February 9, 2011

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Dear Colleagues:

The attached proposal for a new major in Environmental Health Science (Ph.D.) will be an agenda item for the February 16, 2011, Full University Curriculum Committee meeting.

Sincerely,

David E. Shipley, Chair
University Curriculum Committee

cc: Provost Jere W. Morehead
Dr. Laura D. Jolly
November 15, 2010

Graduate Curriculum Committee
UGA Graduate School
University of Georgia

Dear Colleagues,

Please find attached a proposed new Ph.D. degree program in environmental health science. The proposal was presented to the CPH Curriculum and Academic Programs Committee for comment and has received approval. We present it to the Graduate Curriculum Committee for review and approval.

Please feel free to contact me if any questions arise.

Sincerely,

Phillip L. Williams, Ph.D.
Dean
UNIVERSITY SYSTEM OF GEORGIA  
DOCTORAL DEGREE  
NEW PROPOSAL

<table>
<thead>
<tr>
<th>Institution:</th>
<th>The University of Georgia</th>
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| Institutional Contact: | President Michael Adams  
| | VP for Academic Affairs & Provost Jere Morehead |
| Date: | August, 2010 |
| School/Division: | College of Public Health |
| Department: | Environmental Health Science |
| Departmental Contacts: | Dr. Jia-Sheng Wang, Department Head  
| | Dr. Erin K. Lipp, Graduate Coordinator |
| Name of Proposed Program/Inscription: | Environmental Health Science |
| Degree: | Ph.D. |
| Major: | N/A |
| CIP Code: | 51.2202 |
| Anticipated Starting Date: | Fall 2011 |
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1. Program Description and Objectives

The Dept. of Environmental Health Science at the University of Georgia aims to provide the first PhD program in environmental health in the University System of Georgia. Environmental health is a critical component of good public health implementation and policy, and there is a critical need for workforce development in environmental health service and research, as identified by the WHO, CDC, and National Academies of Science. In addition to the national need for training in environmental health, in Georgia we face a high proportion of environmental exposure issues related to chemicals, occupational hazards and food and waterborne pathogens in addition to a growing population vulnerable to such exposures (i.e., rural, elderly and those of low socioeconomic status). Doctoral-level scientists specifically trained in understanding and solving these issues are critical to improving public health in Georgia as practitioners, administrators and educators, training new generations of environmental health scientists. The development of a PhD program in environmental health is a high priority for the Dept. of Environmental Health Science as well as for the College of Public Health and is included in their respective strategic plans. The program also supports the University’s commitment to develop a top-ranked school of public health. Currently there are no universities (public or private) in Georgia that offer a PhD in Environmental Health Science1. As the only university within the University System with an accredited school of public health, UGA is well-positioned to offer the first PhD of this kind in the state.

2. Description of Program Fit within the Mission of the Institution and the Discipline

The University’s overall mission is reflected in its motto “to teach, to serve, and to inquire into the nature of things.” Core characteristics of the University promote an environment of excellence for students and staff where the highest levels of scholarship, discovery and creativity, research productivity and commitment to service are possible and can be applied to education and service to the state of Georgia and the global society. The mission of the Department of Environmental Health Science clearly embraces these goals in its desire to develop itself as a national leader in education, research and service in Environmental Health. Development of a PhD program in Environmental Health Science is a key facet to achieving national standing. UGA would also be the only university within the state of Georgia to offer a PhD in environmental health science.1

Program fit within the missions and strategic goals of the University, College and Department

The University of Georgia has recently completed an extensive strategic planning effort to develop goals and directions for the next 10 years. The proposed PhD program in Environmental Health Science will support many of the priorities set forth by the University. In terms of enhancing graduate and professional programs (Strategic Direction II), the proposed program would provide opportunities for interdisciplinary doctoral education (Priority C), that integrates

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1As of the date of this proposal there are no universities within the state (public or private) that offer a PhD in environmental health science. A PhD program in environmental and occupational health has been proposed at Emory University, Rollins School of Public Health, but will not start accepting students until Fall 2011 (http://www.sph.emory.edu/cms/departments_centers/eoh/degree_programs/phd.html).
learning across faculty and students in a variety of settings, including seminars, course work and research opportunities. The Dept. of Environmental Health Science currently serves as the primary department for a cross disciplinary doctoral training program in oceans and human health (the NOAA-funded Georgia Oceans and Health Initiative Graduate Training Consortium (GOHI), one of only five such programs nation-wide), which serves as an example of institutional commitment to supporting interdisciplinary research. The proposed program would also help the University meet at least three of its illustrative benchmarks to show enhanced graduate and professional programs. The PhD program would contribute to increasing the percent of total graduate enrollment, increasing the number of doctorates awarded each year and specifically increasing the number of doctorates awarded in STEM disciplines. The proposed PhD program in environmental health science would also increase graduate training in interdisciplinary environmental research (Strategic Direction III: investing in proven and emerging areas of research excellence at UGA). Finally, this program will improve the lives of the citizens of the State of Georgia and elsewhere by providing critical training in a core area of public health (Strategic Direction IV; Serving the citizens of the state of Georgia and beyond).

Likewise, the mission of the College of Public Health to “promote health in human populations through innovative research, exemplary education, and engaged service dedicated to preventing disease and injury within the state and around the world” will be supported with the addition of a PhD program in environmental health science. There is a critical need both in Georgia and the nation for highly trained professionals and researchers in environmental health sciences and as the only such PhD program in the state, UGA and the College of Public Health would be well positioned to be leaders in this area.

At the department level, the need for a stand-alone PhD program to specifically train students is a critical component in realizing the departmental mission to “conduct innovative research to improve human health, well being, and quality of natural and working environments, and to provide exemplary education and training for future environmental health professionals.” Furthermore, the PhD program would extend graduate options beyond the MS level that is currently available, allowing UGA to offer the terminal degree in Environmental Health Science. EHS faculty have a long history of training PhD students, but students have resided in other programs such as the Interdisciplinary Toxicology Program, Food Science and Ecology. While some EHS students will continue to be a part of those programs because they desire more focused training in these disciplines, others are better served by the broader, public health focus of a PhD in EHS.

Program fit within the needs of the discipline

There is a nationwide and worldwide need for increased training in environmental health sciences. Reports by professional societies (e.g., National Environmental Health Association, the Institute of Medicine, National Academies of Science, Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) all cite a need for adequately trained professionals in public health in general, and specifically in environmental health sciences. In 2003, the CDC, in collaboration with several other agencies and professional societies, published a strategic plan for expanding the capacity of environmental health in the United States (A National Strategy to Revitalize Environmental Public Health Service). Among
the key needs for enhancing the nation’s environmental public health infrastructure is the development of a workforce (at multiple levels) that can adequately respond to myriad environmental health issues that we continue to face. Of note, in addition to addressing traditional problems in food, air, and water quality, we now face an increasingly complex set of potential health issues related to environmental exposures. These include, but are not limited to, climate change effects on health, nanotechnology and associated pollution with nanoparticles, increased antibiotic resistance among bacterial pathogens in food and water, and an expanding array of chemicals that continue to be introduced into the environment. In Georgia, we face particular pressures on public health associated with environmental exposures, which are illustrated by vulnerable populations living near hazardous waste sites, and a high level of low income populations that are disproportionately affected, the highest incidence of Salmonella infections in the nation (and high profile national outbreaks arising from Georgia plants in recent years), among other issues. Training a cadre of researchers to address these issues and to translate science into practice will be a critical component for public health capacity.

3. Program Demand and Need

“Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments.” – World Health Organization

Up to a quarter of all preventable illnesses could be eliminated through environmental health practices. According to the WHO, up to 13 million deaths (including 4 million children) per year could be prevented by controlling environmental exposures, especially in the developing world. Even in developed countries, environmental exposures are related to significant morbidity attributed to poor air quality (especially in urban areas) and exposure to chemical and microbiological contaminants through food and water. Environmental health professionals and research in environmental health is critically needed for the development of a nationwide health tracking system, as called for by the Pew Environmental Health Commission, to begin to address growing issues in public health associated with environmental exposures (including understanding baseline levels of disease and contaminants as we experience a changing environmental landscape due to development and climate change). The report states that, “We have to track what and where the hazards are in the environment, whether people are at risk from exposures to these hazards, and the health of our communities. Our information about environmental factors must run as deep and comprehensive as our knowledge of the genome.”

To address how the environment impacts public health and how controls of environmental exposure can prevent disease, people trained to deal with emerging issues in environmental health science and across traditional disciplinary boundaries are needed. Currently, there is a global, national and statewide shortage of highly trained environmental health researchers and professionals. The National Environmental Health Association in conjunction with the Centers for Disease Control and Prevention has indicated increasing workforce capacity in the environmental health science as a critical need for protection of public health.
The PhD degree in environmental health science would provide critical workforce training and cutting edge research, which are critically needed at the state, national and international levels. The Dept. of Environmental Health Science has been working toward offering the terminal degree in the field for ~10 years. The department’s strategic plan (2002) specifically identified increasing graduate training in environmental health and proposed two additional degree programs. The first was the establishment of a Masters of Public Health (MPH) degree (implemented in 2005 with the start of the College of Public Health) and the second was the development of a PhD in environmental health science. Furthermore, the strategic plan for the College of Public Health, which is currently under development, also calls for the development of the PhD in Environmental Health Science. Given the lack of similar programs in the state, the high rate of applicants to our graduate programs each year, and critical need for environmental health researchers, we expect the demand for the program to be high.

4. Institutional Resources for the Proposed Ph.D. Program

The Dept. of Environmental Health Science was first created in 1998 and has maintained an active (and growing) academic and research program. The department is housed in the Environmental Health Science Building on the south campus of UGA. The department and the EHS building supports an undergraduate program (BSEH), two master’s programs (MSEH and MPH with a concentration in EHS), and predoctoral research, with office space (for faculty, staff, post-doctoral research associates, research professionals, and graduate students), instructional space (a large classroom, two small conference rooms and a teaching laboratory), computer support (including a student computer lab), and research space.

Personnel

The Dept. of Environmental Health Science includes seven tenured/tenure track faculty, one full time instructor, and two research scientists. The department also has five adjunct professors. The faculty is supported by two administrative staff. The staff members provide academic support (e.g., student records, course loading, admissions) as well as accounting support (e.g., ordering of supplies, payroll and personnel, processing of travel authority requests and travel expense reimbursements). One of the staff members is also the official Graduate Coordinator Administrative Assistant and the Undergraduate Coordinator Administrative Assistant.

Library

The University Libraries are composed of three on-campus facilities, the Main Library, the Science Library and the Law Library. The University Library is the largest university library in the state, having over 4.7 million volumes and 37,000 full textbooks available online (2007-2008 figures). Approximately 750,000 printed volumes are in the Science Library. As a regional depository, the Library automatically receives all U.S. government publications made available to depositories through the Depository Library Program. The UGA Libraries have access to 80,748 current serials, including 7,763 purchased print subscriptions, 48,691 purchased electronic subscriptions and access to 24,294 titles outside of traditional subscription models. These and over 400 databases can be accessed through GALILEO, a statewide on-line resource (“virtual library”) for scholastic publications. The Library also has three special collections: the Felix Hargrett Rare Book and Manuscript Library, the George Foster Peabody Awards Collection, containing over fifty years of broadcast materials, and the Richard B. Russell Library.
for Political Research and Studies, which emphasizes the history, culture and current affairs of Georgia and Georgia's representatives in the federal government, especially the intersection of public interest with government. The Russell Library holds regular programs for the public, some of which have focused on health issues. These three special collections (Hargrett, Russell, and Peabody) are preparing to move into a new facility that is under construction now and expected to open in late 2011. The Miller Learning Center has both classroom and electronic library facilities, adding to the different ways that students can access library resources at UGA. The libraries hold a considerable number of monographs and journals (print and electronic) that support the environmental health PhD program. Appendix 4 contains a partial list of scientific journals relevant to EHS that are available through the UGA libraries.

**Laboratory and Equipment Resources**

The Dept. of Environmental Health Science has laboratory space for classroom instruction and facilities devoted to areas of faculty research expertise. Many of the EHS courses have a laboratory component, which allows students to apply scientific techniques and risk assessment methods. The EHS Department has research space totaling 5,224 ft² in the EHS building. Four small research laboratories are within the first floor of the EHS building: a 205 ft² DNA Research lab (room 130), a 348 ft² Aquatic Organism Laboratory (room 128), a 217 ft² Air Quality Laboratory (room 126) with a small Environmental Room (room 126a, 64 ft²) and an Environmental Exposure Assessment Lab (room 103, 219 ft²).

Three research laboratories are located on the second floor of the main EHS building: the Developmental Toxicology laboratory (room 200, 566 ft²), a small Tissue Culture laboratory (room 201a, 174 ft²) and a Molecular Microbiology Lab/Clean Room (room 202, 224 ft²).

Five research laboratories (rooms 300, 301, 303, 304, and 305, total of 2,775 ft²), ranging in size from 429 to 679 ft², are located on the third floor of the EHS building, including an Environmental Toxicology and Genomics Lab, Cancer Research Lab, Aquatic Toxicology Lab, Environmental Microbiology Lab and an Environmental Chemistry Lab. Two smaller rooms for incubator storage (room 204a, 119 ft²) and a graduate student office/microscope room (303a, 49 ft²) are located between rooms 303 and 304. In 2008 additional space was renovated to create a small Research Services room (room 307, 132 ft²) and a Chemical Exposure Lab (room 306, 132 ft²), with pass-through access to the PBPK Lab. All of these research laboratories have been renovated (new cabinets, fixtures and floors) within the past 10 years, and four of these laboratories have chemical fume hoods. Each of the research laboratories has state of the art equipment for conducting research in basic environmental health research (including molecular biology, microbiology, toxicology, cancer biology, analytical chemistry, animal exposure, and modeling).

**Developmental Toxicology Laboratory.** The developmental toxicology laboratory (room 200) is composed of two rooms, a basic toxicity and biochemical laboratory of approximately 566 ft² and a microorganism and tissue culture facility of 174 ft². The laboratory is fully equipped for biochemical and toxicological analyses, including a μQuant universal microplate spectrophotometer capable of measuring fixed wavelengths between 200-999 nm with KC4.
software for data analysis, an Eppendorf Realplex 4 Mastercycler, ep gradient S, gel electrophoresis apparatus, table top centrifuges, a water bath, pipettors, pH meter, and other typical biochemical equipment. Microscopes are also available, including an inverted phase microscope and compound microscopes. A small tissue culture facility is also available for incubations and is equipped with a laminar flow clean bench, a biosafety hood, CO₂ incubators and a Coulter counter for determining cell counts. Histochemical equipment is also available for fixing and staining tissue for pathology studies. Storage equipment includes -80°C and -20°C freezers and 4°C refrigerators.

