Master of Science in Geoscience
Department of Geography & Geology
Program Review 2007-2014

Self-Study
December 2014

Self-Study Program Review Committee:

Joanne Halls, Chair
Michael Smith, Geoscience Graduate Coordinator
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Executive Summary

The UNC Wilmington Department of Geography and Geology began in 1970 and has grown to be a thriving and vital component of the Earth sciences at both undergraduate and graduate levels. The department currently has 19 tenure-track faculty, 2 lecturers, 1.5 staff people who support four undergraduate (geography, geoscience, geology, and oceanography) and two graduate (geoscience and geospatial technology) programs. Within the past 5 years the department has had several changes in faculty composition through retirements/departures and new hires. The degree programs have also changed substantially where the MS in Geology has become the MS in Geoscience. The result is a growth in our graduate program from 24 students in 2013 to 43 students in 2014. The greatest challenge that has consistently affected the Department is space. The faculty are spread across campuses (Center for Marine Science and main campus) and buildings, there is insufficient research space for faculty and students on the main campus, and the space is in need of refurbishment to accommodate the latest trends in science and technology. The greatest challenge for the MS in Geoscience program are the student stipends. The number of stipends and the funding amount is far less than comparable programs within North Carolina and in the mid-Atlantic region. It is a strong testament to the recruiting efforts of Department faculty that given this low funding the program has grown so quickly over the past few years. The concern is whether or not we can sustain this growth in numbers of students and increase the level of support for our students. The current time-to-completion is 2.5 years which is an improvement since the previous graduate program review. Considering the increase in faculty workloads, the weak graduate student financial support, and the space concerns, the productivity of students is a testament to the dedication of the students and faculty. The youthful and vibrant dynamic of the Department is palpable and has translated into positive numbers of students and productivity (awards, presentations, grants and publications).
1. General characteristics of and brief history of the academic unit

1.1 History of the Department of Geography and Geology

The Department of Geography and Geology was established in 1970 and provided service courses in geology and geography. In 1973, the Department was renamed Earth Sciences and offered courses in earth sciences, geology, geography, and pre-engineering surveying. From 1973 to 1981 the department offered an undergraduate Bachelor of Arts degree in Earth Sciences with concentrations in earth science, geology, and geography. In 1982, separate B.A. degrees in earth sciences, geography, geology, and a Bachelor of Science degree in geology were established. The B.A. degree in earth sciences was dropped in 1984 because of low enrollments. In fall 1988, the department enrolled its first students in the new Master of Science in geology program. In 1995 an interdisciplinary B.A. degree in environmental studies and B.S. degree in environmental science were established and managed as the Environmental Studies Program within the Department of Earth Sciences and the department continued to offer the other undergraduate degree programs.

In fall 2002, the non-thesis option of the M.S. in geology was implemented. It was also at this time, 2002, 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. In 2011, the department began offering a Post-Baccalaureate Certificate in Geographic Information Science as well as new undergraduate B.A. in Geoscience, B.S. in Oceanography, and minors in Geospatial Technologies and Oceanography. In 2012, the undergraduate Certificate in Geographic Information Science was dropped in order to focus undergraduates to enroll in the minor and to recruit potential graduate students to the Post-Baccalaureate Certificate in Geographic Information Science. In fall 2013 the department renamed the M.S in Geology to M.S in Geoscience with both thesis and non-thesis options and three concentrations: geology, geospatial science, and Earth processes and global change.

The department has grown from two faculty in 1970 to currently 19 tenure-track faculty (including the UNCW Provost) and 1 full-time lecturer who is split between the Department of Geography and Geology and the Department of Environmental Studies. Since the last graduate program review in 2007, the department has had 10 faculty (Abrams, Argenbright, Ainsley, Cleary, Dockal, Grindlay, Harris, Huntsman, Thayer, and Tobias) either retire or leave UNCW for other institutions. Meanwhile, we have hired 9 faculty: Dr. Battles (Provost), Dr. Ghoneim (Assistant Professor of remote sensing and physical geography), Dr. Hawkes (Assistant Professor of coastal geology), Dr. Hoffman (Assistant Professor of paleoceanography), Dr. LaMaskin (Assistant Professor of geology), Dr. Lane (Assistant Professor of stable isotope geochemistry), Dr. Loh (Assistant Professor of chemical oceanography), Dr. Nooner (Assistant Professor of marine geophysics) and Dr. Pricope (Assistant Professor of Geographic Information Science and climate change).

During the past seven years, the department has also seen changes in the administration of the department. Since 2012, the chair of Geography and Geology, Dr. Lynn Leonard, has also been the chair of the department of Physics and Physical Oceanography. For several years the department had two full-time administrative assistants, but approximately 5 years ago, when one staff person retired, the department lost this position during budget cuts. Geographically the department has also changed through time. From 1970 to 1973, the department was housed in
Alderman Hall and Hoggard Hall and then 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. When the new Center for Marine Science was opened in 1999 at the Myrtle Grove location 5 faculty members were located in this new facility. Currently 7 faculty members reside at CMS which is approximately 6 miles from main campus. In 2015, 3 faculty who currently reside in DeLoach Hall (Gamble, Halls and Pricope) will be moved to renovated space in the building formally known as the Social and Behavioral Sciences Building. Renovations are currently underway. Therefore, the department of Geography and Geology is complex in comparison to other departments since we offer 4 undergraduate programs, 2 graduate programs, numerous minors; cover a wide variety of disciplines (e.g. human geography, geomorphology, meteorology, geospatial analysis, geochemistry, paleontology, coastal geology, tectonics, structural geology, climate change, marine geophysics, and others); and are housed in multiple locations both on and off campus.

1.2 Department of Geography and Geology Mission Statement and Goals
The Department of Geography and Geology contributes to the mission of the University through its commitment to quality in teaching, research, and professional service. The primary objective of the Department is to offer rigorous and comprehensive degree programs in geography and geology that cover fundamental geographic and geologic knowledge as well as the latest innovations within these disciplines. The degree programs emphasize experiential learning opportunities including field studies, laboratory analysis, geospatial and quantitative methods, student research, internships, and international studies. Faculty research and service include a wide range of efforts dedicated to scholarly achievement, civic engagement, and applied problem solving at the local, regional, national, and international levels. We build on the traditional strengths of the department while contributing specifically to the University goals of providing a 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.

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. 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, geology, and oceanography.

The specific goals of the department's mission are:
1. Provide the highest quality undergraduate and graduate teaching of geography, geology, and oceanography through innovative and effective curricula that emphasize contemporary concepts and technologies and a variety of experiential learning opportunities.
2. Produce and disseminate new knowledge in geography, geology, and oceanography through vigorous, creative research and scholarship, and to enhance student learning through involvement in research.
3. Provide resources in geography, geology, and oceanography 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 MS in Geology was conducted in 2007 and completed in 2008. The reviewers identified primary strengths such as: 1) a solid geology program that covers the breadth of the discipline, 2) it offers diverse opportunities for graduate students, and 3) it prepares students well for their professional and academic futures. The external review committee indicated that students who graduated were well prepared for either further graduate work at the Ph.D. level or for careers as professional geologists in government or the private sector. The external review committee found that even though the M. S. Geology graduate program addressed the issues that were identified in previous 2000/2001 review, they also concluded that some of the problems were outside the department. For example, the review committee indicated that the greatest challenges facing the program were insufficient space (teaching, research, and storage) and low graduate student stipends that were neither competitive nor sufficient for student support. These challenges are outside of the ability of the program to successfully overcome without some major contribution from the university. The Department of Geography and Geology felt that the external review team adequately reviewed the program and concurred with the findings.
3. General program characteristics

3.1 Description of the MS in Geoscience degree program
In 2013 the department of Geography and Geology (G&G) renamed the MS program from Geology to Geoscience and substantially altered the program to have 3 concentrations: geology, geospatial science, and Earth processes and global change. UNCW's coastal location facilitates coastal and marine geoscience research in a manner unequaled by other UNC institutions. Formal ties to the marine and environmental programs are fostered by geography and geology graduate faculty who routinely teach courses for, and advise students in, these interdisciplinary programs.

3.1.1 Educational Objectives:
The MS in Geoscience has both thesis and non-thesis options which provide a foundation for employment in the environmental fields including consulting, mineral and energy industries, and government agencies. The thesis option prepares students for professional employment or advanced study leading to the doctoral degree and the non-thesis option prepares students for professional licensure in geology or professional certification in Geographic Information Processing (GISP). Specific objectives of the program are:

1. Develop research competence in the geosciences.
2. Develop professional competence in the assessment of water, energy and mineral resource potentials through the integrated analysis of geological and geographical data using advanced technologies.
3. Develop a level of research competence in the geosciences that encourages continued effort towards an advanced (e.g., doctoral) degree or professional licensure.
4. Provide the scientific community with meaningful geologic, geographic, and oceanographic data.

As described in Section 7 below, the UNCW MS in Geoscience 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
As stated above, the MS in Geoscience has both a thesis and non-thesis options and three concentrations. The thesis option requires a minimum of 30 semester hours while the non-thesis requirement is 33. Each student must complete the requirements of one of the concentrations. Each student must complete an approved course of study within 5 years of the date of first registration for graduate study. In the thesis option, students must submit an approved thesis prospectus, successfully complete a comprehensive oral exam prior to registering for thesis hours, and complete, present and defend a thesis. In the non-thesis option, each student must complete either a final project or an internship, pass a written comprehensive exam, and submit and defend a degree portfolio of significant works.

The degree requirements for each concentration are:

3.2.1 Geology Concentration
3.2.1.1 Thesis Option
In addition to meeting the requirements listed above for the thesis option, students must complete:

GLY 501 - Research Methods in Geology Credits: 2
GLY 502 - Technical Communication in Geology Credits: 2
15 graduate credit hours of geology courses (GLY prefix).
Eight additional graduate credit hours of GLY or GGY courses, or other approved graduate courses.
GLY 599 - Thesis Credits: 1-6 (Must take 3 hours, may take up to 6 hours.)

3.2.1.2 Non-thesis Option
In addition to meeting the requirements for the non-thesis option listed above, students must complete:
GLY 501 - Research Methods in Geology Credits: 2
GLY 502 - Technical Communication in Geology Credits: 2
GLY 526 - Geohydrology Credits: 4
GLY 565 - Introduction to Geophysics Credits: 3
GGY 522 - Remote Sensing in Environmental Analysis Credits: 3
GLY 597 - Final Project in Geology Credits: 3
Or
GLY 598 - Internship Credits: 3
16 additional graduate credit hours of GLY or GGY courses, or other approved graduate courses.

3.2.2 Geospatial Science Concentration
3.2.1.1 Thesis Option
In addition to completing the requirements listed above for the thesis option, students must complete:
GLY 501 - Research Methods in Geology Credits: 2
GLY 502 - Technical Communication in Geology Credits: 2
GGY 520 - Fundamentals of Geographic Information Systems Credits: 3
GGY 522 - Remote Sensing in Environmental Analysis Credits: 3
And two of the following:
GGY 524 - Advanced Geographic Information Systems Credits: 3
GGY 526 - Environmental Geographic Information Systems Credits: 3
GGY 528 - Advanced Remote Sensing Credits: 3
And
11 additional graduate credit hours of GLY or GGY courses, or other approved graduate courses.
GLY 599 - Thesis

3.2.1.2 Non-thesis Option
In addition to meeting the requirements for the non-thesis option listed above, students must complete:
GLY 501 - Research Methods in Geology Credits: 2
GLY 502 - Technical Communication in Geology Credits: 2
GGY 520 - Fundamentals of Geographic Information Systems Credits: 3
GGY 522 - Remote Sensing in Environmental Analysis Credits: 3
And 12 credit hours from:
GGY 524 - Advanced Geographic Information Systems Credits: 3
GGY 526 - Environmental Geographic Information Systems Credits: 3
GGY 528 - Advanced Remote Sensing Credits: 3
GGY 591 - Directed Independent Study Credits: 1-3
GGY 592 - Special Topics in Geography Credits: 1-4
GGY 594 - Teaching Practicum in GIS and Remote Sensing Credits: 1-3
And
Eight additional graduate credit hours of GLY or GGY courses, or other approved
graduate courses.
GGY 598 - Internship in Applied Geography

3.2.3 Earth Processes and Global Change Concentration
3.2.1.1 Thesis Option
In addition to meeting the requirements listed above for the thesis option, students must
complete:
GLY 501 - Research Methods in Geology Credits: 2
GLY 502 - Technical Communication in Geology Credits: 2
15 graduate credit hours in the department (GLY or GGY courses).
Eight additional graduate credit hours of GLY or GGY courses, or other approved
graduate courses.
GLY 599 - Thesis

3.3. How the Program Enhances UNCW
The MS in Geoscience program provides the only Earth science graduate program at UNCW.
The curriculum content of the program and the collaborations that have been formed with related
disciplines makes this program an integral component of the natural sciences at UNCW. Faculty
and their students interact well with Biology and Marine Biology, Chemistry, Environmental
Studies, Marine Science, Physics and Physical Oceanography and Computer Information
Systems by providing courses that students from these programs utilize and it is common for
G&G faculty to advise and provide committee support for students in these other programs. For
example, every year at least 2 or 3 Marine Science students are advised by faculty in G&G
(Table 1).

Table 1. Number of New Graduate Students by Academic Year

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<th>Date (Academic Year)</th>
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<th>MS Marine Science</th>
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<td>2014 - 2015</td>
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3.3.1 Mission of UNCW:
Graduates of the MS in Geoscience (formally Geology) work in the local, regional, national, and
international locations for private, not-for-profit, and non-governmental organizations. They
provide professional expertise to these organizations and exemplify the educational mission of
the university. For example, recent graduates work for The Coastal Federation, North Carolina
Department of Environment and Natural Resources, the US Army Corps of Engineers, and both large and small businesses such as Catlin Engineering and Shell Oil.

Faculty and graduate students frequently conduct research projects within the UNCW region and provide valuable information for natural resources management. Students in the non-thesis option undertake both paid and unpaid internships with local and regional organizations which is a perfect example of the close ties our department and the MS in Geoscience program has with the community. Our program is highly regarded for applied and experiential learning opportunities (http://uncw.edu/qep/Progress.html) and has received four ETEAL grants in two years (2013 and 2014).

3.4. Program Strengths/Weaknesses

3.4.1. Comparison with other graduate programs:

In comparison to other graduate programs at UNCW, the MS in Geology (now Geoscience) has shown continued growth and in 2013 was ranked 28th out of 54 programs (Table 2). In a comparison of all MS programs at UNCW, the Geology program was ranked 10th (out of 12 programs) in total number of students in 2013. However, in 2014 the number of students in the program has risen to 43 active students which represents an 80% growth over 2013 and moves the program up to 4th place behind Chemistry, Nursing, and Accountancy. There are several reasons for the continued growth in the MS program, but perhaps the two obvious reasons are 1) we have hired 8 new faculty in the past few years and these replacements have provided a wealth of new and exciting opportunities for our undergraduate and graduate students and 2) we have renamed and reconfigured the MS in Geology to MS in Geoscience and have broadened the content to reflect the faculty diversity in geospatial technology and oceanography.

Table 2. Number of Students in UNCW Graduate Programs (2007-2013)

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3.4.2. Educational objectives:

According to the 2013 Assessment report, all graduate students conducting thesis research have either met or exceeded expectations (educational objective #1). Five graduate students defended their MS in Geology thesis in 2013 and 71 faculty filled out assessment forms during the public presentations and 12 committee members read and assessed the thesis documents. Evaluations of the internship programs are all positive. Employers are satisfied with the student interns and the students are satisfied with the experience. Given the recent increase in number of non-thesis students there will be a need for more internship sites and increased oversight of the internship program. Students complete program exit surveys and one of the findings is that they request more diversity in the course offerings. Given the difficult balance between undergraduate and graduate course offerings and the need for minimum enrollments in each course, it is challenging to provide the breadth of courses that the students would like to take. Therefore, we have experienced an overall small increase in the number of graduate courses being offered each semester and also an increase in the number of Directed Independent Studies classes where students get the necessary information prior to working on thesis research. Even though we have had several new faculty hires in the past few years, our department has not replaced the faculty who have retired or left UNCW. Given the growth in the undergraduate and graduate programs we will need to be able to hire 1-2 faculty in the next few years to make up for the shortfall in faculty lines. Additionally, we may have 3 additional retirements over the next few years, which will dramatically impact the ability to keep up with student demand.

All students who have completed the MS program have either obtained professional employment or have entered PhD programs (objectives #2 and #3). The graduate student retention rates are consistently over 90%, which is a sign that students are happy with the graduate program.

There are several methods for announcing research accomplishments in order to increase the opportunities for future use of the wealth of data and information generated by the faculty and students. First, all theses at UNCW are published electronically via Randall Library. Second, the department is developing a workflow for disseminating all thesis and peer-reviewed publication abstracts via the department website. By announcing the results of projects via the website we are anticipating higher traffic and increased requests for further information. Ultimately, we need to do a better job publicizing our accomplishments. Not only will this increase the potential for increased student interest but it can also increase the number of research collaborations.
4. Certification, Interdisciplinary, and Other Programs

The Department of Geography and Geology offers a graduate certificate in GIS. Additionally, various faculty members from the Department of Geography and Geology are involved in seven graduate degree programs other than the geology graduate program: Master of Science in Marine Science, Master of Arts in Liberal Studies, Master of Science in Marine Biology, Ph.D. in Marine Biology, Master of Science in Environmental Studies, Master of Coastal Ocean Policy, and Master of Education.

4.1 Graduate Certificate in GIS

The Department of Geography and Geology offers a Post-Baccalaureate Certificate Program in Geographic Information Science. Geographic Information Science (GISci or GIScience) is the academic theory behind the development, use, and application of geographic information systems (GIS), remote sensing, data visualization, global positioning systems, spatial analysis, and quantitative methods. The purpose of this graduate certificate in GIScience is to provide students with a solid foundation in GIScience and enable the students to explore application areas that utilize this technology. The curriculum is a mixture of core courses that teach the fundamental theory and application of geospatial technology and electives that cover the vast range of this burgeoning technology in disciplines such as computer programming; field methods including GPS technology and spatial analysis; environmental and ecological applications; geological applications in oceanography, coastal and upland environments; and quantitative analysis and database management. The graduate certificate in GIScience is intended to provide a mixture of theory and practical knowledge. The GIS certificate is designed to serve: 1) students who wish to acquire technical expertise to support knowledge gained in other graduate programs and 2) returning students who wish to acquire expertise to further their current and/or future job requirements. At the end of the program, students will employ a balanced combination of theory of spatial concepts and practical application of GIScience techniques to spatial problems in their own field of study. Seventeen students (in fall 2014) are enrolled in the program and three Geography and Geology faculty (Ghoneim, Halls, and Pricope) teach courses that directly apply to the certificate program.

4.2 Master of Science in Marine Science

The College of Arts and Sciences, in conjunction with the Center for Marine Science (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 students (in fall 2014) are enrolled in the program and twelve Geography and Geology faculty (Nooner, Lane, Loh, Hawkes, Hoffmann, Ghoneim, Leonard, Laws, Kelley, Halls, Gamble, Henry) teach courses that are included as part of the marine science M.S. program curriculum as either electives or as core courses. One course (GLY 550 – Marine Geology) offered in the geology M.S. program serves as a core foundation course for the marine science graduate program. Additionally, GLY501 (Methods in Scientific Research) is required of all students in the marine science program who are pursing geological studies. Geography and
Geology faculty who advise MS Marine Science students varies from year to year depending on student interest. There are currently eight Geography and Geology faculty (Ghoneim, Halls, Hawkes, Hoffmann, Kelley, Lane, Leonard, Loh) advising students in this program as either primary advisor or committee member.

4.3 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. Forty-four students are currently (fall 2006) enrolled in the program and one Geography and Geology faculty member (Hines) frequently teaches courses that are included as part of the MALS curriculum and/or advise students in this program.

4.4 Master of Science in Marine Biology
The Department of Biology and Marine Biology at UNCW offers courses of study leading a Master of Science degree in marine biology. Thirty-one students (in fall 2014) are enrolled in the program. Geography and Geology faculty members frequently co-advise or serve on committees of students in this program. Currently two faculty members (Lane, Nooner) are serving on student committees in this program.

4.5 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 2014) are enrolled in the program. Geography and Geology faculty members frequently advise, co-advise or serve on committees of students in this program.

4.6 Master of Science in Environmental Studies
The Master of Science in Environmental Studies is an interdisciplinary graduate degree designed for professionals, practitioners, citizens and students who wish to strengthen their knowledge of the environment. The multidisciplinary nature of this program provides the student with a unique balance of the scientific background necessary for sound environmental decision-making within the context of educational, political, sociological, economic and legal frameworks. This approach is intended to produce future and current environmental professionals with the broad perspective necessary to be effective leaders in the field. Thirty-seven students are currently (fall 2014) enrolled in the program and three Geography and Geology faculty (Gamble, Pricope, and Shew) teach courses that are included as electives in the curriculum and/or advise students in this program.

4.7 Master of Coastal and Ocean Policy
The Master of Coastal and Ocean Policy (MCOP), housed in the Department of Public and International Affairs in the College of Arts and Sciences, is a professional, non-thesis, multidisciplinary degree program designed to provide students with the knowledge and skills needed to assume leadership roles in governmental and nongovernmental organizations involved
in the formulation, implementation, and administration of coastal and ocean policy at all levels of
government. Nineteen students are currently (fall 2014) enrolled in the program and one
Geography and Geology faculty member (Shew) teaches courses that are included in the
curriculum for this program.

