department of Geography and Geology  
University of North Carolina Wilmington  
601 S. College Road  
Wilmington, NC 28403-3297  
(910)-962-3387  
blaked@uncw.edu;  
www.uncw.edu/people/blaked/index.html  
**Home:** 3422 Sparrow Hawk Court  
Wilmington, NC 28409  
(910)-392-3320  
**Birthdate:** 7/15/60

**Education:**  
Washington State University- Ph.D. in Structural Geology, Metamorphic Petrology, and Tectonics  
1986-1991  
North Carolina State University - M.S. in Structural Geology and Metamorphic Petrology;  
Minor in Geophysics, 1983-1986  
University of North Carolina at Chapel Hill - B.S. in Geology, 1978-1982

**Professional Experience:**  
1996-Present  
Associate Professor of Geology in the Department of Geography and Geology, University of North Carolina Wilmington.  
**Duties included:** undergraduate lectures and labs in Physical Geology, Applied Physical Geology, Igneous and Metamorphic Petrology, Methods in Geology, Geologic Field Course, Principles of Tectonics, Mineralogy, Structural Geology, Senior Seminar, and Directed Individual Studies in Tectonics, Paleoecology, Advanced Field Methods, and Advanced Structural Analysis; graduate lectures and labs in Tectonics, Advanced Structural Geology, Geothermobarometry, Advanced Metamorphic Petrology, Advanced Igneous Petrology, Geology of the Blue Ridge Mountains, and Regional Geology of North America.  
**Duties have also included:** Curator of the Porter Rock and Mineral Collection, Director of the ERS Petrology Preparation Laboratory, Laboratory Coordinator for Departmental Graduate Teaching Assistants; Coordinator for the UNCW Summer Geologic Field Course; Member of the Geology Curriculum Committee, Graduate Faculty and the Graduate Program Advisory Committee; M.S. Thesis Advisor, Geology Club Advisor, Faculty Member to the Campus Judicial Board and Faculty Senate, Advisor to the General College Advising Center.

Summer 1989  
Consulting Geologist, Westmont Mining, Inc.; Mt. Hamilton Gold Skarn Project, Ely, Nevada;  
**Duties:** Project geologist in core drilling program, logging 4000' of rock core, mapping of structures and mineral assemblages in a skarn deposit, preparation of isopach maps of gold grade and gold grade X ore thickness.

**Professional Societies:**  
Geological Society of America: Southeastern Section; Member of the Structural Geology and Tectonics Division, Carolina Geological Society; Sigma Xi Scientific Society; Hells Canyon Geological Society

**Research:**  
**MS.:** The geology of the Grissom area, Franklin, Granville, and Wake Counties, North Carolina: A structural and metamorphic analysis.  
**Ph.D.:** Geology of the western Idaho suture zone in the Salmon River gorge, west-central Idaho.  
**Recent:** Geologic mapping, structural and metamorphic fabric analysis, and geochemical systematics of volcanogenic rocks, western flank of the Raleigh metamorphic belt, NC.  
Rock fabric development and tectonic relationships involved in an arc-continent collision within and adjacent to the western Idaho shear zone in the Salmon River gorge, ID.

**M.S. Students:**  
**Advisor** to Buford, Christopher, "Lithodemic and structural analysis of the northwestern Middleburg 7.5-minute quadrangle, northeastern North Carolina Piedmont," UNCW.  
**Advisor** to Parnell, David, "Lithodemic and structural analysis of the northern Oxford 7.5-minute quadrangle, northeastern North Carolina Piedmont," UNCW.  
**Advisor** to Reed, Dawn, "Kinematic Analysis of an arc-continent boundary, Partridge Creek area, west-central Idaho," UNCW.

Committee Member for Mondziel, Stephen, "Recent faulting along the Puerto Rico trench," UNCW.
Committee Member for Grosser, Benjamin: "Petrology and petrogenesis of the Wildcat Gulch Syenite," UNCW, 2005
Committee Member for Dulaney, Timothy, "Volcanic morphology of the Southwest Indian Ridge (15°-35°S): Implications for crustal accretion at an ultra-slow spreading ridge," UNCW, 2002
Committee Member for Miller, Amy, "Gravity study of the Puerto Rico trench and surrounding region: Implications for the origin and tectonics of the Puerto Rico trench," UNCW.
Committee Member for Worley, Brad, "Geologic map and structural analysis of the Pisgah Forest 7.5-minute quadrangle, Transylvania and Henderson Counties, North Carolina," UNCW, 2000.
Committee Member for Phillips, Joanne, "Chlorine isotopic composition of hydrothermal vent fluids from the Juan de Fuca Ridge" UNCW, 1999.
Committee Member for Tappen, Christine, "Emerald and tourmaline as indicators of pegmatite petrogenesis within the Spruce Pine district, western North Carolina" UNCW, 1998.

Recent Honors and Grant Awards:
2008 NC Geological Survey Section STATEMAP Grant (UNCW-$9,000.00)
2007 NC Geological Survey Section STATEMAP Grant (UNCW-$13,000.00)
2006 Invited Member of the 2006 Geological Society of America Field Forum entitled “Tectonic Significance of Vertical Boundaries in the Cordillera,” McCall, Idaho
2006 NC Geological Survey Section STATEMAP Grant (UNCW-$10,400.00)
2005 NC Geological Survey Section STATEMAP Grant (UNCW-$10,400.00)
2004 NC Geological Survey Section STATEMAP Grant (UNCW-$8,000.00)
2003 NC Geological Survey Section STATEMAP Grant (UNCW-$10,400.00)
2003 UNCW Faculty Research Reassignment, Spring Semester
2002 NC Geological Survey Section STATEMAP Grant (UNCW-$11,000.00)
2001 USGS EDMAP Grant (UNCW-$10,000.00)
2000 NC Geological Survey Section STATEMAP Grant (UNCW-$3800.00)
1999 Invited Member of the 1999 Geological Society of America Penrose Conference entitled "Terrane accretion along the Western Cordilleran margin: Constraints on timing and displacement," Winthrop, Washington
1999 Center for Teaching Excellence Noteworthy Advancement of Professional Excellence Award for Significant Contribution to the UNCW Teaching Environment
1999 NC Geological Survey Section STATEMAP Grant (UNCW-$7000.00)
1998 Recognized by the Chancellor as an Outstanding Faculty Member of the University.
1996-1998 Board Member, Carolina Geological Society
1998 USGS EDMAP Grant (UNCW-$8000.00)
1998 NC Geological Survey Section STATEMAP Grant (UNCW-$6500.00)
1997 NC Geological Survey Section STATEMAP Grant (UNCW-$7500.00)
1996 Cahill Award for Faculty Research and Development (UNCW-$1300.00)
1996 College of Arts and Sciences Summer Initiative Stipend (UNCW-$3000.00)

**Recent Field Experience:**

May-June, 2007 Lead Instructor of the UNCW/GMU Summer Field Course in Virginia, North Carolina, and New Mexico.


May-July, 2006 Instructor at the UNCW Summer Geologic Field Course in conjunction with the UNC System-wide Field Camp in New Mexico; Detailed Geologic Mapping of the western Riggins Hot Springs 7.5-Minute Quadrangle along the Salmon River gorge, west-central Idaho.


May-June, 2005 Instructor at the UNCW Summer Geologic Field Course in conjunction with the UNC System-wide Field Camp in New Mexico; Detailed Geologic Mapping of the western Riggins Hot Springs 7.5-Minute Quadrangle along the Salmon River gorge, west-central Idaho.


May-June, 2004 Instructor at the UNCW Summer Geologic Field Course in conjunction with the UNC System-wide Field Camp in New Mexico; Detailed Geologic Mapping of the western Riggins Hot Springs 7.5-Minute Quadrangle along the Salmon River gorge, west-central Idaho.


May-June, 2001 Instructor at the UNCW Summer Geologic Field Course in conjunction with the UNC System-wide Field Camp in New Mexico; Detailed Geologic Mapping of the western Riggins Hot Springs 7.5-Minute Quadrangle along the Salmon River gorge, west-central Idaho.


June-July, 1999 Detailed Geologic Mapping of the western Riggins Hot Springs 7.5-Minute Quadrangle, along the Salmon River gorge, west-central Idaho.


May-October, 1997 Instructor at the UNCW Summer Geologic Field Course; Detailed Geologic Mapping of the southeastern Cary 7.5-Minute Quadrangle, North-Central North Carolina Piedmont.


**Published Books - Refereed**

Refereed Articles, *Refereed Abstracts, **NCGS Open File Map Reports, ***Non-Refereed Articles


**Bruce, M. L. and Blake, D. E.,** 1996, Lithostratigraphy and structures along the western boundary of the western Idaho suture zone, Salmon River gorge, Idaho: GSA Abstracts with Programs, v. 28, p. 5.
James Allan Dockal, Ph.D.
North Carolina Licensed Geologist, No. 298

Education:

1966-1970 Iowa State University of Science and Technology, Ames, Iowa; **Bachelor of Science in Geology**, May 1970

1970-1973 Iowa State University of Science and Technology, Ames, Iowa; **Master of Science in Geology** December 1973


Professional Experience:

1983 to Present  Employed by the University of North Carolina Wilmington in the Geography and Geology Department. Current rank, **Professor with Tenure**. Course taught in past 5 years: Principals of Geology (GLY 101), Sedimentary Petrology (GLY 312), Advanced Mineralogy (GLY 402), Field Course in Geology (GLY 470). Currently supervising two graduate students working on a field mapping/metamorphic petrology thesis.

1981-1983  Employed by Walker Exploration Company as a **Consulting Geologist**.

1980-1981  Employed by AMOCO West Texas/New Mexico Division, Houston, Texas as a **Petroleum Geologist**.

1973-1975  Employed by the Iowa Geological Survey as a **Research Geologist**. Supervised an exploration program for the evaluation of the coal potential and Pennsylvanian stratigraphy of southern Iowa.


1970  Employed by Norandex (Noranda, USA) as an **Assistant Geologist**.

Professional Society Memberships

- American Association of Petroleum Geologists
- Carolina Geological Society
- Geological Society of America
- Sigma Xi
- The Rocky Mountain Association of Geologists
Publications:

Published (Refereed) Papers:


Abstracts:


World Wide Web Electronic Resources:


EDUCATIONAL BACKGROUND
Undergraduate: Miami University (Ohio)
Degree: Bachelor of Arts in International Studies, 1989

Graduate: University of Georgia
Degree: Master of Arts in Geography, 1993

University of Georgia
Degree: Doctor of Philosophy in Geography, 1997

AWARDS

PUBLICATIONS (REFEREED JOURNALS)


PUBLICATIONS (PEER REVIEWED BOOK CHAPTERS)


PUBLICATIONS (EDITED PROCEEDINGS)


PUBLICATIONS (GRANT AND TECHNICAL REPORTS)

PUBLICATIONS (FIELD GUIDES)

PUBLICATIONS (BOOK REVIEWS)

PUBLISHED ABSTRACTS (ACCOMPANIED BY ORAL OR POSTER PRESENTATION)

EXTERNAL GRANTS AND CONTRACTS RECEIVED


RESEARCH PERMITS
1. Douglas W. Gamble, 1997-Open. A Field Evaluation of San Salvador Island’s Climatology. Field Research Project, Bahamian Field Station Research Committee, San Salvador, Bahamas and the Bahamas Department of Agriculture. (Seventeen field research excursions to date.)

INSTRUCTIONAL PUBLICATIONS


MEMBERSHIPS
1. Association of American Geographers (Specialty Groups: Climatology, Coastal and Marine Resources, Water Resources)
2. Association of American Geographers, Southeastern Division
3. North Carolina Geographical Society
4. Sigma Xi, The Scientific Research Society
EDUCATION
Postdoctoral Fellow, University of Rhode Island 1991-1993, Advisor: P. Jeff Fox

Ph.D., Oceanography (Marine Geology and Geophysics), University of Rhode Island, 1991,
Thesis Title: *Morphology and Tectonics of the Southern Mid-Atlantic Ridge: Implications for Accretion of Oceanic Lithosphere*, Advisor: P. Jeff Fox

B.A., Earth Sciences, Dartmouth College, 1983

PROFESSIONAL EXPERIENCE
2006  Summer Visiting Scientist, Institute for Marine Science, Bologna, Italy
2005-pres.  Graduate Coordinator, Master of Science in Geology program, University of North Carolina Wilmington
2004  Summer Visiting Scientist, Woods Hole Oceanographic Institute, Woods Hole, MA
2003-pres.  Professor with tenure, Department of Earth Sciences, University of North Carolina Wilmington
2000-2003  Associate Professor with tenure, Department of Earth Sciences, University of North Carolina Wilmington
1997-2000  Associate Professor, Department of Earth Sciences, University of North Carolina Wilmington
1995-1997  Assistant Researcher, Department of Geology, University of Puerto Rico Mayagüez
1993-1995  Assistant Professor, Department of Geology, University of Puerto Rico Mayagüez
1991-1993  Postdoctoral Fellow, Graduate School of Oceanography, University of Rhode Island
1990  Lecturer, Department of Geology, University of Rhode Island
1984-1990  Graduate Research Assistant, Graduate School of Oceanography, University of Rhode Island
1983-1984  Geologist, National Oceanographic and Atmospheric Administration

PROFESSIONAL AFFILIATIONS
American Geophysical Union (AGU)
Association for Women Geoscientists
Geological Society of America (GSA)
National Science Foundation RIDGE Program
InterRidge Program
National Science Foundation MARGINS Program
Sigma XI
National Association of Geoscience Teachers

CURRENT RESEARCH INTERESTS
Morphology, structure and evolution of submarine plate boundaries
Seabed classification
Slope instability, sediment movement and tsunami generation on continental and insular margins
FELLOWSHIPS AND AWARDS
Alumni Award, University of Rhode Island
Graduate Research Fellowship, University of Rhode Island
Tenneco Geology Scholarship, Dartmouth College

OCEANOGRAPHIC EXPEDITIONS SINCE 2000
I have sailed as participant (12) or Chief Scientist (6) on 18 deep-water oceanographic expeditions to the South Atlantic, Caribbean, Eastern and Western Pacific, and Southwest Indian oceans. In addition, I have conducted numerous (20+) high-resolution marine geophysical surveys in the southeastern North Carolina coastal ocean and Cape Fear River aboard the R/V Cape Fear.

Bathymetry, gravity, coring and MCS investigation, Anegada Passage/Virgin Islands basin, R/V Vaedderen, 2007.
Bathymetry, magnetic, gravity, dredging and MCS investigation, Southwest Indian Ridge, Andrew Bain Transform, R/V Strakhov, 2006.

PUBLICATIONS SINCE 2000
* = student

Refereed Articles:

Non-refereed Articles, Reports and Field Guides:


Manuscripts Submitted:

PROFESSIONAL ACTIVITIES AND SERVICES SINCE 2000
Invited Participant, IODP Workshop “Tectonics, Circulation and Climate in the Caribbean Gateway” Austin, TX, 2006.
National Underwater Research Program grant review panel member, 2005
Member, UNOLS R/V Marcus Langseth Scientific Oversight Committee, December 2005-
Antarctic Geology and Geophysics grant review panel member, NSF Polar Programs, 2001-2003.

RESEARCH GRANTS AWARDED
External:
A pilot study to investigate the possible linkages between submarine groundwater fluxes and amphitheater-shaped scarps on the northern insular margin of Puerto Rico, University of PR Sea Grant Program, $118,983, 03/01/04-02/28/08, Principal Investigator.
Collaborative research: An investigation of the effects of cold, thick lithosphere on deformation of slowly slipping mega-transforms: The Andrew Bain transform, SW Indian Ridge, National Science Foundation, $80,368, 09/01/03-08/31/07, Principal Investigator.
Physical Processes at the sediment water interface on the continental shelf: SE Coastal Ocean Research and Monitoring Program (CORMP), National Oceanographic and Atmospheric Administration, $58,272, 08/01/02-07/31/03, Assoc. Investigator.