**Environmental Toxicology and Toxicogenomics Laboratories.** The Environmental Toxicology laboratory is a 549 ft² lab that was recently renovated (2002) at a cost of approximately $150,000. All renovation expenses were paid for by a gift from the Georgia Power Company. This lab is equipped with a chemical fume hood, biological safety cabinet, incubators, microscopes, and specialized computer tracking equipment for performing toxicological research using the nematode, *Caenorhabditis elegans*. In addition to traditional toxicology work, toxicogenomic capabilities are also available. Pre-PCR methods (DNA/RNA extractions, etc.) are conducted in room 300 using pipettors, centrifuges, and other small equipment needed for DNA extraction and setting up PCR reactions. PCR and post-PCR experiments are conducted in Room 120, an 865 ft² teaching laboratory, along with room 130, a 205 ft² research laboratory, with shared instrumentation (e.g., DNA thermocyclers, a real-time PCR system, gel electrophoresis systems, power supplies, centrifuges, freezers, and a photodocumentation system). EHS researchers also make extensive use of the Georgia Genomics Facility (GGF; a shared core laboratory at UGA with >3500 ft² of space and >$1.5 M in instrumentation; see: http://dna.uga.edu), with 2 EHS faculty having offices and formal positions within the GGF.

**Environmental Microbiology and Molecular Microbiology Laboratories.** Room 303 in the EHS Bldg. is dedicated as the environmental microbiology lab. It is certified as BioSafety level 2 and has immediate access to an autoclave, dishwashing facilities and water purification system. The main portion of the laboratory is 429 ft² and accommodates experiments in both traditional microbiology and molecular biology. The laboratory is equipped for media and reagent preparation, environmental sample processing, DNA analysis and image analysis, PCR preparation and data processing. Equipment includes a laminar flow hood, water baths, low temperature, shaking and standard incubators, and a -80°C freezer for detection, culture and maintenance of microorganisms. A research grade Olympus compound microscope with epifluorescence is also available. An M.J. Research temp cycler with dual alpha blocks and a 96-well gradient block is on-hand for PCR (polymerase chain reaction) and RT (reverse transcription)-PCR. The laboratory also includes an Applied Biosystems Step One real time PCR system. Standard horizontal electrophoresis and a CHEF DR II (Bio-Rad) pulsed field gel electrophoresis (PFGE) system are used for physical separation of nucleic acid fragments. Phylogenetic software for analysis of DNA sequences and DNA fingerprinting are loaded on laboratory computers. Additionally, room 202 serves as a clean room for molecular assays and includes two PCR work stations, freezer, refrigerator, additional PFGE rig, water baths and refrigerated centrifuge.
Environmental Chemistry and Exposure Laboratories. These laboratories (rooms 301 and 306; total of 732 ft²) are designed for environmental chemistry analyses and experimental studies to support development of exposure and toxicity models. The primary lab has two fume hoods with flammable/acid solvent cabinets, a variety of inhalation exposure chambers, instrumentation and analytical equipment, including two Gas Chromatographs, two Gas Chromatograph-Mass Spectrometers (with quadrupole and ion trap mass spectrometer units), and an Ion Chromatograph.

Aquatic Toxicology and Aquatic Animal Laboratories. Rooms 305 and 128 contain research space and equipment for conducting aquatic toxicology research. Brood stock and progeny of fish and frogs are cultured and maintained in the Aquatic Organism Lab in room 128. Experiments are also conducted in this room. This room is equipped with a high-throughput tap water dechlorination system with UV polishing, a 150 gallon head tank for dechlorinated water storage and distribution, three 70 gallon PE tanks and numerous glass aquaria on racks. Source water temperature can be regulated manually via a mixing valve. Analytical toxicology work is conducted in the Aquatic Toxicology Lab in room 305. This lab is equipped with a fume hood and bench space that provides adequate workspace for the current personnel to conduct water quality analyses; tissue, water and sediment extractions and metal digestions; biochemical extraction and analyses for biomarkers. The room also contains incubators for the culture and exposure of aquatic invertebrates; basic histology staining equipment; research-grade stereo, inverted and compound microscopes and two digital cameras with a digital analysis capability. Two Pentium IV computers and a separate desk are available for graduate student use.

Environmental Exposure Assessment and Air Quality Laboratories. Rooms 126 and 103 in the EHS Bldg. are dedicated primarily for research in air quality and environmental exposure assessment. The Air Quality Lab (room 126) is outfitted with a standard wet lab facility and a freezer to store environmental samples. It also has a small climate-controlled room attached to it that is outfitted with an analytical balance (Cahn 35 electro-microbalance) used to weigh filters for air monitoring research. The main portion of the laboratory is 350 ft² and accommodates experiments in both traditional exposure assessment using environmental and biological samples, and environmental epidemiology. Room 103 has four computer workstations for data reduction and analysis for environmental exposure assessments and storage space for field instrumentation. Additional field instruments for air quality research (cyclone pumps, high capacity filter units, etc.) are stored in the EHS Storage room (105E; 306 ft²).

Cancer Etiology and Prevention Research Labs. Room 304 in the EHS Building and additional lab space in the second floor of the Coverdell Building (Room 226) are designated for Dr. J.-S Wang by the VP for Research. These laboratories are well-established with many pieces of equipment for chemical and biochemical analyses, including a Thermo LC/MSn system, ESA HPLC-CoulArray system, two Agilent HPLC systems (1100 and 1200) with autosampler, Diodearray UV detector, and Fluorescence detector, one Thermo HPLC system including autosampler, Diodearray UV detector, and Fluorescence detector; two Beckman Coulter UV/VIS spectrophotometers (DU640 and DU800), a molecular Devices Spectromax 96 well plate reader for ELISA, a Labco speed vacuum system, a chromatography cool cabinet, a fluorometer, multiple centrifuges, and microanalytical balance. The laboratory in Coverdell Building also equipped with a Fast Real Time 7500 PCR system, two regular PCR machines, an
image system, 1- and 2-D gel facilities for genotypic and proteomic analysis, a separate culture facility including a culture hood, two CO₂ incubators, and an Olympus inverted microscope, and a biospecimen repository equipped with six Reveco -80°C freezers two -20 °C freezers and cryogenic facility for storage of human cells and biospecimen.

**Teaching Lab.** The EHS Department also has an 865 ft² teaching laboratory with bench space for 18 students, which was part of renovated space in 2002. This teaching lab is equipped with two fume hoods, a biosafety cabinet, an autoclave and an 83 ft² storage/lab preparatory room. Wet labs are offered as part of core and elective courses in all EHS degree programs. The teaching lab provides bench space and equipment to support training in environmental microbiology, aquatic toxicology, environmental biotechnology, industrial hygiene and environmental chemistry.

**Computer Lab.** Room 104 (295 ft²) houses a 10-station computer lab outfitted with ten Pentium IV computers and a high throughput laser printer. The College of Public Health server is also located in a small room behind this facility (room 104A, 71 ft²). All computers are loaded with standard word processing, spreadsheet, internet and publishing software and a subset of them also have statistical (SAS, SPSS), graphic (SigmaPlot), GIS (ArcGIS) and risk assessment (Crystal Ball) software. This lab is administered by CPH IT staff and is not a part of the University-wide computer group EITS. The lab is for the exclusive use of CPH students and is used for both instructional and research purposes. A mobile teaching system with 20 Apple Macintosh laptop computers was acquired in 2009. The Macintosh notebook computers can operate both OS X and Windows operating systems and are loaded with standard word processing, spreadsheet, internet, and publishing software as well as specialized software for statistical, graphical, and DNA analysis. Video conferencing equipment is available for use of faculty and graduate students for conducting meetings with off-site collaborators and participating in video conferences. This equipment is on a mobile cart and can be used in any classroom of the EHS building.

**Supplies**

Research related supplies, which support the research activities of faculty and graduate students, are provided almost exclusively from extramural grant support. Funding to purchase supplies for graduate level laboratory courses is derived from student lab-fees, supplemented by Departmental or College funds when available. Lab fees range from $50 - $135 per student per course.

**Capital expenditures (start-up and at first program review)**

Graduate level training (including at the PhD level) has been on-going by faculty in the department for >15 years. The proposed Ph.D. would serve to formalize a program with a specific academic focus in environmental health science; therefore, we do not anticipate significant start-up costs, especially in tight budget time. However, in order to best position our program, recruit excellent candidates and to provide critical support to our growing course offerings, we are requesting two graduate assistantship positions (33.3% FTE for the academic year), which will be provided by the College of Public Health.
5. Curriculum

The field of environmental health science is, by its nature, interdisciplinary, relying on core disciplines of toxicology, microbiology, molecular biology, epidemiology and biostatistics within a framework of public health principles. Students are expected to master all foundational areas in this field. While existing graduate programs, such as the Interdisciplinary Program in Toxicology, may offer focused training in one or two of these core disciplines, the PhD in EHS offers a broader degree with a foundation in public health principles and advanced training in all areas of environmental health, including but not focusing on, single disciplines such as toxicology. In developing the curriculum for the PhD in environmental health science, top-ranked peer and aspirational PhD programs in environmental health science were evaluated and elements were adopted such that they fit with the research expertise of the faculty within environmental health science at the University of Georgia and adhered to the guidelines set forth by both the University of Georgia Graduate School and the Council on Education for Public Health (CEPH; the accrediting body for all schools of public health).

The proposed course curriculum falls into Core (21 hours) and Elective (9 hours) categories, with additional doctoral research hours (as recommended by students’ advisor and/or doctoral committee). Core areas are defined both by the specific research areas in environmental health science and the need for a solid foundation in public health, which are required by the accrediting body for Schools of Public Health. To that end the curriculum proposed for this degree requires 21 hours of core content, including advanced topics in environmental health, epidemiology, biostatistics, professional ethics and seminars. The requirement of a professional ethics course and the requirement that students regularly present their research to faculty and fellow graduate students are part of the program’s effort to socialize doctoral students into the environmental health science discipline as professionals.

When students enter the program they will have an assigned advisor (major professor) who, in most cases, will continue to advise the student (and his/her research) for the duration of the program. In the case of co-advisors, at least one shall be a tenured or tenure-track faculty member of EHS, and each co-advisor will have a full vote on the committee.

The student will work with his or her advisor(s) to develop a dissertation project and will consult on the formation of the student’s dissertation committee. The committee will be formed by the end of the first year and will include at least three other faculty members or professionals with the highest terminal degree in their field. At least three committee members (including the major advisor) shall have UGA graduate faculty status. At least two committee members shall be from the department of Environmental Health Science regular or adjunct faculty, including the major professor. Additionally, at least one member of the committee shall be from outside of the department.

After formation of the committee, the student will present a dissertation prospectus for approval (this may also take the form of a full DOE, EPA, NIH, NOAA, NSF or USDA style proposal, at the discretion of the committee). The committee will also review and approve the student’s preliminary and final programs of study.

After completing required coursework, students will complete written and oral exams for admission to PhD candidacy. The exams will be administered by the student’s committee. Students will not progress to the oral exam unless they have passed the written exam. The committee may suggest or require students to complete additional coursework, directed readings
or other instruction to help students fill knowledge gaps identified during the exams. Students who fail either portion of the exams will be allowed to repeat them one time. Students who fail a second attempt will be allowed to enter the MSEH program.

**Proposed Course of Study †**

The following curriculum is based on the guidelines set forth by the University of Georgia Graduate School. The PhD in Environmental Health Science will require 30 hours of coursework. For students entering with a M.S. (or other Master’s) degree, 16 hours must be taken at 8000 level; those with no master’s degree must successfully complete at least an additional 4 hours in graduate-only courses. For all students, greater than 50% of hours on the course of study must be in classes that are limited to graduate students only.

**Core (21 h)**

- Advanced Topics in Environmental Health Science I (EHSC 8010)* 3 h
- Advanced Topics in Environmental Health Science II (EHSC 8020)* 3 h
- Responsible Conduct of Research (GRSC 8550) 1 h
- Proseminar in Environmental Health (EHSC 8050)* 1 h
- Graduate Seminar in Env. Hlth. Res. (EHSC 8030* or PBHL 8200) 1 h (x 3 semesters)
- Biostatistics (advanced course) (selection from BIOS or STAT) 3 h
- Epidemiology (advanced course) (selection from EPID) 3 h
- Doctoral Dissertation (EHSC 9300) 3 h
- Environmental Health Seminar [Exit Seminar] (EHSC 8150) 1 h

**Electives (9 h)**

As determined by major professor and dissertation committee
- >6 h must be from courses with EHSC prefix (currently offered EHSC courses at the graduate level are listed below).