4.8 Master of Education
The Master of Education (M.Ed.) programs address the need for conceptual and procedural
foundations for decision-making and for specific alternatives within the student's area of
professional practice. The M.Ed. programs address the North Carolina Masters/Advanced
Competencies requirements and are designed for individuals who have "A" level teaching
licenses. Four students are currently (fall 2014) enrolled in the program and one Geography and
Geology faculty member (Shew) teaches courses that are included in the curriculum for this
program.
5. Geosciences Graduate Facilities

5.1 Classroom Facilities
The Department of Geography and Geology and the Geosciences Graduate Program is primarily housed in DeLoach Hall, where it moved in August 1997 after a 1.5 million-dollar building renovation project. The department shares its space with the Department of Physics and Physical Oceanography, and is assigned 42 rooms (15,570 sq. ft.) in the building. Presently there are two lecture classrooms, eight teaching laboratories, and one seminar room utilized for geosciences graduate instruction. The two traditional lecture classrooms combined accommodate 141 students. The teaching laboratories can house between 5-32 students depending on lab seating, and the seminar room accommodates up to 16 students.

All of the rooms including the teaching laboratories in DeLoach Hall are equipped with Internet access ports. All rooms also have wireless access through the recently upgraded Hawkwifi system. Both classrooms and all teaching laboratories have SONY multimedia projectors controlled by a Windows-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. One large 200-person lecture room and two additional teaching classrooms are available for geosciences graduate instruction at CMS and can accommodate approximately 45 students and have wifi access.

The teaching laboratories for graduate instruction in DeLoach Hall include: Mineralogy Laboratory; Petrology Laboratory; Soil and Sedimentology Laboratory; Spatial Analysis Laboratory; and Stratigraphy and Paleontology Laboratory. These are discussed in detail below.

Mineralogy Laboratory: This 738 sq. ft laboratory is located on the second floor of DeLoach Hall (RM 224). It is equipped with workspace for a maximum of 16 students. The lab houses the Geosciences Mineralogy Collection, and contains equipment to conduct microscopy, specific gravity, and material property investigations of minerals and rocks. Although labeled as the mineralogy laboratory, a variety of other courses and student groups utilize this building space as a lecture and laboratory classroom, as well as a meeting room. Drs. Blake and Smith supervise the Mineralogy Laboratory.

Petrology Laboratory: This facility (676 sq. ft.) is located on the second floor of DeLoach Hall (RMS 222/224A). The lab is equipped with eleven Olympus BH-2 petrographic microscopes, ten Leica Dm EP petrographic microscopes, three Olympus BX 50 petrographic microscopes, hundreds of thin sections, and several tons of rock hand samples. Thin section production can completed in house there on a Hillquist Cutoff Saw and Grinder, as well as in the Petrology Preparation Lab (see below). Although labeled as the Petrology Laboratory, a variety of other courses and student groups utilize this building space as a lecture and laboratory classroom, as well as a meeting room. Drs. Blake and LaMaskin supervise the Petrology Laboratory.

Soil and Sedimentology Laboratory: The laboratory is a 720 sq. ft. room located on the second floor of DeLoach Hall (RMS 217/218). The lab contains equipment and supplies needed to conduct grain size and compositional analyses, wet chemistry, and water filtration. Specific analytical equipment includes glassware, drying ovens, top-loading and analytical balances, muffle furnaces, distilled water, sieves, sieve shakers, centrifuge, acid hoods, hydrometers, magnetic stirrers, hotplates, vacuum pumps and filtration apparatus, and a Windows-platform
computer having Internet access. This lab is a multi-user facility and is supervised by the geosciences graduate faculty users and graduate students assigned additional responsibilities in any given semester, as well as Yvonne Marsan.

**Spatial Analysis Laboratory**: This 636 sq. ft. facility, directed by Dr. Joanne Halls, is housed on the first floor of DeLoach Hall (RM 125) and is equipped with 20 workstations having an ESRI site license (ArcGIS-Arc 10.2), ENVI (5.0), IDRISI Selva, MATLAB, and ModFlow capabilities. Peripherals include a high resolution scanner Epson Expression 10000XL, large format HP 4020ps plotter, HP CP6015xh color laserjet high-resolution color printer, and a HP 600 M601 printer monochrome laserjet printer. Spatial Analysis Lab servers (housed in the Hoggard building) include the following 3.25 TB: ARCGIS01 – ArcGIS Server 10.0 (hallsj) Server 2003 X64/2 vCPUs/4GB memory/ 40GB Hard drive; ARCGIS02 – ArcGIS Server 10.1 (hallsj) Server 2008 X64/2 vCPUs/4GB memory/ 40GB Hard drive; ARCGIS03 – 10.1 web server (hallsj) Server 2008 R2 X64/2 vCPUs/4GB memory/ 40GB Hard drive; ARCGIS04 – not currently in use/set up to run ArcGIS 10.1 Desktop; Server 2008 R2 X64/2 vCPUs/8GB memory/ 40GB Hard drive. Yvonne Marsan, the departmental lab technician, helps maintain the equipment in this space. All undergraduate and graduate students enrolled in GIS and remote sensing courses are granted 24-hour access to this facility.

**Stratigraphy and Paleontology Laboratory**: The Stratigraphy and Paleontology Laboratory is a 994 sq. ft. room on the first floor of DeLoach Hall (RM 105). The lab is equipped with one non-operational fume hood, several large tables, and a sink. The laboratory also includes twelve Leica and fifteen Bausch and Lomb binocular microscopes, and collection specimens for both petrographic and microfossil analysis and invertebrate paleontology/petrography teaching. This lab is a multi-user facility and is supervised by Drs. Kelley, Laws, and LaMaskin, as well as Yvonne Marsan.

**5.2 Research Facilities**
The research space available to geoscience graduate faculty in DeLoach Hall is inadequate for effective conduct of research because of the lack of secure dedicated research space. Research and related activities typically take place in the teaching laboratories or one of the following research laboratories: Advanced Microscopy Laboratory; Clean Laboratory; Environmental Hydrology Laboratory; Geologic Materials Laboratory; Remote Sensing Laboratory; and X-ray Diffraction Laboratory. The 838 sq. ft. of research laboratory space in DeLoach Hall is shared by 19 faculty (44 sq.ft. /faculty), an increase of 2 faculty since the last MS review but five new faculty total (3 retirements). All of this space is shared and multi-user (undergraduate, graduate, and geoscience graduate faculty research investigating a variety of research projects). In contrast, the research space available to geoscience graduate faculty housed at CMS is adequate for effective conduct of research. The seven geoscience 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 geoscience graduate faculty at CMS. Geoscience faculty who conduct marine-related research also have access to a research vessel fleet that includes vessels ranging in size from 13 to 68 ft.

Most geosciences 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 Windows-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, Wireless access is available. A
subset of students are housed in the Petrology Laboratory storage space (RM 224A), which includes desk space, a Windows based computer, printer, sink space, and Internet access. Graduate students also have access to the Cartography Laboratory in DeLoach Hall that is equipped with 15 Windows-based computers with word-processing, graphics, presentation, and statistical software, a color scanner, a laser printer and a large-format color plotter. Some students only have office space in faculty offices or research areas. Five additional graduate students are assigned desks in DL 211A (8 total desks, shared with physics MS students).

On the main campus of UNCW and at CMS, several laboratories having various research focuses provide primarily equipment support for geoscience graduate faculty and their students. Descriptions of these laboratories are listed below.

5.2.1 DeLoach Hall and Academic Support Building:
**Advanced Microscopy Laboratory:** This 400 sq. ft facility housed on second floor of DeLoach Hall (RM 215) is intended for faculty and graduate student research. Houses a Olympus BX-60 (1.2X and 2.5X) and Leica M165C research-grade binocular microscope and a Leica DM2700P with attachable Leica DFC 450 camera as well as a Leica DMEP research-grade stereo microscopes. The lab also hosts a fume hood for zircon separation and sample preparation, a magnetic separator, light table, a sink and cabinets for storage. This facility is over utilized and houses many undergraduate and graduate projects which make the room crowded and inefficient. A larger, more suitable room is required for this purpose.

**Clean Laboratory:** A 177 sq. ft., single hood clean laboratory originally constructed for isotope separation work is located on first floor DeLoach Hall (RM 115E) now houses a diatom slide preparation lab supervised by Dr. Laws (Air flow and temperature have been unstable in this facility). The small size of the room precludes its use as an undergraduate laboratory and it is used primarily for geosciences honors and graduate research sample preparation.

**Environmental Hydrogeology Laboratory:** This facility is housed on second floor DeLoach Hall (RM 212) in a small room (~170 sq. ft.) and is supervised by Dr. Eric Henry. The laboratory was originally a lecture preparation room for the adjacent Physics lecture classroom, which is now heavily used for physics 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. In association with this lab, an AMS 9100 ATV PowerProbe percussion coring system is stored in a cargo trailer on the east side of campus for use in hydrological and sedimentological research.

**Geologic Materials Laboratory:** A subset of geoscience graduate faculty teach courses and conduct research involving the petrologic evaluation of igneous, sedimentary, and metamorphic, as well as paleontological samples. Topical interests are varied and the Geologic Materials 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 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 analyses of material specimens, 2) prepare samples for mesoscale to microscale petrographic analysis, and 3) prepare powdered samples for geochemical analysis and detrital and crystalline zircon extraction.

**Academic Support Building**: Approximately 770 sq.ft. in the Academic Support Building (RM 107) 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. It has a keyed access and is supervised by Drs. Blake and LaMaskin. The supervisors, through the administrative staff, assign keys to faculty and geosciences graduate students who plan to use the laboratory as part of their teaching responsibilities, geosciences thesis or individual geosciences, graduate faculty research efforts, or special needs projects. Users 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. They must be made aware of the proper use and cleanup of the lab by the supervisors or a trained graduate assistant. A written set of policies and procedures for laboratory equipment operation is provided to each new user. A sign-up sheet registers the geosciences graduate faculty and 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 lighted, 200 sq. ft. storage building located immediately across from the Geologic Materials Lab on the rear side of the Academic Support Building. There, geosciences graduate student thesis and graduate faculty research rock samples and rock core are archived. The geosciences graduate program shares this building with the Anthropology Program, and has use of approximately 1/3 of the building. This space is secured by a key padlock on the door.

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, BICO UA V-belt driven pulverizer, BICO VD chipmunk jaw crusher, 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, Fischer Scientific General Purpose drying oven, Thermolyne Extra-Capacity hotplate, 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, one fume hood located in the Advanced Microscopy Laboratory in DeLoach Hall is used to facilitate hydrofluoric acid work required to stain rock samples for modal analysis. Within this facility, a spectrum of geosciences and marine science graduate students, and geology/geosciences undergraduate students and geosciences faculty have the capability of preparing a variety of petrographic and geochemical samples for qualitative and quantitative analyses.

**Soils and Sedimentology Analysis Laboratory**: This facility contains 720 sq. ft. space located on the second floor of DeLoach Hall that is split into two separate (RM 217, small, and RM 218,
large) laboratories. This space has a dual purpose whereby RM 218 is dedicated to applied learning and RM 217 to storage, sediment prep, specialized equipment, chemicals, and distiller which are not suitable for general use space. The labs are intended for faculty and student research with maintenance and operation assistance by Yvonne Marsan. The area 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 via lockbox access to ensure security. The lab is equipped with an eye wash/shower station, and has access to a fire blanket mounted in RM 218. It is important to note that research grade experiments by students and faculty cannot be left in RM 218 because of teaching use, so that longer term projects have no dedicated space.

Remote Sensing Research Laboratory: The RSRL, directed by Dr. Eman Ghoneim, is housed on the first floor of DeLoach Hall (RM 115B). This area houses 3 graduate students and serves as a research facility for specialized training of contracted students from private industries. This research lab is equipped with 6 workstations with ESRI site license capabilities (ArcGIS-Arc 10.2), ENVI (5.1) and a B&W laser printer. Yvonne Marsan, the departmental lab technician, helps maintain the equipment in this space.

X-ray Diffraction Laboratory: A 100 sq. ft. Radiation Safety approved research laboratory for the use of X-rays is located on the first floor of DeLoach Hall (RM 115A). 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, geosciences graduate faculty and students use the instrument in their research. Dr. Smith supervises this laboratory.

5.2.2 Center for Marine Science:
Crustal Dynamics and Geophysics Laboratory: This facility is housed at CMS (RM 1312) and is supervised by Dr. Nooner. The laboratory includes 520 sq. ft. of research space dedicated to utilizing geophysical tools and techniques to carry out research in areas with active crustal deformation in both terrestrial and marine settings. A wide range of research is undertaken including instrument development, fieldwork and data collection, and numerical modeling. Major equipment includes Mac workstations and PC laptops with Matlab, COMSOL finite element software, ArcGIS, Adobe Illustrator, LabView, Gamit/GLOBK, SAC, and Antelope Trillium compact Broadband Seismometer, Paroscientific absolute pressure gauges (for seafloor geodesy), Solinst water level recorders and air pressure recorders, Deadweight tester (for pressure gauge calibration), Ground Penetrating Radar, GPS antennas and receivers, Starfish towed sidescan sonar, Soldering workstation, and a drill press.

Estuarine and Marine Sedimentology Laboratory: This facility is housed at CMS (RM 1305) 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 Sontek, Nortek, and RDI current meters and profilers, assorted data loggers, petite ponar grab samplers, box corers and water level and water quality sensors, and all peripheral sediment prep analysis equipment (ovens, furnace, balance, etc).

A separate, 220 sq. ft space hosts a Beckman-Coulter LS 200 Particle Sizer (RM), which is a multi-use instrument housed at CMS and used by geosciences, marine biology, biology, chemistry, environmental science and physics.

Additionally, the Ocean Observing Program and buoys have two large labs in the technical wing of CMS (rms) and 3 staff to support this large program (ROVs, buoys, multicorer, CTDs, side scan sonar, imaging, etc).

**Isotope Ratio Mass Spectrometer (IRMS) Laboratory:** The Isotope Ratio Mass Spectrometry (IRMS) Laboratory (RM 1348) is administered and maintained by geography and geology faculty member Dr. Chad Lane in concert with CMS administration. 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 Elemental Analyzer, Gas Bench, Total Organic/Inorganic Carbon Analyzer peripherals. A new NSF-funded gas chromatograph and isotope mass spectrometer interface for compound-specific analysis will be added to this lab by March, 2015. The IRMS Laboratory also includes two ultra high-precision microbalances, a micromill, and wet lab space for sample preparation. The IRMS facility 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 integrated into at least 15 graduate and undergraduate research projects and classes in the geography and geology, chemistry, and biology and marine biology departments at any one time.

**Invertebrate Paleontology Laboratory:** This 520 sq. ft. of space at CMS (RM 1309) dedicated to invertebrate paleontology research. Dr. Kelley supervises this laboratory. It includes sample preparation and curation space, microscopes, aquarium facilities, and houses Kelley’s research collection of Recent and fossil molluscs from the US Coastal Plain, Mexico, and Iceland.

**Organic Geochemistry Laboratory:** This facility includes 520 sq. ft. of space dedicated to the study of the fate and transport of naturally occurring organic matter in aquatic systems. The laboratory is housed at CMS (RM 2302) and is supervised by Dr. Ai Ning Loh. The lab is fully equipped for the extraction, purification and detection of solvent-extractable organic molecules, and for the analysis of dissolved and particulate C, N and P. In addition, the lab also includes equipment for sample collection (field pumps, vacuum pumps, peristaltic pumps, filter manifolds, benthic chambers) and sample preparation (balances, furnace, oven, shaker table, centrifuge, sonicator). Small field equipment such as a light meter, YSI, HOBO sensors, box corer, GPS, depth sounder and tools are also available. The lab has several -20°C freezers, one deep freezer (-80°C) and one temperature-controlled incubator.

**Sea Level Research Laboratory:** This facility includes 520 sq. ft. of space dedicated to short- (storms, tsunamis, earthquakes) and long-term (glacial isotatic adjustment) changes in relative sea level. The laboratory is housed at CMS (RM 1310) and is supervised by Dr. Andrea Hawkes. The lab includes 3 research-grade (two Leica and one Olympus) binocular microscopes, one with high-resolution HD digital imaging capabilities. The lab also includes microfossil and sediment analysis preparation equipment (sieves, slides, chemicals, beakers, wet and dry splitters, etc) and
small field equipment such as a laser total station, YSI, HOBO pressure sensors, Ekman grab sampler, samples bags and vials, GPS and depth sounders, and tools. An exterior cold storage facility (250 sq. ft) is located behind CMS. Large field equipment is stored in an exterior dry storage unit behind CMS and includes Russian, gouge and vibrocores, rods, vibrating motor, hoses, tripods, and core sleeves.

**Paleoenvironmental Change Laboratory**: The Paleoenvironmental Change Laboratory (520 sq. ft) is supervised by Dr. Chad Lane and housed at CMS (RM 1308). The lab includes two large fume hoods, binocular scopes, desktop and floor centrifuges, a rotary evaporator, refrigeration, ovens, furnaces, and an assortment of glassware and other supplies for fossil pollen, charcoal, stable isotope, microfossil, and a variety of other geochemical analyses. Research in this laboratory focuses on broad spectrum paleoecological and paleoclimate reconstructions using sediments and soils from terrestrial lakes and ponds as well as coastal lagoons and bays.

**Paleoceanography Laboratory**: This 520 sq. ft facility is supervised by Dr. Hoffmann and housed at CMS (RM 1311). The lab includes three research grade Olympus binocular microscopes, balance, oven, sonicating bath, shaker, hot plates, sieves, and beakers for sediment and microfossil analysis. Research in this lab focuses on reconstructing the distribution and circulation of surface and deep water masses in the world oceans and the relationship of circulation to climatic and environmental changes.

**5.2.3 Other Research Facilities**

**DeLoach Storage Unit**: A 160 sq ft, non-ventilated and unlit shipping container is located outdoors along the northeast side of DeLoach Hall in a courtyard adjacent to the Loading Dock. It is outfitted with 6 steel shelving units (77”x60”x24”) that each hold three shelves. These shelves are assigned to geosciences graduate faculty for sample and equipment storage. Yvonne Marsan supervises the storage unit, which is accessed through a set of keyed padlock swing doors. The facility has a water leak.

**Old Theater Storage Unit**: Located a few miles away on Oleander Drive, this storage facility houses archived sediment and rock samples from present and previous faculty and state cores that are being held in perpetuity.

**5.3 Support Facilities**

Randall Library is a 132,823 sq. ft. facility 200 m from DeLoach. The library provides physical and virtual spaces where users have a wealth of resources and can interact with each other. The library is open 107 hours per week and maintains a powerful information technology infrastructure, including the Millennium integrated library system which supports the libraries at Fayetteville State University, UNC Pembroke, and UNC Wilmington. The library hosts more than 1 million volumes, 40,000 journal and serial titles, and Web-based catalog with links to more than 30,000 e-books and access to over 200 databases and provides information literacy instruction sessions, credit courses, online tutorials, and one-on-one instruction/research consultations. Nearly a dozen Liaison Librarians support subject area, academic department or campus units, working with faculty, staff and students to enhance library collections and services. The library has a total of 21 librarians, or 1.74 librarians per 1,000 students.

The Information Technology Systems Division (ITSD) manages this facility. A 24-hour security-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 computers 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.

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

5.4 Future Space

Future Space Acquisition with STEM building

Estimated move in date is July 2015. This remodeled building will house smaller groups from several different STEM departments including Anthropology, Math and Statistics, Biology and Marine Biology, and Geography and Geology. Drs. Gamble, Halls and Pricope from the Department of Geography and Geology will be moving over to this new space. Drs. Gamble, Halls and Pricope will have 120sq ft of office space and share 1 TA/RA office (120 sq ft) and 1 admin office (120 sq ft). They will also share a 600 sq ft applied learning space with 6 work stations and conference table, 1 instrumentation lab (120 sq ft) and 1 geospatial teaching lab that will hold 40 students.
6. Personnel

6.1 Tenure Track Faculty

The Department of Geography and Geology has six full professors, five associate professors, and eight assistant professors. Thirteen tenure track faculty in the Department of Geography and Geology are members of the Graduate Faculty (verified 10/13/14 in the 2014-2015 Graduate Catalog). Curricula vitae of geography and geology tenure track faculty are provided in Appendix A.