Southeast Atlantic Marine Monitoring and Prediction Center: 2002 Coastal Ocean Research and Monitoring Program National Oceanographic and Atmospheric Administration, $68,995, 08/01/01-07/31/03, Assoc. Investigator.

Integration of new and existing marine geophysical and geological data offshore Western and Southern Puerto Rico into a GIS database: Implications for improved earthquake Hazard Assessment, U.S. Geological Survey National Earthquake Hazard Reduction Program, $40,325, 1/1/02-1/31/02, Principal Investigator.


Event-driven sediment and biota dynamics on the inner continental shelf Onslow Bay, NC, National Oceanographic and Atmospheric Administration, $110,210, 9/1/99-8/31/00, Assoc. Investigator.

Acquisition of a digital sidescan sonar and high-resolution sub-bottom profiler to support coastal and continental shelf research, National Science Foundation, $149,575, 5/1/99-4/30/00, Principal Investigator.

Investigation of the potential tsunami hazard on the North Coast of Puerto Rico due to submarine slides along the Puerto Rico Trench, Agency: University of Puerto Rico/Puerto Rico Civil Defense, $9,516, 6/1/98-5/31/99, Principal Investigator.

Time-transgressive deformational effects of oblique underthrusting of aseismic ridges on the Puerto Rico trench and island margin: Sidescan, seismic reflection, gravity and magnetic studies, National Science Foundation, $330,544, 4/15/96 - 6/30/00, Principal Investigator.

A high-resolution bathymetric and geophysical investigation of the Southwest Indian Ridge: Spatial characterization of an ultra-slow spreading center, National Science Foundation, $320,085, 11/15/95 - 10/31/99, Principal Investigator.

Internal:
Center for Marine Science Pilot Project: Use of high-resolution seismic and sidescan sonar to locate historic and ancient oyster beds in southeastern North Carolina, $30,589, Co-Principal Investigator with T. Alphin, L. Abrams, S. Baker.

Center for Marine Science Pilot Project: Integration of newly acquired and existing marine geophysical data offshore western Puerto Rico into a GIS database, $37,250, Principal Investigator with L. Abrams.

Provost’s Award for Best Class Webpage, $1000.
BRIDGES XI Academic Leadership for Women, College of Arts and Sciences, $1500.

Center for Marine Science Pilot Project: Monitoring storm-driven sedimentary and fluid dynamic changes on the shoreface off Kure Beach, NC: An Exemplary site of cross-shore transport off a replenished beach, $36,872, Co-Principal Investigator with W. Cleary.

RESEARCH SUPERVISED

Undergraduate Honor Theses Advisor:
Kelly Robertson: “A morphotectonic analysis of the Mona Canyon in northeastern Caribbean and possible tectonic origins” (GLY)

Undergraduate Honor Theses Committee Member:
David Sutherland (PHY), Christopher Wood (GLY), Gennifer Miller (BIO)
Graduate Master’s Theses Advisor:

Amy Miller: “A gravity study of the Puerto Rico trench and surrounding regions: Implications for the origin and tectonics of the Puerto Rico trench”.

Timothy Dulaney: “Volcanic morphology of the ultra-slow spreading Southwest Indian Ridge (15°-35°E): Implications for crustal construction”.

Joni Backstrom: “Monitoring storm driven sedimentary changes of the shoreface of a replenished beach: Kure Beach, North Carolina”.

Matthew Head: “Use of high-resolution sidescan sonar to quantitatively map and monitor a mid-continental shelf hardbottom: 23-mile site, Onslow Bay, NC”.

Meghan Hearne: “Investigation of submarine landslides along the northern Puerto Rico-Virgin Islands margin”.

Jeffery Marshal: “Event driven sediment mobility on the Inner continental shelf of Onslow Bay”.

Jennie Mancinone: “Seamounts as a proxy for lithospheric strength, accretion style and magma supply along the ultraslow SW Indian Ridge”.

Kassy Rodriguez: “Use of high-resolution sidescan sonar and seismics to map historic oyster reefs in the Lower Cape Fear River”.

Amanda Maness: “Mapping and habitat characterization of Oculina Banks Habitat of Particular Concern, southeast Florida Shelf”.

Steven Mondziel: “Structural Analysis of Mona Canyon offshore NW Puerto Rico: Implications for seismic and tsunami hazards”.

Graduate Master’s & PhD Thesis Committee Member:

Joanne Philips (UNCW), Tara Marden (UNCW), Luke Del Greco (UNCW), Shane Detweiler (UDEL), Dana Vitek (UDEL), Michael Murphy (UNCW), Michael Slattery (UNCW), Emerson Hasbrouck (UNCW), Merritt Mclean (UNCW), Jesse Baldwin (UNCW), Steve Muszala (UT-Austin), Jean-Paul van Gestel (UT-Austin-PhD).

COLLEGE AND UNIVERSITY SERVICE

Graduate Coordinator, Master of Science in Geology Program (2005 - )
Elected Member, UNC Marine Science Taskforce (2001 - 2005)
Elected Member, Reappointment, Promotion and Tenure Committee (2005 - )
Elected Member, Graduate Council (2004 -2007)
Elected Member, Center for Marine Science Internal Advisory Committee (2003 -2005)
Elected Member, Faculty Hearings Panel (2000-2002)
Elected Member, Faculty Senate (1999-2001)
Appointed Member, Faculty Senate Research Committee (2006 - )
Appointed Member, Honors Council (2006 - )
Chair, Kenan Marine Sciences Professorship Search Committee (2000-2001)
Member, Department of Earth Sciences Isotope Geochemist Search Committee (2002-2003)
Member, Master of Science in Geology Program Review Committee (2001)
Member, Master of Science in Marine Science Program Review Committee (2004)
Member, Master of Science in Marine Science Education Advisory Committee (2001 - )
Member, Ocean Exploration and Research Cooperative Institute Working Group (2007 - )
Member, Chancellor’s Faculty Advisory Committee (2001 -2003)
Webmaster, Master of Science in Marine Science Program webpage (2001-2003)
Member, Campus Fulbright Screening Committee (2001, 2004)
Member, Center for Marine Science Postdoctoral Selection Committee (1998)

Organized and hosted a 3-day advanced training workshop for the scientific visualization software Fledermaus designed by IVS3D. The course was attended by 17 governmental and industry representatives and resulted in a no-cost site license for the software for one year, Jan. 2005.
JOANNE N. HALLS
Associate Professor of Geography
Director, Spatial Analysis Lab
Director, Latin America Studies Program
Department of Geography and Geology
University of North Carolina Wilmington
Wilmington, NC 28403-3297
Phone: (910) 962-7614 Fax: (910) 962-7077
hallsj@uncw.edu

Educational Background

Ph.D., Geography, University of South Carolina (USC), Columbia (May 1996).
4.0 GPA
Major field of study: Geographic Information Processing
Dissertation: Spatio-Temporal Models for Forecasting Residential Growth

MS, Geography, USC, Columbia (May 1990)
3.9 GPA
Major field of study: Remote Sensing

BS, Geography, University of Denver, Denver, Colorado (1985)
3.0 GPA
Major fields of study: Geomorphology and Geographic Information Systems

Diplome Education du College, Social Sciences, Champlain Regional College,
Lennoxville, Quebec (1982)
Major fields of study: computer science and graphic design

Professional Experience

2006 – present    Director, Latin American Studies Program, UNC Wilmington
2005 – present    Associate Professor of Geography, Director, Spatial Analysis Lab,
                  Department of Geography and Geology, UNC Wilmington
1999 – 2005       Assistant Professor of Geography, Director, Spatial Analysis Lab,
                  Department of Earth Sciences, University of North Carolina at
                  Wilmington.
1994-1999         Director, Geographic Information Systems Department, Research
                  Planning, Inc. 1121 Park Street, Columbia, South Carolina 29201.
1990-1994         GIS Project Manager, Humanities and Social Sciences Computing Lab,
                  University of South Carolina, Columbia, South Carolina.
1988-1990         Research Assistant, Humanities and Social Sciences Computing Lab,
                  University of South Carolina, Columbia, South Carolina.
PUBLICATIONS

Peer-Reviewed Publications (since 2002):


Non-Peer-Reviewed Publications (since 2002):


Professional Presentations (since 2002):


“Population Growth and Migration in Latin America” UNCW Intercultural Week, February 9, 2006.


“Land Use Development Versus Natural Resources Protection: A Multi-Scale Analysis of Southeastern North Carolina” Guest lecture at the Department of Geography, University of Toledo, April 12, 2002.

**Poster Presentations (since 2002):**


Halls, Joanne N., Brent Manning, and Andrew Shepard, 2003. A Multi-Media Approach to Spatial Habitat Analysis and Internet GIS for Disseminating Information for the Oculina Banks Marine Protected Area, Southeast Coastal Ocean Science Conference and Workshop, 27-29 January.

**Selected published Abstracts (of 14 since 2002):**


RESEARCH GRANTS (since 2002)

UNCW Center for Regional Engagement Conference ($3,000)
Proposal to Write a White Paper for the State of the Region Conference. To support summer research, publication, and presentation at the annual meeting on June 1, 2007.

UNCW Office of Research Services and Sponsored Programs
Faculty Engagement in Sponsored Research (FESR) Proposal Development Fellowship: An Investigation of Coastal Change in North Carolina: Human Settlement Patterns, Demographics, and Economic Indicators. Submitted September 22, 2006 and awarded October 5, 2006. This grant funded one course buyout in Spring 2007 which enabled us to hire a part-time lecturer.

UNCW Center for Faculty Development ($540)
Travels funds to support giving a research presentation at Spatial Accuracy 2006, Lisbon, Portugal, July 1-7, 2006.

UNCW International Programs ($650)
Travel funds to support giving a research presentation at the ISPRS Mid-Term Symposium: Remote Sensing: From Pixels to Processes, Enschede, Netherlands, May 6-16, 2006.

UNCW College of Arts and Sciences Summer Research Initiative ($3,500)
May, 2006 to June, 2006 Comparison of Marsh Changes at Masonboro Island and Topsail Island: An Evaluation of Aerial Photography from 1938 to 2002

NOAA National Marine Fisheries Service ($84,771)

North Carolina Sea Grant ($5,000)
Marsh Fragmentation and Extent (Area) Versus Barrier Island Topography: An Investigation Using Aerial Photography, Digital Terrain Modeling, and GIS March 1, 2003 to July 31, 2006, co-PI with Dr. Leonard (UNCW)

UNCW Center for Marine Science Research Pilot Projects
August 15, 2003 to Summer 2004 Habitat Fragmentation and Extent (Area) Versus Barrier Island Topography and Land Use Development: An Investigation Using Aerial Photography, Digital Terrain Modeling, and GIS

Impact Assessment Inc.
August 2003 to May 2004 Mapping Project for Gulf of Mexico Fishing Communities

NOAA National Undersea Research Center
August 1, 2001 to July 31, 2003 Oculina Research Reserve Characterization Expedition (ORRCE): Data Access via GIS

UNCW Office of Sponsored Programs Charles L. Cahill Awards for Faculty Research and Development
Summer 2003 Evaluation of Disparate Data Sources for Modeling Watershed Nonpoint and Point Source Pollution

UNCW College of Arts and Sciences Curriculum Development Initiatives
Summer 2003 Developing Course Materials for Geography of Latin America

UNCW Center for Marine Science Research Pilot Projects
August 15, 2002 to Summer 2003 Use of Geographic Information Systems (GIS) and spatial statistics to examine bottlenose dolphin community structure

TEACHING ACTIVITIES

Courses Taught:
Introduction to GIS (GGY 328); Advanced GIS (GGY 424); Environmental GIS (GGY 426); Aerial Photography and Remote Sensing (GGY 422); Geography of Latin America (GGY 386); Practical Methods in Geography (GGY 205); Computer Mapping (at USC)

Graduate Students (advised):


Courtney Hanby, MS Marine Science, 2005. Use of a Geographic Information System (GIS) to Examine Bottlenose Dolphin Community Structure and Habitat Use in Southeastern North Carolina. Co-advisor with Dr. Laela Sayigh, Department of Biology and Marine Biology.


Brent Manning, MS Marine Science, 2003. Habitat Change in Oculina Banks Marine Protected Area, Florida.


Graduate Students (committee member):
Amanda Manness; Srinisvasan Dharmapuri; Brooke Landry; Michelle Barbieri; Shelly Miller; Paula Whitfield; Rick Civelli; Andy McLeod,

Professional Memberships:
AAG; ACSM; ASPRS; IFIP; ISEM; International Association for Society and Natural Resources; North Carolina Coastal Federation; North Carolina Geographical Society; North Carolina GIS; North Carolina Arc Users Group; Sigma Xi

Selected Awards:
RÉSUMÉ
W. BURLEIGH HARRIS  North Carolina Licensed Geologist - 460

PERSONAL INFORMATION
Address:  University of North Carolina Wilmington
Dept. of Geography and Geology
Wilmington, NC 28403
Office Phone - (910) 962-3492 (ERS)
Home Phone - (910) 799-6378
FAX: (910) 962-7077
E-Mail: HARRISW@uncw.edu

ACADEMIC RECORD

<table>
<thead>
<tr>
<th>Schools Attended</th>
<th>Location</th>
<th>Degree</th>
<th>Year</th>
<th>Major</th>
</tr>
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<tbody>
<tr>
<td>Campbell College</td>
<td>Buiies Creek, NC</td>
<td>B.S.</td>
<td>1966</td>
<td>Geology</td>
</tr>
<tr>
<td>West Virginia Univ.</td>
<td>Morgantown, WVA</td>
<td>M.S.</td>
<td>1968</td>
<td>Geology</td>
</tr>
<tr>
<td>Univ. N. C.</td>
<td>Chapel Hill, NC</td>
<td>Ph.D.</td>
<td>1975</td>
<td>Geology</td>
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PROFESSIONAL WORK EXPERIENCE

<table>
<thead>
<tr>
<th>Title</th>
<th>Organization</th>
<th>Dates</th>
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</tr>
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<tr>
<td>Professor</td>
<td>Univ. of NC</td>
<td>5/02 -</td>
<td>Stratigraphy, Coastal Plain Geology, Environmental Geology, Research Methods, Natural Disasters</td>
</tr>
<tr>
<td>Professor and Assoc. Dean of Graduate School</td>
<td>Univ. of NC Wilmington, NC</td>
<td>8/99 - 5/02</td>
<td>Stratigraphy, Environmental Geology Research Methods</td>
</tr>
<tr>
<td>Professor and Department Graduate Coordinator</td>
<td>Univ. of NC Wilmington, NC</td>
<td>7/95 - 7/99</td>
<td>Stratigraphy, Integrative Stratigraphy, Coastal Plains Geology, Methods in Geology, Physical Geology, Environmental Geology</td>
</tr>
<tr>
<td>Professor</td>
<td>Univ. of NC</td>
<td>7/91- 6/95</td>
<td>Stratigraphy, Integrative Stratigraphy, Coastal Plains Geology, Methods in Geology, Physical Geology, Environmental Geology</td>
</tr>
<tr>
<td>Professor and Acting Chairman</td>
<td>Univ. of NC</td>
<td>7/89-6/91</td>
<td>Stratigraphy, Coastal Plains Geology</td>
</tr>
<tr>
<td>Professor and Research Associate</td>
<td>Univ. of NC</td>
<td>1/84-6/89</td>
<td>Stratigraphy, Field Methods,</td>
</tr>
</tbody>
</table>
PROFESSIONAL ORGANIZATIONS - MEMBERSHIPS

Carolina Geological Society
Federal Demonstration Partnership
Geological Society of America
North Carolina Science Teachers Association
National Science Teachers Association
Sigma Gamma Epsilon
Sigma Xi
Society of Economic Paleontologists and Mineralogists
PROFESSIONAL EXPERIENCE (Last Five Years)

2002 - North Carolina Core Hole Project Coalition, Chair
Consultant, Northeast New Hanover Conservancy
- Co-organizer, The 4th Bald Head Conference on Coastal Plains Geology; and
- Consultant, Northeast New Hanover Conservancy
- Elected to Fellow in the Geological Society of America

2003 - Consultant, North Carolina Department of Transportation
- North Carolina Core Hole Project Coalition, Chair

2004 - Consultant, North Carolina Department of Transportation
- Consultant, U.S. Geological Survey
- North Carolina Core Hole Project Coalition, Chair
- Guest Editor of Southeastern Geology, Selected papers from the 4th Bald Head Island Conference on Coastal Plains Geology.