**List of Graduate-Level Electives Offered through the Dept. of Environmental Health Science**

- EHSC 4090/6090 (3 h) Emerging Technologies: Bioremediation
- EHSC 4100/6100-4100L/6100L (3 h) Industrial Hygiene
- EHSC 4150/6150 (3 h) Solid and Hazardous Waste Management
- EHSC(FDST)(MIBO) 4310/6310-4310L/6310L(4 h) Environmental Microbiology
- EHSC 4350/6350-4350L/6350L (3 h) Environmental Chemistry
- EHSC 4400/6400 (3 h) Environmental Issues in the Developing World
- EHSC 4610/6610 (3 h) Water Pollution and Human Health
- EHSC 4490/6490 (3 h) Environmental Toxicology
- EHSC 4700/6700 (3 h) Genetic Applications in Environmental Health Science
- EHSC 4710/6710-4710L/6710L (3 h) Environmental Biotechnology

† Appendix 1 lists all courses and descriptions
* New course – approval pending
EHSC 4080/6080 (3 h) Environmental Air Quality
PHRM(VPHY)(EHSC) 6910 (3 h) Introductory Toxicology
EHSC 7010 (3 h) Fundamentals of Environmental Health Science
EHSC 8100 (1-3 h) Current Topics in Environmental Health Science
EHSC 8110 (3 h) Fundamentals of Chemical and Microbial Risk Assessment
EHSC(AAEC) 8120 (2 h) Roles and Responsibilities of Environmental Policy Makers
EHSC 8150 (1 h) Environmental Health Seminar
EHSC 8210 (3 h) Cancer Etiology and Prevention
EHSC 8220-8220L (4 h) Predictive Toxicology Using Predictive Models
EHSC(EPID) 8250 (3 h) Biomarkers: Public Hlth, Clin & Environmental Toxicology Applications
EHSC 8310 (3 h) Advanced Topics in Aquatic Microbiology, Health and the Environment
EHSC(MARS) 8410 (3 h) Oceans and Human Health
EHSC 8440 (3 h) Occupational and Environmental Diseases
EHSC 8450 (3 h) Genome Technologies
EHSC 8510-8510L (3 h) Environmental Risk Assessment and Communication
EHSC(EPID) 8540-8540L (3 h) Microbial Quantitative Risk Assessment
EHSC 8550 (3 h) Development and Reproductive Toxicology
EHSC(ECOL)(FISH)(WASR) 8610 (3 h) Aquatic Toxicology
EHSC 8630-8630L (4 h) Quantitative Ecological Toxicology
EHSC 8710 (3 h) Issues in Biosafety and Biosecurity
EHSC 8800 (1-3 h) Special Problems in Environmental Health Science

Sample Program of Study

Student with prior M.S. degree (and no remedial requirements)

YEAR 1

Fall
- Advanced Topics in EHS I (EHSC 8010) 3 h (Core)
- Responsible Conduct of Research (GRSC 8550) 1 h (Core)
- Adv. Topics in Aquatic Micro., Health, and the Env. (EHSC 8310) 3 h (Elective - EHSC)
- Fund. of Chem. & Microb. Risk Assess. (EHSC 8110) 3 h (Elective - EHSC)
- Research (EHSC 9000) 8 h

Spring
- Advanced Topics in EHS II (EHSC 8020) 3 h (Core)
- Proseminar in Environmental Health (EHSC 8050) 1 h (Core)
- Environmental Microbiology (EHSC 6310/6310L) 4 h (Elective - EHSC)
- Molecular Epidemiology (EPID 8200) 3 h (Core)
- Doctoral Research (EHSC 9000) 1-12 h

Summer
- Doctoral Research (EHSC 9000) 1-12 h

2 Graduate only courses
Committee formed by end of year 1 (membership includes major professor and at least 3 others [≥3 must have graduate faculty status] ≥2 faculty, including the major professor, must be from the Dept. of Environmental Health Science, one committee member can be selected from outside of Environmental Health Science). Students are encouraged to write a dissertation prospectus; this may entail the writing of a full proposal at the discretion of the dissertation committee.

YEAR 2

Fall
- Proseminar in Environmental Health (EHSC 8050) 1 h (Core)
- Introductory Biostatistics II (BIOS 7020) 3 h (Core)
- Oceans and Human Health (EHSC(MARS) 8410) 3 h (Elective – EHSC)
- Genetic Applications in Env. Health Sci. (EHSC 4700/6700) 3 h (Elective – EHSC)
- Doctoral Research (EHSC 9000) 1-12 h

Spring
- Doctoral Research (EHSC 9000) 1-12 h

Summer
- Doctoral Research (EHSC 9000) 1-12 h

Comprehensive exams – written and oral format (oral exam following generally within 2 weeks but no more than 6 months after the written exam)

YEAR 3

Fall
- Grad. Seminar in Environmental Health Res. (EHSC 8030) 1 h (Core)
- Doctoral Research (EHSC 9000) 1-12 h

Spring
- Doctoral Research (EHSC 9000) 1-12 h

Summer
- Doctoral Research (EHSC 9000) 1-12 h

YEAR 4

Fall
- Proseminar in Environmental Health (EHSC 8050) 1 h (Core)
- Doctoral Research (EHSC 9000) 1-12 h

Spring
- Doctoral Research (EHSC 9000) 1-12 h
- Doctoral Dissertation (EHSC 9300) 1-12 h
- Environmental Health Seminar (EHSC 8150) 1 h
6. Admissions Criteria

Applicants will be evaluated based on GRE scores, GPA (undergraduate and/or graduate), official transcripts, statement of interest and three letters of recommendation. Admissions standards will meet or exceed Graduate School guidelines. Students seeking admission to the PhD program directly from a bachelor’s degree will be expected to show a high level of achievement in their undergraduate degree to indicate capacity for adequate performance in PhD level curriculum and research. International students whose native language is not English must also submit results of the Test of English as a Foreign Language (TOEFL).

Students admitted to the PhD program must have earned a degree (bachelor’s or master’s) from an accredited program in Environmental Health or an equivalent science degree. Students entering are expected to have had introductory level epidemiology and biostatistics (or statistics). These may be satisfied by earning the equivalent senior or graduate level course credit prior to admission to the program or by taking courses in these areas as a part of their graduate program with the approval of their graduate committee.

The admissions committee of the Dept. of Environmental Health Science will review all applications and make recommendations to the full faculty. For an applicant to be accepted to the program following favorable departmental review, one member of the faculty will need to sponsor the applicant as the academic and research advisor.

7. Availability of Assistantships

The Dept. of Environmental Health Science offers a limited number of graduate teaching assistantships (GTA) each year. The number of GTAs varies from 4 to 5 annually; GTAs provide an assistantship at 33.3% FTE for the academic year (10 months). All PhD students will have the opportunity to serve as teaching assistants during their academic tenure.

More often graduate students are supported in the department through graduate research assistantships (GRA), which are funded by faculty extramural grants. Collectively, faculty members in the Dept. of Environmental Health Science support 21 to 26 students each year at rates from 33.3% to 50% FTE for the fiscal year (12 months). These assistantships currently fund both MS and PhD students. With the addition of a PhD program in Environmental Health Science, we anticipate an increase in support through extramural funding which will further support students at both the Master’s and PhD level.

Excellent applicants will also be nominated for competitive assistantships through the Graduate School (Graduate School Assistantships, Graduate Recruitment Opportunities Assistantship, Presidential Fellows Graduate Program and Dissertation Completion Award) and through available training programs such as the Georgia Oceans and Health Initiative.

It is expected that any student accepted to the PhD program in Environmental Health Science will receive adequate funding in the form of assistantships.
8. Student Learning Outcomes

Through coursework and research experiences toward the completion of the PhD degree in Environmental Health Science, graduates will meet the following competencies:

1) Exhibit a strong foundation in the core disciplines of environmental health science, including air quality, food and water quality, environmental exposure, toxicology and risk assessment.

2) Follow and promote good ethical practices in the conduct of research.

3) Apply biostatistical approaches and evaluate epidemiological studies as they pertain to environmental health research beyond the introductory level.

4) Evaluate and critique emerging areas of research in environmental health science and their application to the larger public health discipline.

5) Demonstrate in-depth knowledge in at least one area of specialization within the framework on environmental health science.

6) Formulate new scientific knowledge in the field of environmental health science and effectively communicate results and their significance through publications, discussions and presentations.

Assessment

Students matriculating in the PhD program in Environmental Health Science will be evaluated annually for their progress toward degree milestones, research productivity and attainment of stated learning outcomes (competencies). Annual evaluation will be completed by both the student (self-evaluation) and the student’s committee using a standard assessment survey used within the College of Public Health and tailored to our specific program. The Graduate Coordinator will maintain all evaluation records. The Department of Environmental Health Science will also work with the College of Public Health’s Assistant Dean for Assessment to develop instruments to track alumni and their career paths. The adopted assessment protocols will ensure that current students are making adequate forward progress for their degrees, that all EHS PhD graduates are meeting our expected learning outcomes and competencies, and that we have a mechanism in place to evaluate the quality of our graduates by tracking their career paths.

9. Administration

The Ph.D. in Environmental Health Science will be housed within the Dept. of Environmental Health Science in the College of Public Health at the University of Georgia. The administrative structures of the College of Public Health and the Department of Environmental Health Science are included (Appendix 5). Briefly, the EHS Department Head is directly responsible to the CPH Dean and to the faculty of the Department of Environmental Health Science. The EHS faculty report directly to the Department Head and the research and teaching programs in EHS are the direct responsibility of the EHS Department Head. The EHS Graduate Coordinator handles all aspects of the graduate programs housed in EHS (MS EH and the proposed PhD in EHS), including student administration (admissions and annual assessment reporting to UGA and accreditation agencies), graduate orientations, and other activities as needed. An EHS
Graduate Admissions Committee will assist the Graduate Coordinator with admissions decisions.

10. Waiver to Degree-Credit Hour
This section is not applicable to this program (total credit hour requirements do not exceed those of similar programs).

11. Accreditation
Currently, there is no formal accreditation for PhD degrees in environmental health science. The accrediting agency for environmental health, the National Environmental Health Science & Protection Accreditation Council (EHAC), primarily provides accreditation for the bachelor’s degree. UGA’s BSEH degree remains the only undergraduate degree program in environmental health in Georgia that is accredited by EHAC.

The College of Public Health and all academic and professional degrees offered fall under the general accreditation of the Council on Education for Public Health (CEPH) and specific requirements must be met for each degree under a School’s accreditation. Doctoral programs must follow the criteria for all academic degrees, which require that “students pursuing [any academic degree] shall obtain a broad introduction to public health, as well as an understanding about how their discipline-based specialization contributes to achieving the goals of public health” (CEPH Criterion 2.9, Accreditation Criteria for Schools of Public Health. June 2005).

With regard to curriculum and outcomes, the CEPH criterion expects the following:

“Students in academic curricula should be familiar with the basic principles and application of epidemiology and should develop competence in other areas of public health knowledge that are particularly relevant to their own disciplines. Opportunities for cross-disciplinary work should be afforded to all academic students.

While opportunities to engage in research activities are important for all students, they are essential for students in academic or research curricula. Such opportunities are possible only when faculty themselves are actively engaged in research. Research curricula should culminate in an integrative activity that permits the student to demonstrate the ability to successfully undertake research.”

The course of study and expectations of students in the proposed PhD program fulfill these expectations. Environmental epidemiology will be a critical module in the proposed Advanced Topics in Environmental Health Science I and II. All students in the PhD program will also take at least one course in biostatistics and epidemiology beyond the introductory level. To increase exposure to other disciplines and ensure that students have opportunities for cross-disciplinary work, all students will be required to have at least one committee member from outside of the Dept. of Environmental Health Science and will be encouraged to take elective coursework (at least 3 h) in outside departments.

Finally, all faculty members (with the exception of full time instructor[s]) are actively engaged in research, consistently receive extramural funding, provide ample research opportunities for
doctoral level students and have an excellent track record of publishing student research. The student’s dissertation, which is a culmination of his or her research, and the public defense of the dissertation will be used to demonstrate the student’s ability to successfully undertake research. Furthermore, it is expected that the research will result in peer reviewed publications with the student as the first author.

12. Projected Enrollment
Faculty members in the Dept. of Environmental Health Science are routinely sought out as potential advisors for prospective PhD students, even without an existing PhD program in EHS. These prospective students express specific interest in our respective research areas and often go on to matriculate at UGA but are admitted through outside programs where our faculty have courtesy appointments (e.g., Interdisciplinary Toxicology Program, Odum School of Ecology, Warnell School of Forestry and Natural Resources, Dept. of Marine Science, Dept. of Food Science and Technology). In some cases, these students would be more interested and be better served by a degree in environmental health science. Student demand can be shown by current and past advisement of Ph.D. students by our faculty (see Table 13.2) and by letters of inquiry to the Graduate Coordinator and individual faculty.

Initial enrollment projections are based on an assessment of current level of support for new students among the core EHS faculty. In the first year, we expect to accept up to 4 new students and anticipate that at least two students may transfer into an EHS PhD from another program. In subsequent years, we anticipate up to 6 new students per year as new faculty are recruited (searches for two assistant professors are currently in progress). The primary limitation on accepting students is the number of available graduate research assistantships that can be offered. Student funding is primarily accomplished through extramural grants to faculty with limited reliance on teaching assistantships. Only in unusual circumstances will students be accepted to the program without an assurance of funding. A secondary constraint on enrollment is the amount of dedicated graduate student desk space in the EHS building, which is sufficient for about 16 PhD students. Additional space is slated for the EHS department when the department moves to join the rest of the College of Public Health at the former Navy School Campus [medical partnership and public health campus].

Recruitment
Upon approval of the PhD program in environmental health science, advertising and recruitment efforts will target potential doctoral students. This will be accomplished through highlights on the departmental and college web site, announcements through the ASPH (Association of Schools of Public Health) weekly e-newsletter, and presence at meetings of professional organizations. Additionally, the department has a history of supporting a higher than average level of underserved and/or minority populations among our graduate students. We anticipate that this trend will transfer to the new PhD program as well. Dr. Mary Alice Smith received the 2005 Alfred P. Sloan Foundation Mentor of the Year award for her work with minority graduate students. She has had two students graduate with PhDs that received the Sloan Foundation fellowships for minority students and currently has one student on a Sloan Foundation fellowship.
Matriculation

Students may be accepted during any academic semester; the program will not be structured in a cohort-based format. The curriculum is designed such that a student may matriculate in any semester and be able to take appropriate course-work.

13. Faculty

The Department of Environmental Health Science faculty includes experts in the core fields of environmental health science, including toxicology, air quality, water quality, genomics, microbiology and risk assessment.

There are currently 7 faculty members with academic rank (Table 13.1) including 2 full professors, 5 associate professors and one full time instructor. Searches are currently underway for two assistant professors, positions that are expected to be filled by Spring 2011. In addition to the core faculty, two research scientists and five adjunct professors augment the program. All core and adjunct faculty contribute to graduate instruction, mentorship and/or advisement. Biographical sketches of all Environmental Health Science core, research and adjunct faculty are included in Appendix 2.

The department has had an active M.S. degree in Environmental Health Science (MSEH) since 1995. Additionally, departmental faculty have a sustained record of advising PhD students through programs such as UGA’s Interdisciplinary Program in Toxicology (ITP) (all core EHS faculty are members), where EHS consistently houses the majority of students in this program. Faculty also have obtained courtesy status in other departments on campus in related fields (e.g., Ecology, Marine Science, Forestry and Natural Resources), which has allowed another avenue for advisement of PhD students.