Professors:

Douglas Gamble
Ph.D. University of Georgia
Date Hired: Fall 2000
Research Areas: Applied climatology, hydrology, and island environments

Patricia H. Kelley
Ph.D. Harvard University
Date Hired: Fall 1997
Research Areas: Invertebrate paleontology, paleoecology, evolution

Richard A. Laws
Ph.D. University of California-Berkeley
Date Hired: Fall 1983
Research Areas: Microalgal biostratigraphy, taxonomy, and paleoecology

Lynn A. Leonard, Chair
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

Associate Professors:

Michael Benedetti
Ph.D. University of Wisconsin
Date Hired: Fall 2000
Research Areas: Geomorphology, Quaternary geology, soils, geoarchaeology

David E. Blake
Ph.D. Washington State University
Date Hired: Fall 1990
Research Areas: Structural geology, igneous and metamorphic petrology, tectonics
Joanne N. Halls  
Ph.D. University of South Carolina  
Date Hired: Fall 1999  
Research Areas: Application of Geographic Information Systems for analysis of terrestrial and marine coastal environments

Eric J. Henry  
Ph.D. University of Arizona  
Date Hired: Spring 2002  
Research Areas: Hydrology, vadose-zone processes, environmental geology, groundwater-surface water interactions

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

Ai Ning Loh  
Ph.D. College of William and Mary  
Date Hired: Fall 2014  
Research Areas: Isotope and organic geochemistry of aquatic organic matter, fate and transport of carbon, nitrogen, and phosphorous in aquatic environments

Assistant Professors:  
Eman Ghoneim  
Ph.D. University of Southampton  
Date Hired: Fall 2010  
Research Areas: Remote sensing, geographic information systems, desert geomorphology, water resources, coastal hazards

Andrea D. Hawkes  
Ph. D. University of Pennsylvania  
Date Hired: Fall 2012  
Research Areas: Coastal geology, natural hazards, paleoenvironmental reconstructions, paleogeodesy, paleoceanography

Sharon Hoffmann  
Ph.D. Massachusetts Institute of Technology/Woods Hole Oceanographic Institution  
Date Hired: Fall 2013  
Research Areas: Radio and stable isotope geochemistry, oceanography and paleoceanography, paleoclimatology

Todd A. LaMaskin  
Ph.D., University of Oregon  
Date Hired: Fall 2011  
Research Areas: Stratigraphy, tectonics, basin analysis, geochronology
Chad Lane  
Ph.D. University of Tennessee  
Date Hired: Spring 2011  
Research Areas: stable isotope geochemistry, paleolimnology, paleoclimatology, palynology, biogeography

Scott Nooner  
Ph.D., University of California San Diego  
Date Hired: Summer 2012  
Research Areas: Marine and terrestrial geophysics, geodesy, crustal geodynamics

Narcisa G. Pricope  
Ph.D. University of Florida  
Date Hired: Fall 2013  
Research Areas: Land change science, geographic information systems, remote sensing, water resources, climate change.

6.2 Non-Tenure Track Faculty
Historically non-tenure track faculty have been hired by the department to teach University 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 are typically for a semester or academic year period.

In 2013, a candidate who had accepted a full-time, tenure track position in the department in the area of tectonic geomorphology, and was granted a one-year deferral, defaulted on his acceptance. This left the department in need of someone to cover GLY 101 (University Studies). Patricia Mason was hired as a full-time temporary replacement for the 2014-2015 academic year.

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.Sci. 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.

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 (www.uncw.edu/earsci).
7.0 Graduate Students

7.1 Student Profiles
From 2007 to Fall 2014, the graduate program in geology received 129 completed applications, of which 86 were accepted into the program (67% acceptance rate; Table 3). During that time, 70 students matriculated in the program, with ten (10) of these students choosing to follow the non-thesis option.

Table 3. Number of Completed Applications, Accepted Students, and Matriculated Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Applied</th>
<th>Accepted</th>
<th>Matriculated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>15</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>2008-2009</td>
<td>11</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>2009-2010</td>
<td>19</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>2010-2011</td>
<td>15</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>2011-2012</td>
<td>11</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2012-2013</td>
<td>16</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>2013-2014</td>
<td>23</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>2014 (Fall)</td>
<td>19</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Totals</td>
<td>129</td>
<td>86</td>
<td>70</td>
</tr>
</tbody>
</table>

Forty three (43) percent of the matriculating students were female (Table 4). The department has had some success attracting underrepresented minority applicants. Since 2007, the program has matriculated eight (8) minority students, representing 11% of the total. Over 67% of the matriculated students in the Master of Science in Geology (and now Geoscience) 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 Nepal, Egypt, and Jordan. The program has enrolled students from the following North Carolina undergraduate institutions: Western Carolina University, UNC Chapel Hill, North Carolina State University (NCSU) and UNCW, and from the following out-of-state universities: Ohio State University, Coastal Carolina University, Georgia Southern University, Eckerd College, 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 University of Arkansas.
Table 4. Graduate Student Residency, Program Option, Ethnicity and Gender

<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 Indian</th>
<th>Other*</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>7</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2008</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2009</td>
<td>7</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2010</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>0</td>
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<td>1</td>
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<td>2</td>
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<tr>
<td>2011</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>3</td>
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<td>2</td>
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<tr>
<td>2012</td>
<td>9</td>
<td>2</td>
<td>10</td>
<td>1</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2013</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>4</td>
<td>14</td>
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<td>0</td>
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<td>9</td>
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<tr>
<td>2014</td>
<td>6</td>
<td>6</td>
<td>11</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

* “Other” category is mainly international students who often list this classification rather than race (Source: UNCW Institutional Research).

The UNCW Graduate School and the Department of Geography and Geology requires that students seeking admission to the graduate program in geoscience must hold a bachelor’s degree from an accredited university or college (or its equivalent in a foreign institution based on a four-year program) in a discipline appropriate to advanced study in the geosciences. Students should have a strong overall academic record with a “B” average on the basic courses prerequisite to geoscience and satisfactory scores on the Graduate Record Examination. Upon entrance into the master’s program, the student’s advisor may identify deficiencies and recommend remedies. All deficiencies must be removed before a student is accepted as a candidate for the degree. 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 5 lists the average GRE scores each year for students matriculating in the geology M.S. program between 2007 and 2014 (Fall). Please note that the Education Testing Service (ETS) made a serious change in the scoring of the GRE for post-2013 applicants (see URL: http://www.ets.org/gre/institutions/scores/interpret). This resulted in a conversion chart that suggests that GRE score values pre-2013 were measured significantly differently than post-2013. In order to compare the pre 2013 GRE scores with the post 2013 GRE scores we have converted all scores to the pre-2013 scoring system. The average GRE scores from 2007 to Fall 2014 were: verbal (GRE-V): 508, quantitative (GRE-Q): 602, analytical writing (GRE-A) component: 3.9. The mean verbal GRE scores (508) for matriculated graduate students are in the 62-64 percentile, similar to the reported average score (510) for all students in the Earth, Atmosphere and Marine sciences that have taken the GRE (see the URL: https://www.ets.org/s/gre/pdf/gre_guide_table4.pdf). The mean quantitative GRE scores (602) are in the 44-49 percentile and are below the average score (690) for students in this field. The reported analytical writing GRE scores (3.9) are in the 50 percentile and are slightly higher than the mean reported score for similar students (3.8). In the last three years, we have seen an improvement in the GRE verbal and analytical writing score. This is viewed as a very positive
trend, as faculty feel that strong verbal/written skills are essential to the timely and successful completion of the master's degree.

Table 5. Mean GRE Scores for Matriculating Students

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>GRE-V</th>
<th>GRE-Q</th>
<th>GRE-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>8</td>
<td>570</td>
<td>522</td>
<td>3.8</td>
</tr>
<tr>
<td>2008-2009</td>
<td>3</td>
<td>497</td>
<td>537</td>
<td>3.7</td>
</tr>
<tr>
<td>2009-2010</td>
<td>9</td>
<td>450</td>
<td>537</td>
<td>3.8</td>
</tr>
<tr>
<td>2010-2011</td>
<td>4</td>
<td>457</td>
<td>578</td>
<td>4.0</td>
</tr>
<tr>
<td>2011-2012</td>
<td>6</td>
<td>527</td>
<td>588</td>
<td>4.3</td>
</tr>
<tr>
<td>2012-2013</td>
<td>11</td>
<td>520</td>
<td>670</td>
<td>3.6</td>
</tr>
<tr>
<td>2013-2014</td>
<td>17</td>
<td>490</td>
<td>670</td>
<td>3.7</td>
</tr>
<tr>
<td>2014 (Fall)</td>
<td>12</td>
<td>520</td>
<td>690</td>
<td>3.9</td>
</tr>
<tr>
<td>Total/Average</td>
<td>70</td>
<td>508</td>
<td>602</td>
<td>3.9</td>
</tr>
</tbody>
</table>

7.2 Recruitment Efforts

The master's in geoscience program recruits students through maintaining a current web site (URL: http://www.uncw.edu/msgeoscience/index.html), that includes separate pages with information and photographs of current students and 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 August 2014, a recruitment video addressing the MS Geoscience program was completed and uploaded to the web page. This video was part of the initiative by the Department to improve our visibility at the local and regional level and was supported by funding from the Graduate School to cover the costs. This effort appears to have modestly increased the traffic of prospective students, especially those students outside of the southeast Atlantic region and international, to our web site.

In addition, we rely on modified forms of recruiting that include the development of a new MS Geoscience brochure (Summer 2014) that addresses the changes in the graduate program. This brochure, funded in part by the Graduate School as part of the initiative to increase graduate school enrollment, is in both a glossy brochure and color PDF that can be either mailed or emailed to undergraduate geology departments at other southeastern colleges and universities, and to local environmental, engineering and geological firms. This new MS Geoscience brochure can now be update and revised more easily (in the PDF format) to address any future changes to department faculty membership or change in areas of research and investigation.

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 (sometimes with the help of the Graduate School) typically absorbs the fees associated with booth rental and advertising. In the last seven years we have recruited mainly at the southeastern sectional meetings and occasionally at the national Geological Society of America meeting (cost prohibitive in the last 3 years). At each meeting, a record of interested students is maintained (with email addresses), which the Graduate Coordinator uses as a contact list to
provide these potential students with further information on the MS Geoscience program. Since 2007, we have matriculated seven students who were recruited through these meetings. In addition, faculty and students who attend national (or other discipline) meetings post advertising flyers to aid our recruiting efforts.

7.3 Orientation
The Department of Geography and Geology has an 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, often in coordination with the Graduate School, 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 (currently under review and revision for AY 2014-2015) that is available on the departmental website (URL: http://www.uncw.edu/msgeoscience/current/handbook.html). 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. 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.

An additional orientation for all graduate students, which is also administered by the Graduate School, is held at the beginning of each fall and spring term. Important academic deadlines, scholarship and funding opportunities, health insurance, and new Graduate School policies that impact the students are discussed.

7.4 Advising
In the Department of Geography and Geology, each thesis-option graduate student has an individual graduate advisor who serves as the chair of the student's graduate advisory committee. Non-thesis option graduate students are initially advised by the Graduate Coordinator until a faculty adviser is determined (generally related to the direction of the non-thesis student area of investigation or internship). Normally, full-time students (e.g., GTA stipend funded) 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 or non-thesis project or internship and the design of the research/internship program. The graduate advisor also provides guidance during the research/internship project and critically edits the thesis/project 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, he or she must apply for a courtesy (generally 3-year appointment) 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 (obtained via SEANET database on the university server) 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. 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
Currently, the Department of Geography and Geology can award ten, 20hr/wk graduate teaching assistantships (GTA) each academic year ($11000). In AY 2011-2012, the GTA (per full time GTA) was raised by $1000. However, due to the requirement that ALL graduate students have health coverage (currently at ~$700/semester) and increases in graduate tuition rates, this increase has largely been made irrelevant.

These GTAs are provided by the university through the Graduate School and are awarded on a competitive basis. Approximately one or two students per year are funded on either 20 hr/wk ($11000) or 10hr/wk ($5500) research assistantships (RA) during the academic year. These assistantships are funded by individual faculty research grants. In addition, other funds (usually related to part-time university funds secured by the Department Chair) are sometimes available to provide partial support (5-10 hr/wk, $1375-$2750) either during the regular academic semester or during the summer months (e.g., field course or laboratory section GTA; Table 6). Additionally, some graduate assistantships (GA) are offered through various administrative units on campus ranging from 5 hr/wk to 20 hr/wk positions. Students not receiving support through the department can apply for the GA positions, which are awarded on a competitive basis.

“Out-of-state” tuition remissions (6 to 8 credit hours currently $8,951.60/each) are provided by the university and are awarded each year to qualified students in the department. These “out-of-
state” tuition waivers allow the student to be considered as an ‘in-state’ student for tuition payment purposes. Students may receive either a complete or partial out-of-state tuition remission. Currently, the department can award six (6) fully funded (6 to 8 credit hour/semester) awards.

Other tuition related funds are the New Scholar Award ($1000) that is also available to recruit highly qualified students. In addition, the department also has $9500 annually (from the Graduate School) to award scholarships to defray in-state tuition in fees.

For Fall 2014, 18 students receive some support in the form of a GTA or RA, eleven (11) have received some degree of out-of-state tuition remissions, and eight (8) 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 6. Graduate student support. GA=Graduate Assistant, RA-AY=Research Assistant academic year, RA-SU=Research Assistant summer

<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>2007-2008</td>
<td>21</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2008-2009</td>
<td>18</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2009-2010</td>
<td>18</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2010-2011</td>
<td>18</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>2011-2012</td>
<td>22</td>
<td>10</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2012-2013</td>
<td>24</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2013-2014</td>
<td>31</td>
<td>13</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2014 (Fall)</td>
<td>39</td>
<td>17</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

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 (< $500) 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. Up to five (5) 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 as well the laboratory preparation space between DeLoach Rooms 224 and 222. About 17 students use DeLoach 209 mainly to hold office hours. Several faculty in the Department also house graduate students in their offices in DeLoach Hall (due to lack of additional space). 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 2007 and 2014 was 93%. Of the five (5) students that left the program, four (4) left for personal/medical reasons, and the other requested a leave of absence and later withdrew from the program without completing the final manuscript. A total of 38 MS Geology (and now MS Geoscience) students graduated between 2007 and 2014 (Fall). The majority of the students elected the thesis option while five (5) students completed the non-thesis option. The time to degree for students who graduated between 2007 and 2014 ranged from 6 to 1.5 years. The median total time to degree was 3.2 years (Table 7). This median value is longer than the previous time to degree for 2001 to 2007 (2.75). In part this was due to the large number of retirements from 2008 to 2011. This resulted in the slowing of the completion of a number of graduate students who had to be shepherded through to completion by the Graduate Coordinator. The longer time to completion is also a result of students leaving UNCW for fulltime employment.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number Graduated</th>
<th>Median Time to Degree (yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2008-2009</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2009-2010</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>2010-2011</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>2011-2012</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2012-2013</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>2013-2014</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>2014 (Fall)</td>
<td>4</td>
<td>2.5</td>
</tr>
<tr>
<td>Total/Average</td>
<td>38</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Table 7. Median time to degree (2007-2014)

Of the 38 MS Geology (or Geoscience) students who completed their thesis, 23 of these students matriculated between Fall 2007 to Fall 2014. If we compare the data (Table 8) for these students compared to the total number who completed, there is a definite improvement of the time to degree data for this cohort. Therefore, the recent improvement in time-to-completion is a positive sign that the faculty and students are dedicated to successfully completing the program.
Table 8. Graduation Data – Time to Completion – For 23 MS Geology (or MS Geoscience) graduate students who matriculated between Fall 2007 to Fall 2014  

<table>
<thead>
<tr>
<th>Time to completion</th>
<th>Percentage/number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 semesters (or less)</td>
<td>39.1% (9 students)</td>
</tr>
<tr>
<td>5 semesters</td>
<td>17.4% (4 students)</td>
</tr>
<tr>
<td>6 semesters</td>
<td>17.4% (4 students)</td>
</tr>
<tr>
<td>7 semesters</td>
<td>8.7 % (2 students)</td>
</tr>
<tr>
<td>8 semesters</td>
<td>4.4 % (2 students)</td>
</tr>
<tr>
<td>10 semesters</td>
<td>4.4 % (1 student)</td>
</tr>
<tr>
<td>Mean: 5 semesters (2.5 years)</td>
<td></td>
</tr>
</tbody>
</table>

In addition the faculty and support staff of the MS Geology (now Geoscience) program also house and mentor MS Marine Science graduate students. In part this is due to the diversity of our graduate faculty. Although these students are funded through the Marine Science program, our program houses them, supervises their teaching or laboratory GTA and under GAG faculty thesis supervision. Since 2007, six (6) MS Marine Science graduates have completed their theses with time to completion results shown in Table 9.

Table 9. Graduation Data – Time to Completion – For MS Marine Science graduate students (under GAG faculty thesis supervision) who matriculated between Fall 2007 to Fall 2014  

<table>
<thead>
<tr>
<th>Time to completion</th>
<th>Percentage/number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 semesters (or less)</td>
<td>50.0 % (3 students)</td>
</tr>
<tr>
<td>5 semesters</td>
<td>16.7% (1 students)</td>
</tr>
<tr>
<td>7 semesters</td>
<td>33.3 % (2 students)</td>
</tr>
<tr>
<td>Mean: 4 semesters (2 years)</td>
<td></td>
</tr>
</tbody>
</table>
8. Affirmative Action

8.1 Efforts to Obtain Support
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 demographics of the faculty in the Department of Geography and Geology do not follow this national trend when it comes to gender. Currently the faculty are 50% male/female. 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. Our diversity of non-white population (faculty and students) is significantly lower than the national average. As of 2013 (Census.gov), 28% of the North Carolina population is non-white and 22% of the US population is non-white. At UNCW, 17% of the student body is non-white (http://www.uncw.edu/aboutuncw/aboutJustthefacts.html). In the MS in Geoscience, less than 10% of the population is non-white.

8.2 UNCW Equal Opportunity and Affirmative Action Policy
(http://uncw.edu/policies/documents/02230EOandAA.pdf; accessed 10/15/14; policy revised September 7, 2012; December 22, 2009; revised and reformatted July 8, 2005)
Source of Authority: 41 CFR 60; N.C. State Personnel Manual, Section 1
Responsible Offices: Human Resources, Provost, Dean of Students

I. Purpose
The University of North Carolina at 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 policy is established in accordance with 41 CFR Part 60 and is implemented in accordance with the following laws and their amendments: Title VII and Title IX of the Civil Rights Act of 1964; Executive Order 11246; the Age Discrimination Act of 1964; the Rehabilitation Act of 1973; the American with Disabilities Act of 1990; 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. UNC 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 should utilize the procedures available under the Code of Student Life, the SPA 02.230 UNCW EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION POLICY Page 2 of 2 Grievance and Appeal Procedures, the EPA Grievance and Appeal Procedures and the Faculty Grievance Procedures as appropriate. Harassment concerns and complaints must be filed in accordance with 02.210 Harassment Resolution Procedures. The existence of these internal procedures does not prohibit individuals from also filing claims externally with the U.S. 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, Ms. JoAnn McDowell, at (910) 962-3160, ADA Coordinator, Mr. David Todd, at (910) 962-4287, or the Title IX Coordinator, Dr. Terrence Curran, at (910) 962-3718.
9. Summary of Research and Scholarship

9.1 Introductory summary statement
The geography and geology faculty have an impressive record of research and scholarship. In the last seven years, faculty published more than 160 refereed articles, gave almost 450 presentations at regional, national, or international meetings, and received more than $8M in extramural funding. Individual accomplishments are available in the copies of the abbreviated curriculum vita appended to this document (Appendix A). Below is a summary of the accomplishments of faculty during the period under review.

9.2 Publishing, performances, or 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 authors or co-authors of 19 books, textbooks, laboratory and/or instructor manuals, 168 refereed publications, 449 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, Geological Society of America Bulletin, GSA Today, Geophysics Research Letters, Limnology and Oceanography, Water Resources Research, Journal of Geophysical Research, Geochemistry, Geophysics and Geosystems, Palaeogeography, Palaeoclimatology, Palaeoecology, Physical Geography, Geomorphology, Catena, 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 2007, 10 faculty members in the Department of Geography and Geology were principal investigator on 63 extramural grants worth $19,589,187 (Table 10). This represents nearly a two-fold increase in extramural funding from the last review cycle. The biggest programs in terms of funding include the National Science Foundation, NOAA/SECORA, USACE, and NC Sea Grant. 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. In the last seven years, geography and geology faculty received approximately $160,000 from in-house sources.
Table 10. Total Amount of New Grants Received (2007-2014)

<table>
<thead>
<tr>
<th>Academic Year</th>
<th># of new projects</th>
<th>Total Amount</th>
<th>Major Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>11</td>
<td>$2,203,865</td>
<td>NOAA; NSF</td>
</tr>
<tr>
<td>2008-2009</td>
<td>9</td>
<td>$2,379,941</td>
<td>NOAA; NSF; ECSU/USACE</td>
</tr>
<tr>
<td>2009-2010</td>
<td>10</td>
<td>$4,173,549</td>
<td>NSF; NOAA</td>
</tr>
<tr>
<td>2010-2011</td>
<td>11</td>
<td>$4,879,212</td>
<td>NSF; SC Sea Grant</td>
</tr>
<tr>
<td>2011-2012</td>
<td>7</td>
<td>$739,343</td>
<td>SEECORA; NC Sea Grant</td>
</tr>
<tr>
<td>2012-2013</td>
<td>10</td>
<td>$4,590,065</td>
<td>NSF; NOAA; USGS-EDMap</td>
</tr>
<tr>
<td>2013-2014</td>
<td>10</td>
<td>$623,212</td>
<td>NSF; NOAA</td>
</tr>
</tbody>
</table>

9.4 Presentations at refereed conferences

Since the fall of 2007, 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 449 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 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 American Association of Geographers 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. Geography and geology faculty made presentations at one or more of these 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 36 professional organizations. In the last seven years, geography and geology faculty convened or co-convened at least 10 technical sessions at professional meetings. Faculty also organized and led numerous field trips sponsored by organizations such as the Geological Society of America. Several faculty were chair and organizer or co-organizer of regional and national workshops, symposia and meetings including the Southeastern Section Meeting of the Geological Society of America.