2005 - Consultant, North Carolina Department of Transportation
- Consultant, U.S. Geological Survey
- Consultant, Maryland Highway Administration
- North Carolina Core Hole Project Coalition, Chair

2006 - Consultant, North Carolina Department of Transportation
- Consultant, U.S. Geological Survey
- Consultant, Maryland Highway Administration
- North Carolina Core Hole Project Coalition, Chair

- North Carolina Core Hole Project Coalition, Chair

RESEARCH

Atlantic Coastal Plain surface and subsurface stratigraphy and structural geology; economic hydrocarbon accumulations; glauconite mineralogy and origin, rare earth element chemistry, stable isotope chemistry, radiometric dating; bentonite age dating; carbonate petrology and sedimentology; seismic and sequence stratigraphy of extensional basins; sedimentary basin origin and tectonostratigraphy; hydrogeology; and geotechnical applications to Coastal Plain stratigraphy

PUBLICATIONS: ABSTRACTS, PAPERS, AND REPORTS LAST FIVE YEARS (*SPEAKER)

Harris, W.B., Shafer, K. and Kezios, S., 2003, Developing science graduate students as middle school resources: Abstracts with Programs, Invitational Conference on K-12 Outreach from University Science Departments, The Science House, N.C. State University.

Kezios, S., Harris, W.B., and Shafer, K., 2003, Developing science graduate students as middle school resources: Conference on K-12 Outreach, Linking the Science in the Classroom to the Science in the Laboratory, The Science House, N.C. State University, p. 81-82.


Harris, W.B., Shafer, K.D., and Kezios, S., 2003, UNCW science graduate students as resources in middle schools, NSF GK-12 program: Geological Society of America, Annual Meeting, Seattle, v. 35, no. 6, p. 16.


Shafer, K.D., Kezios, S.M., and Harris, W.B., 2005, Graduate students: Sustainable resources in science classrooms: National Science Teachers Association, National Convention, Dallas, TX, v. 3, p. 103.

*Harris, W.B. and Douglas, T., 2005, Stratigraphic Interpretations of limestone, geophysical surveys, and borehole data identify potential impact on highway and guide future quarry expansion: 56th Highway Geology Symposium, Wilmington, NC, May 4-6, 2005, p. 51-72.


Self-Trail, J.M. and Harris, W.B., 2006, Correlation between Late Cretaceous calcareous nannofossil and strontium isotopic data from the North Carolina Coastal Plain, USA: International Nannofossil Association, Annual Meeting, Lincoln, Nebraska.


Eric J. Henry  
Curriculum Vitae

Department of Geography and Geology  
University of North Carolina Wilmington  
601 S. College Rd.  
Wilmington, NC 28403  
(910) 962-7622  
E-mail: henrye@uncw.edu

RESEARCH INTERESTS:  
Engineering hydrology; Water quality; Water Resources; Groundwater modeling; Contaminant fate, transport, and remediation; Vadose zone processes; Groundwater-surface water interactions

EDUCATION:  
The University of Arizona, Department of Hydrology and Water Resources, Tucson, AZ  
Doctor of Philosophy, December 2001  
Major: Hydrology  
Minor: Soil, Water and Environmental Science  
Dissertation: “Contaminant Induced Flow Perturbations in Unsaturated Porous Media”.

The University of New Mexico, Department of Civil Engineering, Albuquerque, NM  
Master of Science in Civil Engineering, December 1995  
Thesis: “Groundwater Modeling of Gradient Manipulation and Barrier Location for Remediation at a Uranium Mill Tailings Remedial Action (UMTRA) Site”.

Bachelor of Science in Civil Engineering, May 1993

RESEARCH EXPERIENCE:  
Associate/Assistant Professor  
Department of Geography and Geology, University of North Carolina Wilmington  
Conducting numerical groundwater modeling related to contaminant effects on unsaturated flow and transport, including the effects on engineered capillary barrier performance and subsurface drainage systems. Also using modeling to examine contaminant transport in the capillary fringe. Associate professor: August 2007-present; Assistant professor: Jan. 2002-July 2007.

Faculty Research Associate  
Dept. of Civil and Environmental Engineering, Arizona State University  
Part of a four-member team that conducted a state-wide assessment of the impacts to Arizona groundwater caused by petroleum releases from leaking underground storage tanks (LUSTs). Part of my individual assignment involved analytical modeling to assess the potential for LUSTs to impact water supply wells. January 2001-December 2001.

Research Assistant/NIEHS Trainee  
Department of Hydrology and Water Resources, University of Arizona  
Designed, executed, and analyzed laboratory experiments and numerical modeling related to the transport of organic contaminants and surfactants in the vadose zone. Produced the first 2D numerical simulations of surfactant-induced unsaturated flow. January 1997-December 2000.

Research Associate  
Armstrong Laboratory, Tyndall Air Force Base, FL  
Developed and executed summer research project investigating the effect of dissolved organic matter on Fe (II) transport in the subsurface. Investigations involved sorption experiments to determine the influence of surface area, fraction of organic carbon, and ionic strength on Fe(II) transport. Summer 1996.
**Research Assistant**  Department of Civil Engineering, University of New Mexico  

**Research Assistant (1/2 time)**  Sandia National Laboratories. Albuquerque, NM.  
Conducted research investigating sorption of uranium and nickel to geologic material from the proposed Yucca Mountain Repository Site. *March 1993-June 1994.*

**Research Assistant (1/2 time)**  Department of Civil Engineering, University of New Mexico  

**PUBLICATIONS:**  
**Refereed Publications**


**Non-refereed Publication**

PRESENTATIONS (* = student presenter):


Henry, E.J. Invited lecture: Contaminant effects on flow and transport in the vadose zone. Departmental seminar series, Department of Geology, East Carolina University, November 14, 2003, Greenville, NC.


TEACHING EXPERIENCE:
Assistant/Associate Professor of Geology Department of Geography and Geology, University of North Carolina Wilmington
January 2002-present
Courses taught or team-taught:
GLY 120 Environmental Geology
GLY 120L Environmental Geology Laboratory
GLY 125 Natural Disasters
GLY 220 Field Methods in Environmental Sciences
GLY 226 Environmental Hydrology (course title changed to Principles of Hydrology)
GLY 495 Senior Seminar
GLY 525 Engineering Geology
GLY 426/526 Geohydrology Lecture and Laboratory
GLY 598 Internship (Internship coordinator and advisor for 4 non-thesis MS students)
GLY 491/591 Directed Independent Study (supervised 5 undergrad & 3 grad research projects)
Other:  Environmental Geology lab coordinator, fall 2004-present
  Non-thesis MS program coordinator, January 2002-June 2004
  UNCW Center for Teaching Excellence Department Liaison, 2006-present
  Instructor, INSTAR (Investigating Nature Through Science Teacher Active Research), summer 2003
  Instructor, Project WET (Water Education for Teachers), June 2002, August 2005
  Participant: NSF workshop, “Designing Effective and Innovative Courses in the Geosciences”, July 28-
  August 1, 2002, Hamilton College.
  Participant: “Mentoring Graduate Students For Success, A Dialogue for Faculty”, April 3, 2003, North
  Carolina State University.
  Nebraska.

Education Assistant  Water Resources Research Center, University of Arizona
  Taught instructional seminars for K-12 educators in rural Arizona related to water resources, including water

Teaching Assistant  Department of Civil Engineering, Washington State University
  Duties included grading, proctoring, and tutoring students in fluid mechanics and engineering statics. August 1995-
  May 1996.

HONORS & AWARDS:
  Faculty International Travel Grant, UNCW Office of International Programs, ~$850, June 2007
  Software grant, GAEA Technologies, $10,495, August 2006
  Summer Research Initiative Grant: “Computer simulations of contaminant transport in heterogeneous geologic media”,
  UNCW, $3000, Summer 2004
  Educational Support Grant, Friends of UNCW, $1000, Spring 2002
  The Montgomery Prize for Outstanding Student Presentation, Department of Hydrology and Water Resources, El Dia
  Del Agua Student Research Symposium, University of Arizona, April 5, 2000
  Outstanding Student Paper, American Geophysical Union Fall Meeting, December 13-17, 1999
  John and Margaret Harshbarger Doctoral Fellowship in Hydrogeology, University of Arizona, 1999-2000
  Environmental Studies Traineeship, National Institute of Environmental and Health Sciences Superfund Hazardous
  Waste Research Program, University of Arizona, 1997-2000
  Departmental Fellowship, Dept. of Civil & Environmental Engineering, Washington State University, 1995-1996

REVIEWER FOR:
  Journals: Water Resources Research, Ground Water Monitoring and Remediation, Environmental & Engineering
  Journal, and Soil and Sediment Contamination.
Curriculum Vitae

Elizabeth Hines
Geographer

Geography and Geology, University of North Carolina Wilmington
Wilmington, North Carolina 28403-3297
(910) 962-3012; FAX (910) 962-7077
hinese@uncw.edu; http://people.uncw.edu/hinese/

EDUCATION
B.A. Geography, University of North Carolina at Greensboro, 1981. Concentration in physical geography.

TEACHING EXPERIENCE
Associate Professor of Geography, UNCW, 1997 to present. Assistant Professor of Geography, UNCW, 1992-97. UNCW’s Chancellor’s Teaching Excellence Award, 2007.
Director, Geography Intern Program, Earth Sciences, UNCW, 2000 – present
Resident Director, UNCW Semester Abroad in Wales, University of Wales, Swansea, 2002
Instructor, Department of Geography and Anthropology, LSU, 1988-92
Assistant Professor, Louisiana Tech University, Ruston, Louisiana, 1990-91

Classes: Physical Geography; Regional Geography of Europe and the Americas; Regional Geography of Africa, Asia and the Pacific Rim; Principals of Planning; Cartography; Regional and Environmental Land Use Planning; Historical Geography of Food; Historical Geography of Race Relations; Honors seminars on Food and Race; Graduate Seminars on Food and Race.

RESEARCH AND PUBLICATIONS


Book Reviews

Markovitz, Jonathan, Legacies of Lynching: Racial Violence and Memory, Historical Geography, Fall 2005.


Vandal, Gilles, 2000, Rethinking Southern Violence: Homicides in Post-Civil War Louisiana, 1866-1884, Historical Geography, Fall 2000.


Presented Research

“Sea Breeze to Sherbet Town: An Historic African American Beach Resort is Lost to Affluenza,” Southeastern Division of the Association of American Geographers, Charleston, S.C., 2007

Invited Talks

OTHER PROFESSIONAL ACTIVITIES
Human Geography Editor, The North Carolina Geographer
Certificate from the National Institute of Health: Human Participant Protections Education for Research Teams, 2006
African American Heritage Foundation President’s Award for Community Service, 2006

STUDENT MENTORING
Graduate Student Theses
Frazier, Patricia, “Gullah Geechee Culture of St. Helena, South Carolina,” Reader, 2007
Timothy Corbett, “The Need For Accessible Transportation For The Physically Challenged And Elderly “The Making Of Ivory’s Accessible Transport Service, Inc.,” Director, 2007
Holly Lentz, “Nothing to Wear in My Closet,” Reader, 2005
Beth Roberts, “A Sweet Success: Krispy Kreme Doughnut Company, Inc.,” Reader, 2005
Christl Weide, “Reflections Upon Growing Up in Hitler’s Germany,” Reader, 2004

Graduate Student Directed Independent Studies
Travis Corpening, “Internship with African American Heritage Foundation of Wilmington, Inc.” 2006
Allan Serkin, “Water Pollution in Page’s Creek, New Hanover County, N.C.,” 2004
Tim Corbett, “Accessible Transportation in Rural Southeastern North Carolina,” 2007

Undergraduate Honors
Jovian Sackett, “Vision Quest,” Reader, 2005

Undergraduate Directed Independent Studies
Anthony Street, “Recent Southeastern North Carolina Hurricane Impacts, 2005
Jason Eversole, “GIS for Site Selection of Dare County Airport,” 2005
Christopher Haas, “Civil Rights: Delayed Justice,” 2004
Melanie Wemple, “Cartography at the National Geographic Society,” 2004
Becky Metts, “Planning on Topsail Island,” 2004
PROFESSIONAL ASSOCIATIONS
Association of American Geographers
Southeastern Division of the Association of American Geographers
Southern Historical Association
North Carolina Geographical Society
NAACP
African American Heritage Foundation of Wilmington, Inc., Board of Directors
Southeastern and Central N.C. Food Bank, Advisory Board
JOHN R. HUNTSMAN

ADDRESS:
Department of Earth Sciences
University of North Carolina at Wilmington
601 S. College Road
Wilmington, NC  28403-3297
(910) 962-3499, (910) 962-7077 fax
e-mail: HuntsmanJ@uncwil.edu

EDUCATION:

<table>
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<tr>
<th>Institution</th>
<th>Date</th>
<th>Degree</th>
<th>Field</th>
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<tr>
<td>Mount Union College</td>
<td>9/69-6/73</td>
<td>B.S. in Geology, 6/73</td>
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<tr>
<td>Bryn Mawr College</td>
<td>9/73-5/75</td>
<td>M.A. in Geology, 5/75</td>
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<tr>
<td>Bryn Mawr College</td>
<td>9/75-5/78</td>
<td>Ph.D. in Structural Geology and Petrology, 5/78</td>
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Master's thesis title: "Crystalline rocks of the Wagontown 7.5 minute quadrangle, Chester County, Pennsylvania". Directed by William A. Crawford.

Dissertation title: "Geology and mineral resources of the Caribou Mountain area, southeastern Idaho". Supervised by Lucian B. Platt.

EMPLOYMENT HISTORY:

1989-present  Associate Professor of Geology, Earth Sciences Department, University of North Carolina at Wilmington, Wilmington, NC; Structural geology.
1979-1989  Assistant Professor of Geology, Earth Sciences Department, University of North Carolina at Wilmington, Wilmington, NC; Structural geology. Tenured: 1983-84.
1992  Part-time instructor, North Carolina State University, Raleigh, NC; summer field camp in geology.
1991  Part-time instructor, North Carolina State University, Raleigh, NC; summer field camp in geology.
1988  Part-time instructor, North Carolina State University, Raleigh, NC; summer field camp in geology.
1986  Part-time instructor, Brunswick Technical College, Supply, NC; physical geography lecture and lab.
1985  Part-time instructor, Brunswick Technical College, Supply, NC; physical geography lecture and lab.
1978-1979  Instructor of Geology, Earth Sciences Department, University of North Carolina at Wilmington, Wilmington, NC; Structural geology.
1977  Instructor of Environmental Science, Science Department, Widener College, Chester, PA; Environmental/physical geology.
1975-1976  Teaching Assistant, Department of Geology, Bryn Mawr College, Bryn Mawr, PA; Physical, Historical, and Structural geology labs.
1973-1974  Teaching Assistant, Department of Geology, Bryn Mawr College, Bryn Mawr, PA; Physical, Historical geology labs.
1972  Teaching Assistant, Department of Geology, Mount Union College, Alliance, Ohio; Physical geology lab.
PROFESSIONAL RESEARCH AND CONSULTING EXPERIENCE:

Present-2002  Geological consulting services, CEC, Inc., Wilmington, NC
1979-1980  Consulting geologist, E. I. du Pont de Nemeurs and Company, Savannah River Lab. Compilation and preparation of geologic maps, mineral resources maps, and technical reports for the following 1o x 2o NTMS quadrangles: Pocatello, Idaho; Challis, Idaho; Richfield, Utah; Delta, Utah.
1977, 1976  Field mapping (1:24,000), southeastern Idaho.
1975 (summer)  Geochemical Analyst, Department of Geology, Bryn Mawr College. Atomic absorption/UV-visible spectrophotometer work on Piedmont metavolcanic rocks.
1974  Field mapping (1:24,000), southeastern Pennsylvania Piedmont.