Currently, faculty members in the Dept. of Environmental Health Science serve as major professors for 14 PhD students and, collectively, the core faculty has graduated >24 PhD students (Table 13.2). Additionally, Ph.D. students advised by Environmental Health Science faculty have been recognized for excellence both within the University as well as nationally (and internationally). Students have received awards for teaching and research at UGA (including Outstanding Teaching Assistant and the E. Broadus Browne Award for Excellence in Research). Several students have been awarded competitive university-wide assistantships (e.g., Presidential Fellowships, Graduate School Assistantships) and UGA Dissertation Completion Awards. Students routinely receive competitive travel awards from professional societies (e.g., American Society for Microbiology, Society of Toxicology, Society for Environmental Toxicology and Chemistry), and have competed successfully for top prizes for best poster and best presentation at regional, national and international meetings. Finally, Ph.D. students advised by Environmental Health Science faculty have also received fellowships from the U.S. EPA (STAR fellowships), NOAA (Nancy Foster Scholarship), National Estuarine Research Scholarships and the Georgia Oceans and Health Initiative (a PhD training grant to UGA, funded by NOAA), which are extremely competitive and awarded to a very few students nation-wide each year.
Table 13.1 Inventory of faculty directly involved in the administration of the proposed PhD program (core faculty in the Dept. of Environmental Health Science)

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Rank</th>
<th>Highest Degree</th>
<th>Degrees Earned</th>
<th>Academic Discipline</th>
<th>Current Workload</th>
<th>Graduate Courses Taught</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black, Marsha C.</td>
<td>Associate Professor (Asst. Dean)</td>
<td>Ph.D.</td>
<td>Ph.D. 1989</td>
<td>Aquatic Toxicology; Ecotoxicology</td>
<td>17.5% Research</td>
<td>EHSC 6600, EHSC 6610, EHSC 6010, EHSC 8610, EHSC 8100, PBHL 7800, EHSC 6910</td>
</tr>
<tr>
<td>Glenn, Travis</td>
<td>Associate Professor</td>
<td>Ph.D.</td>
<td>M.S. 1990, Ph.D. 1996</td>
<td>Environmental Genomics</td>
<td>32.5% Research, 12.5% Teaching, 25.0% Admin, 5.0% Service</td>
<td>EHSC 6710, EHSC 8450, EHSC 6010</td>
</tr>
<tr>
<td>Lipp, Erin K.</td>
<td>Associate Professor</td>
<td>Ph.D.</td>
<td>Ph.D. 1999</td>
<td>Environmental Microbiology</td>
<td>32.5% Research, 37.5% Teaching, 5% Service</td>
<td>EHSC 6310, EHSC 6310L, EHSC 8410, EHSC 8310, EHSC 6010, PBHL 7800</td>
</tr>
<tr>
<td>Naehler, Luke P.</td>
<td>Associate Professor</td>
<td>Ph.D.</td>
<td>M.S. 1994, 1998, Ph.D. 1998</td>
<td>Air Quality; Exposure Assessment</td>
<td>32.5% Research, 37.5% Teaching, 5% Service</td>
<td>EHSC 6080, EHSC 7010, EHSC 6010</td>
</tr>
<tr>
<td>Smith, Mary Alice</td>
<td>Associate Professor</td>
<td>Ph.D.</td>
<td>M.A.T. 1976, M.S. 1980, Ph.D. 1990</td>
<td>Developmental Toxicology; Risk Assessment</td>
<td>32.5% Research, 37.5% Teaching, 5% Service</td>
<td>EHSC 6490, EHSC 8110, EHSC 8550, EHSC 6010</td>
</tr>
<tr>
<td>Wang, Jia-Sheng</td>
<td>Professor (Dept. Head)</td>
<td>Ph.D.</td>
<td>M.D. 1982, Ph.D. 1994</td>
<td>Molecular Toxicology; Cancer Etiology</td>
<td>32.5% Research, 15.0% Teaching, 22.5% Admin, 5.0% Service</td>
<td>EHSC 7010, EHSC 8210</td>
</tr>
<tr>
<td>Williams, Phillip</td>
<td>Professor (Dean)</td>
<td>Ph.D.</td>
<td>Ph.D. 1988</td>
<td>Industrial Hygiene; Toxicology</td>
<td>100% Admin</td>
<td>EHSC 6100, EHSC 6080, EHSC 6010, EHSC 8120</td>
</tr>
<tr>
<td>Zimeri, Anne Marie</td>
<td>Instructor</td>
<td>Ph.D.</td>
<td>Ph.D. 2004</td>
<td>Genetics</td>
<td>100% Teaching</td>
<td>EHSC 6090, EHSC 6150, EHSC 6700</td>
</tr>
</tbody>
</table>

1 See Appendix 1 for a full description of courses; all faculty also direct student research and writing through EHSC 9000 and EHSC 9300
2 Director of the Georgia Genomics Facility (25% in academic year and 8.3% [one month] summer)

Proposal for Ph.D. in Environmental Health Science
Table 13.2. Record of PhD-level advisement among core faculty in the Dept. of Environmental Health Science.

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th># of current PhD students¹</th>
<th># of graduated PhD students¹</th>
<th># of PhD committees (non-major professor)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsha Black</td>
<td>1</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Travis Glenn</td>
<td>3</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Erin Lipp</td>
<td>3</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Luke Naeher</td>
<td>3*</td>
<td>0*</td>
<td>3</td>
</tr>
<tr>
<td>Mary Alice Smith</td>
<td>2</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Jia-Sheng Wang</td>
<td>4</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Phillip Williams</td>
<td>2</td>
<td>4</td>
<td>15</td>
</tr>
</tbody>
</table>

¹Major advisor or co-advisor
²Current + former; includes external readerships (foreign PhD granting institutions)
* In addition to PhD students, Dr. Naeher has graduated one DrPH (Doctor of Public Health) student and is currently advising one DrPH student.

No significant change in workload for the core faculty is anticipated. All faculty members with research appointments already serve as major professors for PhD students matriculating through other programs. All faculty members also teach graduate/PhD-level courses that will be utilized in the new PhD program. Faculty will all contribute lectures in the new core courses in the program (Advanced Topics in Environmental Health Science I and II).

In addition to a record in graduate level training (both through the MSEH program and the varied involvement in other PhD programs), faculty members in Environmental Health Science also demonstrate a clear ability to fully fund and support PhD level students. Appendix 3 provides a summary of current (active) grants within the Department. All tenure/tenure track members of the department are principal investigators or co-investigators on one or more grants. Total award amounts currently exceed $9.4 million. This funding has and will continue to provide an excellent base to support pre-doctoral students in the program as well as access to current research projects directed by faculty. While teaching assistantships are also used to support students, the majority of student funding comes through external grants obtained by the core faculty.

This Department has the content expertise, experience, research productivity, and size to support a Ph.D. program in Environmental Health.
14. External Reviews

The following list of potential reviewers represents leaders in the field of environmental health science who are members of peer and aspirational academic programs in the field. The list excludes any colleagues who read or provided feedback on the development of this proposal.

- Dr. G. Thomas Chandler, Professor and Dean, University of South Carolina, Arnold School of Public Health, Department of Environmental Health Science
- Dr. Paul Epstein, Associate Director of the Center for Health and the Global Environment at Harvard Medical School
- Dr. Elaine Faustmann, Professor, University of Washington, Dept. of Environmental and Occupational Health Sciences
- Dr. Evan Gallagher, Professor, University of Washington, Dept. of Environmental and Occupational Health Sciences
- Dr. John Groopman, Professor and Dept. Chair, Dept. of Environmental Health Science, Johns Hopkins University
- Dr. Mark Sobsey, Professor, University of North Carolina-Chapel Hill, Gillings School of Global Public Health, Department of Environmental Sciences and Engineering

15. Fiscal, Facilities and Enrollment Impact (Estimated Budget)

The University general funds from the State provide academic salaries for faculty members, usually at 37.5% for teaching, 32.5% for research, and 5% for service. The University general funds also support staff salary. Research grants are used to cover salaries for other research personnel, including research scientists, postdoctoral associates, technicians, and graduate research assistants. Additional stipends for graduate students are provided through Graduate School Assistantships, research assistantships through the interdisciplinary Toxicology Program, and teaching assistantships provided through the College of Public Health. Costs for research supplies, travel, and laboratory equipment purchases are mainly covered by research grants and indirect cost returns. No start-up funds are requested to support this new PhD program. Given that we have a history of supporting PhD students, we will be able to leverage currently available resources and support to establish the PhD Program.
### Table 15.1 Projections for enrollment, expenditure and revenue

#### I. ENROLLMENT PROJECTIONS

<table>
<thead>
<tr>
<th>Student Majors</th>
<th>AY 2011/12</th>
<th>AY 2012/13</th>
<th>AY 2013/14</th>
<th>AY 2014/15</th>
</tr>
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<tbody>
<tr>
<td>Shifted from other programs</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New to the institution</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Majors</strong></td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>6</td>
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</table>

#### Course Sections Satisfying Program Requirements

<table>
<thead>
<tr>
<th></th>
<th>AY 2011/12</th>
<th>AY 2012/13</th>
<th>AY 2013/14</th>
<th>AY 2014/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously existing</td>
<td>35</td>
<td>38</td>
<td>38</td>
<td>40</td>
</tr>
<tr>
<td>New</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Program Course Sections</strong></td>
<td>38</td>
<td>38</td>
<td>40</td>
<td>41</td>
</tr>
</tbody>
</table>

#### Credit Hours Generated by Those Courses

<table>
<thead>
<tr>
<th></th>
<th>AY 2011/12</th>
<th>AY 2012/13</th>
<th>AY 2013/14</th>
<th>AY 2014/15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing enrollments</td>
<td>~560</td>
<td>~560</td>
<td>~560</td>
<td>~560</td>
</tr>
<tr>
<td>New enrollments</td>
<td>~70</td>
<td>~50</td>
<td>~60</td>
<td>~60</td>
</tr>
<tr>
<td><strong>Total Credit Hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### DEGREES AWARDED

<table>
<thead>
<tr>
<th></th>
<th>AY 2011/12</th>
<th>AY 2012/13</th>
<th>AY 2013/14</th>
<th>AY 2014/15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

#### II. EXPENDITURES

<table>
<thead>
<tr>
<th>Personnel – reassigned or existing positions</th>
<th>EFT Dollars</th>
<th>EFT Dollars</th>
<th>EFT Dollars</th>
<th>EFT Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty (7 faculty)</td>
<td>643,788.19</td>
<td>663,101.00</td>
<td>682,994.00</td>
<td>703,483.85</td>
</tr>
<tr>
<td>Part-time Faculty (3 faculty)</td>
<td>15,000</td>
<td>15,450.00</td>
<td>15,913.50</td>
<td>16,391.00</td>
</tr>
<tr>
<td>Graduate Assistants (up to 26, including MS students)</td>
<td>350,465.00</td>
<td>360,978.95</td>
<td>371,808.00</td>
<td>382,962.57</td>
</tr>
<tr>
<td>Administrators</td>
<td>150,000.00</td>
<td>154,500.00</td>
<td>159,135.00</td>
<td>163,909.00</td>
</tr>
<tr>
<td>Support Staff (2 staff positions)</td>
<td>55,000.00</td>
<td>56,650.00</td>
<td>58,349.50</td>
<td>60,100.00</td>
</tr>
<tr>
<td>Fringe Benefits</td>
<td>317,461.50</td>
<td>326,984.83</td>
<td>336,794.38</td>
<td>346,900.00</td>
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<tr>
<td>Other Personnel Costs</td>
<td>90,000.00</td>
<td>92,700.00</td>
<td>95,481.00</td>
<td>98,345.00</td>
</tr>
<tr>
<td><strong>Total Existing Personnel Costs</strong></td>
<td>1,621,714.69</td>
<td>1,670,364.78</td>
<td>1,720,475.38</td>
<td>1,772,091.42</td>
</tr>
</tbody>
</table>

2 Includes state operating funds, extramural research grants and indirect cost returns
3 Assumes 3% annual increase

*Proposal for Ph.D. in Environmental Health Science*
<table>
<thead>
<tr>
<th>Personnel – new positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty</td>
</tr>
<tr>
<td>Part-time Faculty</td>
</tr>
<tr>
<td>Graduate Assistants</td>
</tr>
<tr>
<td>Administrators</td>
</tr>
<tr>
<td>Support Staff</td>
</tr>
<tr>
<td>Fringe Benefits</td>
</tr>
<tr>
<td>Other personnel costs</td>
</tr>
<tr>
<td>Total New Personnel Costs</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Start-up Costs (one-time expenses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library/learning resources</td>
</tr>
<tr>
<td>Equipment</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total One-time Costs</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

| Operating Costs (recurring costs – base budget)

| Supplies/Expenses | 807,137.00 | 800,000.00 | 800,000.00 | 800,000.00 |
| Travel            | 69,930.00  | 70,000.00  | 70,000.00  | 70,000.00  |
| Equipment         | 50,000.00  | 50,000.00  | 50,000.00  | 50,000.00  |
| Library/learning resources |
| Other              |
| Total Recurring Costs | 927,067.00 | 920,000.00 | 920,000.00 | 920,000.00 |

<table>
<thead>
<tr>
<th>Grand Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,525,774.60</td>
</tr>
</tbody>
</table>

4 Includes both State operating funds, extramural research grants and indirect cost returns.
### III. REVENUE SOURCES

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Base Budget</th>
<th>One-time Funds</th>
<th>GRAND TOTAL REVENUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reallocation of existing funds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New student workload</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Tuition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Federal funds (estimated income from external grants)</td>
<td>$250,000</td>
<td>$250,000</td>
<td>$256,000</td>
</tr>
<tr>
<td>Other grants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student fees (associated laboratory fees)</td>
<td>$6,000</td>
<td>$6,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New state allocation requested for budget hearing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Nature of Funds**
- Base budget
- One-time funds

**GRAND TOTAL REVENUES**
- $256,000
- $256,000
- $256,000
- $256,000
Appendices
Appendix 1. Description of all graduate level courses offered in the Dept. of Environmental Health Science

<table>
<thead>
<tr>
<th>Course ID</th>
<th>EHSC 6080</th>
<th>3 hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Environmental Air Quality</td>
<td></td>
</tr>
<tr>
<td>Course Description</td>
<td>Sources, control, and modeling of air pollution; effects of air pollutants on human health and the environment; atmospheric chemistry, indoor air quality, and regulatory issues.</td>
<td></td>
</tr>
<tr>
<td>Oasis Title:</td>
<td>ENVIR AIR QUALITY</td>
<td></td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>CHEM 2211 and CHEM 2211L</td>
<td></td>
</tr>
<tr>
<td>Semester Course</td>
<td>Offered spring semester every year.</td>
<td></td>
</tr>
<tr>
<td>Offered:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grading System:</td>
<td>A-F (Traditional)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course ID</th>
<th>EHSC 4090/6090</th>
<th>3 hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Emerging Technologies: Bioremediation</td>
<td></td>
</tr>
<tr>
<td>Course Description</td>
<td>Bioremediation is the treatment of contaminated soils, sediments, and groundwater by microorganisms, fungi, plants, or components from these organisms. Overview of organism physiology, genetic engineering, and details of environmental health hazards amenable to bioremediation. Exploration of case studies that exemplify approaches to bioremediation.</td>
<td></td>
</tr>
<tr>
<td>Oasis Title:</td>
<td>BIOREMEDIATION</td>
<td></td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>BIOL 1103 or BIOL 1107-1107L</td>
<td></td>
</tr>
<tr>
<td>Semester Course</td>
<td>Offered spring semester every even-numbered year.</td>
<td></td>
</tr>
<tr>
<td>Offered:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grading System:</td>
<td>A-F (Traditional)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course ID</th>
<th>EHSC 4100/6100-4100L/6100L</th>
<th>3 hours. 2 hours lecture and 2 hours lab per week.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Industrial Hygiene</td>
<td></td>
</tr>
<tr>
<td>Course Description</td>
<td>The anticipation, recognition, evaluation, and control of those environmental factors, arising in or from the workplace, which can cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among community citizens.</td>
<td></td>
</tr>
<tr>
<td>Oasis Title:</td>
<td>INDUSTRIAL HYGIENE</td>
<td></td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>CHEM 2211 and CHEM 2211L</td>
<td></td>
</tr>
<tr>
<td>Semester Course</td>
<td>Offered fall semester every year.</td>
<td></td>
</tr>
<tr>
<td>Offered:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grading System:</td>
<td>A-F (Traditional)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course ID</th>
<th>EHSC 4150/6150</th>
<th>3 hours.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Title</td>
<td>Solid and Hazardous Waste Management</td>
<td></td>
</tr>
</tbody>
</table>
Course Description: Regulatory, chemical, and engineering aspects of solid and hazardous waste management, including RCRA, CERCLA, landfill and incinerator design, pollutant transport and fate, and potential for human health impacts.