In the last seven years, 13 faculty members served as members of National Science Foundation grant review panels. Numerous other faculty reviewed proposals for various agencies.

9.6 Honors and Awards

Over the past 7 years, faculty in the Department of Geography and Geology were recognized 22 times for their contributions to research and teaching both within and beyond the university. The faculty continued a long and distinguished record of teaching excellence including awards both at UNCW, in North Carolina, and on a National and International Level. For example, Drs. Gamble and Kelley were recognized for outstanding service to the profession. In November 2014, Dr. Kelley was awarded “U.S. Professor of the Year” by the Carnegie Foundation for the Advancement of Teaching (http://uncw.edu/articles/2014/11/kelley_us_professor_of_the_year.aspx).

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 also serve as judges for events such as the North Carolina Geography Bee, Ocean Science 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. Recently several faculty have also given invited presentations at local high schools. Given the lack of geoscience and geography curriculum we feel that these community engagement activities are vital for the development of our disciplines.
10. Goals and objectives: Strengths and weaknesses

10.1 Space Concerns
By far the most critical problem that needs to be addressed is the insufficient space to conduct research. Unlike the adequate research space that is available at the Center for Marine Science, there is not sufficient space in DeLoach to satisfy the current demand by faculty and students. It is common that students are found working in faculty offices because there are no other options available. It is against University policy to have students in faculty offices where they have access to records and potentially a conflict of interest when faculty meet with students to discuss grades and progress. The lack of sufficient space for students to conduct research is directly related to the extended time to completion of the MS degree. For example, the Advanced Microscopy Lab houses 5 professors and approximately 15 graduate students. There are three primary needs: 1) more shared research space for maps, rocks, mineral separation and other geological research, 2) shared research space for computer research such as GIS, MATLAB, Illustrator, statistics, and other specialized software as well as preparing presentations and printing posters, 3) quiet shared research space for writing and conducting other smaller group meetings. The renovation of the Social and Behavioral Sciences building may help, but the department has no control over relocation or allocation of space in DeLoach Hall.

10.2 Fractionated Department
Although the department of Geography and Geology is used to working this way, the faculty and students are divided among several different work spaces: DeLoach Hall, Center for Marine Science, Rock Lab and soon the renovated S&BS (STEM building). This severely limits interaction, leads to a breakdown of collegiality, severely limits the potential for collaboration, and pulls the Chair and Graduate Coordinator in different directions to deal with the people and spaces. There is also some concern that there is a growing division among the graduate students between the GIS Certificate Program and the MS in Geoscience. We need to pay close attention to the students and foster collegiality across all disciplines and among students at both the undergraduate and graduate levels. The recent addition of picnics and the GEO activities have helped to create a sense of community so we need to be sure to continue these activities. The faculty need to continue to set a good example for the students.

10.3 MS Student Funding
There is currently no in-state tuition waiver (NC Law) and a limited number of out-of-state tuition waivers, which makes tuition a larger burden on our graduate students in comparison to other universities outside of North Carolina. The TA stipend is extremely low, which makes it difficult to compete with other universities for potential new graduate students. New and increasing fees (e.g. parking and health insurance) result in higher costs and no complementary increase in student funding support. It is remarkable that given the low assistance the numbers of new students in the MS in Geoscience grew by 30% this year. We attribute the student population growth to several new faculty and programmatic changes to geoscience, which now includes geology, geospatial, and global change. Related to low MS student funding, the time to completion is more than 2 years because students leave to take jobs before they finish their degrees. Leaving campus dramatically lengthens the time to completion and increases the odds of not finishing the degree. University Diversity services must work harder with our department to increase the student diversity and funding to attract non-white students.
Although our department does a good job at securing external funding, these opportunities have decreased through the years and therefore Research Assistantship support for graduate students has also declined. There are several reasons for a decrease in external funding some of which include: 1) greater competition and less funding to support research; 2) faculty spend a greater amount of time conducting university service in comparison to the past, which decreases the time that is available to write grant proposals, 3) there is minimal support to develop proposals from the Sponsored Programs Office, which makes the proposal writing process even more difficult and time consuming, 4) managing an award is difficult given the current lack of administrative support, and 5) there is only 1 administrative support person in the department for 18 full-time faculty and there is a general lack of adequate support and communication from all related offices (e.g. purchasing, sponsored programs, travel, etc.), which places more burden on faculty to administer a grant. The result is many faculty feel disenfranchised after bad experiences and prefer to find alternatives to securing funding or not pursue external funding.

10.4 Programmatic Strengths and Weaknesses
The Department of Geography and Geology recently substantially changed the MS program and already we have seen a substantial increase in the numbers of students entering the program. However, there are still some issues that need to be resolved:

- We need to offer more graduate classes; however, the faculty workloads are over capacity and we don’t always have enough students to make the minimum enrollments. We need to think creatively to offer a breadth of topics, perhaps using 1-credit courses or block scheduling, in order to appeal to the students and also not further strain the faculty workloads. We need to pay close attention to balanced undergraduate and graduate focus of our teaching in order to provide excellent programs for all students.

- Our department is known for its use of applied and experiential learning; however, these types of courses are a financial burden. In order to continue this endeavor we need to get financial support from the university and matching funds from NGOs/donors/granting agencies. In the past we have requested help from the office of University Advancement, but it has not been fruitful so we would like to obtain more assistance from this office in order to generate donor funding.

- Although we are happy with the progress that has been made with the MS in Geoscience program, we need to further develop detailed guidelines to help the students progress in a timely manner. The program handbook and website need to be maintained on a regular basis, students need to regularly meet with their advisors, and the faculty need to be cognizant of the degree requirements. We have made substantial progress regarding the development and implementation of policies and procedures, but we need to continue this effort in order to make the program requirements as clear as possible.

10.5 Goals and Future Opportunities:
Although conference attendance is good we need to increase visibility of UNCW when we attend. This will require the university pay for booths and materials to be on display. Our faculty and students will gladly attend and help spread the virtues of our program if we can get some financial support to do so.
Our undergraduate geography internship program has existed for many years and has done a good job at placing students in the workforce. With the recent changes in the MS in Geoscience and the expansion of the non-thesis option we need to further develop internship opportunities at the graduate level.

UNCW and East Carolina University are working together to propose a new PhD in Marine Science (name is still being discussed) and the department of Geography and Geology is actively involved in this endeavor. We are leading the interaction and development of the proposed program and look forward to successfully starting this multi-institutional degree. The program is currently in the planning stages and the Proposal to Plan will be submitted to the UNC General Administration in 2015.

Although the department has a breadth of disciplinary expertise, there are disciplinary gaps across geology, geography, and oceanography. In geology, we currently have no expertise in volcanology/igneous petrology/high temperature geochemistry. We also expect to have two paleontology retirements in the near future, which will leave a large gap in the program. In oceanography, we have no marine geologist who works on samples derived from the modern ocean or sea-floor mapping. Sea floor mapping is also a technology that is needed in the Geospatial Technology program. In geography, we do not have a quantitative human geographer or a specialist in data visualization and web development.

Given the research growth of the program (we currently have 42 M.S. students), our goal for the next 5 years is to expand the program by increasing the student population by 10% and ultimately the largest we expect the program to be will be 54 students (3 students per 18 tenure-track faculty). We will continue to maintain an up-to-date, uniform, and modern web presence. We will attempt to increase our presence in the community via applied and experiential learning opportunities. Several years ago we developed an alumni chapter and we would like to reconnect with our alumni and further develop this relationship; however, given the burdens and challenges we already face, we hope other offices on and off-campus (e.g. alumni relations) can help foster this relationship. A first step would be an open invitation to department picnics. Other goals are to maintain department recruiting materials and staff a booth regularly at conferences.
Appendix A: Abbreviated CVs
CURRICULUM VITAE

MICHAEL M. BENEDETTI
UNCW Department of Geography & Geology
Email: benedettim@uncw.edu; Phone: 910/962-7650

EDUCATION
2000 Ph.D., Geography (Soil Science minor), University Of Wisconsin-Madison.
1993 M.S., Geography, University Of Wisconsin-Madison.
1991 A.B. (Honors), Geography, University Of Chicago.

APPOINTMENTS
2006-Present Associate Professor, Geography & Geology, University of North Carolina Wilmington.
2000-2006 Assistant Professor, Earth Sciences, University of North Carolina Wilmington.

SELECTED GRANTS AND AWARDS
2014 Research Grant Supplement, National Science Foundation, Research Experiences for Undergraduates. Sedimentological and geochemical approaches to site formation at the Middle-Upper Paleolithic boundary: Lapa do Picareiro, Portugal. $5,060.
2011-2014 Research Grant, National Science Foundation, Archaeology Program. Collaborative Research: Human Responses to Late Pleistocene Coastal Environmental Change in Portuguese Estremadura. BCS-1118183, $136,014.
2006-2012 Faculty Travel Awards, UNCW International Programs, Support for geoarchaeological field research in Portugal and Mozambique (2006-2014).

SELECTED PUBLICATIONS (* student co-author)

**SELECTED CONFERENCE PRESENTATIONS** (* student co-author*)


2009  Gray*, C.M., **Benedetti, M.M.**. Buried soils as stratigraphic marker horizons on the Cape Fear River floodplain, Bladen County, NC. Geological Society of America, Southeastern Section, Tampa FL.

**SELECTED TEACHING, ADVISING, AND SERVICE**

**Undergraduate Departmental Honors Students (Primary Advisor, B.A. Geography students)**

n.d.  Forrest Melvin, Site formation at the Middle-Upper Paleolithic boundary: Lapa do Picareiro, Portugal.

2011  Jessica Patrick, Sedimentology of the Óbidos lagoon, central Portugal.

2009  Carla Gray, Buried soils as stratigraphic marker horizons on the Cape Fear River floodplain, NC.

2007  Laura Neal, Streamflow response to tropical and extra-tropical storms on the Carolina Coastal Plain.

**Graduate Student Advising (Primary Advisor, M.S. Geology students)**

n.d.  Darryl Mott, Particle size analysis by laser diffraction: variations due to methodological treatments.

2011  John Hawkins Gagnon, Age and stratigraphy of the Smith Island complex, southeastern NC.

2008  Carolyn Gomes, Spatial distribution of subsurface soil horizons in New Hanover County, NC.

2004  Maverick Raber, Sediment transport to the Cape Fear River estuary, southeastern North Carolina.

**Service**

2008-2013  Advisory board, UNCW Center for Support of Undergraduate Research and Fellowships.

2010-2012  Departmental ambassador, UNCW Quality Enhancement Plan.

2000-2013  Supervisor, Soil & Sedimentology Laboratories, UNCW Geography & Geology.


2009  Session Moderator, North Carolina Undergraduate Research Symposium.

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

**Education:**
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, Earth Materials, Applied Physical Geology, General Petrology, Igneous and Metamorphic Petrology, Field Methods in Geosciences, Geologic Field Course, Principles of Tectonics, Mineralogy, Structural Geology, Senior Seminar, and Directed Individual Studies in Petrographic Analysis, Tectonics, Paleogeography, 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, Regional Geology of North America and Advanced Analysis of Earth Materials. **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-GMU Summer Geologic Field Course; Chair of the Assessment Committee; Member of the Geology Curriculum Committee, Graduate Faculty, Annual Evaluation, and the Graduate Program Advisory Committees; 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

**Affiliate Status**
Affiliate Faculty in the Department of Atmospheric, Oceanic, and Earth Sciences, George Mason University

**Research:**

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 Brandon Peach, UNCW, current.

**Advisor** to Morrow, Robert, "Lithodemic and structural analysis of the southern Inez 7.5-minute quadrangle, northeastern North Carolina Piedmont," UNCW.

**Advisor** to Rhodes, Daniel, "Lithodemic and structural analysis of the northeastern Lake Michie 7.5-minute quadrangle, northeastern North Carolina Piedmont," UNCW.


**Committee Member** for Shawn McGuire, UNCW, current

**Committee Member** for Wes Massoll, UNCW, current

**Committee Member** for Nick Moore, UNCW, current

**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

**Recent Honors and Grant Awards:**

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<th>Year</th>
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<tr>
<td>2013</td>
<td>NC Geological Survey Section STATEMAP Grant (UNCW-$7341.00)</td>
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<td>2012</td>
<td>USGS EDMAP Grant (UNCW-$31,718.00)</td>
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<td>2010</td>
<td>NC Geological Survey Section STATEMAP Grant (UNCW-$15,000.00)</td>
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<td>2009</td>
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<td>2007</td>
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<td>2006</td>
<td>Invited Member of the 2006 Geological Society of America Field Forum entitled “Tectonic Significance of Vertical Boundaries in the Cordillera,” McCall, Idaho</td>
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<td>2003</td>
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<td>2003</td>
<td>UNCW Faculty Research Reassignment, Spring Semester</td>
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<td>2000</td>
<td>NC Geological Survey Section STATEMAP Grant (UNCW-$3800.00)</td>
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**Recent Field Experience:**

- **May-June, 2014** Lead Instructor of the UNCW/GMU Summer Field Course in Virginia and New Mexico.
- **May-June, 2013** Lead Instructor of the UNCW/GMU Summer Field Course in Virginia and New Mexico.
- **May-June, 2012** Lead Instructor of the UNCW/GMU Summer Field Course in North Carolina, Virginia, and New Mexico.

May-June, 2011  Lead Instructor of the UNCW/GMU Summer Field Course in North Carolina, Virginia, and New Mexico.


May-June, 2010  Lead Instructor of the UNCW/GMU Summer Field Course in North Carolina, Virginia, and New Mexico.


May-June, 2009  Lead Instructor of the UNCW/GMU Summer Field Course in North Carolina, Virginia, and New Mexico.


May-June, 2008  Lead Instructor of the UNCW/GMU Summer Field Course in Virginia, North Carolina, and New Mexico.


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

**Published Books - Refereed**

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


**Blake, D.E. and Parnell, D.B., 2005a, Geologic map of the southeastern Townsville 7.5-minute quadrangle, Vance County, North Carolina: NCGS Open File Report, 1:24,000-scale map deliverable to the U.S. Geological Survey STATEMAP Project.**


Douglas W. Gamble

a. Education
Miami University International Studies BA 1989
University of Georgia Geography MA 1993
University of Georgia Geography PhD 1997

b. Appointments
2012-Present Professor, Department of Geography and Geology, UNC Wilmington
2000-Present Extended Faculty, Center for Marine Science, UNC Wilmington.
2006-2012 Associate Professor, Department of Geography and Geology, UNC Wilmington
2000-2006 Assistant Professor, Department of Earth Sciences, UNC Wilmington.
1997-2000 Assistant Professor, Department of Geosciences, Mississippi State University.
1991-1997 Teaching Assistant, Lab Coordinator, and Part-Time Instructor, Department of Geography, University of Georgia.
1995-1996 Part-Time Instructor, Department of Geography, Georgia State University.

c. Products

Products most closely related:

Other significant products:

d. Synergistic Activities

e. Collaborators & Other Affiliations
1. **Collaborators and Co-Editors in the last 48 months:**
   - Teddy Allen *University of Miami*,
   - David Barker *University of West Indies-Mona*,
   - Michael Benedetti *UNC Wilmington*,
   - Donovan Campbell *University of West Indies-Mona*,
   - Scott Curtis *East Carolina University*,
   - David Dodman *University of West Indies-Mona*,
   - Pascal Kindler *University of Geneva*,
   - Lynn L. Leonard *UNC Wilmington*,
   - Duncan McGregor *Royal Holloway University - London*,
   - John Mylroie *Mississippi State University*,
   - Darren Parnell *Salisbury University*,
   - Jeff Popke *East Carolina University*,
   - John Rodgers, *Mississippi State University*,
   - Neil Sealey *Bahamian Nature Conservancy*.
2. **Graduate Advisors**
   - Ikubolijah Logan (M.A. University of Georgia), Vern Meentemeyer (Ph.D. University of Georgia)
3. **Thesis Advisees**
   - Jessica Nester, MS Geosciences (in progress), Dept. of Geography and Geology, UNCW
   - Will Weiland, MS Geology 2012, Dept. of Geography and Geology, UNCW
   - Josh April, MS Geology 2012, Dept. of Geography and Geology, UNCW
   - Tim Metevelis, MS Marine Science 2010, Dept. of Geography and Geology, UNCW
   - Sarah Beth Jenkins, BA Geography (Honors Thesis) 2006, Dept. of Geography and Geology, UNCW
   - Michael A. Crump, MS Geology 2002, Dept. of Earth Sciences, UNCW
   - Marck Oduber, MS Geosciences 2000, Dept. of Geosciences, Mississippi State University
   - Kathy Sherman, MS Geosciences 1999, Dept. of Geosciences, Mississippi State University
   - Wayne Verno, MS Geosciences 1999, Dept. of Geosciences, Mississippi State University
CURRICULUM VITAE

Eman M. Ghoneim

UNCW Department of Geography & Geology
Email: ghoneime@uncw.edu;
Phone: 910 962-2795

EDUCATION:
Ph.D. 2002: Physical Geography, Faculty of Science, Southampton University, UK
Mphil. 1999: Physical Geography, Faculty of Science, Southampton University, UK
M.Sc. 1996: Geomorphology, Geography Department, Tanta University, Egypt
B.A. 1990: Geography (Honors), Tanta University, Egypt

APPOINTMENTS:
2010 – Present: Assistant Professor, Geography and Geology, University of North Caroline Wilmington, USA
2007 - 2014: Associate Professor, Geography, Tanta University, Egypt
2007 - 2010: Research Assistant Professor, Center for Remote Sensing, Boston University, USA
2003 - 2006: Research Associate, Center for Remote Sensing, Boston University, USA
1997 - 2002: Ph.D. postgraduate, Southampton University, UK
1996 - 1997: Assistant Lecturer of Geography, Tanta University, Egypt
1990 - 1995: Demonstrator of Geography, Tanta University, Egypt

PEER-REVIEWED PUBLICATIONS (* student co-author):


**CONFERENCE PROCEEDINGS AND ABSTRACTS:**


Abubakr, M., El-Baz, F., Geriеш, H., Gabr, S., Ghoneim, E., Zeineldin, M., Zeid, S. Paleo-channel delineation as an indication of groundwater accumulation in northern Sinai, Egypt.


**RESEARCH GRANTS AND CONTRACTS:**

2015 - 2016: Exploring the link between drought and air quality in Saudi Arabia using space data and ground observations. *KAU, Kingdom of Saudi Arabia fund* (Ghoneim, PI). ($15,000)


Charles L. Cahill Award, UNCW Graduate School. Implementation of remote sensing, GIS and field techniques in support of advanced surface and subsurface mapping of Fort Anderson State Historic Site (Ghoneim, PI). ($3,000).

2013: Professional consulting, contract Adelphi, Berlin, Germany. Assessment and mapping of climate change vulnerability in the water sector in MENA region. (Ghoneim, PI) ($21,000).

2012: Charles L. Cahill Award, UNCW Graduate School. Using Spatial Analysis Technology to Assess Coastline Change and Impact of Sea Level Rise on Nile Delta Rosetta Promontory (Ghoneim, PI). ($2,800).

2011: North Carolina Coastal Homeowner Perceptions and Attitudes about Climate Change and Sea Level Rise. North Carolina Sea Grant (Ghoneim: CoPI). ($8,000).

Evaluate Hurricane Ike Building Failures. North Carolina Sea Grant (Ghoneim: *Supporting*) ($33,046).

2009: A Remote Sensing investigation of Some Impacts of Global Warming on the Arab Region, AFED. (Ghoneim, PI) ($10,000).

2005 - 2008: Influence of structures on drainage patterns in the Tushka region, southwest Egypt. NSF grant # OISE-0513379 (*Junior Scientist*). ($60,000).

2004 - 2009: Technical support of the Techno Park, Dubai, Unites Arab Emirates (Ghoneim, CoPI). ($147,000).

**SELECTED TEACHING, ADVISING, AND SERVICE**

**Graduate Student Advising (Primary Advisor)**

- M.S. (Geoscience). Jehan Mashaly Baggarley: Assessment of Flash flood in the eastern desert of Egypt using space data and hydrological modeling (completed in 2014)
- M.S. (Geoscience). Alina Jakubcanin: Integration of remote sensing and GIS for drought monitoring in Tunisia. (In progress)
- M.S. (Geoscience). Caroline Narron: Monitoring wetland change along the coastal area of Abu Dhabi, UAE using space technology and GIS modeling. (In progress)
- M.S. (Geoscience – Non-Thesis). Wesley Cartner: (In progress)
- M.S. (Geoscience – Non-Thesis). Karl Mohr: (In progress)

**Service**

- Director of the Remote Sensing Research Lab (RSRL): Geography and Geology, UNCW.
- Lead Scientist: 1001 Wells for Darfur project. This initiative is mainly to solve the humanitarian crisis in Darfur by using space date and GIS technology to locate potential sites for groundwater exploration.
- **Editorial board member:** The Scientific Committee of the iWISE2014 conference (“International Conference on Water, Informatics, Sustainability and Environment, Canada) Jan – Aug, 2014. (Received a Certificate of Appreciation from the conference organizers).