PROFESSIONAL EDUCATION:


FIELDS OF RESEARCH:

Tectonics and structures of the Idaho-Wyoming thrust belt
Regional geology of the western Cordillera of the United States
Appalachian tectonics and structures
Structures, tectonics, and mineral deposits of the Piedmont and Carolina slate belt in central and eastern North Carolina
Structural analyses of the eastern Piedmont and Carolina Slate Belt, North Carolina
Structural analyses of the Valley and Ridge, West Virginia and Virginia
Structural analysis of the Burnsville fault zone in Yancey and Mitchell Counties, North Carolina

GRADUATE STUDENTS:

Major advisor:
Andrew D. Smits, "Cleavage development and related structures in the Carolina Slate Belt near Albemarle, NC." M.S., UNCW, December 1990.

Committee member:

Michelle Lynn Bruce, "Lithostratigraphy and structures along the western boundary of the Western Idaho Suture Zone", M.S., UNCW, May 1998.


Kelley Kaltenbach, “Petrology, Tectonic Transport and Paleotemperatures in Brevard Fault Zone Marbles and their Correlation to the Cambrian-Ordovician Platform underplating the Blue Ridge-Piedmont Thrust Sheet, North Carolina”, M. S., UNCW.
OTHER PROFESSIONAL SERVICE AND EXPERIENCE:
Assistant Chairman, Earth Sciences Department/Geography and Geology, 1980-81; 1999 – 2002; 2007-
Graduate Teaching Assistant Coordinator, Earth Sciences Department (1991-93)
Graduate Coordinator, Earth Sciences Department (1989-91)
Director, X-ray Diffractometry Lab, Earth Sciences Department, (1984-89)
Geology Curriculum Committee Chair, Earth Sciences Department, (1983-85; 1995-2001)
Earth Sciences Seminar Coordinator (1980-81)
General College Advisor (1982-1995)
Faculty Senate and various Senate committees, UNC-Wilmington, 1978 - present
Earth Science Programs Planning Committee, UNC System (1985 - 1993)
Campus Representative, Geological Society of America
Consultant, Orange County School District, North Carolina (1986)
Consultant, E.I. du Pont de Nemeurs and Company, Savannah River Lab, 1979-81
Grant reviewer, NASA, August 1988
Textbook reviewer, W. B. Saunders Company, W.C. Brown, and Merrill Publishing
Advisory Board, Annual Editions: Geology, Dushkin/McGraw-Hill Publishing

HONORS AND AWARDS:
1974-1977 Research Grant, Ida H. Ogilvie Bequest to the Department of Geology, Bryn Mawr College
1974-1975 Fellowship in Geology, Bryn Mawr College
1976-1977 Fellowship in Geology, Bryn Mawr College
1977 Sigma Xi Research Grant-in-Aid
1977-1978 Melodee Siegel Kornacker Fellowship in Geology, Bryn Mawr College
1980 Faculty Research and Development Grant, University of North Carolina at Wilmington
1980 Selected as an Outstanding Young Man of America by U. S. Jaycees
1981 Faculty Research and Development Grant, University of North Carolina at Wilmington
1982 Faculty Research and Development Grant, University of North Carolina at Wilmington
1985 Faculty Research and Development Grant, University of North Carolina at Wilmington
1985 Selected for inclusion in 2nd Edition of Who's Who in Frontiers of Science and Technology
1987 Faculty Research and Development Grant, University of North Carolina at Wilmington
1989 Selected for inclusion in Who's Who in American Education
1990 Selected for inclusion in 22nd edition of Who's Who in the South and Southwest
1990 Selected for inclusion in Who's Who in Science and Engineering
1992 Elected to Graduate Faculty, University of North Carolina at Wilmington
PROFESSIONAL AFFILIATIONS:
  Geological Society of America
  Sigma Xi, The Scientific Research Society
  Carolina Geological Society
  American Geophysical Union
  North Carolina Licensed Geologist (No. 504)
  International Association of Structural/Tectonic Geologists

PUBLICATIONS:


Huntsman, J. R., 1992, Geologic map of the central and southeastern portions of the Flowers 7.5 minute quadrangle, Johnston County, North Carolina. Unpublished final report to the North Carolina Geological Survey, STATE 1:100,000 GEOLOGIC MAP PROGRAM.

Huntsman, J. R., 1993, Geologic map of the west central portions of the Flowers 7.5 minute quadrangle, Johnston County, North Carolina. Unpublished final report to the North Carolina Geological Survey, STATE 1:100,000 GEOLOGIC MAP PROGRAM.


Name: Patricia H. Kelley

Education:
College of Wooster Geology B.A., 1975
Harvard University Geology A.M., 1977, Ph.D., 1979

Appointments:
University of North Carolina Wilmington: Chair, Dept. Earth Sciences, 1997-2003, Professor, 1997-present
University of North Dakota: Professor and Chair, Dept. Geology and Geol. Engr., 1992-1997
National Science Foundation: Program Director for Geology & Paleontology, 1990-1992
New England College, Instructor, 1979

Refereed Articles and Books (last 5 years):


Nonrefereed Publications (last five years):


Published Abstracts:
36 abstracts published in last five years (13 coauthored with graduate students)

Additional Presentations (last five years):
National Association of Geoscience Teachers Distinguished Speaker engagements (public lectures, department seminars and teaching workshops): 10 total in 2007, at Valdosta State University, University of Georgia, Lafayette College, University of Idaho, University of Florida, Idaho State University
Paleontological Society Distinguished Lecturer engagement: 1 in 2007, Syracuse University, Keynote Speaker for Central New York Earth Science Student Symposium

Departmental seminars:
2007, University of Southern California
2006, Ohio State University, University of North Carolina Chapel Hill, University of Alabama
2005, SUNY-Geneeseo, College of Wooster, Georgia Southern University, University of Barcelona (Spain)
2004, University of Buffalo

Public Lectures:
“Evolution and Creation: Conflicting or Compatible?”
University of Alabama ALLELE (Alabama Lectures on Life’s Evolution) series, 2006
Western Washington University, 2005
Twenty-Fourth Annual Richard G. Osgood Jr., Memorial Lecture, College of Wooster, 2005
Darwin Day, College of Charleston, 2002; UNCW 2007

Panel Presentations:
Panelist for screening (with film-maker) of Flock of Dodos (film on intelligent design controversy), East Carolina University, 2007.
“Science, Policy, and Evolution” UNCW Sigma Xi meeting, 2005
“Role of the scientist in influencing the teaching of evolution vs. creationism,” Geological Society of America annual meeting, 2003

Grants (last five years):


UNCW Center for Teaching Excellence grant for student assistance in developing resources for teaching paleontology -- $250, 2004


National Science Foundation, “Integrating Research and Education in Paleontology and Marine Ecology: An Inquiry-based Grade 6 – 8 Curriculum that Investigates Spatial and Temporal Patterns in Naticid Gastropod Predation,” -- $53,170 (UNCW subcontract), 2000-2001 (collaborative project with Jack Hall and Thor Hansen); $23,672 supplement and extension received through 1/31/03.

Honors, Awards, Professional Service Special Achievements:

Honors:
National Association of Geoscience Teachers Distinguished Speaker, 2006-2009
Victor A. Zullo Memorial Lecture, UNCW, 2007
Elected Centennial Fellow of the Paleontological Society, 2006
Invited Speaker, ALLELE 2005-2006 (Alabama Lectures on Life’s Evolution), 2006
University of North Carolina Wilmington Faculty Scholarship Award, 2005
24th Annual Richard G. Osgood, Jr., Memorial Lecturer, College of Wooster, 2005
Elected Fellow of the American Association for the Advancement of Science, 2004
Association for Women Geoscientists Outstanding Educator Award, 2003
University of North Dakota Elwyn B. Robinson Lecturer, 1996
Elected Fellow of the Geological Society of America, 1995
University of North Dakota Sigma Xi Faculty Award for Outstanding Scientific
Research, 1995
Outstanding Faculty Member of the School of Engineering, University of Mississippi,
1989-1990
National Science Foundation Graduate Fellowship, 1976-1979
Salutatorian, College of Wooster, 1975
Sigma Xi, June 1975
Phi Beta Kappa, June 1974

Offices held:
Past-President and member of Executive Committee, Paleontological Research
Institution, 2006-2008
President, UNCW chapter of Sigma Xi, 2006-2007
President, Board of Trustees, Paleontological Research Institution, 2004-2006
First Vice President, Board of Trustees, Paleontological Research Institution, 2003-2004
Board of Trustees, Paleontological Research Institution, 2003-present
Past-President, Paleontological Society, 2002-2004
Associate Editor, Palaios, 2002-present
President, Paleontological Society, 2000-2002
President-Elect, Paleontological Society, 1998-2000
North Dakota EPSCoR Steering Committee, 1997
Chair, Nominating Committee of Geology and Geography Section, American
Association for the Advancement of Science, 1996-1997
Chair, North Central Section of the Paleontological Society, 1995-96
Vice-Chair, North Central Section of the Paleontological Society, 1994-95
Member at Large, Executive Committee, North Dakota Academy of Science, 1993-1996
Chairperson, Southeastern Section of the Paleontological Society, 1984-1985
Chairperson-elect, Southeastern Section of the Paleontological Society, 1983-1984
Co-Liaison, Mississippi Committee of Correspondence on Creation/Evolution,
1982-1990
Curriculum Vitae

Richard A. Laws

Personal
Address: Department of Earth Sciences and Center for Marine Sciences, University of North Carolina at Wilmington, Wilmington, NC, 28403, USA
Phone: Work 910-962-4125; FAX 910-962-7077; Home 910-431-2992
E-mail: laws@uncwil.edu

Professional Specialization
Taxonomy and ecology of benthic microalgae in the coastal zone; Biostratigraphy and paleoecology of Cenozoic marine phytoplankton

Education and Credentials
B.A., 1975, University of North Carolina at Wilmington, Geology
Licensed Professional Geologist, N.C. Seal #892

Professional History
7/2002-present  Department Chair, Department of Geography and Geology, UNCW
1999 to present  Professor of Geology, Department of Earth Sciences, UNCW
7/91 to 8/97  Department Chair, Department of Earth Sciences, UNCW
1990 to 1999  Associate Professor, Department of Earth Sciences, UNCW
1983 to 1990  Assistant Professor, Department of Earth Sciences, UNCW
1982 to 1983  Lecturer in Geology, Department of Earth Sciences, UNCW

Professional Activities
Selected Published Papers (since 1992)
et al. (eds.), Sequence stratigraphy and facies associations: International Association of Sedimentologists, Special Publication 18, p. 537-561.


Published Abstracts (since 2000)


Research grants (since 1990)

**Laws, R.** and Cahoon, L., 1990. Continuation of Composition, distribution and productivity of microphyto-benthos on the continental shelf of southeastern North Carolina. NOAA National Undersea Research Center, 5 days ship time.

**Laws, R.,** 1990. Taxonomic composition, relative abundance, and areal distribution of diatoms in Masonboro Sound, UNCW, CMSR, one month salary.


Presentations at professional meetings (since 1990)


“Composition and biomass of microalgae from Masonboro Island, NC: Impact of storm induced overwash”, to the Biannual Meeting of the Estuarine Research Federation, September 27, 1999, New Orleans.

"A method for distinguishing the effects of tectonics from eustasy in sequence stratigraphic analyses on passive margins", Annual meeting of the Southeast Section, GSA, March 23, 2000, Charleston, SC.

Continuing education
Several workshops on proposal development and grant writing.
Four-day short course on Scanning Electron Microscope operation and techniques,
   International Scientific Instruments, Pleasanton, CA.
Numerous workshops and short courses on Staff Evaluation, Total Quality Management,
   Peer Evaluation, Sexual Harassment, Leadership Excellence, Assessment, and other
   aspects of administration and management, on and off campus.
Academic Chairperson’s Conference, February 9-11, 2005, Orlando FL. Attended and
   participated in several symposia and workshops related the duties of a department
   chair.

Teaching Activities
Courses taught
GLY 101; GLY 102; GLY 131; GLY 135; GLY 150; GLY 200; GLY 312; GLY 337; GLY
   431; GLY 450; GLY 480; GLY 491; GLY 495; GLY 499; GLY 502; GLY 531; GLY 533;
   GLY 535; GLY 550; GLY 591; GLY 592; GLY 595; GLY 599

Supervision of student research
Undergraduate Honors Thesis
   Margaret Williamson, 1988. Stratigraphy of the Warley Hill Formation, South
   Carolina.
   Patricia Mason, 2005. Paleoenvironment of a middle Eocene molluscan fauna from the
   McBean Formation of South Carolina.

Graduate Theses Supervised
Wayne Parker, 1992. Calcareous Nannoplankton Biostratigraphy of the Oligocene
   and Lower Miocene Strata in Jones, Onslow and Craven Counties, North
   Carolina. Major advisor.
   Daniel B. Kline, 1997. Systematics and Biostratigraphy of Miocene Cirripedia of the
   Chesapeake Group: Maryland, North Carolina and Virginia. Major advisor.
   Jacquie Hilterman, 1998. Effects of Hurricanes Bertha and Fran on Diatom
   Assemblages in Back-Barrier Habitats, Southeastern North Carolina. Major
   advisor.
   Karyn Olschesky, 2003. Upper Miocene through Pleistocene Diatom biostratigraphy
   and paleoceanography at ODP Leg 185, Hole 1149. Major advisor.
   Dorien McGee, 2005. Morphological Comparison of Shallow and Deepwater
   Patti Mason, continuing. Biostratigraphy and Paleoecology of Campanian and
   Maastrichtian foraminiferal faunas from the North Carolina coastal plain. Major
   advisor.

Graduate Thesis Committees
   Donald Freeman; Eric R. Powers; Jennifer Nowak; Stanley Harts; Guy Beretich;
   Amy McDonald; Tara Sams; Carolyn Keith; Kalliopi Angelidaki; Kimberly Norris-
   Jones; Elizabeth Moundalexis; Shari Mendrick; Amber Huntoon; Maureen Jones;
Service Activities

University committees and leadership positions

Senate Research Committee (1986-1990, Chair 1987-1989) - During my tenure as chair, this committee established the first University Award for Faculty Research, now called the Award for Faculty Scholarship.

Faculty Research and Development Committee (1987-1989) - this committee awards faculty research grants.