Oasis Title: SOL HAZ WASTE MGMT
Prerequisite: MATH 1113 and CHEM 2211 and CHEM 2211L
Semester Course Offered: Offered fall semester every year.
Grading System: A-F (Traditional)

Course ID: ENVM(EHSC) 4250/6250
Course Title: Environmental and Public Health Law
Course Description: Basic legal principles and procedures as they relate to environmental regulations and public health. Coverage of common law, torts, nuisances, regulatory standards, and state and federal environmental laws. Delineation of significant constitutional and federal regulations that affect managerial decisions.

Oasis Title: ENV PUB HLTH LAW
Duplicate Credit: Not open to students with credit in AAEC 4930/6930
Prerequisite: Third-year student standing and (POLS 1101 or HIST 2111 or HIST 2112)
Semester Course Offered: Offered spring semester every year.
Grading System: A-F (Traditional)

Course ID: EHSC(FDST)(MIBO) 4310/6310-4310L/6310L
Course Title: Environmental Microbiology
Course Description: Types of microorganisms in the environment; effect of environmental conditions on microbial existence; public health aspects of environmental microbiology; applications of microorganisms to solve environmental problems.

Oasis Title: ENVIRON MICROBIOL
Prerequisite: MIBO 3000-3000L or MIBO 3500
Semester Course Offered: Offered spring semester every year.
Grading System: A-F (Traditional)

Course ID: FDST(EHSC)(MIBO) 4320/6320-4320L/6320L
Course Title: Hazard Analysis Critical Control Point in the Food Industry
Course Description: Emphasis on Hazard Analysis Critical Control Point (HACCP) and its prerequisite (e.g., GAP, GMP, SSOP) programs used to promote food safety in the food industry. Upon completion of the course and passing an examination, the students will receive HACCP
Proposal for Ph.D. in Environmental Health Science

Course ID: **EHSC 4350/6350-4350L/6350L**. 3 hours. 3 hours lecture and 2 hours lab per week.
Course Title: **Environmental Chemistry**
Course Description: Chemical principles of environmental processes which result from natural or human-generated phenomena; air, water, and soil chemical reactions involving pollutants and wastes; measurement of pollutants in the environment.

Course ID: **EHSC 4400/6400**. 3 hours.
Course Title: **Environmental Issues in the Developing World**
Course Description: Study of environmental issues in developing countries, including water, soil, and air contamination resulting from human impacts and industrial development. Strategies to mitigate or manage contamination issues will also be discussed.

Course ID: **EHSC 4490/6490**. 3 hours.
Course Title: **Environmental Toxicology**
Course Description: Extent and significance of toxic agents in the environment, and the physical, chemical, and biological processes which determine their behavior, fate, and ultimate effect on human health.
**Semester Course**  Offered fall semester every year.

**Grading System:**  A-F (Traditional)

**Course ID:**  EHSC 4610/6610. 3 hours.

**Course Title:**  Water Pollution and Human Health

**Course Description:**  Human health issues related to water consumption and use, focusing on water contamination from municipal, industrial, and agricultural practices.

**Oasis Title:**  WATER POLLUTION

**Prerequisite:**  EHSC 3060

**Pre or Corequisite:**  (CHEM 2211 and CHEM 2211L) or permission by department

**Course ID:**  EHSC 4700/6700. 3 hours.

**Course Title:**  Genetic Applications in Environmental Health Science

**Course Description:**  Exploration of environmental and public health issues through the use of genetics. Overview of basic genetics followed by the use of molecular genetic tools to provide evidence for use in the food industry, conservation biology, and pollutant remediation. Includes ethical, legal, and social implications of these technologies.

**Oasis Title:**  EHS APPL GENETICS

**Prerequisite:**  BIOL 1103 or 1107-1107L

**Semester Course**  Offered spring semester every odd-numbered year.

**Offered:**

**Grading System:**  A-F (Traditional)

**Course ID:**  EHSC 4710/6710-4710L/6710L. 3 hours. 2 hours lecture and 3 hours lab per week.

**Course Title:**  Environmental BioTechnology

**Course Description:**  The use of molecular genetic tools to solve ecological, environmental, and public health issues. Provides detailed insight for applications and use of molecular genetic tools and hands-on experience. Intended to provide relevant training and experience for laboratory-based graduate studies and careers.

**Oasis Title:**  ENVI BIOTECH

**Undergraduate Prerequisite:**  (BIOL 1103 or BIOL 1107-1107L) and (BIOL 1104 or BIOL 1108-1108L) and ([CHEM 1110 and CHEM 1110L) or (CHEM 1211 and CHEM 1211L) or (CHEM 1311 and CHEM 1311L)] and (GENE (BIOL) 3200 or EHSC 4700/6700)

Proposal for Ph.D. in Environmental Health Science
Graduate Prerequisite: One-year undergraduate biology, introductory chemistry lab, and a course in genetics

Semester Course: Offered fall semester every year.

Grading System: A – F (traditional)

Course ID: EHSC 6010. 1 hour.
Course Title: Proseminar in Environmental Health
Course Description: Research methods with an emphasis on presentation and instructional techniques.
Oasis Title: PROSEMINAR IN EH
Prerequisite: Permission of department
Semester Course: Offered spring semester every year.
Offered: Grading System: A-F (Traditional)

Course ID: PHRM(VPHY)(EHSC) 6910. 3 hours.
Course Title: Introductory Toxicology
Course Description: Basic toxicology principles, including dose-response relationships, principles of toxicity and safety evaluation, pharmacokinetics and metabolism of chemicals, basic mechanisms of cellular injury, factors influencing toxicity, carcinogenesis/mutagenesis, governmental regulations, and exposure and risk assessment.
Oasis Title: INTRODUCTORY TOX
Semester Course: Offered fall semester every year.
Offered: Grading System: A-F (Traditional)

Course ID: EHSC 7010. 3 hours.
Course Title: Fundamentals of Environmental Health Science
Course Description: Fundamentals of environmental health science, including health problems related to contamination of air, water, food, the workplace, and other environments. Environmental control agencies, policies and regulations, and pollution prevention and control strategies are discussed.
Oasis Title: FUND ENV HLTH SCI
Duplicate Credit: Not open to students with credit in EHSC 7060
Semester Course: Offered fall and spring semester every year.
Offered: Grading System: A-F (Traditional)
Course ID: EPID(EHSC) 8070, 3 hours.
Course Title: Environmental and Occupational Epidemiology
Course Description: Advanced concepts in epidemiology with a focus on environmental and occupational epidemiology. Areas of emphasis will include exposure assessment, observational and experimental study designs, data interpretation, major environmental exposure groups (e.g., air, water, pesticides, metals, noise, others), case studies, and real-world practical applications.
Oasis Title: ENV OCC EPI
Prerequisite: EHSC 4070/6070 or permission of department
Semester Course Offered: Spring semester every year
Grading System: A-F (Traditional)

Course ID: EHSC 8100, 1-3 hours. Repeatable for maximum 6 hours credit.
Course Title: Current Topics in Environmental Health Science
Course Description: Public health, industrial hygiene, environmental protection, hazardous waste management, and environmental/occupational toxicology.
Oasis Title: TOPICS ENVIRON HLTH
Semester Course Offered: Not offered on a regular basis
Grading System: A-F (Traditional)

Course ID: EHSC 8110, 3 hours.
Course Title: Fundamentals of Chemical and Microbial Risk Assessment
Course Description: Examination of fundamental elements of risk assessment, chemicals, and microorganism assessments, and assessment use by federal agencies. Risk assessments conducted and used by international groups will be compared and evaluated. Includes a combination of lecture, case studies, critical discussions of primary literature, and a group risk assessment project.
Oasis Title: FUND RISK ASSESS
Duplicate Credit: Not open to students with credit in EHSC 7510 or EHSC 8510-8510L
Semester Course Offered: Spring semester every year
Grading System: A-F (Traditional)

Course ID: EHSC(AAEC) 8120, 2 hours.
Course Title: Roles and Responsibilities of Environmental Policy Makers
Course Description: Roles of science, engineering, law, journalism, economics, grass roots activism, and the legislative and regulatory process in the development of environmental policy.
Course ID: EHSC 8150. 1 hour. Repeatable for maximum 2 hours credit.
Course Title: Environmental Health Seminar
Course Description: Selected topics in environmental health.
Prerequisite: Permission of department
Semester Course Offered: Not offered on a regular basis.
Offered:
Grading System: A-F (Traditional)

Course ID: EHSC 8210. 3 hours.
Course Title: Cancer Etiology and Prevention
Course Description: Cancer is the leading cause of mortality in the world and fully understanding cancer’s etiology is essential for public health professionals. This course covers etiological risk factors and preventive strategies of major human cancers, and will explore environmental causes, carcinogenesis, and prevention of human cancers.
Prerequisite: EHSC 7060 or EPID 7010 or PHRM(VPHY) 6910 or permission of department
Semester Course Offered: Offered fall semester every year.
Offered:
Grading System: A-F (Traditional)

Course ID: EHSC 8220-8220L. 4 hours. 3 hours lecture and 2 hours lab per week.
Course Title: Predictive Toxicology Using Mathematical Models
Course Description: This modeling course is designed for life science graduate students with an interest in quantitative toxicology. Biologically based models founded on fundamentals of chemistry, biochemistry and physiology such as physiologically based pharmacokinetic/pharmacodynamic (PBPK/PD) models are discussed in mammalian species. PBPK models are dosimetry models that describe the uptake, distribution, metabolism, and elimination of chemicals in the body and when combined with toxic responses, predict toxicity.

Oasis Title: PBPK MODELS
Prerequisite: Permission of department
Semester Course Offered: Not offered on a regular basis.
Grading System: A-F (Traditional)

Course ID: EHSC(EPID) 8250. 3 hours.
Course Title: Biomarkers: Public Health, Clinical, and Environmental Toxicology Applications
Course Description: Biomarkers in clinical practice, and in public and environmental health. Biomarkers of disease, exposure to chemicals or pathogens, and adverse insults on humans play an important role in Environmental Health Science, Epidemiology, and Toxicology.

Oasis Title: BIOMARKERS
Prerequisite: EPID 7010 or EHSC 7060 or EHSC 4490/6490
Semester Course Offered: Offered spring semester every year.
Grading Sys: A-F (Traditional)

Course ID: EHSC 8310. 3 hours. Repeatable for maximum 9 hours credit.
Course Title: Advanced Topics in Aquatic Microbiology, Health, and the Environment
Course Description: Special topics related to public health, water quality, and environmental microbiology will be covered by a combination of lecture, student-driven seminars, and critical discussions of primary literature. Topics will vary by semester and may include oceans and human health, methods in environmental microbiology, and wastewater microbiology.

Oasis Title: AQUATIC MICRO HEALT
Prerequisite: Permission of department
Semester Course Offered: Offered fall semester every odd-numbered year.
Grading Sys: A-F (Traditional)

Course ID: FISH(EHSC)(ECOL)(ENTO)(VPHY)(PHRM) 8350. 3 hours.
Course Title: Fundamentals of Ecotoxicology
Course Description: An introduction to the toxic effects of contaminants on non-human organisms, types of contaminants impacting ecosystems, fate and transport of contaminants in the environment, effects of contaminants at various levels...
of biological organization ranging from biochemical reactions in the cell
to ecosystem function, and ecological risk assessment.

**Oasis Title:** 
FUND ECOTOX

**Duplicate Credit:**
Not open to students with credit in
FISH(EHSC)(ECOL)(ENTO)(VPHY)(PHRM) 8350 or ENTO(EHSC)4060/6060

**Prerequisite:**
BIOL 1108-1108L and CHEM 2211

**Semester Course**
Offered spring semester every even-numbered year.

**Grading Sys.:**
A-F (Traditional)

**Course ID:**
EHSC 8400. 3 hours.

**Course Title:**
**Occupational and Environmental Diseases**

**Course Description:**
Provides an understanding of the current state of occupational and environmental
diseases in the United States for occupational health and safety practitioners,
toxicologists, and other public health students. A basic understanding of toxicology,
human physiology, and anatomy is recommended for the course.

**Oasis Title:**
OCC & ENV DISEASES

**Duplicate Credit:**
Not open to students with credit in EHSC 7400

**Prerequisite:**
EHSC 4490/6490 or PHRM(VPHY) 6910 or permission of department

**Semester Course**
Offered spring semester every year.

**Grading Sys.:**
A-F (Traditional)

**Course ID:**
EHSC(MARS) 8410. 3 hours.

**Course Title:**
**Oceans and Human Health**

**Course Description:**
Oceans and the marine environment are increasingly recognized for their role in the
health of the human population, both as a source of disease and source of new bioactive
(medicinal) agents. Exploration of this emerging field with a combination of lecture,
student-driven seminars, and critical discussions of primary literature.