- **Program Coordinator:** Provide professional training/research in RS and GIS to an international scholar (from the Libyan National Oil Cooperation) at the Remote Sensing Research Laboratory (RSRL), Department of Geography and Geology, UNCW. (Duration: one year, 2012 – 2013).

**NEWS CITATIONS:**

2015: Channel-1 TV broadcast: Latest discoveries using Remote Sensing technology in Egypt. January 7th, [http://m.youtube.com/watch?v=k3vxH2YUYRc](http://m.youtube.com/watch?v=k3vxH2YUYRc)

2015: Ghoneim achievements will appear in Al-Hayat newspaper- Lebanon, and in a chapter in a book entitled “Arabic scientists achievements in America and Canada” by Dr. Masoud Dhaher, in 2015. (In Arabic)


2011: Al-Masry Al-Youm, Egyptian daily newspaper (In Arabic): “Al-Masry Al-Youm reveals the source of the Western Desert River and provides detailed map of its ancient waterway”. (Article states that this is a significant discovery by US-Egyptian professor at UNCW. The Egyptian Minster of Agriculture commented positively on this article. June 20th.

2011: Arabic Finance (In Arabic): “The detection of two new oil and gas fields near the discovered Western Desert River”. (The article stated that the discovery of the two fields confirm Ghoneim’s research outcomes). August 7th.


2009: Wikipedia, the free encyclopedia “Eman Ghoneim”.


JOANNE N. HALLS  
Associate Professor of Geography  
UNC Wilmington Department of Geography & Geology

### Professional Preparation
Champlain Regional College, Lennoxville, Quebec  
- Social Sciences Diplome Education du College, May 1982

University of Denver, Denver, Colorado  
- Geography BA, May 1985

University of South Carolina, Columbia, SC  
- Geography MS, May 1990

University of South Carolina, Columbia, SC  
- Geography Ph.D., May 1996

### Appointments
- **2013 - present**  
  Website manager: [www.uncw.edu/gis](http://www.uncw.edu/gis)

- **2010 – present**  
  Coordinator, graduate Certificate in Geographic Information Science

- **2005 – present**  
  Associate Professor of Geography, Director, Spatial Analysis Lab, UNCW Campus GIS Coordinator

- **1999 – 2005**  
  Assistant Professor of Geography, Director, Spatial Analysis Lab, 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

- **1986-1988**  
  GIS Specialist, Advanced Sciences, Inc., Denver, Colorado

- **1985-1986**  
  Remote Sensing and GIS Technician, Advanced Sciences, Inc., Denver, Colorado

- **1984-1984**  
  Geological Assistant, Century Oil & Gas Corporation, Englewood, Colorado

### Recent Peer-Reviewed Journal Articles and Book Chapters (*students*)


Zavalaga, Carlos B.*, Giacomo Dell’Omo, Joanne N. Halls, and Scott A. Taylor, 2009, At-Sea Movement Patterns and Diving Behavior of Peruvian Boobies Sula Variegata in Northern Peru, *Marine Ecology Progress Series*


Recent (2011-present) Conference Papers, Presentations, and Posters
Halls, Joanne N. and Matthew McCarthy*, 2012, An Integration of Satellite Imagery and LiDAR for Characterizing Change on a Barrier Island: An Example from Coastal North Carolina, SEDAAG Annual conference, Asheville, NC.

Synergistic Activities
Advising undergraduate students in the Applied Option of the BA in Geography
Manage curriculum and advise students in the minor in Geospatial Technologies
Advising graduate students in Geoscience (formally Geology) and Marine Science masters programs

Graduate Students (Thesis Advisor, last 10 years)
Ms. Alyssa Randall, MS in Geoscience (2013-present),
Ms. Kaitlyn Costin, MS in Marine Science (2012-present), Tidal Creek Habitat Mapping and Assessment of WorldView-2 Imagery for Deriving Bathymetry and Estuarine Habitats.
Mr. Timothy Moss, MS in Marine Science (2011-present), Investigation of Topographic Change on Masonboro Island Using LiDAR.
Mr. Aaron Caldwell, MS CIS (2013), Development of Web-GIS for Data Distribution and Visualization.
Mr. Matthew McCarthy, MS in Marine Science (2013) Using Spatial Analysis Technology to Assess habitat Change on North Carolina Barrier Islands.
Ms. 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.
Ms. Brooke Landry, MS Marine Science (2005), Decadal Scale Changes in the Abundance and Distribution of Macroalgae in Florida Bay.

Total number of graduate students advised (1999 – present): 23
Curriculum Vitae - Andrea D. Hawkes

Department of Geography and Geology
University of North Carolina Wilmington
Wilmington, NC 28403
Tel: (901) 962-2350
Fax: (901) 962-7077
hawkesa@uncw.edu

Professional Preparation
2004 - 2008: PhD Earth and Environmental Science University of Pennsylvania, USA
Advisors: Benjamin P. Horton, Alan R. Nelson
2002 – 2004: MSc Earth and Environmental Science Dalhousie University, Canada
Advisor: David B. Scott
1996 - 2001: BSc Geology Dalhousie University, Canada

Appointments
Aug 2012 – Present Assistant Professor, Department of Geography and Geology, University of North Carolina Wilmington, USA.
May 2010 – Aug 2012 Postdoctoral Investigator, Geology and Geophysics Department, Woods Hole Oceanographic Institute, USA.
Sept 2008 – May 2010 Postdoctoral Scholar, Geology and Geophysics Department, Woods Hole Oceanographic Institute, USA.

Selected Funding
- Centre for Marine Science Pilot Project Grant, 2014. Is the Cape Fear region really an Atlantic coast sea-level anomaly?; UNCW CMS $20,000; 2014-2015
- Enhancing Undergraduate Research Award, UNCW College of Arts & Sciences (Mike Benedetti and Andrea Hawkes, PIs), 2013. International Field and Laboratory Research: Coastal Sedimentology, Tectonics, and Geoarchaeology of the Central Portuguese Coast. $9,497.
- University of North Carolina Wilmington - College of Arts and Science Equipment Grant; $15,000; 2013
- Tracking Sea Level Source Contributions: A Hemispheric Approach to High Resolution Sea-Level Variations Over the Last Two Millennia; Co-PI with Donnelly (now subaward); NSF $252,601; 2012-2015

Awards and Fellowships
2008-2010 Postdoctoral Scholar Woods Hole Oceanographic Inst.
2007-2008 Dean’s Fellowship University of Pennsylvania
2004-2007 Benjamin Franklin Fellowship University of Pennsylvania
2004-2005 Henry Lewis Endowment Fund University of Pennsylvania

Selected Publications
Selected Co-Author Publications

Recent Selected Conference Presentations

Synergistic Activities
Graduate students: Courtney Pierce, Jaimie Little, and Paulina Capar (primary advisor UNCW); Joanna Peth, Wes Massoll, Jonathan Whitley (committee member UNCW).
Undergraduate students: Haley Kachmarik (primary honors advisor UNCW); Kristin Heidenreich, Steven Tanaka (honors committee member UNCW); Megan Davis, Kyle McDermott, Jin-Si Over (undergrad lab researchers UNCW)
Courses Taught: Advanced Oceanography; Beaches and Coasts; Introduction to Oceanography, Micropaleontology (UNCW).
Session chair: Paleotempestology, GSA Annual Meeting 2012; Paleogeodesy at subduction zones, GSA Annual Meeting 2009

Collaborators: Drs Jeff Donnelly, Andrew Ashton, Liviu Giosan, Joan Bernhard (WHOI); Prof. Horton (Rutgers); Prof Engellart (URI); Prof Kemp (Tufts); Drs Brian Atwater, Alan Nelson, Jeff Williams, Bruce Jaffe, Rob Witter (USGS); Prof. Culver (ECU); Dr Yuki Sawai (Geological Survey of Japan); Prof. Kelsey (Humboldt State University); Drs Switzer and Rubin (Eos); Prof. John Compton (Univ. of Cape Town); Drs Eduardo Gomez, Paula Pratolongo (Argentina Institute of Oceanography); Indonesia Institute of Science (LIPI).
EDUCATION

- Ph.D. in Hydrology, 2001, University of Arizona
- M.S. in Civil Engineering, 1995, University of New Mexico
- B.S. in Civil Engineering, 1993, University of New Mexico

APPOINTMENTS

- Associate Professor, Geography and Geology, University of North Carolina Wilmington, 2007-Present.
- Assistant Professor, Earth Sciences, University of North Carolina Wilmington, 2002-2007.
- Research Associate, Armstrong Laboratory, Tyndall Air Force Base, FL, Summer 1996.
- Research Assistant, Civil Engineering, University of New Mexico, 1994-1995.

PUBLICATIONS AND PRESENTATIONS

Refereed Publications  (* denotes student as co-author)


**Professional Presentations** (* denotes student as co-author)


Henry, E.J. Invited lecture: Coupled Flow and Transport During Surfactant Infiltration Into the Vadose Zone, Department of Civil, Construction, and Environmental Engineering, NCSU, April 22, 2008, Raleigh, NC.


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


AWARDS
- Discere Aude Award for excellence in undergraduate student mentoring, UNCW, 2009.
- Outstanding Manuscript Review Award for 2005 by the Vadose Zone Journal (awarded in 2006).
- Received commendation from the journals Ground Water (2006) and Ground Water Monitoring and Remediation (2004) for manuscript review efforts
- 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

GRANTS AWARDED
- Sources and Impacts of stormwater inputs to an urbanized tidal creek: Bradley Creek, New Hanover County, NC, UNCW Cahill Research award, $2170, 2012.
• Computer modeling of a previously unknown mechanism of surfactant-enhanced contaminant transport, UNCW Summer Research Initiative Grant, $3500, 2008.
• Faculty International Travel Grant, UNCW Office of International Programs, ~$850, June 2007
• Software grant, GAEA Technologies, $10,495, August 2006
• Computer simulations of contaminant transport in heterogeneous geologic media, UNCW Summer Research Initiative Grant, $3000, Summer 2004
• Educational Support Grant, Friends of UNCW, $1000, Spring 2002

GRANTS APPLIED FOR BUT NOT AWARDED
• Groundwater Fluxes of Trace Metals and Nutrients to Two Tidal Creeks, Wilmington, NC, North Carolina Sea Grant, $69624. Co-PI w/ S. Skrabal (UNCW), 2009.
• Physical and geochemical exchange between groundwater and tidal creeks, New Hanover County, North Carolina, North Carolina Water Resources Research Institute, $49731. Co-PI w/ S. Skrabal (UNCW), 2009.
• Sources and impacts of stormwater inputs to an urbanized tidal creek: Bradley Creek, New Hanover County, NC, UNCW Cahill Grant, $3000. PI, 2010.
• Relating Nitrogen fluxes to land use in a multiple land-use watershed, Atlantic Coastal Plain, USA, USDA, $472,572. Co-PI with T. Callahan (Coll. of Charleston) and D. Amatya (USFS), 2005.
• Development of hydrologically based soil/site evaluation protocol for designing on-site wastewater management systems, Pre-proposal to EPA, $199,866. Co-PI with A. Amoozegar and D. Lindbo (NCSU), 2005.
• Relating Nitrogen Fluxes to Land Use at the Catchment-Scale in a Multiple Land-Use Watershed, US Atlantic Coastal Plain, USDA, $499,929. Co-PI with T. Callahan (Coll. of Charleston), D. Amatya (USFS), C. Trettin (USFS), and M. Miwa (Int'l Paper), 2004.
Sharon S. Hoffmann
Assistant Professor
Department of Geography and Geology
University of North Carolina – Wilmington
hoffmanns@uncw.edu (910) 962-2072

Education
Ph.D., Marine Geology, degree awarded February 2009.
Massachusetts Institute of Technology/Woods Hole Oceanographic Institution Joint Program in Oceanography
Thesis title: Uranium-Series Radionuclide Records of Paleoeceanographic and Sedimentary Changes in the Arctic Ocean
Thesis advisor: Jerry F. McManus.

B.A., 1999, Geological Sciences and English (double major)
Columbia College, Columbia University (summa cum laude)

Research Experience
University of North Carolina – Wilmington, Wilmington, NC
Assistant Professor, Department of Geography and Geology, beginning August 2013.
Research interests include Arctic/Atlantic deep water exchange, Labrador Sea deep water formation and circulation, speleothem records of tropical climate change, and deep Atlantic circulation as recorded by Carolina Slope sediments.

Lamont-Doherty Earth Observatory of Columbia University, Palisades, NY
Postdoctoral Research Fellow / Columbia Science Fellow, August 2010-present
Research interests include high North Atlantic and Labrador Sea records of ocean circulation using U-series nuclides and stable isotope proxies, and Holocene ENSO variability from speleothem data. Co-PI on NSF-funded project, "Western Equatorial Pacific Rainfall During the Holocene: New Interannual records from High Resolution Borneo Stalagmites."

University of Michigan, Ann Arbor, MI
Postdoctoral Research Fellow, October 2008-July 2010
Research interests include export, burial, and distribution of U-series nuclides in the Arctic Ocean and high North Atlantic, ENSO variability as seen in high-frequency speleothem sampling in the Western Pacific Warm Pool, Pacific oceanic circulation.

Woods Hole Oceanographic Institution, Woods Hole, MA
Graduate Student, June 2002-September 2008
Thesis describes changes in U-series radionuclide deposition in sediments of the Arctic Ocean during the late glacial, deglacial, and Holocene periods, and their importance for understanding sedimentation and water column processes. Techniques used include sediment digestion, ion-exchange chromatography, inductively-coupled plasma mass spectrometry, stable isotope analysis of oxygen and carbon, simple 1-dimensional modeling.

Lamont-Doherty Earth Observatory, Palisades, NY
Senior Research Assistant, November 1998 – June 2002
Assisted with research on North Atlantic millennial-scale climate change in the Holocene and glacial periods. Processed deep sea core samples, identified and picked foraminifera for isotopic, radiocarbon and species assemblage studies, used Geotek multi-sensor core logger.

Teaching Experience
2013-present Assistant Professor, University of North Carolina Wilmington. Teach introductory and advanced oceanography.
2010-2013 Columbia Science Fellow, Columbia University, C1100 Frontiers of Science. Seminar leader for two sections of required freshman core curriculum course teaching scientific thinking skills. Develop and present activities, homeworks and exams on various scientific topics including astronomy, neuroscience, climate science, volcanoes, quantum physics, and biodiversity.
2012-Present  Online instructor/course scientist, American Museum of Natural History, Seminars on Science “Climate Change” online course for educators. Engage students in online discussion of course topics, present research and interact with students at in-person sessions at the Museum.

2007 Guest Lecturer, Boston College, GE530 Marine Geology. Planned, prepared and delivered four lectures for undergraduate-level course on marine geology, developed and graded homework assignments and exam questions.


Grants, Awards and Honors
2011-2013 National Science Foundation grant to Columbia Univ. and the Univ. of Michigan, “Collaborative Research: Western Equatorial Pacific rainfall during the Holocene: New interannual records from high resolution Borneo stalagmites.” Co-PI with D. Lund (UM) and J. McManus (CU).

2004-2005 Schlanger Ocean Drilling Fellowship
2002-2003 MIT Presidential Fellowship
1999 Phi Beta Kappa
1995-1999 Rabi Scholars Program (undergraduate research fellowship)
1995-1999 National Merit Scholarship

Service
2012 Volunteer, World Science Festival, led geology tours of Brooklyn Bridge Park
2009,2010 Volunteer science judge, National Ocean Sciences Bowl
2007 Participant in Falmouth Kids Global Climate Change Institute, a K-12 educational project
2004-2005 Joint Program Student Representative; organized informal student lecture series, organized visit of 2005 WHOI Steinbach Scholar, member of WHOI Educational Council

Field Experience
2005 International Arctic Research Center Summer School: Climate Change in the Arctic Ocean
   Held shipboard during the 2005 Nansen and Amundsen Basins Observation System research cruise to the Laptev Sea, aboard Russian icebreaker Kapitan Dranitsyn. Assisted with water sample processing, in situ filtering, cell culturing, enzyme activity analyses.
2002 Shipboard scientific party, USCGC Healy cruise 02-02, investigating water-column and sedimentary nitrate budgets in the Bering Sea. Assisted with coring, oxygen microprobe profiles, sampling, oxygen titration.

Publications
Papers in Preparation
Hoffmann, S.S., D.C. Lund et al., Holocene precipitation trends from a fast-growing Borneo speleothem, in prep for Quaternary Science Reviews.
Hoffmann, S.S., J.F. McManus et al., Catastrophic sediment redistribution following deglacial Arctic ice breakup and sea level rise, in prep. for Geology.
Hoffmann, S.S., J.F. McManus et al., Glacial, deglacial, and Holocene sedimentation in the Arctic from \(^{230}\text{Th}\) \text{–normalized sediment fluxes, in prep. for Geochimica et Cosmochimica Acta.}

Abstracts
Hoffmann, S.S., McDermott, K.J., McManus, J.F., Mukasa, S.B., \(^{231}\text{Pa}/^{230}\text{Th}\) records of Arctic/Atlantic interchange in Fram Strait. Abstract PP21B-1324, presented at the American Geophysical Union 2014 Fall Meeting.
Hoffmann, S.S. and J.F. McManus, The 8200 year event in intermediate water circulation at the Carolina Slope from sedimentary \(^{231}\text{Pa}/^{230}\text{Th}\). Abstract PP51A-2107 presented at the American Geophysical Union 2012 Fall Meeting.

Professional Memberships
American Geophysical Union
Geochemical Society
PATRICIA H. KELLEY
Professor, Department of Geography & Geology
University of North Carolina Wilmington

Education
1975  BA, Geology  College of Wooster, Wooster, OH
1977  AM, Geology  Harvard University, Cambridge, MA
1979  PhD, Geology  Harvard University, Cambridge, MA

Professional Experience
1979  Instructor  New England College, Henniker, NH
1979-1990  Asst. – Full Professor  University of Mississippi, University, MS
1990-1992  Program Director  National Science Foundation, Washington, D.C.
1992-1997  Chair, Dept Geol & GE  University of North Dakota, Grand Forks, ND
1992-2003  Chair, Dept Earth Sci.  University of North Carolina Wilmington, Wilmington, NC
2003-2014  Professor of Geology  University of North Carolina Wilmington, Wilmington, NC

Courses Taught (past five years)
GLY 132 The Earth Through Time
GLY 135 Prehistoric Life
GLY 337 Invertebrate Paleontology
GLY 502 Technical Communication in Geology
GLY 510 Sedimentary Environments
GLY 533 Paleocology
GLY 535 Stratigraphic Paleontology
HON 120 The Shaping of Darwin: Geology and Biology of the Galapagos
HON 120 Behavior of Animals – Dead and Alive
HON 120 Finding Your Inner Fish
HON 210 Evolution and Creation: Conflicting or Compatible?

Theses advised (past five years)
• PhD dissertation completed: Visaggi
• MS Completed: White, Burzynski, Gould, Friend, Korpanty, Kerr
• MS in progress: Stanford, Sime, Cronin, Cooke, Kelly, Neely (currently on 3 additional committees)
• Senior honors thesis completed: Hattori (currently on 1 additional committee)

Awards (while at UNCW)
2003  Outstanding Educator Award  Association for Women Geoscientists
2005  Distinguished Faculty Scholar Award  UNCW
2011  Professional Excellence Award  Association for Women Geoscientists
2012  Chancellor’s Teaching Excellence Award  UNCW
2013  Discere Aude Award  UNCW
2013  Distinguished Teaching Professorship  UNCW
2013  Board of Trustees Teaching Excellence Award  UNCW
2014  Board of Governors Award for Teaching Excellence  University of North Carolina System
2014  J. Marshall Crews Distinguished Faculty Award  UNCW
2014  U.S. Professor of the Year (Master’s Universities)  Council for Advancement & Support of Education
        and Carnegie Foundation

Recent Publications (past five years, of 56 total refereed publications)
        University Press, 400 p.