Ad Hoc Committee on Individually Structured Interdisciplinary Majors (1991-1992)


Marine Sciences Advisory Committee (1993-1994)

Center for Marine Sciences Planning Committee (1993-1997)

EVS Program Advisory Committee (1994-1996)

University Curriculum Committee (2000-2002)

Provost’s Faculty Advisory Committee (2001-2002)

University Budget Committee

Department committees and leadership positions


Co-Chair, Departmental Self Study, (1990-1991)


Graduate Coordinator (Spring-Summer, 1993)

Chair, Long Range Plan Steering Committee (1995-1996)

Assistant Chair (1997-1998)

Chair, Peer Evaluation Committee (1999-2000)

Service to professional organizations

Organizing committee and Field Trip Leader (with W. Cleary and W. Harris) for the 1996 meeting of the Carolina Geological Society.

Co-Chair and Convenor (with W. Harris and P. Kelley) for SEGSA Theme session Bald Head Island Conferences revisited, March 2000.

General Chair, 2011 Annual meeting, Southeast Section, Geological Society of America

Manuscript Reviewer for:

W.C. Brown; Prentice-Hall; Geological Society of America; Palaeogeography, Palaeoclimatology, Palaeoecology; Paleontological Society; Macmillan Press; Palaios; Carolina Geological Society; Elisha Mitchell Society

Grant reviewer

ACS Petroleum Research Fund; NSF
VITAE
Lynn Ann Leonard
Department of Earth Sciences
University of North Carolina at Wilmington
601 S College Road
Wilmington, NC  28403

Education:
College of William and Mary, Williamsburg, VA
August 1982 - May 1986;  B.S. (with high honors) in Geology, 1986.
Senior research topic:  Stratigraphy and development of the Goodwin Islands, Virginia.

Duke University, Durham, NC
Area of research: Beach replenishment on U.S. Atlantic Coast barrier islands.

University of South Florida, St. Petersburg, FL
Area of research: Sediment dynamics and surficial hydrodynamics in an open marine marsh.

Professional Experience:
September 2005-present:  Director, Coastal Ocean Research and Monitoring Program, UNCW
August 2004-present: Professor with Tenure, University of North Carolina Wilmington,
Department of Earth Science.
August 1999-2004: Associate Professor with Tenure, University of North Carolina Wilmington,
Department of Earth Science.
August 1999-2004: Graduate Coordinator, University of North Carolina Wilmington,
Department of Earth Science.
August 1994-1999: Assistant Professor, University of North Carolina Wilmington,
Department of Earth Science.
March 2003- present: Adjunct Faculty, North Carolina State University, Marine Earth and Atmospheric Science
August 1996-present: Adjunct Faculty, University of South Florida, Department of Marine Science

Research Cruises and Field Operations (since 2000):
2000-03 Effects of dredged material disposal on tidal marshes, Masonboro Island, NC, small boat work
2001-03 Effects of storms on sediment transport in Onslow Bay, NC RV SeaHawk
2001-04 Monitoring the effects of dredging on water level in the Cape Fear River
2002-03 Sediment mobility on the mid-continental shelf, Onslow Bay, NC RV SeaHawk
2002-03 Influence of flow dynamics and particle dispersion on the Everglades landscape, airboat work
2003-04 Surficial sediment characteristics in Long Bay, NC—the role of the Cape Fear Plume  RV SeaHawk; RV Cape Fear
2004  Sidescan sonar survey on sediment types near the mouth of the Cape Fear River, NC RV Cape Fear
2004-07 Flow dynamics and landscape evolution in Everglades National Park

Honors and Awards:
Most Outstanding Faculty Member, Department of Earth Sciences, UNCW:  April 1999
UNCW Million Dollar Club:  April 1999
UNCW Five Million Dollar Club:  April 2006
Biggs Teaching Award Nominee, Geological Society of America: Nov. 1999
Chancellor’s Teaching Excellence Award: May 2000
Research Grants (since 2002):

2007. Year 1 Carolinas Regional Coastal Observing System (PI – Leonard) NOAA CSC ($1.4M)
2006. Year 5: Coastal Ocean Research and Monitoring Program (PI-Leonard) NOAA CSC ($413,000)
2006. Field Test of the AIS ASWSS Buoy System. (PI-Leonard). General Dynamics ($17,000)
2005. Coastal Ocean Research and Monitoring Program (PI-Leonard; Co-PIs: Bingham, Cooper, Cahoon, Durako, Lankford, Moss, Mallin and Posey) NOAA CSC ($2,160,000)
2004. Coastal Ocean Research and Monitoring Program (PI-Moss; Co-PIs: Bingham, Cooper, Cahoon, Durako, Lankford, Leonard, Mallin and Posey) NOAA CSC ($2,400,000)
2003. A Collaborative Coastal Ocean Research and Monitoring Program (PI-Moss; Co-PIs: Bingham, Cooper, Cahoon, Durako, Lankford, Leonard, Mallin and Posey) NOAA ($1,192,200)
2003. Monitoring of the Cape Fear River Widening and Wilmington Harbor Dredging Project (PI- Hackney, Co-PIs: Leonard, Posey, Avery) USACE ($365,000)
2003. Marsh Fragmentation and Extent Versus Barrier Island Topography: An Investigation Using Aerial Photography, Digital Terrain Modeling and GIS. (w/ Dr. J. Halls) NC Sea Grant ($5000)
2002. Year 2: Monitoring the effects of the Cape Fear Harbor dredging project on water levels in the Cape Fear River 2001-2002 (PI- Hackney, Co-PIs: Leonard, Posey, Avery) USACE ($235,062)
2002. Effects of potential increased tidal range in the Cape Fear River ecosystem due to deepening Wilmington Harbor, NC (PI- Hackney, Co-PIs: Leonard, Posey, Avery; Three separate awards in the amounts of: $10,044, $25,884, and $43,188).

Publications:

Submitted:

Published (since 2002):


Published Reports

Peer-reviewed


Selected Abstracts since 2006 (student co-authors denoted by *)


Invited Talks:


2005. The Coastal Ocean Research and Monitoring Program at UNCW. LCFRP Steering Committee, Mtg. Wilmington, NC


Graduate Theses Supervised (since 2003):


Richard Civelli:  Sedimentation Patterns in Urbanized Marsh Systems. Master of Science in Geology, University of North Carolina at Wilmington.
Michael Slattery. Sediment dispersal from the Cape Fear River Plume in Long Bay. Master of Science in Geology, University of North Carolina at Wilmington.
Lori Saal. Impact of Rainfall on Suspended Sediment Concentrations in an Urbanized Tidal Creek, Southeastern North Carolina.
Sara Altof. Hydrodynamics in S. alterniflora Salt Marsh Canopies.


**Undergraduate Research Projects Supervised:**

**2004-2005**
- Devon Olivola (Honors)  Sediment Deposition in Riparian Wetlands

**2003-2004**
- Dana Rohrbacher:  Impact of Dredging on Tidal Levels in the Cape Fear River
- Devon Olivola:  Sedimentation in tidal swamps of the lower Cape Fear River

**2002- 2003**
- Dana Rohrbacher:  Environmental Science Internship – Analysis of Water Level Change in the Cape Fear River
- Susan Blake:  Environmental Science Internship -- Coastal Ocean Research and Monitoring
- Susan McKenzie:  Effects of Causeways on Sediment Delivery to Coastal Marshes

**2001-2002**
- Maverick Raber:  Analysis of Marine and Estuarine Sediments by Laser Diffraction

**Courses Taught:**

**Undergraduate:**
- GLY101; GLY 150; GLY120H; GLY 220; GLY 350; GLY 480; GLY 480; GLY 491; GLY 495; HON 210

**Graduate:**
- GLY 501; GLY 550; GLY 590; GLY 555; GLY 591; GLY 592

**Other Synergistic Activities**

**2004-05**  COTS/ONR “Common Interface” working group: Interoperability Demonstration Project II
**2004-05**  COTS/ONR Interoperability Demonstration Project II Steering Committee
**2005-06**  SECOORA Business Planning Committee
**2004-06**  Co-Director, Coastal Ocean Research and Monitoring Program, UNCW
**2004-05**  SECOORA planning workshop participant (June 2004, Nov. 2004 and July 2005)
**2004**  COTS/SECOORA/NDBC Buoy upgrade planning meeting (Sept. 2004)
Michael S. Smith

Department of Geography and Geology Telephone: (910) 962-3496
University of North Carolina FAX: (910) 962-7077
Wilmington, NC 28403-5944 E-mail: smithms@uncw.edu

EDUCATION:
1990, Ph.D., Washington University St. Louis, MO 63130 (Geochemistry and Metamorphic Petrology).
1984, Bachelor of Science, cum laude, Millersville University, Millersville, PA 17551 (Geology)

PROFESSIONAL EXPERIENCE:


August 1990 - July 1991: Department of Earth Sciences, Montana State University, Assistant Professor in Geology: Sabbatical/Leave Replacement.

REFERRED PUBLICATIONS:
Abstracts (since 2002)


**Articles (since 2002)**


**NON-REFEREED ARTICLES:**


BOOKS AND MANUALS


In press:


PEER-REVIEWED ARTICLES IN PRESS, UNDER REVIEW, OR SUBMITTED FOR PUBLICATION

In press:


Submitted/in review:


NON-REFERRED ARTICLES IN PRESS, UNDER REVIEW, OR SUBMITTED FOR PUBLICATION


GRANT ACTIVITY (Funded since 2002)

2002 Investigation Of Early Colonial Earthenware Ceramics From The Charles Towne Colony, Cape Fear River, North Carolina (1664-1667) Cahill Grant. $2430.00

2002 Ceramic Petrology Investigation Of Barbadian-Style Pottery From Charles Towne Landing State Park and the City of Charleston, South Carolina. Charleston Museum. $400.00


2005 Patterns In Mineral And Chemical Composition Of Prehistoric Pottery: Further Investigation of the Raw Material Source Areas For Prehistoric Artifacts From Ft. Bragg, North Carolina. TRC GARROW ASSOCIATES, INC. (TRC) and the U. S. Army. $9000.00
2007 Petrographic Analysis of Prehistoric Ceramics from Fort Bragg, North Carolina: Phase II study continuation. TRC GARROW ASSOCIATES, INC. (TRC) and the U. S. Army. $2000.00

2007 Phase III (Fayetteville Outer Loop project) Archaeology Study for Three Sites at Fort Bragg, NC: Petrographic Investigation of Thermoluminescence-dated Ceramics NEW SOUTH ASSOCIATES, INC. (Greensboro, NC) and NC-DOT. $5000.00

PROFESSIONAL SOCIETIES
American Association for the Advancement of Science (AAAS); American Chemical Society (ACS); American Geophysical Union (AGU); Carolina Geological Society (CGS); Ceramic Petrology Working Group - British Museum; Geochemical Society; Geological Society of America (GSA); History of Earth Sciences (HESS); International Geological Congress (IGC); Mineralogical Society of America (MSA); National Association of Geoscience Teachers (NAGT); Sigma Xi; Society for Historical Archaeology (SHA)

UNDERGRADUATE (RESEARCH) STUDENTS SUPERVISED:
Honors Student or Departmental Thesis research
Kemp Magnus Burdette. The Ballast Stones of Wilmington: An Investigation Into the Geology, Petrology, Geographic Distribution and Uses in the Region. Presentation of this research at North Carolina Academy of Science meeting (March 21, 2003) as well as invited manuscript currently submitted to Society of Historical Archaeology journal.

Rhonda Cranfill. Mineralogical and petrological investigation of Historic St. Mary's City orange micaeous ceramics. Presentation of this research at Geological Society of America regional meeting (2004; Washington, D. C.) and the Middle Atlantic Archaeology Conference (2004; Rehobath Beach, DE).

Brianne Lee Catlin, Mineralogical and petrological investigation of prehistoric ceramic sherds from the island of Anguilla in the northern Lesser Antilles island chain of the Caribbean. Presentation of this research at Geological Society of America national meeting (2005; Salt Lake City, UT). Abstracts and presentation of this work found in GSA Abstracts under Catlin. (Departmental honors research project).

Jessica Phillips. Ceramic and glaze formulation experiments: The recreation of Sung Dynasty (China) glazes for Chun, northern Celadon, and southern Kuan wares (2006; Honors research project).

William Brockton Edward. Petrographic and geochemical study of the Keefer Fm. (Clinton Group) oolitic ironstones, eastern West Virginia (Marlinton area). Presentation of this research at the Southeast Geological Society of America regional meeting (2007; Savannah, GA).

GRADUATE (MASTER'S) STUDENTS SUPERVISED:
Grosser, Benjamin. (2005) Petrology and geochemistry of the Wildcat Gulch syenite intrusions, Nine Mile Hill, Gunnison County, Colorado (UNCW)

GRADUATE (MASTER'S) STUDENTS COMMITTEE MEMBER:
Meghan E. Hearne (completed); Kelly Kaltenbach (completed); Jason Millington (in progress); David Parnell (in progress); Maverick J. Raber. (completed); Dawn Reed (in progress); Kenneth Robitaille (completed).
Paul A. Thayer

Personal Information
Office Phone: (910) 962-3780. Office Fax: (910) 962-7077. Home Phone: (910) 815-0825. E-mail: Thayer@uncwil.edu.com Thayer@coastalnet.com

Education
Rutgers - The State University: B.A. Geology, 1961.
The Ohio State University, Graduate Studies, 1961-1962

Experience
Texas A & M University, Kingsville, Texas, 1968-1970: Assistant Professor of Geology.

Consultancies

Grants and Contracts
Petrology and Diagenesis of Tertiary Sandstones, South Carolina Water Resources Core Holes C-2 and C-6, South Carolina Water Resources Commission, 1988-1989, $5,000.

Memberships
Geological Society of America (Fellow); Society for Sedimentary Geology (SEPM); International Association of Sedimentologists; American Association of Petroleum Geologists; Carolina Geological Society; Gulf Coast Section, Society of Economic Paleontologists and Mineralogists.

Professional Activities

I have been vice-chairman and chairman of the SEPM Clastic Diagenesis Research Group and chaired a number of sedimentary petrology and sedimentology sessions at regional, national and international geological meetings. I have also been a member of the AAPG Research Committee. I regularly review papers for the Journal of Sedimentary Petrology, American Association of Petroleum Geologists Bulletin, Geological Society of America Bulletin, Southeastern Geology, Society for Sedimentary Geology, and Gulf Coast Section, Society of Economic Paleontologists and Mineralogists. I have reviewed geology text books for Prentice-Hall and University of Florida Press. I also review National Science Foundation, National Geographic Society, and Petroleum Research Fund (American Chemical Society) grant proposals. I am currently a member of the SEPM Committee on Hydrogeology and Environmental Geology and campus representative for the SEPM.

Publications


Thayer, P.A., Harris, M.K., and Blount, G.C., 1995, Case studies of the effect of subsurface pseudo-karst on preferential contaminant transport at the Savannah River Site, South Carolina, USA (abs.): International Symposium and Field Seminar on Karst Waters and Environmental Impacts, Antalya, Turkey, p. 46.


**Honors and Grants**

Who's Who in the South and Southwest, 19th (1985) and later editions.

Who's Who in America, 43rd (1985) and later editions.

Who's Who in the World, 8th (1986) and later editions.

American Men and Women of Science, 16th (1986) and later editions.

Best Published Paper Award, Gulf Coast Section, Society of Economic Paleontologists and Mineralogists Annual Meeting 1985 (Austin, TX).