**Oasis Title:**
OCEAN HUMAN HEALTH

**Prerequisite:**
MARS(MIBO) 4620/6620-4620L/6620L or EHSC(FDST)(MIBO) 4310/6310-
4310L/6310L or MARS 8010 or permission of department

**Semester Course**
Offered fall semester every even-numbered year.

**Grading System:**
A-F (Traditional)

**Course ID:**
EHSC 8450. 3 hours.

**Course Title:**
**Genome Technologies**

**Course Description:**
The development and use of new high throughput molecular genetic tools. Provides
detailed insight for applications, acquisition of instrumentation, and use of genomic
assays. Intended to provide relevant training for students that will establish laboratories
and make use of genomic information.

**Oasis Title:**
GEN TECH
Prerequisite: [(BIOL 1103 and BIOL 1103L) or (BIOL 1104 and BIOL 1104L) or BIOL 1107-1107L or BIOL 1108-1108L)] and [GENE(BIOL) 3200 or EHSC 4700/6700] or permission of department

Semester Course: Offered spring semester every odd-numbered year.

Grading System: A-F (Traditional)

Course ID: EHSC 8510-8510L. 3 hours. 2 hours lecture and 2 hours lab per week.
Course Title: Environmental Risk Assessment and Communication
Course Description: Assessment of risks related to environmental exposures; government agency definition and conduct of risk assessments; public communication of environmental exposure risks.
Oasis Title: ENV RISK ASST/COM
Prerequisite: EHSC 4490/6490 or PHRM(VPHY) 6910 or PHRM(VPHY)(POUL)(EHSC) 8930 or permission of department

Semester Course: Not offered on a regular basis.

Grading System: A-F (Traditional)

Course ID: EHSC(EPID) 8540-8540L. 3 hours. 2 hours lecture and 2 hours lab per week.
Course Title: Microbial Quantitative Risk Assessment
Course Description: Presentation of the framework for stochastic microbial quantitative risk assessment (QRA) to evaluate threats to human or animal health resulting from exposure to contaminated food, water, or air. The use of simulation software in QRA modeling will be introduced. Food and Drug Administration QRA's will be covered as examples.
Oasis Title: MICRO RISK ASST
Pre or Corequisite: Any one of the following: BIOS 2010-2010L or BIOS 7010 or MATH 2500 or STAT 2000 or STAT 2100H or STAT 6210 or STAT 6310 or STAT 6810 or permission of department
Semester Course: Not offered on a regular basis.

Offered:

Grading Sys.: A-F (Traditional)

Course ID: EHSC 8550. 3 hours.
Course Title: Developmental and Reproductive Toxicology
Course Description: Topics will include developmental and reproductive processes; how chemical, biological, or physical agents disrupt normal processes; experimental approaches to evaluating suspected teratogens; and mechanisms for how exposure to agents results in reproductive or developmental abnormalities. Class will include a combination of lecture, case studies, and critical discussions of primary literature.

Oasis Title: DEVELOP REPROD TOX
Prerequisite: PHRM(VPHY) 6910 or EHSC 4490/6490 or permission of department

Semester Course: Offered spring semester every year.

Offered:

Grading Sys.: A-F (Traditional)

Course ID: EHSC(ECOL)(FISH)(WASR) 8610. 3 hours.
Course Title: Aquatic Toxicology
Course Description: Toxicological effects of aquatic pollution focusing on fate and transport of xenobiotics; xenobiotic accumulation, dynamics, and toxicity in aquatic organisms; the analysis and modeling of the effects of aquatic pollution on organisms; and the determination of related risks to aquatic ecosystems and human populations.

Oasis Title: AQUATIC TOXICOLOGY
Prerequisite: CHEM 2211 and CHEM 2211L and [EHSC 4490/6490 or PHRM(VPHY) 6910 or PHRM(VPHY)(POUL)(EHSC) 8920]

Semester Course: Offered spring semester every even-numbered year.

Offered:

Grading System: A-F (Traditional)

Course ID: EHSC 8630-8630L. 4 hours. 3 hours lecture and 2 hours lab per week.
Course Title: Quantitative Ecological Toxicology
Course Description: Principles and quantitative methods for the analysis of ecotoxicological data.

Oasis Title: QUANT ECOTOXICOLOGY
Prerequisite: ECOL(BIOL) 3500-3500L and (STAT 4220 or STAT 6220)
Semester Course: Offered maymester every odd-numbered year.

Offered:
Grading System: A-F (Traditional)

Course ID: EHSC 8710. 3 hours.
Course Title: Issues in Biosafety and Biosecurity
Course Description: Legal and technical aspects of biosafety and biosecurity as applied to emerging infections, bioterrorism, bioengineering, and laboratory or environmental situations involving humans, plants, or animals. Specific prevention strategies and techniques for containment, decontamination, and disposal, designed to prevent or minimize occupational or environmental risk, will be presented.
Oasis Title: ISSUES IN BIOSAFETY
Duplicate Credit: Not open to students with credit in EHSC 7070
Semester Course Offered: Not offered on a regular basis.

Grading System: A-F (Traditional)

Course ID: EHSC 8800. 1-3 hours. Repeatable for maximum 6 hours credit.
Course Title: Special Problems in Environmental Health Science
Course Description: Research or intensive study in a specialized area of environmental health under the direction of a faculty member.
Semester Course Offered: Offered fall, spring and summer semester every year.

Grading System: A-F (Traditional)

Course ID: PHRM(VPHY)(POUL)(EHSC) 8930. 3 hours.
Course Title: Chemical Toxicology
Course Description: Chemical contamination of air, water, and food by major agricultural and industrial chemicals. Emphasis will be placed on sources of contamination, fate of chemicals in the environment, target species, health effects, chemical analyses, and contamination control.
Semester Course Offered: Offered spring semester every year.

Grading System: A-F (Traditional)

Course ID: EHSC 9000. 1-12 hours. Repeatable for maximum 45 hours credit.
Course Title: Doctoral Research

Proposal for Ph.D. in Environmental Health Science
Course
Description: Research while enrolled for a doctoral degree under the direction of faculty members.
Oasis Title: DOCTORAL RESEARCH
Nontraditional Format: Independent research under the direction of faculty members.
Prerequisite: Permission of department
Semester Course Offered: Offered fall, spring and summer semester every year.
Offered: 
Grading System: S/U (Satisfactory/Unsatisfactory)

Course ID: EHSC 9005. 3 hours. Repeatable for maximum 45 hours credit.
Course Title: Doctoral Graduate Student Seminar
Course Description: Advanced supervised experience in an applied setting. This course may not be used to satisfy a student's approved program of study.
Oasis Title: DOC GRAD STU SEM
Nontraditional Format: Seminar.
Semester Course Offered: Offered fall, spring and summer semester every year.
Offered: 
Grading System: S/U (Satisfactory/Unsatisfactory)

Course ID: EHSC 9300. 1-12 hours. Repeatable for maximum 12 hours credit.
Course Title: Doctoral Dissertation
Course Description: Dissertation writing under the direction of a major professor.
Oasis Title: DOCT DISSERTATION
Prerequisite: Permission of department
Semester Course Offered: Offered fall, spring and summer semester every year.
Offered: 
Grading System: S/U (Satisfactory/Unsatisfactory)
Appendix 2. Biographical sketches for all faculty members in the Dept. of Environmental Health Science (including core faculty, research associates and adjunct faculty)

Core Faculty
Marsha C. Black, Associate Professor and Assistant Dean
Travis C. Glenn, Associate Professor
Erin K. Lipp, Associate Professor
Luke P. Naheer, Associate Professor
Mary Alice Smith, Associate Professor
Jia-Sheng Wang, Professor and Dept. Head
Phillip Williams, Professor and Dean
Anne Marie Zimeri, Instructor

Adjunct Faculty and Research Associates
Dana Cole, Adjunct Assistant Professor
William Cosgrove, Adjunct Instructor
Brian G. Forrester, Adjunct Associate Professor
Ken Jones, Research Associate
Dr. Ron Riley, Adjunct Professor
Ted Simon, Adjunct Professor
Lili Tang, Research Associate
Core Faculty
BIOGRAPHICAL SKETCH

Marsha C. Black, PhD

Professional Preparation:

<table>
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<tr>
<th>Degree</th>
<th>Field</th>
<th>Institution</th>
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<tr>
<td>PhD</td>
<td>Ecology</td>
<td>University of Tennessee</td>
<td>1989</td>
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<tr>
<td>BA</td>
<td>Comprehensive Science</td>
<td>Converse College</td>
<td>1975</td>
</tr>
</tbody>
</table>

Academic and Research Experience:

8/08 – present  Interim Assistant Dean for Academic Affairs, College of Public Health; Associate Professor, Graduate Coordinator (7/08-6/09), Department of Environmental Health Science, The University of Georgia, Athens, GA

7/06 – 8/08  Interim Department Head, Department of Environmental Health Science, College of Public Health, The University of Georgia, Athens, GA

7/00 – 7/06  Associate Professor and Undergraduate Coordinator (7/01-6/08), Department of Environmental Health Science, The University of Georgia, Athens, GA

1/95 - 6/00  Assistant Professor, Department of Environmental Health Science, The University of Georgia, Athens, GA

8/90 - 12/94  Assistant Professor, Department of Zoology, Oklahoma State University, Stillwater, OK

5/89 - 7/90  Postdoctoral Research Associate, Department of Biology, University of Joensuu, Joensuu, Finland

Peer-reviewed Publications (10 of 38 total)


**Books and Book Chapters (1 of 4 total)**


**Membership and Service to Professional Societies**

SETAC--Society of Environmental Toxicology and Chemistry (member since 1984)
SETAC North America Board of Directors 2000-2003

**Collaborators & Other Affiliations (since 2005)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Co-Author</th>
<th>Collaborator</th>
<th>Advisees=1 Advisors=2</th>
<th>Other – Specify Nature</th>
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<td>Armbrust, Kevin</td>
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<td>Strange, Richard</td>
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<td>White, Sarah</td>
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<td>Zimeri, Anne Marie</td>
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</tbody>
</table>
BIOGRAPHICAL SKETCH Travis C. Glenn

a. Professional Preparation

Iowa State University, Ames, IA. Animal Ecology BS 1989
University of Michigan, Ann Arbor, MI Natural Resources MS 1990
University of Maryland, College Park, MD Zoology Ph.D 1997
University of South Carolina, Columbia, SC Biology Postdoc 1997-1998

b. Appointments

2007- present Associate Professor, Department of Environmental Health Science, UGA
2007- present Georgia Genomics Facility, Faculty Director, UGA
2004-2007 Assoc. Director, Institute of Biol. Research and Training, Univ. of South Carolina
1998-2007 Adjunct Assistant/Associate Professor, Dept. Biol. Sci., Univ. of South Carolina
1998-2004 Assistant Research Scientist, Savannah River Ecology Lab, UGA
1997-1998 Post-doctoral Researcher, Dept. of Biology, University of South Carolina
1992-1996 Pre-doctoral Research Fellow, Smithsonian Institution, Washington, DC

c. Publications (10 of 104 total: postdoc, graduate or undergraduate student authors)


techniques for genetic parentage of half-sib progeny arrays. Genetics Research 91: 313-
325.

Standardized reference ideogram for physical mapping in the saltwater crocodile (Crocodylus
porosus). Cytogenetic and Genome Research 127:204-212.

Duffie, C. V., T. C. Glenn, F. H. Vargas, and P. Parker. 2009. Genetic structure among breeding
colonies of the Galápagos endemic flightless cormorant (Phalacrocorax harrisi). Molecular

and T. C. Glenn. 2009. Multi-year multiple paternity and mate fidelity in the American

Ma, H., P. M. Bertsch, T. C. Glenn, N. J. Kabengi, and P. L. Williams. 2009. Bioavailability and
toxicity of manufactured zinc oxide nanoparticles in the nematode Caenorhabditis elegans.
Environmental Toxicology and Chemistry 28(6):1324-1330.

the nematode Caenorhabditis elegans as a biomonitor for heavy metal contamination.
Environmental Toxicology and Chemistry 28(6):1311-1318.

2009. A genetic linkage map for the saltwater crocodile (Crocodylus porosus). BMC
Genomics 10:339.

Proposal for Ph.D. in Environmental Health Science 45


d. Synergistic Activities

Wrote the first step by step protocol for development of microsatellite loci targeted to workers in ecology and evolution, and made it available by ftp (pre-dated web sites). The updates to these protocols continue to be used around the world. These protocols have been used in workshops in multiple countries, as well as my own classes. In the fall 2009 class we isolated microsatellites for students from 6 different departments at UGA, with model organisms including plants, animals, and fungi.

Co-founded the Reptilian Genomics Working Group, which successfully proposed and sequenced Anolis carolinensis – the first non-avian reptile to have its entire genome sequenced. The genome manuscript is in prep for submission to Nature in 2010. The painted turtle is also now being sequenced at the Wash U. Genome Sequencing Center. American alligators and saltwater crocodiles are being sequenced by a coalition of researchers.

Established and maintained collaborative multi-user DNA research laboratories at UGA, the Savannah River Ecology Laboratory and the University of South Carolina.

Made the SREL DNA lab available to investigators regionally, nationally, & internationally, emphasizing minority-serving institutions; hosting students, post-docs, and faculty from around the US & world.