Recent Presentations (of 212 total published abstracts; 4 additional in press)


External Grants (while at UNCW)
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; $23,672 supplement through 1/31/03.
National Science Foundation, “RET Supplement to REU Site: Research Experiences for Undergraduates in Biodiversity Conservation,” -- $9,908, 2010-2013

Internal Grants (past 5 years)
UNCW Award to Host Visiting Darwin Scholar: $6500 to host Niles Eldredge, $3800 to Host Eugenie Scott, $3800 to host Kevin Padian; 2008-2009
UNCW Quality Enhancement Plan award to develop Pilot Project, “Experience Research: Enhancing the CSURF Program to Promote Engagement in Research as Applied Learning,” (with Bruce, Atwill, and Borrett) – $1500, 2011
UNCW Quality Enhancement Plan eTEAL-Supported Pedagogy Initiative for GLY 337 Invertebrate Paleontology course - $1500

UNCW service in past five years (of 65 UNCW committees in 17 years)
- Geography & Geology Post-Tenure Review Committee, 2009-11, 2012-13
- Geography & Geology Curriculum Committee, 2008-2009, 2012-2013
- Geography & Geology Recruitment/Public Relations Committee, 2008-2009
- Geography & Geology Seminar Speaker Committee, 2009-2010
- UNCW Faculty Professional Relations Committee, 2009-2012
- Geography & Geology Outreach Committee, 2010-2011
- Sedimentary Geology Search Committee, 2010-2011
- UNCW Quality Enhancement Plan Finalist Team, 2011-2013
- Chair, Geography & Geology PR & Student Incentives Committee, 2011-
- Geology Curriculum Committee, 2011-
- College of Arts & Sciences Faculty Research Award Comm., 2011-2012
- Geophysics Search Committee, 2011-2012
- Chair, Landscape Dynamics Search Committee, 2012-2013
- CAS Chancellor’s Teaching Excellence Award Committee, 2013
- Chair, Geography & Geology Facilities Improvement Committee, 2013-2014
- Honors College Associate Director Search Committee, 2013-2014
- UNCW Distinguished Teaching Professorship Committee, 2014
- Chair, Geology Lecturer Search Committee, 2014
- UNCW Post-Tenure Review Policy Revision Committee, 2014
• Geography & Geology Public Relations Committee, 2014-2015
• Geography & Geology Classroom Visitation Committee, 2014-2015
• UNCW Board of Governors Teaching Award Selection Committee, 2014-2015

Service to profession (past five years, of 56 total leadership or committee positions)
• National Association of Geoscience Teachers Distinguished Speaker, 2006-2009
• Paleontological Society Distinguished Lecturer, 2006-2013
• Geological Society of America Teaching Earth Sciences Policy Statement Revision Panel, 2009-2011
• Leader, Workshop on Grant Opportunities (NSF and Others) for Early Career Paleontologists, Geological Society of America meeting, Portland, OR, October 18, 2009
• Breakout Group secretary and reporter, NSF workshop for REU-BIO program directors, March 19, 2010
• Organizing Committee, Annual Meeting of Southeastern Section of Geological Society of America, 2010-2011 (student volunteer coordinator)
• Paleontological Society Distinguished Lecturer on Evolution and Society, 2013-
• Geological Society of America 125th Anniversary Committee Publications Subcommittee, 2010-2011
• Organizer and Convener, Topical Session, “Macropaleontology of the U.S. Coastal Plain,” Southeastern Section of the Geological Society of America meeting, Wilmington, NC, March 25, 2011
• Field Trip Organizer and Leader, Field Trip 401 – Plio-Pleistocene Stratigraphy and Paleontology of Southeastern North Carolina, Southeastern Section of the Geological Society of America meeting, March 26, 2011
• National Science Foundation Surface Earth Processes Section Committee of Visitors, Chair of Sedimentary Geology and Paleobiology Sub-Group, June 2011
• Steering committee, National Science Foundation GEO Directorate Research Experiences for Undergraduates Principal Investigators meeting, 2011-2012
• National Evolutionary Synthesis Center Advisory Board, 2012-
• National Center for Science Education Advisory Council, 2012-
• Paleontological Society Fellows Committee, 2012-
• Paleontological Society Pojeta Award Committee, 2013-
• Organizer and Convener, Topical Session, “Teaching Evolution in the Southeast,” Southeastern Section of the Geological Society of America meeting, Chattanooga, TN, March 20, 2015

Offices in professional organizations (while at UNCW)
• President-Elect, Paleontological Society, 1998-2000
• President, Paleontological Society, 2000-2002
• Past-President, Paleontological Society, 2002-2004
• Associate Editor, Palaios, 2002-present
• Board of Trustees, Paleontological Research Institution, 2003-present
• First Vice President, Board of Trustees, Paleontological Research Institution, 2003-2004
• President, Board of Trustees, Paleontological Research Institution, 2004-2006
• Past-President and member of Executive Committee, Paleontological Research Institution, 2006-2008
• President, UNCW chapter of Sigma Xi, 2006-2007
Curriculum Vitae

Todd A. LaMaskin
Assistant Professor

Education

<table>
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<th>Institution</th>
<th>Concentration</th>
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<tr>
<td>University of Oregon</td>
<td>Geological Sciences</td>
<td>2003–2009</td>
<td>Ph.D.</td>
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<td>Radford University</td>
<td>Geology</td>
<td>1988–1992</td>
<td>B.S.</td>
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Professional History

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<th>Position/Rank</th>
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<th>Dates</th>
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<tr>
<td>Assistant Professor</td>
<td>University of North Carolina Wilmington</td>
<td>2011–present</td>
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<tr>
<td>Assistant Professor</td>
<td>University of Wisconsin-Extension</td>
<td>2010–2011</td>
</tr>
<tr>
<td>Principal Geologist</td>
<td>URS Corporation</td>
<td>2000–2010</td>
</tr>
<tr>
<td>Instructor</td>
<td>Lane Community College</td>
<td>2008–2009</td>
</tr>
</tbody>
</table>

Refereed Publications. *Indicates Student Author


Curriculum Vitae

Todd A. LaMaskin

Department of Geography and Geology
University of North Carolina Wilmington


Published Abstracts. *Indicates Student Author


Curriculum Vitae

Todd A. LaMaskin
Department of Geography and Geology
University of North Carolina Wilmington

(28) **LaMaskin, T.A.**, 2013, Reassessing terrane boundaries in the Blue Mountains Province of eastern Oregon using detrital zircon U-Pb ages (abstr.): Geological Society of America Abstracts with Programs, Vol. 45, No. 6, p.67.


(24) **LaMaskin, T.A.**, 2011, Sequential regularity of detrital zircon U-Pb ages in western North American terranes: second-order tectonic control on sediment provenance (abstr.): Geological Society of America Abstracts with Programs, Vol. 43, No. 5, p. 43.


(17) **LaMaskin, T.A.**, Dorsey, R.J., and Vervoort, J., 2009, **Invited**: Early Mesozoic Paleogeography and Tectonic Evolution of the Western United States: Insights from Detrital Zircon U-Pb Geochronology,


Research Grants or Research Fellowships


10) UNCW Faculty Senate Research Committee, Charles L. Cahill award for research and development: Pilot Project: The timing of terrane accretion in California ($3,000; awarded 2012).

9) UNCW Office of Research Services, Research proposal preparation travel stipend ($750; awarded 2012).


7) National Science Foundation-Division of Earth Sciences, Tectonics Program: Collaborative Research: Testing hypotheses for the driving force behind plate-margin deformation: Late Jurassic tectonics of eastern Oregon and western Idaho with Dr. Mark Schmitz (Boise State), Dr. Jeff Vervoort (Washington State), and Dr. Keegan Schmidt (Lewis-Clark State College) ($195,334; declined 2013).


5) National Science Foundation-Division of Earth Sciences, Sedimentary Geology and Paleobiology Program: Collaborative Research: Testing the hypothesis of a long Norian stage: integrated conodont,
ammonite, and bivalve biostratigraphy and high-resolution U-Pb geochronology with Dr. Chad Lane (UNCW) and Dr. Christopher McRoberts (SUNY-Cortland) ($231,305; declined 2012).

(4) **National Science Foundation-Division of Earth Sciences, Tectonics Program:** Constraining the timing of a critical provenance transition in western North American terranes: testing models of North American plate margin evolution ($249,446; declined 2012).

(3) **National Science Foundation-Division of Earth Sciences, Sedimentary Geology and Paleobiology Program:** Filling a critical link in the Great Valley forearc: Early Mesozoic Coon Hollow Formation, eastern Oregon and western Idaho, ($155,883; declined 2012).

(2) **UNCW College of Arts and Sciences:** Summer Research Initiative Award: Developing a robust statistical tool to compare data sets in the field of sedimentary petrology, ($3,500; declined 2013).

(1) **UNCW College of Arts and Sciences:** Summer Research Initiative Award: The geometry and timing of Neoproterozoic continental rifting at Harpers Ferry WVA ($3500; declined 2011).

**Honors & Leadership**

2014–2017  **Member-at-Large:** July 2014– June 2017; Geological Society of America Research Grants Committee

2014–2012  **Faculty of Significant Impact,** UNCW Division of Student Affairs, Recognition as

2014  **Field-trip co-leader and Session Principal Organizer,** Geological Society of America Joint Section Meeting, 66th Rocky Mountain Meeting, 110th Cordilleran Meeting, Bozeman, MT

2013–Current  **Associate Editor:** Geosphere, Published by the Geological Society of America, Boulder, CO

2011  **Session Convener and Session Co-Convener,** Geological Society of America Annual Meeting, Minneapolis, MN.

Since 2010  **Peer Reviewer**

National Science Foundation, Directorate for Geosciences, Division of Earth Sciences, Tectonics (3), Geological Society of America Bulletin (3); International Geology Review (3); Lithosphere (3); Geosphere (2); Canadian Journal of Earth Sciences (2); Journal of Mountain Science (1); Geological Society of America Special Papers (2); Geological Society of America Field Guides (1); Idaho Geological Survey (2); Books (2)
Chad Steven Lane
Assistant Professor in the Department of Geography and Geology
Director of the UNCW Stable Isotope Laboratory

University of North Carolina Wilmington
Department of Geography and Geology
Wilmington, NC 28403
USA

Phone: (910) 962-3466
Fax: (910) 962-7077
e-mail: lanec@uncw.edu

Education
University of Tennessee Geography (Physical) Ph.D., 2007
University of Tennessee Geography (Physical) M.S., 2003
University of Denver Environmental Sciences B.S., 2001

Ph.D. Dissertation: Late Holocene Environmental History in the Northeastern Caribbean: Multi-Proxy Evidence from Two Small Lakes on the Southern Slope of the Cordillera Central, Dominican Republic. Committee: Sally Horn (co-chair), Claudia Mora (co-chair), Ken Orvis, Henri Grissino-Mayer

Research Interests
Quaternary Environments, Paleoclimatology, Global Climate Change, Biogeography, Stable Isotope Geochemistry, Paleolimnology, Circum-Caribbean Region, Prehistoric Human-Environment Interactions

Professional Experience
1/2011–Present Assistant Professor, Department of Geography and Geology, University of North Carolina Wilmington
1/2008–Present Adjunct Professor, Department of Geography, University of Tennessee
7/2009–1/2011 Postdoctoral Fellow, Department of Earth Sciences, Memorial University
9/2007–7/2009 Mead Witter Foundation Postdoctoral Fellow, Department of Geology, Lawrence University

Honors and Awards
- Mead-Witter Postdoctoral Fellowship, Lawrence University, 2008
- University Citation for Exceptional Professional Promise, University of Tennessee, 2007
- University Citation for Outstanding Graduate Student Teaching, University of Tennessee, 2006
- Robert G. Long Outstanding Graduate Student Award, University of Tennessee, 2006
- Outstanding Teaching Associate, University of Tennessee, 2005
- Student Publication Award, University of Tennessee, 2004, 2005, and 2007
- Exceptional Professional Accomplishment Award, University of Tennessee, 2004
- Best Paper Presentation by a Masters Student, Biogeography Specialty Group, Annual Meeting of the Association of American Geographers, New Orleans, LA, 2002
- Magna cum Laude, University of Denver, 2001
- Phi Beta Kappa National Honor Society, University of Denver, 2001
- Environmental Science Program Award for Outstanding Undergraduate Scholarship and Research, University of Denver, 2001
- Gamma Theta Upsilon (Geography Honor Society), University of Denver, 2000
- Golden Key National Honor Society, University of Denver, 2000
Peer-Reviewed Journal Publications (includes manuscripts in review and in press)

*Indicates Advisee/Student Author

(20) Tanner, B.R., **C.S. Lane**, L. Martin, R.S. Young, and B.S. Collins. In Press. Sedimentary proxy evidence of a mid-Holocene hypsithermal event in the location of a current warming hole, North Carolina, USA. *Quaternary Research.*


Publications (continued)


Manuscripts in Preparation

**Lane, C.S.,** *B. Hildebrandt, L.M. Kennedy, A. LeBlanc, K-B. Liu, A.J. Wagner, and A.D. Hawkes.* Stable Oxygen Isotope Composition of Ostracod Valves as a Proxy for Prehistoric Tropical Cyclone Landfalls. For Submission to *Quaternary Research.*


Mitra, S., J. Minnehan, and **C.S. Lane.** An 8000-Year Coastal Sedimentary Record of Black Carbon and Soot: Implications for Historical Wildfires, Climate, and Barrier Island Evolution through the Holocene.
Sánchez, M., S.P. Horn, and C.S. Lane. Reconstructing Precolumbian Human Diets from Stable Carbon and Nitrogen Isotope Analyses of Food Residues in Ceramics from the Southern Pacific Region of Costa Rica. For submission to Cuadernos de Investigación (Costa Rican Journal).

Research Funding; Total: $571,317; Total to Lane (In Parentheses): $251,563

- UNCW Charles L. Cahill Award for Faculty Research and Development, “Reassessment of Paleoenvironmental Change in Coastal North Carolina using Sediment Records from Carolina Bays”, ($3,000), 2014
- UNCW International Faculty Travel Grant in support of travel to the 2014 Annual Meeting of the Geological Society of America in Vancouver, CA, ($1,000), 2014
- National Oceanic and Atmospheric Administration, “Oxygen Isotope Analyses of a Coral Core for Paleoclimate study in the Western Pacific Warm Pool”, ($5,000), 2013-2014
- University of North Carolina-Wilmington College of Arts and Sciences, “Summer Research Initiative”, ($3,500), 2012
- The Friends of UNCW Foundation, “Acquisition of a Dell Latitude XT2 Tablet Computer for Teaching Geography and Geology”, ($2,500), 2011-2012
- University of North Carolina-Wilmington College of Arts and Sciences, “Summer Research Initiative”, ($3,500), 2011
- National Science Foundation, “Collaborative Research: Long-term Records of Hurricane Impacts on Tropical Ecosystems: Fire and Vegetation Response to Major Events”, Co-PI’s L. Kennedy and K-b. Liu, Total Award $234,710 (~$2,000 to Lane, collaborator), 2010-2012
- American Society of Limnology and Oceanography Early Career Travel Grant, ($500), 2010
- Lawrence University Distinctiveness Grant, “Fusing Undergraduate Fieldwork and Laboratory Analyses in the Geosciences”, Co-PI with J. Clark ($2,200), 2009
- Monticello College Foundation Grant, “Stipend to Support Female Undergraduate Research” ($4,800), 2008
- Association of American Geographers Research Grant, “Refining the Spatial Resolution of Lacustrine Proxies of Maize Cultivation”, ($1,000), 2008
- Academic Equipment Grant, Lawrence University, ($1,500), 2007
- Academic Keys Foundation Future Faculty Grant Program, “Stipend for Undergraduate Research Assistant” ($1,000), 2006
- University of Tennessee Travel Grant, ($490), 2006
- Yates Dissertation Fellowship, University of Tennessee, ($15,000), 2005
- Association of American Geographers Ph.D. Dissertation Research Grant, ($500), 2005
• Biogeography Specialty Group of the Association of American Geographers Ph.D. Student Research Grant, ($700), 2005
• University of Tennessee Travel Grant ($300), 2005
• Stewart McCroskey Memorial Fund, University of Tennessee, ($500), 2005
• University of Tennessee Travel Grant, ($200), 2004
• University of Arizona Radiocarbon Lab, awarded six AMS radiocarbon dates for master’s thesis research project, ($3,600 in kind), 2003
• University of Tennessee Travel Grant, ($100), 2003
• Hilton Smith Ph.D. Fellowship, University of Tennessee, ($15,000), 2003
• Keck Summer Research Grant/Stipend, University of Denver, (awarded 3 times, total of $9,000), 1998–2001
• Partners in Scholarship Research Grant, University of Denver, ($500), 1999

Professional Service
• Peer-reviewer for the professional journals Geology, Geochimica et Cosmochimica Acta, Quaternary Science Reviews, Holocene, Quaternary Research, Applied Geochemistry, Estuaries and Coasts, Vegetation History and Archaeobotany, Sedimentology, Rapid Communications in Mass Spectrometry, Journal of Geography, and Forest Ecology and Management
• Peer-reviewer for multiple National Science Foundation grant proposals
• Peer-reviewer for multiple National Geographic Society grant proposals
• Peer-reviewer for American Chemical Society (ACS) Petroleum Research Fund (PRF) grant proposals
• Review Editor (Invited Board Position) for Frontiers in Paleoecology (Nature Publishing Group)
• Coordinator of Paleoenvironmental Change Specialty Group Student Presentation Competition, Association of American Geographers, 2012-2014
• Director of the Paleoenvironmental Change Specialty Group, Association of American Geographers, 2012-2014
• Panelist/Discussant “Postdoctoral and Early Career Advice” Annual Meeting of the Association of American Geographers, Tampa Bay, FL, 2014
• Listserv Manager for Biogeography Specialty Group of the Association of American Geographers, 2007–2014
• Judge for Climate Specialty Group Student Presentation Competition, Annual Meeting of the Association of American Geographers, 2012
• Peer-reviewer The Proceedings of the 15th Symposium on the Geology of the Bahamas and other Carbonate Regions, 2011
• Judge for Biogeography Specialty Group Student Presentation Competition, Annual Meeting of the Association of American Geographers, 2010–2012
• Graduate student representative for the Biogeography Specialty Group of the Association of American Geographers (elected to position twice), 2005–2007
Curriculum Vitae

Richard A. Laws

Personal
Citizenship: USA
Address: Department of Geography and Geology, and Center for Marine Science, University of North Carolina Wilmington, Wilmington, NC, 28403, USA
Phone: Work 910-962-4125; FAX 910-962-7077
E-mail: laws@uncw.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
8/08 – present Professor of Geology, Department of Geography and Geology, UNCW
7/02 - 7/08 Department Chair, Department of Geography and Geology, UNCW
8/99-present Professor of Geology, Department of Earth Sciences, UNCW
7/91 - 8/97 Department Chair, Department of Earth Sciences, UNCW
8/90 - 7/99 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
1991 to 1995 Consultant for Coastal Environmental Services, Wilmington, NC
1986 to 1989 Micropaleontologist-consultant, Dupont DeNemours and Company, Aiken, SC
1986 to 1987 Micropaleontologist-consultant, SC Water Resources Commission
1981 Micropaleontologist-consultant, Geotechnical Engineering, Fremont, CA
1980 to 1981 Micropaleontologist-consultant, USGS Estuarine Studies Group, Menlo Park, CA
Professional Activities

Published Papers


al. (eds.), Sequence stratigraphy and facies associations: International Association of Sedimentologists, Special Publication 18, p. 537-561.


**Published Abstracts - 42**

Research grants

**Laws, R.** and Dockal, J. 1984. Upper Cretaceous through Paleogene stratigraphy of Onslow Bay, North Carolina, UNCW Faculty Research Grant, $1,000.

**Laws, R.,** 1986. Calcareous nanofossil biostratigraphy of “Calcareous Zone” strata beneath the Savannah River Site, South Carolina. DuPont de Nemours, $13,000.


Grants for professional development:

Laws, R., 1990. Support to attend ISI SEM short course, Pleasanton, CA. UNCW Faculty Research and Development Award, $1,200.

Teaching Activities – I have taught 26 different courses at the undergraduate and graduate level

Supervision of student research

Undergraduate Honors Thesis
Laws Vitae Fall 2012

Lauren Glass, 2014, “A Study on the Impact of Active Learning and Web-Based Exercises on Student’s Comprehension of Geoscience Topics”

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 Cirrpedea of the Chesapeake Group: Maryland, North Carolina and Virginia, major advisor
Jacquie Hiltelman, 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
Patti Mason, 2013; Biostratigraphy and Paleoeconomy of Campanian and Maastrichtian foraminiferal faunas from the North Carolina coastal plain.
Kirsten Stokes, 2014, Diatoms as proxies of late Pleistocene/Holocene climatic events in the Bellingshausen Sea, Western Antarctic Peninsula.

Graduate Thesis Committees – I have served on 36 other graduate thesis committees

Service Activities – I have served on countless department and university committees, and as department chair for 11 years
Selected recent service to professional organizations
Organizing committee and Co-Chair (with V. Zullo and W. Harris) for the First Bald Head Island Conference on Coastal Plains Geology.
Organizing committee and Co-Chair (with V. Zullo and W. Harris) for the Second Bald Head Island Conference on Coastal Plains Geology.
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
Chair Elect, Southeastern Section, GSA, 2010
Vice Chair, Southeastern Section, GSA, 2011
Chair, Southeastern Section, GSA, 2012-2014
VITAE
Lynn Ann Leonard
Department of Geography and Geology
University of North Carolina Wilmington

Education:
College of William and Mary  Duke University  University of South Florida
Williamsburg, VA  Durham, NC  St. Petersburg, FL
B.S. Geology w/ high honors  M.S. Geology  Ph.D. Marine Science
1986  1988  1994

Professional Experience:
January 2012 – present: Chair, Department of Geography and Geology, and Chair Department of Physics and Physical Oceanography, UNCW
July 2008- present: Chair, Department of Geography and Geology, UNCW
August 2005-present: Director, Coastal Ocean Research and Monitoring Program, UNCW
August 2004-present: Professor with Tenure, University of North Carolina Wilmington, Department of Geography and Geology.
August 2004-July 2005:  Assistant Chair, Department of Geography and Geology
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.