**Masters Theses Supervised**

Chester G. Robinson, 1990, A textural, petrographic and hydrogeological study of the Congaree Formation at the Savannah River Site, South Carolina

Grant A. Richardson, 1994, Petrology and hydrogeologic characteristics of Eocene calcareous strata in the General Separations Area, Savannah River Site, South Carolina

Mitchell H. Hall, 1997, Heavy mineral provenance of Triassic Dunbarton basin deposits, South Carolina

Jennifer Celeste, 1998, Permeability of R-Area sediments, Savannah River Site, South Carolina: minipermeameter vs. cone penetrometer technology

Larry G. Harrelson, 1999, Ground-water levels in the Tertiary aquifers underlying the General Separations Area, Savannah River Site, South Carolina

Bryan E. Gottfried, 1999, Porosity and permeability of Tertiary sediments at R-Site, Savannah River Site, South Carolina

Michelle Y. Blizzard, 2001, Sedimentology and depositional environments of the Pleistocene Waccamaw Formation, Brunswick County, North Carolina

In addition, I have served as a member of 25 UNCW M.S. Geology thesis committees, including: Julia Berger, Joanne Steenhuis, Kenneth Swain, Brett McLaurin, Douglas Marcy, Tara Marden, Shari Mendrick, Maryellen Sault, Victoria Wise, Susan Avau, Mario Maningas, Mark Raucher, Alex Croft, Adam Knierim, Kimberly Nelson, Jessica Pierson, Tina Roberts, Amy Gross, Edward Cavallerano, Michelle McCoy, Jason Millington, Merritt McLean, Viviana Diaz, Kenny Wilson, and Launna Sampaio.
CRAIG ROBERT TOBIAS  
Dept. of Geography & Geology  
University of North Carolina - Wilmington  
601 S. College Ave  
Wilmington, NC 28403  
(901) 642-3874  
email: tobiasc@uncw.edu

EDUCATION
1993-1999  
Ph.D. Marine Science, College of William and Mary, School of Marine Science, Virginia  
Institute of Marine Science, Gloucester Point, Virginia. Drs. Iris Anderson and Elizabeth  
Canuel co-major professors. Dissertation Title: Nitrate Reduction at the Groundwater /  
Saltmarsh Interface

1985-1989  
B.A. Biological Sciences, University of Delaware, Newark, Delaware. Degree with  
Distinction, Magna Cum Laude.

RELEVANT EXPERIENCE:
2005-Present  
Assistant Professor of Geology: University of North Carolina at Wilmington, Dept. of  
Geography & Geology

Current research targets nutrient pollution in the coastal zone, specifically addressing several aspects  
of nutrient cycling, fate, and transport along an aquatic continuum from watersheds to the coastal  
sea. Hydrologic and stable isotope tracer techniques are my primary tools. Presently funded  
projects examine these topics in tidal creeks, estuaries, and coastal embayments of the Mid Atlantic,  
and on the salt marshes of the Gulf Coast. Much of the work quantifies element processing rates in  
situ, and examines the interaction among hydrology, geochemistry, and biology in regulating overall  
transport of important nutrients. Responsible for design, construction, operation, training,  
and maintenance of the UNCW Stable Isotope Laboratory.

2003- Present  
Adjunct Faculty: College of William and Mary, School of Marine Science / Virginia  
Institute of Marine Science

Research concentrated on defining the interaction among primary production, and denitrification in  
controlling biogeochemical nitrogen, carbon, and oxygen processing in stream networks.  
Experimental tools include natural abundance and tracer level stable isotope characterization of  
multiple elements (nitrogen, carbon, oxygen). The work is done in conjunction with whole-stream  
$^{15}$N nitrate and $^{18}$O$_2$ additions that are used to help assess in situ, reach-scale biogeochemical N-  
cycling rates and gas transfer.

Fall 2002-2005  
Laboratory of Dr. J.K. Böhlke  
Research concentrated on defining the interaction among primary production, and denitrification in  
controlling biogeochemical nitrogen, carbon, and oxygen processing in stream networks.  
Experimental tools include natural abundance and tracer level stable isotope characterization of  
multiple elements (nitrogen, carbon, oxygen). The work is done in conjunction with whole-stream  
$^{15}$N nitrate and $^{18}$O$_2$ additions that are used to help assess in situ, reach-scale biogeochemical N-  
cycling rates and gas transfer.
Additional projects include: 1) Contributions to coastal groundwater fate and transport studies in Mid Atlantic coastal lagoons; and 2) Nitrogen biogeochemistry and trophic transfer in deep-sea hydrocarbon seep food webs in the Gulf of Mexico.

Fall 1999-Fall 2002
Post Doctoral Researcher: Ecosystems Center, Marine Biological Laboratory, Woods Hole, Massachusetts. Laboratory of Dr. Bruce Peterson.
Conducted research associated with the NISOTREX II project. Research efforts consisted of using a whole-estuary $^{15}$N enrichment to determine the fate of watershed-derived nitrogen (N) in a New England estuary. Specific objectives included: 1) identify the inorganic and biotic connections within the estuary, 2) define in situ rates and time-scales for N cycling through multiple biological and chemical pools in the water column and sediments, 3) use isotope tracer data to calibrate a multi-compartment, biogeochemical model linked to the hydrography of the system. The project supported mentorship through the NSF Research Experience for Undergraduates (REU) program.

Fall 1993-1999
Research Assistant: College of William and Mary, School of Marine Science, Virginia Institute of Marine Science, Gloucester Point, Virginia.
Responsible for research that focused on bio-element cycling in a variety of coastal systems, lakes, and adjacent watersheds. Dissertation research investigated biogeochemical nitrogen processing at the groundwater / saltmarsh discharge interface. The work integrated hydrology with biological, geochemical, and isotopic characterization and culminated with the execution of a whole system $^{15}$N-nitrate tracer study. Additional projects included investigation of nitrogen and carbon respiration in coastal aquifers, and study of mechanisms controlling nitrogen saturation and recovery in acidified Bohemian lakes, Czech Republic.

Spring 1994
Field Coordinator /Co-Lecturer: Yale University, New Haven, Connecticut.
Co-instructed the tropical marine ecology portion of an Environmental Economics short-course offered by Yale University in Roatan, Honduras. Taught coral reef monitoring and assessment techniques appropriate for use in economic evaluations of reef communities. Responsible for design and implementation of the field portion of the course. Responsible for diver safety.

1992-1993
Environmental Consultant: Tetra Tech, Inc., Christiana, Delaware.
Performed environmental assessments and site investigations under the authority of the CERCLA (“Superfund”) legislation. Contributed to the design and field implementation of sampling strategies that quantified the fate and transport of potentially hazardous substances in terrestrial, groundwater and surface water systems. Executed field protocol, supervised sampling teams, generated technical documents, and provided recommendations for the USEPA.

1990-1992
Assistant Research Biologist: Virgin Islands National Park, St. John, U.S.V.I.
Investigated coral reef and fisheries resources of the Virgin Islands National Park. Responsible for collection, analysis, and synthesis of field data. Key projects included: Coral reef monitoring; compilation of water quality database; contributions to an evening seminar series.
PUBLICATIONS (since 1997):


**Tobias, C.R.,** Böhlke, J.K., and Harvey, J.W. Biological and geochemical regulation of aquatic DIC and cycling: Reach to continental scales. *In prep for submission (January 2008) to Global Biogeochemical Cycles.*


Dale O., Song, B.K. and **Tobias C.R.,** Linking community structure of anaerobic oxidizing (ANAMMOX) bacteria to their activities in the Cape Fear River Estuary. Applied and Environmental Microbiology. *In review.*


INVITED TALKS (2003 -present):
2007  -Estuarine Research Federation (Providence, RI)
2006  - East Carolina University (Greenville, NC)
2005  -American Geophysical Union Conference (New Orleans, LA)
-Geological Society of America (Salt Lake City, UT)
-NC Water Resources Insitute (Raleigh, NC)
2004  -University of North Carolina-Wilmington
2003  -Estuarine Research Conference (Seattle, WA)
- Skidaway Institute of Oceanography (Savannah, GA)
-University of California (Irvine, CA)

EDUCATIONAL AND SYNERGISTIC ACTIVITIES

Courses Offered
GLY 150; GGY 491; GLY 350; GLY 592-002; GLY 420/520; GLY 592-005; GLY 472/572; GLY 480/592

Supervision of undergraduate / graduate research:
Undergraduate Honors Thesis advisees since 2005:
  o Stephanie Salisbury, “Evaluation of small-scale push pull experiments to quantify streambed denitrification”, B.S. Chemistry.

  • Graduate thesis advisees since 2005:
    o Taylor Graham, “Microbial nitrogen cycling in the Cape Fear River estuary: Attenuation vs. recycling and the effects of a variable freshwater-saltwater boundary”, M.S. Marine Science, expected award date – Fall 2008

  • Graduate thesis committees since 2005:
    Stephen Gill; Carolyn Gomes; Olivia Dale; Michael Polito; Adrienne Michaelis; Nicholas Ballew; David Felix; Scott Ensign (UNC-CH); Frank Parker (VIMS)

Synergistic Activities
2006-present  Program Chair,Southeaster Estuarine Research Society
2005-present  -Coordinator, UNCW/CMS Isotope Ratio Mass Spectrometry (IRMS) Laboratory
2006  -Participant, NSF-RCN Denitrification Modeling Workshop,
2003  -Participant, USDA Northeast Regional Coastal Science Workshop
2001  -Participant, NSF Antarctic Workshop
2000  -Mentor, NSF Research Experience for Undergraduates (REU)

FUNDING HISTORY (Post PhD – present)
Awarded ($849,959):
Evaluating the role of restored black needlerush marsh (\textit{Juncus roemarianus}) as a buffer of anthropogenic eutrophication of coastal systems: An isotope enrichment approach. (MS-Al Sea Grant Consortium, $97,041, Co-PI). Mar 06 – Mar 08.

Microbial nitrogen cycling in the Cape Fear River estuary: Attenuation vs. recycling and the effects of a variable freshwater-saltwater boundary, (NC Sea Grant, $86,840 + student, PI) Mar 06 – Mar 08.

Tracing nitrogen transformations and food chain uptake in an urbanized tidal creek. (NC-WRRI, $49,616, PI). May 06 – May 07.


**Applied for (pending - $950,279):**


Linking hydrogeomorphology and denitrification in the tidal freshwater region of coastal streams (NSF Hydrologic Sciences, $356,000, PI), June 2007. Pending

MIP: Endemic distribution of ANAMMOX bacteria and their interaction with denitrifying communities in Cape Fear River Estuary. (NSF-MIP, $497,089, Co-PI) Declined

ECOFORE 06: Forecasting land use, flushing, and tidal creek water quality. ($566,274 total, $216,000 UNCW, NOAA, Co-PI), Feb. 2006, Declined.


**HONORS AND AWARDS**

2002-2004 - National Research Council Fellow
2001 - ASLO DIALOG IV Symposium Invitee
1999 - Matthew Fontaine Maury Award for Outstanding Achievements in Interdisciplinary Marine Sciences
1996-99 - U.S. National Park Service Grant -in- Aid of Research
1995 - National Science Foundation Doctoral Improvement Fellowship
1995 - Virginia Institute of Marine Science, Graduate Student Research Grant
1993-1996 - PhD Fellowship Award, School of Marine Science, College of William & Mary.
1989 - Phi Beta Kappa

**MEMBERSHIPS IN PROFESSIONAL SOCIETIES**

American Society of Limnology and Oceanography, Estuarine Research Society
GSA, AGU, Sigma Xi, Southeast Estuarine Research Society (Program Chair), Estuarine Research Federation
Appendix V
GEOLOGY GRADUATE STUDENT PUBLICATIONS AND PRESENTATIONS
(2001-2007)

Refereed journal articles, book chapters, field trip guides and conference proceedings

2006


2005
occurrences of rare biota at the Broxton Rocks Preserve, Altamaha Formation, Coffee County, Georgia: Southeastern Geology, v. 44, no. 1, p. 26-36.


2004


2003


2002

2001

Published Abstracts (with oral or poster presentation)

2007


**2006**


12. **Mondziel, S., N. Grindlay, P. Mann and A. Escalona, 2006, Multi-channel seismic images of Neogene rifting in the northern Mona Passage between Puerto Rico and Hispaniola, Eos Trans. AGU, 87(52) Fall Meet. Suppl., Abstract T43D-1679**


14. **Reed, D. and D. Blake, 2006, Testing the role of ductile extension along the western Idaho shear zone in the Salmon river suture zone east of Riggins, Idaho, Geological Society of America, Abstracts with Programs, SE sectional mtg., v. 38, no. 3, p. 75.**

**2005**


2. **Budde, L.E. and Cleary, W.J., 2005, Delineating North Carolina’s Inlet Hazard Zones: Revamping the Standards, GSA Southeastern Section Abstracts with Programs, Biloxi, MS, V. 37,No. 2, p.16.**


4. **Doughty, S.D. and Cleary, W.J., 2005, Recent Evolution of a Hurricane-Impacted Retrograding Barrier Island: Masonboro Island, NC, GSA Southeastern Section Abstracts with Programs, Biloxi, MS, V. 37,No. 2, p.50.**


6. **Mancinone, J. and N. Grindlay, 2005, Seamounts as a proxy for lithospheric strength, accretionary style and magma supply along the ultra-slow spreading Southwest Indian Ridge, NSF RIDGE field course, Cyprus.**


2004


3. **Childers, David,** and Huntsman, John, 2004, Structural analysis of deformational and metamorphic fabric elements of the Ashe Metamorphic Suite southwest of Bakersville, NC. Poster presentation at the CAA Undergraduate Research Symposium, Feb. 28, University of Delaware


**2003**

1. Cleary, W.J., Jarrett, J.T., Sault M., **Jackson, C.W.,** and Welsh, J.M., 2003, Inlet-Induced Shoreline Changes: Linkage Between Channel Migration and Ebb-
Tidal Delta Reconfiguration, Bogue and New River Inlets, North Carolina, Coastal Sediments ’03, American Society of Civil Engineers, p. 321


2002


2001


APPENDIX VI
GEOLOGY GRADUATE STUDENT HONORS, AWARDS AND GRANTS

University-wide and National Honors and Awards
Luke Davis, UNCW Graduate School Teaching Assistant Excellence Award, 2006
Devon Eulie (Olivia), Sylvia and B. D. Schwartz Graduate Fellowship Award, 2006-2007
Meghan Hearne, Inducted into Sigma Xi, 2002
John Huntley, inducted into Sigma Xi, 2002
Brian Jolly, inducted into Sigma Xi, 2007
Heyward Key, inducted into Sigma Xi, 2002
Lindsay Kraatz, Best Paper Award at the International Society of Photogrammetry and
Remote Sensing's Mid-Term Symposium, 2006
Rene Lewis, James R. Welch Scholarship from the Association of Applied
Paleontological Sciences, 2006
Rene Lewis, Association for Women Geoscientists Goldring Award, 2005
Rene Lewis, National Non-Traditional Students Association Scholarship, 2005
Rene Lewis, Inducted into Sigma Xi, 2006
Rene Lewis, Chrysalis Scholarship from the Association for Women Geoscientists, 2007
Michelle McCoy, Inducted into Sigma Xi, 2006
Michelle McCoy, James Leutze Merit Scholarship, 2005-2007
Dorien McGee, Inducted into Sigma Xi, 2003
Pamela Medley, Outstanding Student Poster Presentation, Atlantic Estuarine Research
Society Mtg., 2006
Pamela Medley, Sylvia and B. D. Schwartz Graduate Fellowship Award, 2007-2008
Lori Saal, Outstanding Student Presentation, Estuarine Research Federation Meeting,
2005

University-wide and National Internships and Grants
Faik Bouhrik, NASA Summer Internship, 2007
Michael Crump, Southeastern Geological Society of America Student Research Grant,
2001, 2002
Michael Crump, UNCW Graduate School Summer Research Stipend, 2002
Rene Lewis, UNCW Marine Sciences Summer Research Stipend, 2007
Rene Lewis, Geological Society of America Student Research Grant, 2006
Rene Lewis, UNCW Graduate School Summer Research Stipend, 2006
Jennie Mancinone, UNCW Graduate School Summer Research Stipend, 2003
Jennie Mancinone, National Science Foundation Workshop Travel Grant, 2003
Michelle McCoy, UNCW Marine Science Summer Research Stipend, 2006
Pamela Medley, UNCW Marine Sciences Summer Research Stipend, 2007
Pamela Medley, UNCW Graduate School Summer Research Stipend, 2007
Steve Mondziel, UNCW Marine Science Summer Research Stipend, 2006
APPENDIX VII
GEOGRAPHY & GEOLOGY FACULTY REFEREEED PUBLICATIONS (2001-2007)

Refereed journal articles, book chapters, field trip guides and conference proceedings 2007


dissolved silica loading in stormflow. J. Am. Water Resources Assoc. 43(4), 841-849.