Co-Organized the 2nd and 3rd International Crocodilian Genetics and Genomics Workshops at the San Diego Zoo in 2001 and at the Smithsonian Tropical Research Institute (Panama) in 2007, as well as an international workshop – “Exploring Potential Collaborative Research in Human Health and Ecotoxicology Risks Using Medaka as a Model Organism” at the University of Georgia in 2004.

e. Collaborators and Other Affiliations

i. Collaborators over the last 48 months (and their current affiliations); excludes dozens of co-authors of primer notes and collaborators on the reptilian genomics projects:

K. Beard (UT State), P. Berter (U. KY), R. Brumfield (LSU), J. Carroll (UGA), M. Chuong (Southern CA), L. Densmore (TX Tech.), R. Elsey (LA Wildl. & Fish.), B. Faircloth (UCLA), M. Felder (U. SC), K. Francl (Radford), G. Graves (Smithsonian), J. Hamrick (UGA), C. Hill (Coastal Carolina), H. Hoekstra (Harvard), S. Isberg (Porousus Pty. Ltd., Australia), C. Jagoe (FL A&M), S. Lance (UGA), D. Main (WA State), J McArthur (UGA), K. Mock (UT State), C. Moran (U. Sydney, Australia), T. Mousseau (U. SC), C. J. Nairn (UGA), W. Palmer (Tall Timbers), P. Parker (U. MO, St. Louis), C. Peterson (UGA), C. Pruett (FIT), D. Ray (Miss. State), T. Reeder (San Diego State), A. Sakai (U.C. Irvine), R. Sawyer (U. SC), C. Schneider (Boston U.), N. Schizas (U. Puerto Rico), G Szalai (U. SC), O. Tsyusko (U. KY), D. Trapnell (UGA), T. Tuberville (UGA), R. C. Tuckfield
(Savannah River Nat. Lab.), J. Wade (MI State), P. Williams (UGA), S. Weller (U.C. Irvine), K. Winker (U. AK, Fairbanks), R. Winn (UGA), P. Wu (Southern CA), J. Zimbrick (CO State).

ii. Graduate and Postdoctoral Advisors (and their current affiliations):

Post-doctoral: Roger Sawyer (U. SC); PhD: Wolfgang Stephan (U. Munich) & Michael Braun (Smithsonian); MS: Bobbi Low (U. Michigan)

iii. Thesis Advisor and Postgraduate-Scholar Sponsor (and their current affiliations):

Thesis Advisor or Co-advisor: Ellen Breazel (PhD, Clemson U.), Lisa Davis (MS, PhD, Applied Biosystems); Jeffrey French (MS, U. SC), Susanne Hauswaldt (PhD, U. Potsdam), Susan Humphries (MS, environmental consultant, CO), Lee Miles (PhD, Sigma, Australia), William Curt Ouzts (MS, Midlands Tech. College), Brad Temple (MS, UGA DVM program), John Finger (PhD, current – Toxicology) Anna McKee (PhD, current – Forestry & Natural Resources), and. Arlena Wartell (PhD, current - Ecology).

Graduate Student Sponsor [≥1 year in my lab, (i.e., informal co-advisor)]: Chris Comer (PhD, Stephen F. Austin State U.), Dean Croshaw (PhD, U. AZ), Bobby Fokidis (MS, U. AZ), Taras Oleksyk (PhD, U. Puerto Rico), Hongbo Ma (PhD, UGA), N. Schable (MS, E. IL), 11 additional visiting students (generally ≤ 3 months) – none likely to review this proposal.

Postdoctoral Sponsor/Co-Sponsor: Julie Weston (U. SC), Ramunas Stepanauskus (Bigelow Lab of Ocean Sciences), Olga Tsyusko (U. KY), Ken Jones (UGA), Stacey Lance (UGA)

Total: 7 MS, 10 PhD, 5 Post-doctoral; Last Five Years: 2 MS, 7 PhD, 4 Post-doctoral
BIOGRAPHICAL SKETCH

Erin K. Lipp

(a) Professional Preparation

<table>
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<tr>
<th>Institution</th>
<th>Major(s)</th>
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<tr>
<td>New College of Florida</td>
<td>Biology</td>
<td>B.A.</td>
<td>1994</td>
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<tr>
<td>University of South Florida</td>
<td>Marine Science</td>
<td>Ph.D.</td>
<td>1999</td>
</tr>
<tr>
<td>U MD Inst. of Biotechnology (Center of Marine Biotech)</td>
<td>Post-doc</td>
<td></td>
<td>2000 - 2002</td>
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</table>

(b) Appointments

2007 – present: Assoc. Professor, Environmental Health Science, University of Georgia, Athens
2002 – 2007: Asst. Professor, Environmental Health Science, University of Georgia, Athens
2000-2002: Postdoctoral Fellow, Center of Marine Biotechnology, University of Maryland Biotechnology Institute
1999-2000: Postdoctoral Fellow, Marine Science, University of South Florida

(c) Publications (10 selected)


(d) Synergetic Activities
1. Lead PI for NOAA Oceans and Human Health Ph.D. Training Grant: Georgia Oceans and Health Initiative
2. Invited participant, author and discussion leader for federal agency workshops and assessment products related to the effects of climate change on waterborne disease, including the UESPA (2008 Modeling Workshop and SAP 4.6), CDC (Drinking water and climate change workshop), WHO (training module for southeast Asia members) and NOAA (the “ENSO Experiment”)
4. Member. U.S. Coral Reef Task Force/Southeast Florida Coral Reef Initiative. Technical Advisory Committee (Land Based Sources of Pollution and Water Quality Focus Area).

(v) Collaborators & Other Affiliations
(i) Collaborators and Co-Editors (since 2005)

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
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<tr>
<td>D. Cole (CDC)</td>
<td>R.R. Lowrance (USDA)</td>
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<td>K. Ebi (IPCC)</td>
<td>M. McLaughlin (U. S. Geological Survey)</td>
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<tr>
<td>E. Espeland (UMBI)</td>
<td>J. Porter (University of Georgia)</td>
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<tr>
<td>P. Gay (UGA)</td>
<td>J. Rose (Michigan State Univ)</td>
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<tr>
<td>B. Good (GA DNR)</td>
<td>N. Schmidt (University of Arizona)</td>
</tr>
<tr>
<td>D. Griffin (United States Geological Survey)</td>
<td>K.P. Sutherland (Rollins College)</td>
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<tr>
<td>D. Guadagnoli (GA DNR)</td>
<td>J. Vinjé (CDC)</td>
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<td>M. Jenkins (USDA)</td>
<td>P. Yager (UGA)</td>
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(ii) Advisors
Ph.D: Joan B. Rose (University of South Florida)
Post Doctoral: Rita R. Colwell (University of Maryland Biotechnology Inst.)

(iii) Graduate Advisees (15 total)

<table>
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BIOGRAPHICAL SKETCH  Luke P. Naeher

a. Professional Preparation:
Cornell University, Ithaca, NY  BS  1987-89  Biology
State University of New York, Stony Brook, NY  MS  1990-98  Marine Env. Science
Harvard University, Boston, MA  MS  1992-94  Env. Health Science
Yale University, New Haven, CT  PhD  1994-98  Epi. & Pub. Health

b. Appointments
• 07/07-present  Associate Professor (with Tenure), College of Public Health, Department of Environmental Health Science, The University of Georgia (UGA), Athens, GA
• 06/07-present  Adjunct Professor, Aube Sable Institute for Environmental Studies, Coupeville, WA
• 07/06-present  Visiting Professor, Universidad Peruana Cayetano Heredia, Lima, Peru
• 05/00-present  Adjunct Professor, Wheaton College, Wheaton, IL (Wheaton College Science Station)
• 08/07-07/08  Graduate Coordinator, College of Public Health, Department of Environmental Health Science, UGA
• 07/01-06/07  Assistant Professor, College of Public Health, Department of Environmental Health Science, UGA
• 10/01-09/05  Environmental Epidemiologist, Centers for Disease Control and Prevention, Atlanta, GA (part-time IPA)
• 09/98-06/01  Environmental Epidemiologist, Centers for Disease Control and Prevention, Atlanta, GA
• 01/95-08/98  Doctoral Research Fellow, Yale School of Medicine, New Haven, CT
• 09/93-01/96  Project Consultant, World Health Organization, Xela, Guatemala
• summer 1993  Industrial Hygiene Intern, Exxon Company U.S.A., Houston, TX
• 01/91-08/92  Pre-Doctoral Research Assistant, State University of New York at Stony Brook, Stony Brook, NY

c. Five Most Recent Publications (out of 46)
• Simpson CD, Naeher LP. Biological monitoring of woodsmoke exposure. 2010. Inhalation Toxicology. 22(2):99-103.

**Five Other Significant Publications**


**d. Selected Synergistic Activities**

• 04/09-present Editorial Board Member, Environment International

• 05/09-present Temporary Member, Infectious, Reproductive, Asthma and Pulmonary Conditions (IRAP) Scientific Review Group

• 09/08-present Temporary Member, NIH Kidney, Nutrition, Obesity and Diabetes Epidemiology (KNOD) Scientific Review Group

• 08/07-present Member, TKC (for CDC), Post-Katrina/Formaldehyde/Mobile Home/Trailer Exposure and Health Project Expert Panel

• 01/07-present Member, Scientific Advisory Board, Turkish Armed Forces Preventive Medicine Bulletin

• 01/07-present Councilor (2007-09), International Society of Exposure Analysis

• 10/06-present Member, NIOSH, Environmental Research Center, Site Review Team

• 05/04-present Temporary Member, NIH Epidemiology of Clinical Disorders and Aging (ECDCA) Study Section

• 09/01-present Member, AIHA, Occupation Epi Committee (Secretary 2004/05; Chair elect 2005/06; Chair 2006/07)

• 08/06-08/08 Contributing Author, Atmospheric Brown Clouds: Regional Assessment Report with Focus on Asia. Published by the United Nations Environment Programme, Nairobi, Kenya.

• 09/01-06/05 Member, National Children’s Study, Workgroup on Exposure to Chemical Agents

• 05/00-04/03 Member, American Thoracic Society, Assembly on Env and Occupational Health, Program Committee

*Proposal for Ph.D. in Environmental Health Science*
Collaborators and Other Affiliations

e. Collaborators and other affiliations for the past five years.

<table>
<thead>
<tr>
<th>Research collaborators</th>
<th>graduate/postdoc advisors</th>
<th>Graduate students and postdocs</th>
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<tbody>
<tr>
<td>Drs. Larry Needham, Andreas Sjodin, Ben Blount, J. Tom Bernert, Antonia Califat, and</td>
<td>Dr. Brian Leaderer, Yale University</td>
<td>Gideon St. Helen, Olorunfemi Adetona, Kevin Horton,</td>
</tr>
<tr>
<td>Dana Barr (CDC/NCEH), Dr. Chris Simpson (UW Seattle), Dr Jim Zhang (Rutgers), Drs.</td>
<td>Dr. Bruce Brownawell, SUNY Stony Brook</td>
<td>Suyang Liu, Adwoa Agyepong</td>
</tr>
<tr>
<td>John Balmes, Nina Holland, and Kirk Smith (UC Berkeley), Dr. Jaymie Meliker (SUNY</td>
<td>Dr. Kirk Smith (UC Berkeley)</td>
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<tr>
<td>Stony Brook), Drs. Steve Rathbun and Dan Hall (UGA)</td>
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BIOGRAPHICAL SKETCH

Mary Alice Smith

(a) Professional Preparation

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<tr>
<td>Auburn University</td>
<td>Biology Education</td>
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<td>1971</td>
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<tr>
<td>Emory University</td>
<td>Secondary School Science</td>
<td>M.A.T.</td>
<td>1976</td>
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<tr>
<td>Emory University</td>
<td>Developmental Biology</td>
<td>M.S.</td>
<td>1980</td>
</tr>
<tr>
<td>Univ Ark for Med Sciences</td>
<td>Toxicology</td>
<td>Ph.D.</td>
<td>1990</td>
</tr>
<tr>
<td>Emory University</td>
<td>Toxicology</td>
<td>Postdoc</td>
<td>1989-1991</td>
</tr>
</tbody>
</table>

(b) Appointments

1999 – present: Assoc. Professor, Environmental Health Science and Center for Food Safety, University of Georgia, Athens

2004-present Co-director, Academy of the Environment, University of Georgia, Athens

2000-present Collaborative Scientist, Yerkes National Primate Research Center, Atlanta, GA

2001-2001 Visiting Scientist, Center for Oral and Systemic Diseases, School of Dentistry, University of North Carolina, Chapel Hill, NC

1994-1999: Asst. Professor, Environmental Health Science and Food Science and Technology, University of Georgia, Athens

1993 Assistant Professor (Temporary position), Biology Department, Emory University, Atlanta, GA.

1991-1994 Adjunct Assistant Professor, Environmental and Occupational Health Division, School of Public Health, Atlanta, GA

1991-1993 Senior Scientist, Law Environmental, Inc, Kennesaw GA.

(c) Publications (Five most recent publications)


Five Other Significant Publications:


Henderson, WM† and MA Smith. Perfluorooctanoic acid (PFOA) and perfluorononanoic acid (PFNA) in fetal and neonatal mice following in utero exposure to 8-2 fluorotelomer alcohol (FTOH). Toxicological Science. 95(2):452-61. 2007.


(d) Synergistic Activities (Last 5 years)

- Invited member, National Academies/NRC Committee to Review the Draft IRIS Assessment on Formaldehyde. 2010-2011.
- Secretary, Teratology Society, (2009-2012). Elected by professional society to serve a 3-year term.
- Invited presentation (2009), International Association for Food Protection – Asia, Seoul, Korea.
- Member, National Institutes of Health Study Section, National Institute of Environmental Health Sciences, Special Emphasis Panel on Systemic Injury by Environmental Exposures (SIEE) (ZRG1 DIG-C 90S) 2008-2009.
- Invited voting member, Food and Drug Administration, Advisory Committee Meeting on Antiinfective Drugs, November 18-19, 2008. College Park, MD.
- Member, National Institutes of Health Study Section, National Institute of Child Health and Human Development, National Children’s Study Centers, June 8-10, 2008. Washington, DC.
- Invited member of expert panel for evaluating microbial risk assessment by the Council for Agricultural Science and Technology (CAST) Task Force.
- Invited workshop participant by the Danish Institute for Food and Veterinary Research in KolleKolle, Denmark, 2005.