Selected Research Grants (out of 54 totaling >$10M):
2014  Ocean Observing Efforts in the Carolinas (PI-Leonard), NOAA/SECOORA ($385K)
2013  Ocean Observing Efforts in the Carolinas (PI-Leonard), NOAA/SECOORA ($385K)
2012  Ocean Observing Efforts in the Carolinas (PI-Leonard), NOAA/SECOORA ($367K)
2011. Impacts of Increased Tidal Range and Salinity in the Cape Fear River Ecosystem” (PI-Leonard), Dial Cordy and Associates ($144,734)
2011. Maintenance of RCOOS assets, Data Management Activities, and Education and Outreach (PI-Leonard), SECOORA ($386,749)
2010. Analysis of the Geomorphologic Evolution of Masonboro Island, NC. NC SeaGrant ($4000)
2010. Observing and Data Management in Support of SECOORA (PI-Leonard), SC SeaGrant ($200K)
2010 Implementation of Regional Integrated Ocean Observing Systems Support of RCOOS, (PI-Leonard), SC SeaGrant ($20,015)
2009. Year 3 Carolinas Regional Coastal Observing System (PI – Leonard) NOAA CSC ($1.4M)
2009. Key Parameters for Assessing Beach Functionality (PI-Cahoon; Co-PIs: Leonard, Posey, Alphin Lankford) NC SeaGrant ($59,514)
2008. Key Parameters for Assessing Beach Functionality (PI-Cahoon; Co-PIs: Leonard, Posey, Alphin Lankford) NC SeaGrant ($14,357)
2008. Key Parameters for Assessing Beach Functionality (PI-Cahoon; Co-PIs: Leonard, Posey, Alphin Lankford) NC SeaGrant ($23,395)
2008. Implementation of RCOOS support of RCOOS development for SECOORA: Data Management (PI-Leonard) SC SeaGrant ($13,514)
2008. Year 2 Carolinas Regional Coastal Observing System (PI – Leonard) NOAA CSC ($1.4M)
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. Flow Dynamics and Particle Dispersion in the Florida Everglades (PI- Leonard), Florida International University ($70,000)
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)
2002. Monitoring of the Cape Fear River Widening and Wilmington Harbor Dredging Project (PI-Hackney, Co-PIs: Leonard, Posey, Avery) USACE ($365,000)
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).
2000. Monitoring of the Cape Fear River Widening and Wilmington Harbor Dredging Project (PI-Hackney, Co-PIs: Leonard, Posey, Avery) USACE ($350,000)
1999. Monitoring the potential effects of increased tidal range on the Cape Fear River ecosystem due to deepening and widening Wilmington Harbor, NC. Coastal Zone Resources and the USACE ($67,560-PI Leonard).
**Selected Publications:** (Out of 42 total, student co-authors denoted by *)


**Honors and Awards:**

High Honors in Geology, College of William and Mary, 1986.
Graduate Research Fellowship, University of South Florida: 1988-89.
Graduate Council Fellowship, University of South Florida: 1989-90.
Gulf Coast Oceanographic Fellowship, Dept of Marine Science, Univ. of South Florida: 1989.
Gulf Coast Oceanographic Fellowship, Dept of Marine Science, Univ. of South Florida: 1990.
Gulf Coast Oceanographic Fellowship, Dept of Marine Science, Univ. of South Florida: 1991.
ASLO/ONR Award: Best student Poster ASLO/SWS meeting, Edmonton, Canada: May 1993.
College of Arts and Sciences Research Initiative Award, Wilmington, NC: April 1995.
Sigma Xi: March 1997
UNCW Million Dollar Club: April 1999
Biggs Teaching Award Nominee, Geological Society of America: Nov. 1999
UNCW Chancellor’s Teaching Excellence Award: May 2000
UNCW Five Million Dollar Club: April 2006
Department of Commerce, National Weather Service, Public Service Award: April 2007
UNCW Faculty Scholar Award (2012)
UNCW Ten Million Dollar Club: April 2012

**Graduate Theses Supervised:** 25 (24 M.S. and 1 Ph.D.)
Ai Ning Loh
Associate Professor
University of North Carolina Wilmington, Department of Geography and Geology
601 South College Road, Wilmington, NC 28403
Phone: (910) 962-2734; Email: lohan@uncw.edu

Education
Ph.D. 2002, School of Marine Science, College of William and Mary, Gloucester Point, VA.
M.S. 1998, School of Marine Science, College of William and Mary, Gloucester Point, VA.
B.S. 1995, cum laude in Chemistry, University of South Carolina, Columbia, SC.

Professional Experience
2014-present  Associate Professor, Department of Geography and Geology, College of Arts and Sciences, University of North Carolina Wilmington
2008-2014  Associate Professor of Marine Science
Program Leader for Marine Science (2010-2012)
Department of Chemistry and Mathematics (2008-2010)
Department of Marine and Ecological Sciences (2010-2014)
College of Arts and Sciences, Florida Gulf Coast University, Fort Myers, FL.
May-July, 2013  Visiting Associate Professor (Enseignants Chercheurs Invités), Institut Universitaire Européen de la Mer, Université de Bretagne Occidentale, Brest, France.
2004-2008  Assistant Professor of Marine Science, Department of Chemistry and Mathematics, College of Arts and Sciences, Florida Gulf Coast University, Fort Myers, FL.
2003-2004  Visiting Assistant Professor of Marine Science, Division of Ecological Studies, College of Arts and Sciences, Florida Gulf Coast University, Fort Myers, FL.

Relevant Grants and Contracts


updated January 14, 2015


Environmental and Hydrologic History of Estero Bay: Implications for Watershed Management and Restoration. $73,000 (June 2003 - May 2004). South Florida Water Management District. PI: M. Savarese; Co-PIs: A.N. Loh, J.H Trefry.

Peer-reviewed Publications (*denotes student author)


Technical Reports


Selected Published Abstracts and Contributed Research Presentations

(*denotes student presenter)


updated January 14, 2015


**Research Mentorship**
Graduate advisor to 4 students (3 Masters, 1 PhD); graduate committee (7 Masters); 12 undergraduate research mentorship; 3 high school research mentorship and support for over 30 student internships.

**Courses Taught**

**Service Activities**
Includes professional and peer-review activities, service to the university, college and department, and educational and community outreach.
Damian Maddalena  
Curriculum Vitae

Education

Aug 2013  **PhD**, North Carolina State University, Raleigh, NC  
Forestry and Environmental Resources  
Dissertation Title: *Utilizing Stable Isotopes and GIS to Understand Hillslope Ecohydrological Dynamics*

Aug 2010 **MS**, North Carolina State University, Raleigh, NC  
Natural Resources  
Thesis Title: *Comparison of 30-meter SRTM and NED Data for use in Watershed Delineation and Characteristic Extraction in the Piedmont, North Carolina*

May 2001 **MA**, West Virginia University, Morgantown, WV  
Political Science: Public Policy and Program Evaluation

Dec 1998 **BS**, West Virginia University, Morgantown, WV  
Secondary Education: Social Sciences

Work Experience

2013–present Postdoctoral Research Associate, Oak Ridge National Lab, Oak Ridge, TN

2006–2013 Graduate Research and Teaching Assistant, NC State University, Raleigh, NC


2005–2006 Teacher, Wake County School System, Raleigh, NC

2001-2005 Teacher, Guilford County School System, Greensboro, NC

Research Interests

**GIS Programming and Customization:** Computer programming and GIS development for research applications with a focus on open source software.

**Spatial Ecology:** Application of GIS and spatial statistics to ecological questions, including the incorporation of remote sensing and field data.

- **Land Cover Change:** Investigation of the causes and effects of natural and anthropogenic land cover and ecosystem change at a range of spatial scales.
- **Isoscapes:** Use of stable isotopes and geostatistical modeling to understand landscape scale patterns and ecosystem dynamics.
- **Ecohydrology:** Examination of the patterns of interactions between physical hydrological mechanisms and ecological processes.

**Interdisciplinary GIS Studies:** Working with a diverse group of scientists to examine spatial questions by combining methods and data employed in the social and natural sciences.
**Parallel Computing and GIS:** Applications of supercomputing for processing and analyzing large datasets.

**Science Communication:** Communicating science to non-expert audiences through popular media platforms.

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**Technical Expertise**

**GIS Programming, Customization and Spatial Analysis:** Automation and customization of analysis tools for proprietary and open-source GIS software, including the incorporation of statistical packages and database management.

- GIS
  - GRASS-GIS
  - ESRI GIS Suit
  - QGIS

- Statistical Programming Languages
  - R
  - SAS

- Database
  - PostgreSQL
  - PostGIS

- General Programming
  - Python
  - BASH

**Hydrological Monitoring Field Methods:** Construction, field installation and operation of hydrological monitoring equipment such as lysimeters, monitoring wells, precipitation measurement and sample collection.

**Natural Tracer Hydrology:** Collection and data analysis for stable isotopes of $\delta^2H$ and $\delta^{18}O$.

**Cavity Ringdown Spectrometry:** Lab analysis for $\delta^2H$ and $\delta^{18}O$ in solids and liquids using a Picarro L2120-i Analyzer and peripheral solids induction module.

**Dendrology:** Taxonomy and field identification of woody plants.

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**Teaching Experience**

- Geospatial Data Structures and Web Services
- Geospatial Programming Fundamentals
- Introduction to Geographic Information Science
- Introduction to Photogrammetry and Remote Sensing
- GIS Applications in Sociology

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**Papers**


*in preparation* – Damian M. Maddalena, Eliazebth G. Nichols, and Brian L. Fetzer. “Utilizing $\delta^2H$ and $\delta^{18}O$ Xylem Water and Groundwater Isoscapes to Highlight Tree Source Water Pools on a Hillslope with an Known Source of Enrichment.”
Published Abstracts

Posters


Presentations

White Papers

Honors and Awards
December 2013 Los Alamos Statistical Sciences Conference Grant, Conference on Data Analysis
July 2012 North Carolina State University Graduate School Dissertation Completion Grant, $10,000
Feb 2009 G. Herbert Stout Award for Innovative Student Papers, NC GIS Conference
April 2009 Nomination, Outstanding Graduate Teaching Assistant
Sept 2008 NCSU Graduate Research Fellowship, $5,000

Organizations
2013–present American Geophysical Union
2011–2012 President and founding member, Dendrology and Forest Ecology Club, North Carolina State University
2008–present Member, Xi Sigma Pi
2007–present DJ and Host, WKNC FM, North Carolina State University, Raleigh NC
Continuing Education and Short Courses

Introduction to the Taxonomy and Pollution Ecology of Aquatic Insects. Asheville, NC. July 24-26, 2007

Community Outreach

2007-Present  Weekly radio program on WKNC, Raleigh featuring discussion of the natural sciences, including guests from the NCSU community and the larger North Carolina Research Triangle area.

2008-2010  Fred Olds Elementary Annual Science Fair Judge

2008  Geosciences in Middle Schools Summer Camp, Mentor
Patricia H. Mason  
Curriculum Vitae

4514 Terry Lane  
Wilmington, NC 28405  
E-Mail: masonp@uncw.edu  
Phone: (910)799-8959

Objectives:  
Geology Lecturer

Education:  
Masters of Science in Geology  
December, 2013  
Thesis: Biostratigraphy and Paleoecology of Late Cretaceous Foraminifera from the Dixon Core, Southeastern North Carolina  
University of North Carolina, Wilmington

Bachelor of Science in Geology  
July, 2006  
Undergraduate Thesis: Predator-Prey Relationships in a Middle Eocene Molluscan Fauna from Orangeburg, SC  
University of North Carolina, Wilmington

Career History:

Lecturer – Geography and Geology Department  
University of North Carolina, Wilmington  
2014-2015  
Responsible for creating course content, including syllabus, assigning textbook, all exams, quizzes, demonstrations and audio-visual materials for introductory geology courses. Responsible for completion of other duties within the department as assigned.

Lecturer – Environmental Geology  
University of North Carolina, Wilmington  
2012-2013  
Responsible for creating inter-disciplinary course content, including syllabus, all exams, quizzes, demonstrations and audio-visual materials using an assigned textbook and other resources, as well as for correlating content with a separate Environmental Geology lab course.

Lecturer – Physical Geology  
University of North Carolina, Wilmington  
2010-2013  
Responsible for creating course content, including syllabus, all exams, quizzes, demonstration and multimedia materials using an assigned textbook and other resources.

Teaching Assistant - Physical Geology Lab  
Teaching Assistant - Environmental Geology Lab  
University of North Carolina, Wilmington  
2006-2009  
Assisted in preparing materials, creating and grading exams and quizzes and lecturing students using multimedia and hands-on materials.
Teaching Assistant – Geol. Field Course
University of North Carolina, Wilmington 2007-2010
Instructed students in lithologic studies and applying geologic
principles in the field, with sedimentary, igneous and metamorphic
exposures being studied and mapped in the states of NC, WV and NM.
Responsible for student logistics, including travel to and from field
areas. Additional responsibilities included updating the Field Lab
Manual and additional student materials.

Published Abstracts
1st Author:

- Upper Cretaceous Benthic Foraminifera from the Dixon Core, Southeastern, NC 2012
- Planktonic Foraminiferal Biostratigraphy of Upper Cretaceous Strata, Dixon Core, North Carolina 2011
- Predator-Prey Relationships in a Middle Eocene Molluscan Fauna from Orangeburg, South Carolina 2007
- Sea Level Change Based on Foraminiferal Diversity, Campanian through Maastrichtian Depositional Sequences, Cape Fear River, NC 2006

Co-Author:

- Using Ostracoda and Foraminifera for Paleoenvironmental Analysis of the Duplin (Pliocene) and Waccamaw (Pleistocene) Formations in North Carolina 2011
- Paleoeocology of Foraminiferal Assemblages from Plio-Pleistocene Localities in North Carolina 2011
- Foraminifera and Paleoenvironments of Plio-Pleistocene Strata in North and South Carolina 2010
- Drilling Predation in the Caloosahatchee Formation (Plio-Pleistocene of Florida): Test of a Latitudinal Predation Gradient 2006
- Taphonomy of a Molluscan Assemblage from the Caloosahatchee 2006 Formation (Plio-Pleistocene) Type Area, La Belle, Florida 2006
- Sequence Stratigraphy of Campanian/Maastrichtian Outcrops Along the Lower Cape Fear River and Correlation to the Kure Beach Core, Southeastern NC 2006

Workshops:

- Carolina Cores and Stratigraphy (USGS) August, 2007
**Research Collaborations:**

Correlated foraminiferal biostratigraphy of the Dixon core to the calcareous nannofossil biostratigraphy (with Dr. Jean Self-Trail, USGS).

Correlated foraminiferal biostratigraphy of the Dixon core to the sequence and SR isotope stratigraphy (with Viviana Diaz).

Worked with undergraduate research interns on micropaleontological techniques specific to foraminifera and identification of Plio-Pleistocene benthic assemblages.

**Honors & Awards:**

- NAGT Outstanding Teaching Assistant Award 2011
- University Graduate Teaching Assistant Award 2011
- Department Graduate Teaching Assistant Award 2010
- Department Graduate Teaching Assistant Award 2009
- Research Grant 2007
- New Scholar Award 2007
- Graduate School Travel Grant 2007
- Victor A. Zullo Award for Paleontological Research 2006
- C-surf Travel Grant 2006
- Undergraduate Research Fellowship 2006

**Academic Involvement:**

Co-Founder and Secretary, Women in Science & Engineering at UNCW 2008-2009

President, UNCW Graduate Student Organization 2007-2008

**Professional Memberships:**

- Cushman Foundation Foraminiferal Research
- Geological Society of America
- Paleontological Society
CURRICULUM VITAE

Scott L. Nooner

Department of Geography and Geology
University of North Carolina Wilmington
601 S. College Road
Wilmington, NC 28403

Phone: (910) 962-2352
Email: nooners@uncw.edu
Web: http://uncw.edu/earsci/peoplenooner.html

EDUCATION:

2005  Ph.D. (Earth Sciences), Scripps Institution of Oceanography,
      Univ. of California, San Diego, La Jolla, CA
1999  M.S. (Physics) Texas A&M University, College Station, TX
1996  B.A. (Physics/Fine Arts) Cum Laude with Honors, Hendrix College,
      Conway, AR

EMPLOYMENT:

2012-present  Assistant Professor of Geology
               University of North Carolina Wilmington
2012-present  Adjunct Research Professor
               Lamont-Doherty Earth Observatory, Columbia University
2011-2012     Adjunct Professor
               Earth and Environmental Studies Dept., Montclair State University
2010-2012     Palisades Geophysical Institute/Doherty Foundation
               Lamont Assistant Research Professor
               Lamont-Doherty Earth Observatory, Columbia University
2009-2010     Palisades Geophysical Institute Junior Research Scientist
               Lamont-Doherty Earth Observatory, Columbia University
2008-2009     Doherty Associate Research Scientist
               Lamont-Doherty Earth Observatory, Columbia University
2006-2008     Post-doctoral Research Scientist
               Lamont-Doherty Earth Observatory, Columbia University
               Supervisor – Spahr Webb
2005-2006     Post-doctoral Scholar
               Scripps Institution of Oceanography, Univ. of California, San Diego
               Advisor – Mark Zumberge
1999-2005     Graduate Student Researcher
               Scripps Institution of Oceanography, Univ. of California, San Diego
               Advisor – Mark Zumberge
1996-1999     Teaching Assistant
               Texas A&M University
               Advisor – Joseph Ross
1994-1996  
Research Assistant  
Hendrix College  
Advisor – Pradip Bandyopadhyay

MAJOR RESEARCH INTERESTS:
- Mid-ocean ridges and continental rifting
- Magma dynamics in the crust
- Crustal deformation, rheology, and structure
- Geologic CO₂ Sequestration
- Hazards from flooding and tectonics
- Development of new geophysical instrumentation

HONORS/AWARDS:
2009  
Palisades Geophysical Institute Junior Research Professor  
The only endowed junior research position in earth sciences at Columbia University

2003  
Best paper in Geophysics, ‘A new sea-floor gravimeter’  
Only one selected per year out of hundreds of papers published

2002  
CALIT Fellowship, Scripps Institution of Oceanography

1999-2000  
Folsom Fellowship, Scripps Institution of Oceanography  
Only one awarded per year out of 30-40 entering graduate students

1996-1997  
Dean’s Graduate Scholar Fellowship, Texas A&M University

1992-1996  
Dean’s Scholarship, Hendrix College

1992-1996  
Arkansas Academic Challenge Scholarship, Hendrix College

SOCIETIES:
American Geophysical Union (AGU), Society for Exploration Geophysicists (SEG),  
American Association for the Advancement of Science (AAAS)

TEACHING EXPERIENCE:
2012-present  
Marine Geology (GLY 550), Introduction to Geophysics (GLY 465/565),  
Geological Oceanography (GLY 450), Environmental Geology Lab (GLYL 120),  
Oceanography Capstone (OCN 490), Natural Disasters (GLY 125)  
Department of Geography and Geology, UNCW

2011-2012  
Historical Geology (GEOS114)  
Dept. of Earth and Environmental Studies, Montclair State University

2009-2012  
Mentor – Yang Zha

2011  
Mentor – Graduate Research Assistant Scott DeWolf

2009  
Mentor – Summer Undergraduate Research Assistant Wanda Vargas,  
Graduate Research Assistant Shou Shou Han

2008  
Mentor – Summer Intern and Graduate Research Assistants Phillip Kelley-Dotson, Gina Applebee, Andrea Applebee, Lindsey Doermann

1999-2004  
Departmental Tutor – all Physics I & 2 series courses  
Department of Physics, University of California San Diego

1998-1999  
Course Instructor – Observational Astronomy  
Department of Physics, Texas A&M University, College Station, TX

1997-1998  
Course Instructor – Scientific Instrument Making
Department of Physics, Texas A&M University, College Station, TX

1996-1999  **Teaching Assistant – College Physics I & II**
Department of Physics, Texas A&M University, College Station, TX

1993-1996  **Departmental Tutor – Calculus**
Department of Mathematics, Hendrix College, Conway, AR

1993-1996  **Lab Assistant – General Physics I & II, and Astronomy**
Department of Physics, Hendrix College, Conway, AR.

**FIELD EXPERIENCE**

Dr. Nooner has extensive sea-going experience with 24 cruises since 2000, including seafloor geodesy, compliance, and seafloor micro-gravimetry. All cruises required custom instrumentation developed in-house and most involved submersible or ROV work. He has been Chief or co-Chief scientist on four cruises, and project leader or co-leader on four.

Major land-based fieldwork includes gps surveys, gravity surveys, borehole strainmeter installations, and infrasound sensor installations.

**BIBLIOGRAPHY**

**PUBLICATIONS:**

- Chadwick, W. W., Butterfield, D. A., Embley, R. W., Tunnicliffe, V., Huber, J.