2006


19. Tappen, C., Smith, M.S., and Dockal, J.A., 2006, Beryl (Aquamarine, Emerald, Green and Yellow) and Tourmaline of the Crabtree Pegmatite, Spruce Pine

**2005**


2004


2003


19. Minton, Jason S., Joanne N. Halls, and Hiroyoshi Higuchi, 2003 Integration of satellite telemetry data and land-cover imagery: A study of migratory cranes in Northeast Asia Transactions in GIS, vol. 7, no. 4, pp. 505-528


2002


diatom biostratigraphic data from ODP Leg 185, Hole 1149A. In Ludden, J.N., Plank, T., and Escutia, C. (Eds.), Proc. ODP, Sci. Results, 185 [CD-ROM]. Available from: Ocean Drilling Program, Texas A&M University, College Station, TX, 77845-9547


2001


Books and Textbooks

2007


2004


2003


2002

2001
APPENDIX VIII
GEOGRAPHY & GEOLOGY FACULTY EXTRAMURAL FUNDING
(2001-2007)
<table>
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<td>PI</td>
<td>Tobias, Craig</td>
<td>College of Arts and Sciences</td>
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<td>Camp Lejeune Marsh and Stable Isotope Monitoring</td>
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<td>Camp Lejeune Marsh and Stable Isotope Monitoring</td>
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<td>2008-0063</td>
<td>PI</td>
<td>Gamble, Douglas</td>
<td>College of Arts and Sciences</td>
<td>UNC CH, Renaissance Computing Institute</td>
<td>$1,750.00</td>
<td>Brunswick County Flood Monitoring</td>
<td>04-Oct-07</td>
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<td>2007-0163</td>
<td>PI</td>
<td>Tobias, Craig</td>
<td>Center for Marine Science</td>
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<td>$6,000.00</td>
<td>REU Supplement to Benthic microalgal regulation of carbon and nitrogen turnover in land-margin ecosystems: A dual stable isotope tracer approach</td>
<td>28-Sep-07</td>
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<td>2007-0123</td>
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<td>Leonard, Lynn</td>
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<td>General Dynamics</td>
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<td>Tobias, Craig</td>
<td>College of Arts and Sciences</td>
<td>Dauphin Island Sea Lab</td>
<td>$40,716.00</td>
<td>Evaluating the role of restored black needlerush marsh (Juncus roemerianus) as a buffer of anthropogenic eutrophication of coastal systems: an isotope enrichment approach</td>
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<td>PI</td>
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<td>$1,140,000.00</td>
<td>Integration of Coastal Observations and Assets in the Carolinas in Support of RCOOS Development in SECOORA</td>
<td>17-Aug-07</td>
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<td>Collaborative Research and RUI: Physical Mechanisms Behind the Caribbean Mid-summer Drought</td>
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<td>2008-0025</td>
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<td>Leonard, Lynn</td>
<td>College of Arts and Sciences</td>
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<td>$59,476.00</td>
<td>Field Methods Development and Implementation for Ridge and Slough Flow Patterns</td>
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<td>Tobias, Craig</td>
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<td>Microbial Nitrogen Cycling in the Cape Fear River Estuary: Attenuation vs. Recycling and the Effects of a Variable Freshwater-saltwater Boundary</td>
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<td>2007-0237</td>
<td>PI</td>
<td>Leonard, Lynn</td>
<td>College of Arts and Sciences</td>
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<td>$1,610.00</td>
<td>Sediment analysis of coastal sediments</td>
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<td>PI</td>
<td>Blake, David</td>
<td>College of Arts and Sciences</td>
<td>NC Geological Survey</td>
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<td>Lithodermic and structural relationships in the Carolina Terrane along the northwestern boundary of the deep river mesozooic basin</td>
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<td>$4,975.00</td>
<td>Using Wave Data and Lifeguard Observations to Predict Dangerous Rip Currents: A partnership between the Coastal Ocean Research and Monitoring Program, NC SeaGrant, and Wrightsville Beach Ocean Rescue Squad</td>
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<td>NCSU</td>
<td>Microbial Nitrogen Cycling in the Cape Fear River Estuary: Attenuation vs. Recycling and the Effects of a Variable Freshwater-saltwater Boundary</td>
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<td>Collaborative Research: Benthic Microalgal Regulation of Carbon and Nitrogen Turnover in Land-margin Ecosystems: A Dual Stable Isotope Approach</td>
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<td>$408,464.00</td>
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<td>Tobias, Craig</td>
<td>Center for Marine Science</td>
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<td>Carolinas Coast: One Stop Shop for Marine Observations in the Carolinas</td>
<td>$1,600.00</td>
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<td>Lithodemic and Structural Relationships Between the Nutbush Creek and Lake Gordon Fault Zones Along the North Carolina - Virginia Border</td>
<td>$13,000.00</td>
<td>25-Oct-06</td>
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<td>Evaluating the role of restored black needlerush marsh (Juncus roemerianus) as a buffer of anthropogenic eutrophication of coastal systems: an isotope enrichment approach</td>
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<td>Tobias, Craig</td>
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<td>NCSU</td>
<td>Tracing Nitrogen Transformations and Food Chain Uptake in an Urbanized Tidal Creek</td>
<td>$49,616.00</td>
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<td>Tobias, Craig</td>
<td>College of Arts and Sciences</td>
<td>NCSU</td>
<td>Microbial Nitrogen Cycling in the Cape Fear River Estuary: Attenuation vs. Recycling and the Effects of a Variable Freshwater-saltwater Boundary</td>
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<td>Microbial Nitrogen Cycling in the Cape Fear River Estuary: Attenuation vs. Recycling and the Effects of a Variable Freshwater-saltwater Boundary</td>
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**Total** $627,344.00

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<td>Cleary, William</td>
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<td>NCSU</td>
<td>Collaborative Research: Benthic Microalgal Regulation of Carbon and Nitrogen Turnover in Land-margin Ecosystems: A Dual Stable Isotope Approach</td>
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<td>2006-0036</td>
<td>Blake, David</td>
<td>College of Arts and Sciences</td>
<td>NC Geological Survey</td>
<td>Lithodemic and Fault Zone Relationships in the Northeastern Carolina Terrane, Northern Oxford 7.5-Minute Quadrangle, NC</td>
<td>$10,400.00</td>
<td>15-Dec-05</td>
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<td>2005-0173</td>
<td>Abrams, Lewis</td>
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<td>Collaborative Research: Drilling Site Survey - Life in Subseafloor Sediments of the South Pacific Gyre</td>
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<td>NCSU</td>
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<td>Grindlay, Nancy</td>
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<td>University of Puerto Rico</td>
<td>$64,343.00</td>
<td>A pilot study to investigate the possible linkages between submarine groundwater fluxes and amphitheater-shaped scars on the northern insular margin of Puerto Rico</td>
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<td>National Park Service</td>
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<td>NC DENR/NC Geog</td>
<td>$10,400.00</td>
<td>Lithodemic and Fault Zone Relationships in the Easternmost Carolina Terrane, Townsville and Oxford 7.5-Minute Quadrangles, North Carolina</td>
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<td>College of Arts and Sciences</td>
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<td>Fisheries and Habitat Assessment of the Oculina Banks Habitat Area of Particular Concern: A Multi-Media Approach Using GIS and the World Wide Web</td>
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<td>Grindlay, Nancy</td>
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<td>UCSD/NSF</td>
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<td>Collaborative Research: An Investigation of the effects of cold, thick lithosphere on deformation of slowly slipping mega-transforms: Andrew Bain Transform, SW Indian Ridge</td>
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<td>NC Geological Survey</td>
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<td>Geology of the Nutbush Creek Fault Zone in the Henderson 7.5-Minute Quadrangle, Eastern North Carolina Piedmont</td>
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<td>Benedetti, Michael</td>
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<td>$19,994.48</td>
<td>Sedimentation Study at Sny Magill Unit, Effigy Mounds National Monument</td>
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<td>Workshop and Planning for a Coastal Climatology of the Southeastern United States</td>
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<td>Marsh Fragmentation and Extent (area) Versus Barrier Island Topography: An Investigation Using Aerial Photography, Digital Terrain Modeling and GIS</td>
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Total: $143,845.00
APPENDIX IX
GEOGRAPHY & GEOLOGY FACULTY PRESENTATION VENUES (2001-2007)

1. American Geophysical Union (AGU) semi-annual meetings
2. Geological Society of America field forum
3. 5th International Symposium on Coastal Engineering and Science of Coastal Sediment Processes
4. Ocean Sciences meeting (AGU)
5. Geological Society of America national and regional meetings
6. 4th International Symposium of Environmental Software Systems
7. Estuarine Research Federation Conferences
8. Spatial Accuracy conference
9. American Association of Geographers annual meeting
10. 32nd International Geological Congresses
11. Invitational Conference on K-12 Outreach from University Science Departments
13. 11th & 12th Symposium on the Geology of the Bahamas and other Carbonate Regions
14. Estuarine Research Federation
15. 10th Annual David S. Snipes/Clemson Hydrogeology Symposium
16. 56th Highway Geology Symposium
17. Paleontological Research Institute
18. 7th & 8th International Coastal Symposium
19. National Science Teachers Association 54th National conference
20. IODP Workshop on Caribbean Drilling
21. Coastal Sediments '03 and '07
22. International Nannofossil Association annual meeting
23. SEALAIX'06 Symposium.
24. 4th Hawaii Internation Conference on Social Studies
25. Aruba Conference of the XIX International Congress of Caribbean Archaeologists
26. Water Resources Research Institute
27. North Carolina Academy of Science
28. International Congress of Caribbean Archaeologists
29. 3rd & 4th International Conference on the History of Transport, Traffic and Mobility
30. International Young Researchers Conference
31. Watson Institute for International Studies
32. North Carolina Genealogical Society
33. Pioneer America Society
34. AGU Chapman Conference
35. National Federation of Regional Associations Meeting.
36. Carolina Geological Society
37. Southeastern Estuarine Research Society
38. North Carolina Geographical Society
40. Augusta Genealogical Society
41. Central New York Earth Science Student symposium
42. International Congress on Ichonology
43. American Society of Limnology and Oceanography (AGU)
44. Southeastern Estuarine Research Society
45. US Climate Change Science Program Workshop
46. International Conference on Coastal Conservation and Management in the Atlantic and Mediterranean
47. Congresso Brasileiro de Oceanografia IGCP-495 Quaternary Land-Ocean Interactions: Driving Mechanisms and Coastal Responses
48. 42nd International Forum on the Geology of Industrial Minerals
49. North American Paleontological Convention
50. 4th International Bioerosion Workshop
51. CORONA (Coordination of Research on the North Atlantic)
52. Mesozoic and Cenozoic Bioevents
53. Symposium on The Geology and Paleontology of Calvert Cliffs
54. Alabama Lectures on Life’s Evolution
Preface

This report reviews the Master of Science in Geology at UNC Wilmington for the years 2001-2007. The external review team (Fred Rich, Georgia Southern University; Susan Goldstein, University of Georgia) visited the UNCW campus March 20-21, 2008. Our review is based on the Department of Geography and Geology’s Self-Study Document, a tour of facilities, and discussions with administrators (Dr. Robert Roer, Dean of the Graduate School, Associate Vice Chancellor Akinleye, and Dr. David Cordle, Dean of the College of Arts and Sciences), the Department Chair, Dr. Rich Laws, Graduate Coordinator, Dr. Nancy Grindlay, as well as most faculty members and several graduate students.

Overall, we find the M.S. in Geology to be a solid program which offers diverse opportunities for graduate students. Students who graduate are well prepared for either further graduate work at the Ph.D. level or for careers as professional geologists in government or the private sector. Members of the faculty are diverse, mostly productive, and well qualified. Several members of this faculty in particular are highly productive scientists and would be a credit to any major geoscience program in the U.S. In addition, the Department has made several excellent hires in recent years, and the Program’s potential for the future, therefore is quite high.

The last external program review was conducted in the 2000 – 2001 academic year, and most of the current faculty members were present at that time. Departmental and institutional responses to this review appear to have been positive and many of the issues identified have been addressed. This indeed is commendable for both the Department and Administration. However, several issues remain, particularly those relating to space, facilities and graduate student support. Remedies for these are far more complicated, and solutions will require both careful planning by the department as well as significant institutional support. This report reviews the strengths and challenges and offers several recommendations which we hope will further enhance the growth and quality of the program.
Program Strengths:

We concur in principle with the strengths listed in Section 10.1 of the Self-Study (p. 58). The graduate program is structured to accommodate students with different backgrounds and career goals that range from traditional fields (e.g., structural geology, petrology, paleontology, stratigraphy) to several that are more specialized. Programs in marine geology and geophysics, coastal processes, paleobiology, and field geology are particularly strong. The Department clearly benefits from its close relationship with CMS which provides modern laboratory and support facilities for those faculty members working in marine-related fields. Access to research vessels such as the R/V Cape Fear is an asset. The new program in stable isotope geochemistry (housed at CMS), with its multidisciplinary applications, adds a valuable dimension to the graduate program and should serve the university community well. The planned addition of a technical support position for this facility demonstrates institutional support and indeed is essential for a successful stable isotope facility. The Department also hosts an X-ray diffraction facility housed in DeLoach which has a broad user base. Spatial analysis and hydrology (and related areas) also appear to be fairly new programs. Both are off to a good start and should help meet rising student needs in these fields.

Though we met with just a few graduate students (the site visit was scheduled over a holiday), their remarks support the Department’s characterization of close supervision and interactions with graduate students. We found graduate students to be loyal to the program and keenly interested and engaged in their projects. The Program’s graduate student retention rate (90%) is quite good as is the median time to degree (2.75 years). Graduate students are encouraged to present their research at professional conferences (102 published abstracts with grad student authorship from 2001-2007) and publish in professional journals (25 papers). Students have also earned a number of competitive extramural student research grants. These measures clearly demonstrate the quality and effectiveness of the program. The Department’s orientation and TA training programs also appear to be solid and effective.
The Department hosts a diverse faculty which includes several female full professors, some in leadership roles. The program therefore is more inclusive than many and provides excellent role models for both male and female students.

The Department’s strengths and diversity of specializations overall are a good match for current employment trends in the geosciences (reviews available on AGI and AGU websites). Several faculty members are also licensed professional geologists in North Carolina, and this expertise is a valuable resource for those students seeking careers as professional geologists in the private sector.

The Department’s focus for new hires (p. 67) would both build on current strengths and meet the needs of future graduate students. According to the Self-Study, future hires would be recruited in the areas of (a) coastal processes / marine geology, and (b) remote sensing. Both areas of specialization reflect continued student demand and are quite appropriate considering the location and geologic setting of UNCW. These specializations also take into account pending retirements. The latter area of specialization is especially appropriate because the department includes both geography and geology.

**Departmental Challenges and Needs:**

The greatest challenges currently facing the program are those relating to insufficient space and graduate student stipends that are neither competitive nor sufficient for student support. In addition, members of the Department and/or the administration raised concerns about graduate student recruitment and uneven funding and productivity among faculty.