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**FUNDING HISTORY**

**CURRENT SUPPORT:**
- **Collaborative Research**: Continuing a unique time-series of volcanic inflation at Axial Seamount, National Science Foundation, Dates: 10/12 – 9/13, Award: $69,811, **Lead PI**.
- **Collaborative Research**: Permanent seafloor benchmarks for geodetic measurements of horizontal and vertical plate motion, National Science Foundation, $88,737. **Co-PI** (Lead PI David Chadwell).
- Establishing a long-term geodetic network at the East Pacific Rise RIDGE2000 integrated studies site, National Science Foundation, Dates: 4/07 – 3/12, Award: $297,602, **Lead PI**. (Co-PIs Spahr Webb and Roger Buck)
- **Collaborative research**: Monitoring inflation at Axial Seamount, National Science Foundation, Dates: 9/07 – 8/12, Award $115,660, **Co-PI** (Grant is at LDEO -- Lead PI William Chadwick of Oregon State University)
- **Pire**: Life on a tectonically-active delta: Convergence of earth science and geohazard research in Bangladesh with education and capacity building, Dates: 9/10 – 8/15, Award: $4,499,996, **Co-PI** (Lead PI Michael Steckler). (Grant is at LDEO -- Lead PI Donna Shillington)
- Collaborative Research: Tectonic and magmatic processes during early-stage rifting: An integrated study of northern Lake Malawi, Africa, Dates: 1/12 – 12/16, Award: $3,245,067, **Co-PI** (Grant is at LDEO -- Lead PI Donna Shillington).
- Renewal of NNX08AF13G: Modeling gravity field and Earth deformation from monsoonal flooding in Brahmaputra Delta and Gangetic Plain using hydrographic, GRACE, and GPS data, Dates: 4/12 – 3/15, Award: $506,755, **Co-PI** (Grant is at LDEO -- Lead PI Michael Steckler).
- Renewal of NNX08AF13G: Modeling gravity field and Earth deformation from monsoonal flooding in Brahmaputra Delta and Gangetic Plain using hydrographic, GRACE, and GPS data, Dates: 4/12 – 3/15, Award: $506,755, **Co-PI** (Grant is at LDEO -- Lead PI Michael Steckler).

**PAST SUPPORT:**

- **Collaborative Research**: Faulting processes during early-stage rifting – analysis of an unusual earthquake sequence in northern Malawi, Dates: 12/10 – 12/11, Award: $102,793, **Co-PI** (Lead PI James Gaherty).
- Modeling gravity field and Earth deformation from monsoonal flooding in Bangladesh using hydrographic, GRACE and GPS data, NASA, Dates: 1/08 – 11, Award: $485,000. (Lead PI Michael Steckler)
- **Developing Inexpensive, Easily Hidden Seismometers for the Afar**, LDEO OTIC, Award: $19,000, **Co-PI**. (Lead PI Roger Buck)
- **Monitoring the in situ CO₂ in the Utsira formation using seafloor micro-gravity**, Department of Energy, (submitted by Scripps Institution of Oceanography with a subcontract to LDEO), $98,199, **Co-PI** (Lead LDEO PI). (Lead PI Mark Zumberge of UCSD)
- **US - Malawi Planning Visit**: Developing a multidisciplinary, multinational study of continental rifting, seismicity and volcanism around northern Lake Malawi, Dates: 9/09 – 8/10, Award: $23,400, **Co-PI**. (Lead PI Donna Shillington)
- Constraining early-stage rifting through rapid response to the Lake Malawi earthquake sequence of December 2009, Dates: 12/09 – 12/10, Award: $12,999, **Co-PI**. (Lead PI Jim Gaherty)
- **Statoil Summer 2009 Survey**, Dates: 3/09 – 2/10, Award: $17,136, **Co-PI** (Lead LDEO PI). (Lead PI Mark Zumberge of UCSD)
- **Operation and management of the LDEO Instrument Center of the National Ocean Bottom Seismometer Pool – Baseline**, National Science Foundation, Dates: 4/09 – 3/11, Award: $2,620,000. **Co-PI** (Lead PI James Gaherty)
NARCISA GABRIELA PRICOPE  
Geography and Geology Department  
University of North Carolina Wilmington  
Wilmington, NC 28403

Professional Preparation
2000-2004  B.A., Babes-Bolyai University, Romania, Geography and English. Magna cum laude
2004-2006  M.Sc., Western Kentucky University, Geosciences and GIS.
2006-2011  Ph.D., University of Florida, Geography and Environmental Engineering; awarded a NSF Doctoral Dissertation Improvement Grant for my dissertation work in Africa;
2011-2012  Post-doctoral researcher, University of California Santa Barbara, Geography Department, the Human-Environment Dynamics Lab and Climate Hazards Group.

Appointments
2013- Present  Tenure-track Assistant Professor, Department of Geography and Geology, University of North Carolina Wilmington, Wilmington NC, USA.
2010-2013  Tenure-track Assistant Professor, Environmental Studies Department, Southern Oregon University, Ashland OR, USA.
2011-2012  Visiting Researcher/Post-doctoral researcher, Human-Environment Dynamics Lab and the Climate Hazards Group, University of California Santa Barbara, Santa Barbara CA, USA.
2006-2010  Associate Researcher, National Science Foundation Integrative Graduate Education Research and Traineeship (IGERT) in Adaptive Watershed Management: Water, Watersheds, and Wetlands at University of Florida, Gainesville FL, USA.
2004-2006  Research/Teaching Assistant, United States Geological Survey and Western Kentucky University, Bowling Green KY, USA.

Most Relevant Products


Other Significant Products


Synergistic Activities
1. Interdisciplinary international collaborations: I work synergistically with collaborators from the United States Agency for International Development Famine Early Warning Systems Network (FEWS Net) and collaborators from many non-academic institutions in both southern and eastern Africa. I have been elected a fellow in several competitive interdisciplinary, early-career collaborative symposia including the 2012 Dissertations Initiative for the Advancement of Climate Change Research (DISCCRS) VII symposium (sponsored by the NSF and NASA), the National Center for Ecological Analysis and Synthesis (NCEAS) 2013 Summer Institute (sponsored by the NSF and Packard Foundation), or the 2012 Brown University International Advanced Research Institutes.
3. Applied, transformative undergraduate and graduate education: I am a campus Experiencing Transformative Education through Applied Learning (eTEAL) fellow, having secured two grants to transform and enhance undergraduate education during my first academic year at UNCW.
5. Reviewer and panelist: I have also served as a reviewer and panelist on the NSF Research Coordination Network in Science, Engineering and Education for Sustainability (RCN-SEES) panel and as a Graduate Research Fellowship Program (GRFP) in 2013 and 2015, and the Department of Defense (DoD) and the American Society for Engineering Education for the National Defense Science and Engineering Graduate Fellowship Program.

Collaborators and Co-Editors (48 months):

Graduate Advisors and Postdoctoral Sponsors:
Lopez-Carr, David. Post-doctoral advisor, Department of Geography, University of California Santa Barbara; Binford, Michael. PhD main advisor, Department of Geography, University of Florida. Brown, Mark. PhD co-advisor, Department of Environmental Engineering, UF; Goldman, Abraham and Southworth, Jane, committee member, Department of Geography, University of Florida.
Academic Degrees

M.S. Education, University of Houston, 1996

M.S. Geology, University of North Carolina at Chapel Hill, 1979

B.A. Earth Sciences (Honors) with Biology, UNC-Wilmington, 1976

Relevant Academic Experience

2000 – Present: Lecturer, Geography and Geology and Environmental Sciences Dept., UNC-Wilmington

UNDERGRADUATE:

GEOLOGY/ GEOGRAPHY: Introductory Geology (GLY101), Introductory Geology Lab (GLY101L), Oceanography (GLY150), Environmental Geology (GLY120), Environmental Geology Lab (GLY120L), Earth Through Time (GLY172), Earth Through Time Lab (GLY172L), Earth Materials (GLY 205), Weather and Climate (GGY230), General Petrology (GLY310), Population/Resources/Environment (GGY340), Field Methods in Geoscience (GLY390), Dynamic Earth (GLY485), Directed Independent Studies (DIS 491)

ENVIRONMENTAL SCIENCES: Global Issues in Environmental Sciences (EVS205), Topics and Issues in Sustainability (EVS476), Natural Resources (EVS485), Campus Sustainability (EVS 485), Senior Seminar in Environmental Sciences (EVS 495), Honors 110 Resource and Societal Issues.

GRADUATE COURSES

GEOLOGY and ENVIRONMENTAL SCIENCE: Seismic Stratigraphy, Field Sedimentology, Subsurface and Petroleum Geology, Field Geology Seminar to New Mexico, Wave-Dominated Deltas and Sequence Stratigraphy – Book Cliffs Utah, Resources for a Sustainable Society, Environmental Sciences Seminar.

EARTH SCIENCE: Earth Science (SCI514 – done both as in class and an Online Course), Earth and Environmental Science (SCI515),

2000 – Present: Lab Coordinator, Geography and Geology Dept., UNC-Wilmington

Lab coordinator for Introductory Geology, Environmental Geology, Duties include preparing labs and instructing and supervising Teaching Assistants. I wrote a lab manual for Environmental Geology and prepared all new labs for Introductory Geology. Currently I am the lab coordinator for GLY101.

2008 – 2013: Lab Coordinator, Environmental Science, UNC-Wilmington

Lab coordinator for Introduction to Environmental Science 195. I developed the lab and have written a published (Kendall Hunt) laboratory manual for the lab.
Spring 2000  Geology Instructor, Brunswick Community College


Petroleum Engineering/Geology course taught as part of the graduate program

1996 – 2005  Geology Instructor, University of New Mexico at Carlsbad, Carlsbad, New Mexico

Courses taught on the geology, environmental issues, and biology of West Texas and New Mexico; in particular, the Guadalupe Mountain and Carlsbad Cavern Areas. Courses and workshops are sometimes taught in conjunction with the National Park Service. The courses are primarily for teachers seeking Master’s degrees.

Relevant Professional Experience

1999 – Present  Consultant – Geological, Environmental, and Biological Sciences

Conduct training courses and field seminars for oil and oil service companies on a range of topics including geology, geophysics, petrophysics, and reservoir modeling. Topics of special interest include deepwater and deltaic reservoir characterization and carbonate depositional models that include studies on sedimentology, stratigraphy, and sedimentary petrology. Conduct field assessments of vegetation and soils for community monitoring and plant restoration and for endangered species studies with the Nature Conservancy.

1993 – 1999  Geology Instructor/Geoscience Training Coordinator for Shell U.S. Shell Oil Company, Houston, Texas

Introductory (Petroleum Geology, Petrophysics, Reservoir Characterization) and advanced (Seismic Stratigraphy, Applied Sedimentary Petrology, Core, Cuttings, and Reservoir Interpretation, Integrated Seismic to Pore Scale Studies on Deltas, Deepwater Deposits, and Carbonates) courses conducted for geoscientists, engineers, managers, and technicians. Guidebooks and training manuals were prepared for each course and topic.

1984 – 1993  Research Geologist, Bellaire Research Center, Project Leader Shell Oil Company, Houston, Texas

Production and Exploration research in siliciclastic and carbonate depositional systems with particular emphasis on reservoir characterization (seismic to pore scale properties and models) of deepwater siliciclastics. Over 100 internal reports were published.

1979 – 1984  Development Geologist Shell Oil Company, New Orleans, Louisiana

Responsible for Onshore Gulf Coast drilling in the Tuscaloosa Trend, Deep Sour Gas Area of Mississippi, Eocene deltaics of South Texas, and East Texas carbonate plays. Special assignments were done in Petrophysics, Field logging, and Production Geophysics.

Associated Academic and Professional Experience

2002 – Present  Teacher Workshops – UNC-Wilmington and SMEC

Several workshops have been conducted on Geology, Environmental, and Biological issues as well as Natural History. Many of these are focused on North Carolina, in particular the Coastal Plain. Topics include map interpretation, groundwater resources, mineral resources, and
geohazard mapping and interpretation (floods, hurricanes), fluvial and coastal processes and integrated science modules with including environmental, biological, math, geography, and social sciences. Field trips and lab components accompanied all of these topics. Individual school programs and visits are also conducted and I actively loan materials for use by teachers in the area. I have made numerous presentations at conferences, workshops, and in individual schools.

2000 – 2001  GLOBE Instructor and Training for Teachers (modules on soils, plant cover and distribution, and water).

2000  Taught Coastal Geology – Summer Ventures, UNC-W

Grants Received

- Friends of UNCWilmington Sustainability Committee 2012 Grant for Campus Gardens
- North Carolina Mining Commission: Resource Instruction, Surface Materials and Groundwater in the Coastal Plain, 2004
- National Park Service - Guadalupe Mountains National Park: Park Guides and Educational Lesson Plans for the Web - 2003
- Friends of UNC-Wilmington: Lab supplies for Environmental Geology, 2003
- Eisenhower Grant: Earth/Environmental Science Modules of North Carolina, 2002
- Eisenhower Grant: Natural History of the Coastal Plain of North Carolina: Concepts and Issues in Geology, Biology, and Environmental Science, 2001

Grants in Process
- Education Research Grant (CFDA Number: 84.305A): Developing Mobile-Based, Inquiry-Based, Location-Based Earth and Environmental Science (MILES) Curriculum
- CESTEM grant for Developing Modular Earth and Environmental Curriculum

Grants Applied For but Not Funded
Two grants were written focusing on Earth and Environmental Science Education
2. North Carolina Geoscience Modules
   National Science Foundation (NSF) - $149,999

Professional Affiliations and Memberships

Geological Society of America
American Association of Petroleum Geologists
North Carolina Science Teacher Association
North Carolina Coastal Federation – Executive Steering Committee
The Nature Conservancy
Cape Fear River Watch – Board of Directors
North Carolina Coastal Federation

Honors and Awards

- 2008 UNCWilmington Lecturer of the Year Award
- Three Best of AAPG selections for abstracts and presentations
• Two Honorable Mentions for best presentation at AAPG National conventions
• Runnerup – Best paper award from Houston Geological Society
• Three Special Recognition Awards for Research – Shell Oil
• Research Grant/Award from the N.C. Geological Survey
• Who’s Who Among American Colleges and Universities – UNC-W

Outreach: Forums, Presentations, Educational Activities


UNCW Forums as Presenter/Panelist: Hurricane Katrina Impacts, Education and Science, Sustainability: Topics and Issues, Offshore Energy: Comparing the Gulf of Mexico and Atlantic, Natural Hazards: Global to Local, University Reading “No Impact Man”, University Reading “Zeitoun”

Osher Lifelong Learning: Field Seminars to the Green Swamp, Carolina Bays and Lakes, Ev-Henwood Preserve for the study of natural history including plants, animals, soils, topography, forest uses, and more. Short courses and lectures on topics ranging from Energy Offshore and Issues in the Gulf and Atlantic Margin, Global to Local Water Resources, The Cape Fear Watershed, Groundwater Studies and the Coastal Plain, Hurricanes: Past, Present, and Properties, Sustainability and Population Basics

And numerous presentations to: Men’s Club, Senior Men’s Club, Rotary, Kiwanis, Surfrider Foundation, Cape Fear Green Building Alliance, Cape Fear River Watch, Coastal Museum at Ocean Isle, Southeastern Engineers, National Park Service, Professional Engineers of NC.

Publications


Shew, 2013, Water Keeper Camp Summary Booklet, informal publication for Cape Fear River Watch.


Finelli, Chris, Shew, Roger, Southwood, Amanda, Long, Zachary, Schuettpelz, Eric, and Borrett, Stuart A Walking Tour of the UNCWilmington Natural Areas – Booklet prepared for the Chancellor’s Installation to accompany our field excursion with the Chancellor, Administration and OLLI on April 14th, 2012.

Authors:

Summer River Camp Booklet/Lessons: Prepared for Cape Fear River Watch for a Summer Camp in July 2012. 25 pages


Shew, R. D., 2008, Water Issues from the River to the Coast, Environmental Educators of North Carolina, 18th Annual Conference, Nov. 6 – 8, Fort Caswell.


Shew, R. D., 2008, Green Swamp: Natural History and Issues, Environmental Educators of North Carolina, 18th Annual Conference, Nov. 6 – 8, Fort Caswell, Seminar and field trip.

Michael S. Smith

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http://people.uncw.edu/smithms/index02.html

EDUCATION
1990. Ph.D., Washington University St. Louis, MO 63130 (Geochemistry and Metamorphic Petrology).
“Geochemistry and petrogenesis of Mid-Archaean Malene quartz-rich cordierite-orthoamphibole supracrustal gneisses, Nuuk (Godthaab) region, southern West Greenland”
1984. Bachelor of Science, *cum laude*, Millersville University, Millersville, PA 17551 (Geology)

PROFESSIONAL EXPERIENCE
August 1992 - Present: Department of Geography and Geology, University of North Carolina Wilmington (UNCW)
2007 - Present Full professor (promotion August 2007)
1997 - 2007 Associate Professor of Geology (tenure awarded August 1997)
1992 – 1997 Assistant Professor of Geology ( untenured)

Administrative positions
2007 - present Master of Science (M.S.) Geoscience program Graduate Coordinator
2007 – present UNCW Radiation Safety Committee
2003 - 2005 Assistant Chair - Department of Geography and Geology
1998 - 2002 Program Coordinator - Summer Ventures in Science and Mathematics (SVSM) program at UNCW


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

TEACHING AND INSTRUCTION

COURSES TAUGHT:
Undergraduate:

- **Physical Geology** (introductory)
- **Historical Geology** (introductory)
- **Oceanography** (introductory)
- **Environmental Geology** (introductory; both as a large audience lecture class and also as an Honor Program course with a lecture, literature reading, and discussion format class with field trips)
- **Environmental Geology Laboratory** (Environmental Studies majors – basic field methods with field trips)
- **Mineralogy** (w/laboratory)
- **Optical Mineralogy** (w/laboratory)
- **Igneous and Metamorphic Petrology** (w/laboratory)
- **General Petrology** (w/ laboratory – for both Geology and Environmental Studies majors)
- **Geochemistry** (both low and high temperature topics such as stable and radiogenic isotopes, geochemical cycles in atmosphere, oceans and crust, etc.)
- **Advanced Mineralogy** (cross-listed w/ graduate; w/laboratory)
- **Geology and Geography of the National Parks and National Monuments** (includes variety of weekend to week-long field trips)
- **Field Methods in Geology** (Geology majors; includes 5 day field mapping exercise in western Virginia – Hot Springs quad - and eastern West Virginia – Marlinton region)
- **Field Course in Geology** (6 credit hours; western United States – North Carolina Geology Field Course)
- **Environmental Geology Senior Seminar** (various topics – usually oriented to topics in the southeastern United States – primarily Environmental Studies majors)
- **Geology Senior Seminar** (various topics - usually in conjunction with geology of western United States as students will be taking Field Course)
- **Contemporary Issues in the Geosciences** (various topics – both geological and environmental - capstone course for B.A. program – three directed projects aimed at integrating academic geologic or environmental studies background with practical applications. Project development, data collection and analysis, presentation of results and interpretations – both written and oral in various formats)
- **Directed Independent Studies** (DIS)
- **Undergraduate Honors** or **Departmental Honors Thesis** (6 credit hours, over two semesters, final products of a presentation, defense and a submitted abstract and/or paper to a regional or national meeting – students from geology, environmental studies, archaeology, and history to date).

Graduate:

- **Advanced Igneous Petrology** (w/laboratory)
- **Advanced Metamorphic Petrology** (w/laboratory)
- **Advanced Mineralogy** (w/laboratory)
- **Special Topics** (courses have included Geothermometry and Geobarometry, X-ray Diffraction Techniques, Geology of the Colorado Plateau, Economic Geology of North Carolina), various topical Seminar classes.
- **Research Methods** (GLY 501 – one of the two core courses in the MS Geology program - mixture of literature investigation and review and experimental methods introduction)
- **Thesis Hours**
Michael S. Smith

- Graduate Directed Independent Studies (DIS; various topics – usually geochemistry or analytical/instrumental analysis)

UNDERGRADUATE (RESEARCH) STUDENTS SUPERVISED:

Department Honors Student research (9)

Directed Independent Study (DIS) research (12)
  In Progress (1)
Directed Independent Study (DIS) research – Graduate (1)
North Carolina Teaching Fellows program (2)
Geology internship supervision (6)
  In Progress (5)

GRADUATE (MASTER’S) STUDENTS SUPERVISED (10)
  In Progress (2)
GRADUATE (MASTER’S) STUDENTS COMMITTEE MEMBER:
  Completed (15)
  In Progress (2)
GRADUATE (PH.D) STUDENTS SUPERVISED (2)
  In Progress

Susannah Fishman. (Fall 2013 - present). Dissertation topic: Ceramic entanglements at the Urartian periphery (Ph.D student from University of Pennsylvania). Acting as outside committee member in ceramic petrology and mineralogy.

FIELD COURSES and OTHER FIELD-RELATED INSTRUCTION

Summer Ventures in Science and Mathematics Program
  1994 to 2011
North Carolina Geology Field Course.
  1993 to present
Colorado State University Geology Field course
  Summer 2004 (as well as in 1991-1992 when employed at CSU)
Montana State University Elderhostel Program.
  1990 to 1996
Smithsonian Institute
  1990 to 1991; 1992 to 1993

PROFESSIONAL SERVICE ACTIVITIES

Associate Editor - Earth Sciences History
Journal of the History of the Earth Sciences Society
  2013 to present:

REFERRED PUBLICATIONS

See Research Gate.net or Academia.edu for details on publications
Abstracts (70)

Articles (24; before 2010)


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

In press:


In review/submitted:


In preparation:

Bohn, Robert M., II and Smith, Michael S. Gone and Back Again: Oil and Gas Development in Coastal Plain and Piedmont of North Carolina, 1925 to 2010. In preparation Southeastern Geology.

Michael S. Smith

Morse, David A. and Smith, Michael S. Marl in the Coastal Plain of North Carolina: From Agriculture to Aquaculture. In preparation Southeastern Geology.

NON-REFEREED ARTICLES

Completed (16; before 2015)
In preparation:


BOOKS AND MANUALS

Published (5; before 2011)

FIELD TRIP GUIDEBOOKS


ESSAYS AND REVIEWS