Graduate students raised several issues in addition to the low stipends. They would like to see the geology-based offerings in the GIS area expanded. They complain that the research facilities (other than those related to CMS) are woefully inadequate and that they have insufficient space for research. Only 4 desktop computers are available for their use (in the grad student office), and when they break down, it may take months to repair them. Desk space in the grad student office is available only to teaching assistants and not for all graduate students in the program. The most pressing issue raised by graduate students is that their stipends are too low. Even with the best offer the
Department can make, funds are not sufficient to support them in the Wilmington area, even with very frugal life styles.

1. Space and facilities.

The biggest problem is that space is simply too limited to effectively accommodate the needs of the Program. While those faculty members housed at the CMS facility have modern, well-equipped labs and offices, those housed in DeLoach Hall do not. This has the potential to develop into a two-tiered faculty system which could in turn have negative consequences for both faculty and students in the Program.

Faculty office space is very limited. Offices are quite small, and because faculty housed in DeLoach do not have dedicated research labs, individuals use their small offices for storage of research samples, maps, etc., which further exacerbates the tight accommodations. Some faculty offices are both tiny and shared, especially by those who have labs and offices at CMS.

Office space available for graduate students is also quite limited. Basically, students have desk space in a large common double room which also houses several computers for their use. This space houses 17 graduate students. The layout of this space is crowded and probably not conducive to graduate student productivity. The number of computers is also limiting, and, if possible, additional computers should be made available for student use. Are computer facilities available to undergraduate majors in DeLoach Hall?

Faculty lab space in DeLoach Hall is especially problematic. The teaching labs are organized around broad and sometimes marginally compatible functional themes, and they generally double for both research and instruction. Each lab, therefore, hosts multiple student (supervised) and faculty users. According to the Self-Study document, the Department has just 3 dedicated research labs in DeLoach (838 ft²) which are shared by 14 faculty members. Additionally, the Department has inadequate space allocated for the storage and maintenance of minerals, rocks, and fossils used in research.
**Recommendations.**

The best long-term solution to the crowded conditions would certainly be expansion of the department into renovated space currently occupied by Physics. Because this is not likely to occur soon (based on discussions with administrators during the site visit), it would be in the Department’s best interests to reevaluate its current space utilization to make more efficient use of existing space. Are there underutilized classrooms, or classroom functions that could be combined so that some of these rooms could be converted to faculty research labs? Are there current labs that could be subdivided? A reallocation of space would require careful planning, and we recommend including a facilitator and/or a consultant/facilities planner from outside the Department in the planning process. If implemented, this process would also require significant renovation funds. As external reviewers, we can offer suggestions to this end, however, these remain suggestions. Here are a few ideas to start with (suggestions by Dr. Rich):

- **Acid lab** - This room should probably be renovated in its entirety. The large walk-in fume hoods take up a great deal of space and, considering the nature of faculty research endeavors, probably don’t serve anyone well. The smaller hoods could be removed and either installed elsewhere in the department or put into storage somewhere else on campus if there is no immediate need for them. The department needs to have fume hoods, but not as they are currently configured. The acid lab could then be made into office space. Reducing the number of fume hoods could have a positive effect on achieving greater efficiency in air-handling, too.

- **Seminar room** - Room 113 has old, but not particularly valuable periodicals that occupy an entire wall. These should be given to the Library or somehow disposed of to create better use of wall space storage, or the shelves could be removed entirely. If the shelves were removed and the storage cabinets on the opposite wall were removed, the seminar room could be made into additional graduate student offices. Seminars could easily be held in one of the labs or the auditorium (114), which is actually quite nice. If seminars are held regularly it might be wise to schedule them at a particular day and time each month so that room use in the auditorium, for example, could be dedicated to seminars.
- **Graduate student office** - The crowded conditions are clearly counter-productive, and might well be in violation of the Fire Marshal’s occupancy limits. The battered and mismatched furniture should be discarded and half of it removed. Should the Seminar Room be changed to graduate student offices, the teaching assistants would find themselves better able to help students, and could conduct their own studies more effectively. Computer facilities available to graduate students likewise should be expanded and updated.

- **The Spatial Analysis lab** (125) is overcrowded. There does not appear to be an immediate solution to this, though in the long-term it might be possible to incorporate the adjacent office (currently Dr. Halls’) into the lab by creating a connecting door and moving the office to other renovated space. This might sound like a drastic move, but the Department might have to resort to such measures eventually.

- **The number of undergraduate labs** (5) actually seems excessive, and the department should give serious consideration to converting one of them to a research lab or, perhaps better, faculty office space. Among the labs that could be converted are the Physical/Historical Geology lab (116), the Structure/Stratigraphy/Paleontology lab (105), or the Physical Geology lab (109). Such a move would probably necessitate someone giving up a perceived ownership of lab space, but the needs of the department much override the needs of individuals. The Department at Georgia Southern had to do just such a thing recently, and a large lab space was subdivided into three faculty offices. No one has missed the lab, and the offices were essential. This requires care in room use planning, but it can be done.

- Some labs seem to have unique uses for which they are well suited. The Cartography and Mineralogy labs (224 and 120, respectively) would seem to be best used as they are in view of the equipment and other resources associated with them. Similarly, the Soil Analysis lab (217) should probably be left as is, though there would appear to be no reason why soils research couldn’t be conducted next door in the Sedimentology lab. The Sedimentology lab (218) is spacious and, while it appears to be dedicated mostly to sedimentology and summer teaching
activities, it could be used to teach large introductory labs should one of the Physical Geology labs, for example, be converted to other uses.

2. Graduate Student Support:

As noted above, and during our visit, the support given to graduate assistants is simply inadequate. The current $10K allocation is not competitive, and results in hardship for students who to a significant extent are the life-blood of the department. They are teachers, laborers, and assistants in many different capacities. Furthermore, they are colleagues and friends, and should be treated as such.

Recommendations.

Assistantships should be increased to reach a target of $13K, by current standards. A survey of graduate student stipends offered by both peer and aspirant institutions would prove beneficial to assure that UNCW’s stipends are indeed competitive. Just as importantly, however, complete tuition remission should be enacted very soon. The current national employment climate for geologists is very positive, and schools with attractive assistantship packages will simply out-compete schools who do not have such incentives. Tuition remission would be of great value to the students, clearly, but will also make the Department and the Institution more competitive. Additionally, health insurance should be added to the assistantship package. As we spoke to the Dean of the Graduate School we asked what the most generous offer in the department actually consisted of. A $10K Teaching Assistantship, with out-of-state tuition remission and $2K tuition assistance still resulted in a $3200 tuition levy, plus the cost of health insurance. No one can live in Wilmington, NC, under those conditions. When we asked the students what attracted them to UNCW, it was not the money. Proximity to home, the reputation of the programs, a desirable physical environment, the breadth of the research base (particularly at CMS), and the research connections were all mentioned. It is clear that there are intrinsic values unique to UNCW that draw students from around the country. It is highly advisable to enhance their experiences with adequate financial support.
3. Recruitment of Graduate Students:

The recruitment of top-notch graduate students is highly competitive and a primary concern of every geoscience graduate program. The Department is currently using a listing in Peterson’s online guide, mailing of brochures and flyers to selected undergraduate programs, and advertising at regional conferences (Colonial Academic Alliance Conference, Geological Society of America), and these are all good approaches.

Recommendations.

- Increase graduate student stipends and offer complete tuition waivers, as outlined above.
- Consider offering an annual “open house” for prospective graduate students, scheduled in the early spring just after students have been reviewed for admission but before student deadlines for accepting any offers. It is not necessary to provide travel funds for all students, though the Department might consider doing so for its top prospect(s).
- Continue to update the Department’s website. Provide more photos of students in the field and continually update current research and student research opportunities.
- The Department is planning a combined, 5-year, BS – MS degree program as an added recruitment tool for students interested in the applied geosciences. This might prove effective, especially if it is liked as much as possible with the process of licensure as a professional geologist.

Additional Observations.

- Some are concerned that inadequate credit is granted to those faculty who serve as major professor for students pursuing a M.S. in Marine Sciences rather than Geology, particularly with regard to promotion, tenure, and merit considerations. If this is indeed the case, it might require policy consideration above the department level.
- The requirement that old computers be removed when new ones are purchased simply does not make any sense. An inventory of non-functional computers is to be avoided, but forcing a department to discard perfectly good instruments, when
there is a clear lack of access to computers for general use is counterproductive. This policy needs to be changed. In addition, the growing demand for computers in the Program will probably lead to the need for increased staff support.

- Up-date the hall display cabinets. Whether these are used for teaching, or merely serve a decorative function, they need to be kept up. Their current condition projects an air of resignation, and that is not the image you want to convey. Some cabinets could be dedicated to particular themes, rather than simply being a collection of curiosities. We have had the same problem at Georgia Southern, and we disposed of some cases and made the rest of them more attractive and functional. It takes a curator to do this, but the effort is with it.

- Be sure the groundskeepers maintain the courtyard in an attractive fashion. This is a unique attribute of DeLoach Hall, and actually makes the building quite appealing. It could/should be used as a teaching space, though perhaps that already happens.
October 8, 2008

To: Dr. Robert Roer, Dean
   Graduate School

From: Dr. Lynn Leonard, Chair
       Geography and Geology Department

Departmental Response to Review of the Master of Science in Geology, University of North Carolina Wilmington for the period 2001-2007

I. Process

The Graduate Program Review Committee, Department Chair, and Graduate Coordinator met to discuss the review document and recommendations submitted by the external review team. In general, the Department of Geography and Geology agrees that the external review document accurately describes the state of the M.S. Geology Program at the University of North Carolina Wilmington. The program was described as a solid program that offers diverse opportunities for graduate students. The review committee indicated that students who graduate are well prepared for either further graduate work at the Ph.D. level or for careers as professional geologists in government or the private sector. For the most part, the recommendations fell under two primary categories: space and support. Specifically, the review committee indicated that the greatest challenges currently facing the program are those relating to insufficient space (teaching, research, and storage) and graduate student stipends that are neither competitive nor sufficient for student support. Several other minor issues also were raised. Below we respond to each of these.

II. Recommendations and Responses

A. Space: The review committee indicated that the program suffers from insufficient space for teaching, research and storage. According to their review, the best long-term solution to the crowded conditions would be expansion into renovated space currently occupied by Physics. However, based on their discussions with administrators during the site visit, they found that this was not a solution likely to occur in the near future. Consequently, the review team suggested several possible (short term) space utilization alternatives that could be implemented on a temporary basis. These suggestions and our departmental response to each are listed below.

1. Renovation of the Acid Lab (2nd floor). This laboratory has dedicated fume hoods for specific chemical and material usage and is used by (at least) four faculty members and their students for research. The review team suggested that this
laboratory could be significantly renovated to create office space for graduate students and faculty. The Department does not think that this is a viable option at this time because: 1) Modification of this laboratory would require costly renovations that greatly exceed the Departmental budget; and 2) Conversion of laboratory to office space would exacerbate the research space crisis already faced by the department.

2. **Conversion of DL113 to graduate student office space.** Room 113 is utilized as faculty meeting space, seminar classroom, departmental library, and storage. Although the idea of changing this room to a graduate student office space has merit, again the department lacks sufficient funds for renovation. In addition, the Department regularly uses this room as an overflow classroom for small seminar classes, and to conduct committee meetings etc. Because of the HVAC units located adjacent to the west wall, the room is subject to vibrations and a loud hum when the AC is operating, thus this room is not a desirable alternative for office space.

3. **Renovation of an undergraduate teaching laboratory to faculty offices.** The department respectfully responds that this modification is counterproductive to our goal of providing the best in experiential learning opportunities to our students. At present, the classrooms and laboratories in Deloach Hall are solidly booked for use by our department in addition to other university users. Further, rooms such as DL105 or DL116, are also used to conduct weekly Teaching Assistant meetings, faculty meetings, thesis defenses etc. This is not only impractical, but (again) beyond the fiscal resources available to the department.

4. **Expansion of Spatial Analysis lab (DL125).** We concur that DL125 is overcrowded and that lack of space limits the number of students (graduate and undergraduate) that we can service in this facility. The suggestion to expand the laboratory into Dr. Halls’ office has merit, but again, the cost of such renovations is beyond the Department’s budget. Until such a time that acceptable space is identified for additional faculty offices (other than conversion of heavily used teaching laboratories), this is not a viable solution.

B. **Graduate Student Support:** The second major issue facing the graduate program is the inadequate stipend level. They felt (as does the Department) that the current $10K allocation is not competitive and reported that the low stipends were the most pressing issue raised by graduate students during the visit. Even when a GTA is matched by summer support from grants, the stipend is still insufficient to support them in the Wilmington area. The review committee recommended an increase in stipend $13K and further suggested that UNCW should include complete tuition remission and health insurance in the standard assistance package. The Department concurs with the review team’s observations that such a financial package would increase the Department (and University’s) ability to recruit and retain high quality graduate students. We have begun to survey student recruits who declined acceptance, and now have data showing that in many cases our offers were declined because the assistantship package was not competitive. The Department recognizes, as did the graduate review committee, that securing funding to improve the assistantship package requires action at levels above that of the Department. Further, while the Department has worked diligently to encourage
out-of-state students to take the necessary actions to establish in-state residency, we are concerned that purported changes in the residency review process will make it more difficult for future students to establish residency. Should this occur, we will have fewer out-of-state remission funds available to recruit out-of-state students.

C. Other recommendations:

- **Update display cases:** We concur and have updated all displays in the Department this semester.
- **Ensure adequate credit is given to faculty who mentor Marine Science students:** As Chair (and as a faculty member who mentors Marine Science students and a previous member of the annual evaluation committee), I do not think this is a problem. I have never seen any evidence that faculty who advise graduate students in Marine Sciences rather than Geology, are not given credit for these activities when it comes to promotion, tenure, and merit considerations.
- **Change computer life-cycle policy:** The review team commented that the requirement that old computers be removed when new ones are purchased does not make sense. While they agreed that an inventory of non-functional computers should be avoided, they felt that forcing a department to discard perfectly good instruments, when there is a clear lack of access to computers for general use is counterproductive. We agree that it would be beneficial to have a mechanism that allowed the Department to increase the number of accessible computers by removing “non-returned” computers from the life-cycle list.

III. Summary

In conclusion, the Department of Geography and Geology and the Masters in Geology Program agree with most of the observations and suggestions by the outside review committee. We thank them for taking the time to visit our department and for providing thoughtful comments intended to strengthen the Program. We are pleased that the external review committee recognized our efforts to address the issues identified during the previous external review (conducted in AY 2000 – 2001) and their recognition that the Department had addressed or resolved many of the issues previously identified. However, this review (as did the 2 prior reviews) continues to identify lack of space, resources, and funding as major deterrents to the growth (or even maintenance) of our program. Further, each of these reviews have concluded that the major problems facing our program are outside the venue of the Department. While we recognize that these issues may not be unique to this Department and that space and funding are problems faced by the University as a whole, we feel that it is imperative that we are given the opportunity to work with the Graduate School to develop a strategy that addresses these issues as they relate to our Program. It is our concern that the emphasis being placed on development of new programs, will result in an even greater reduction in resources for existing programs – including this one. As the reviewers noted, our program is fortunate in that there are intrinsic values unique to UNCW that draw students from around the country and that the current national employment climate for geologists is very positive. The latter suggests a rise in the potential number of students seeking advanced degrees in
Geology from which our program could recruit. However, it is our contention based on the comments from three consecutive external reviews that without support from upper administration, it will not be possible for UNCW to compete with those schools who already offer far more attractive assistantship packages and other incentives. Should you wish to meet with me or our Graduate Coordinator to discuss our responses, please do not hesitate to contact me.

Respectfully Submitted,

Lynn A. Leonard, Chair
Department of Geography and Geology