(v) Collaborators & Other Affiliations

(i) Collaborators and Co-Editors (since 2005)

<table>
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<tr>
<th>Research collaborators (recent 5 years)</th>
<th>graduate/postdoc advisors</th>
<th>Graduated Ph.D students</th>
</tr>
</thead>
<tbody>
<tr>
<td>S Stice (UGA, ADS)</td>
<td>Dr. Bill Elmer (Emory U)</td>
<td>Dr. Amita Kanti</td>
</tr>
<tr>
<td>F West (UGA, ADS)</td>
<td>Dr. Ray Harbison (UAMS)</td>
<td>Dr. Jerry Campbell</td>
</tr>
<tr>
<td>L Beuchat (UGA, CFS)</td>
<td>Dr. S Offenbacher (Emory U and UNC, Chapel Hill)</td>
<td>Dr. Lonnie Williams</td>
</tr>
<tr>
<td>M Doyle (UGA, CFS)</td>
<td></td>
<td>Dr. W. M. Henderson</td>
</tr>
<tr>
<td>R Buchanan (Univ MD)</td>
<td></td>
<td>Dr. Elizabeth Irvin</td>
</tr>
<tr>
<td>K Williams (FDA)</td>
<td></td>
<td>Dr. A. Richardson</td>
</tr>
<tr>
<td>R Raybourne (FDA)</td>
<td></td>
<td>Dr. D. Williams</td>
</tr>
<tr>
<td>R Riley (USDA)</td>
<td></td>
<td>Kwaku Agyekum (current)</td>
</tr>
<tr>
<td>K Voss (USDA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M Henderson (EPA)</td>
<td>MS Degrees:</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------------------------</td>
<td></td>
</tr>
<tr>
<td>L Gram (Dutch Food Safety)</td>
<td>Jerry Campbell</td>
<td></td>
</tr>
<tr>
<td>H McClure (Yerkes Primate Center)</td>
<td>David Holcomb</td>
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<td>S Offenbacher (UNC, Chapel Hill)</td>
<td>Emily Hanson</td>
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<td>Lonnie Williams</td>
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<td></td>
<td>Ofia Hodoh</td>
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<td>Denita Williams</td>
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<td>Glenn Tillman</td>
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<td>Post-docs:</td>
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<tr>
<td></td>
<td>Kazue Takeuchi</td>
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<td></td>
<td>Nutan Mytle</td>
<td></td>
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</table>
BIOGRAPHICAL SKETCH  Jia-Sheng Wang

(a) Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major(s)</th>
<th>Degree</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai First Medical College</td>
<td>Preventive Medicine</td>
<td>M.B.</td>
<td>1978</td>
</tr>
<tr>
<td>Shanghai First Medical College</td>
<td>Toxicology</td>
<td>M.D</td>
<td>1982</td>
</tr>
<tr>
<td>Boston University</td>
<td>Pathology/immunology</td>
<td>Ph.D.</td>
<td>1994</td>
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<tr>
<td>Johns Hopkins University</td>
<td>Molecular Epidemiology</td>
<td>PDF</td>
<td>1995</td>
</tr>
</tbody>
</table>

(b) Appointments

2008 - Present  Professor and Head, Department of Environmental Health science, College of Public Health, The University of Georgia
2006 – 2008  Professor and Division Leader, Division of Human Health Sciences, The Institute of Environmental and Human Health, Texas Tech University
2000 – 2005  Associate of Professor (tenured), Department of Environmental Toxicology, Texas Tech University
1997 – 1999  Research Assistant Professor, Johns Hopkins School of Public Health
1994 – 1996  Senior Research Associate, Johns Hopkins School of Public Health
1992 – 1993  Research Affiliate, Division of toxicology, Massachusetts Institute of Technology
1986 – 1991  Visiting Scientist, Division of Toxicology, Massachusetts Institute of Technology
1982 – 1985  Assistant Professor, Food Safety, Nanjing Railway Medical College

(c) Publications (A total of 105)

Five Most Recent Publications:

Five Other Significant Publications:


(d) **Synergistic Activities**

1. National Institute of Environmental Health Sciences (NIEHS) Study Section for review NIEHS Center Grants, 2006-2010
2. National Institute of Environmental Health Sciences (NIEHS) Study Section for review KO1, ROO, RO3, R13, R15, and r21 projects, 2005-2010
3. President, Food Safety Special Section, Society of Toxicology, 2009-2010
4. President, American Association of Chinese in Toxicology, 2009-2011
5. Editorial Board Member for International Journal of Molecular and Genetic Epidemiology
6. Editorial Board Member for Journal of Environmental and Occupational Medicine
7. Keynote Speaker for Latin America Society of Mycotoxinology, 2010
8. Distinguished Cancer Scholar, Georgia Cancer Coalition, 2009-2014
9. Principal Investigator for the National Cancer Institute RO1 grant titled “chemoprevention of green tea polyphenols on liver cancer” (2003-2010).
10. Principal Investigator for the USAID grant titled “Established a global network for aflatoxin exposure” (2008-2013)

(e) **Collaborators & Other Affiliations**

<table>
<thead>
<tr>
<th>Research collaborators (recent 5 years)</th>
<th>graduate/postdoc advisors</th>
<th>Graduated Ph.D students (recent 5 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Timothy Phillips (Texas A&amp;M U.), Dr. Pauline Jolly (UAB), Dr. Dan Brown (Cornell U.), Dr. J-Y Hong (Rutgers), Dr. Leslie Shen (Texas Tech U), Dr. Guiju Sun (Southeast U.), Dr. Jianjia Su (Guangxi Cancer Inst.)</td>
<td>Dr. Gerald Wogan, (MIT) Dr. Ken Zaner, (Boston U). Dr. John Groopman (Johns Hopkins U.)</td>
<td>Dr. Haitao Luo, Dr. Madhavi Billam Dr. Fujun Liu Dr. Qingsong Cai Dr. Zemin Wang Dr. Piwen Wang Dr. Yuntian Tang Dr. Li Xu</td>
</tr>
</tbody>
</table>
**BIOGRAPHICAL SKETCH**

**Phillip L. Williams**

(a) **Professional Preparation**

<table>
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<tr>
<th>Institution</th>
<th>Major(s)</th>
<th>Degree</th>
<th>Year</th>
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<tbody>
<tr>
<td>Georgia State University</td>
<td>Biological Sciences/Chemistry</td>
<td>B.S.</td>
<td>1975</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>Environmental Biology</td>
<td>Ph.D.</td>
<td>1988</td>
</tr>
</tbody>
</table>

(b) **Appointments**

2007 – present: Dean, College of Public Health, University of Georgia, Athens
2005 - 2006 Interim Dean, College of Public Health, University of Georgia, Athens
2001 – present: Professor, Environmental Health Science, University of Georgia, Athens
2001 - 2010 Adjunct Professor, Dept. of Environmental and Occupational Health, Rollins School of Public Health, Emory University, Atlanta, GA
2002 - 2006 Chair, Public Health Division, Biomedical and Health Sciences Institute, University of Georgia, Athens, GA
1993 – 2001 Associate Professor, Environmental Health Science, University of Georgia, Athens
1993 – 2001 Adjunct Associate Professor, Dept. of Environmental and Occupational Health, Rollins School of Public Health, Emory University, Atlanta, GA
1991 – 1993 Adjunct Assistant Professor, Dept. of Environmental and Occupational Health, Rollins School of Public Health, Emory University, Atlanta, GA
1991 – 1993 Vice President, A. T. Kearney (Consulting firm), Atlanta, Georgia
1988 – 1991 Project Director, A. T. Kearney (Consulting firm), Atlanta, Georgia
1985 – 1988 Senior Research Scientist, Georgia Tech Research Institute, Atlanta, GA
1980 – 1985 Research Scientist, Georgia Tech Research Institute, Atlanta, GA
1978 – 1980 Research Technologist, Engineering Experiment Station, Georgia Tech, Atlanta, GA
1975 – 1978 Industrial Hygienist, U.S. Department of Labor, Occupational Safety and Health Administration, Macon, GA

(c) **Publications**

(i) **Five Recent Publications**


(ii) Five Other Significant Publications

(d) Synergistic Activities
2. Review Panel Member, National Research Foundation, Dubai, United Arab Emirates, November 1-2, 2008, Dubai, UAE.

(v) Collaborators & Other Affiliations
(i) Collaborators and Co-Editors (since 2005)
P.S. Rajini (India) Paul Bertsch (Univ. of Kentucky)
David DePomeri (U. of Nottingham)
Stephen Roberts (U. of Florida)

(ii) Advisors
Ph.D.: David B. Dusenbery (Georgia Tech, retired)

(iii) Graduate Advisees

Ma, Hongbo (Ph.D. 2009) 15 Ph.D. committees at UGA (completed degree)
Melstrom, Paul (Ph.D., 2007) 17 MS graduates served as major professor
Boyd, Windy (Ph.D. 2002) 13 MS committees at UGA (degree completed)
Kanna, N. (Ph.D. 1996)
BIOGRAPHICAL SKETCH Anne Marie Zimeri

a. Professional Preparation

Indiana University-Purdue University Biology BS 1997
Indianapolis, IN
University of Georgia, Athens, GA Genetics Ph.D 2004
USDA-Agricultural Research Services Toxicology Postdoc 2004
Athens, GA

b. Appointments

2007- present Instructor, Department of Environmental Health Science, UGA
2007- present Undergraduate Internship Coordinator, Department of Environmental Health Science, UGA
2008- present Undergraduate Coordinator, Department of Environmental Health Science, UGA
2006-2007 Lecturer, Departments of Genetics, Cell biology, and Biochemistry, UGA Gwinnett Campus
2004-2006 Postdoctoral Research Scientist, USDA-ARS Toxicology and Mycotoxin Research Unit, Athens, GA

c. Publications (7 total)

Zimeri AM, Riley, RT, Glenn AE (2009) Fumonisin FB1 works synergistically with other fungal metabolites and is translocated from metabolically active point on the stalk to kernels in maize. *Mycopathologia* (in prep.)

Zimeri AM, Riley RT, Glenn AE (2009) The mycotoxin fumonisin B1 is necessary for corn seedling disease development and is translocated from roots to shoots. *Plant Molecular Biology* (in prep.)


Zimeri AM, Dhanker OP, McCaig B, Meagher RB (2005) The plant MT1 metallothioneins are stabilized by binding cadmiums and are required for cadmium tolerance and accumulation. *Plant Molecular Biology* 58(6):839-55

Proposal for Ph.D. in Environmental Health Science
d. Synergistic Activities

DEVELOPED GRANT BASED RESEARCH PROGRAM: Examined the role of secondary metabolites that work synergistically with FB1 to in fractionated fungal extracts and analyzed genetic responses in maize to FB1 using RT-PCR and creating cDNA subtraction libraries.

OVERSAW AGENCY COOPERATIONS: Coordinated collaborations with microscopists at the University of Georgia to examine cellular toxicity responses.

SUPERVISED AND MENTORED STUDENT INTERNS: Developed student summer internship projects for two South Carolina Alliance for Minority Participation (SCAMP) students, and one Berry College intern. Supervised and monitored research.

COLLABORATE WITH USEPA Collaborate with Section Chief of USEPA to provide instruction and training for undergraduate and graduate students on compliance for RCRA, CERCLA, EPCRA, CFR and other federal environmental regulations.

Administrate the undergraduate program for the department which includes scholarship selection, advising decisions, recruitment.

DIRECT ENVIRONMENTALLY BASED COMMUNITY SERVICE LEARNING PROJECTS: Foster the development of outreach 200 undergraduates each year including an outreach program for the Stroud Elementary fall fair, and a ‘Go Green to Save Green’ at UGA.

SERVE ON DEVELOPMENT COMMITTEES FOR THE INTERDISCIPLINARY TOXICOLOGY PROGRAM (ITP): Collected data and authored education section for the ITP Self Study. Served as editor for the final document submitted to the Dean of the Graduate School. Composed surveys and assimilated data for ITP Strategic Planning committee.

e. Collaborators and Other Affiliations

i. Collaborators since 2005 (and their current affiliations)

Riley, RT (USDA-ARS), Glenn AE (USDA-ARS), Gupta D: student (UGA), Zitomer NC (USDA-ARS), Williams LD (Burdock Group, Orlando FL), Bacon CW (USDA-ARS), Smith MA (UGA), Dhanker OP (U-Mass), McCaig B (UGA), Meagher RB (UGA), Black M (UGA)

ii. Graduate and Postdoctoral Advisors (and their current affiliations):

Post-doctoral: Anthony Glenn (USDA-ARS); PhD: Richard B. Meagher (UGA)
Adjunct Faculty and Research Associates
BIOGRAPHICAL SKETCH

Dana Cole

(a) Professional Preparation

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major(s)</th>
<th>Degree</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Polytechnic Univ.</td>
<td>Animal Science</td>
<td>B.S.</td>
<td>1989</td>
</tr>
<tr>
<td>University of California Davis</td>
<td>Veterinary Med.</td>
<td>D.V.M</td>
<td>1993</td>
</tr>
<tr>
<td>Texas A&amp;M Univ.</td>
<td>Dipl. ACVIM</td>
<td></td>
<td>1994 – 1997</td>
</tr>
<tr>
<td>University of NC – Chapel Hill</td>
<td>Epidemiology</td>
<td>Ph.D.</td>
<td>2004</td>
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</table>

(b) Appointments

2008 – present:  Doctoral Epidemiologist, Centers for Disease Control and Prevention
2004 – 2008:    Medical epidemiologist, GA Division of Public Health, Acute Disease Epi
2002-2004:    Assistant Professor, UGA Large Animal Medicine and Surgery

(c) Selected Publications


(d) Honors (selected)


(e) Advisors

Ph.D: Mark. D. Sobsey (UNC)
BIOGRAPHICAL SKETCH

William Cosgrove

a. Professional Preparation:
   University of Georgia          BS  1978  Environmental Health
   Clemson University             MS  1979  Environmental System Engineering

b. Appointments
   1978 -1980  Environmental Engineer – Water Compliance Unit, EPA
   1990 -1985  Chief, Resources Conservation Recovery Act (RCRA) Unit, EPA
   1996-1998  Lead Region Coordinator – Regional Science & Technology (RS&T) Organization, EPA
   1995-1999  Technical Authority _ RCRA (concurrent with Lead Region Coordinator role) /
   2000-      Acting Chief, Region 4 Office of Quality Assurance and Data Integration , EPA
   2000-2003  Chief, Organic Chemistry Section
   2006- Present  Chief, Ecological Assessment Branch, EPA

c. Publications

Criteria for Project Performance Certification: Journal of the Water Pollution Control Federation, Alexandria, VA, January, 1988


d. Selected Synergistic Activities

1. 1994- Present – Instructor in the Environmental Science Department
3. 1996 – Coordinated the technical training and activities for several EHS student trainees at EPA.
4. 1994- Present EHS Graduate Advisory Committee
5. 2001 - Instructor for EHS Solid and Hazardous Waste Management Class.
6. 1998- Appointed as an Adjunct Instructor Environmental Health Science Department

e. Collaborators and Other Affiliations

N/A
BIOGRAPHICAL SKETCH  
Brian G. Forrester

(a)  Professional Preparation

<table>
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<tr>
<th>Institution</th>
<th>Major(s)</th>
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<tr>
<td>University of Georgia</td>
<td>Chemistry</td>
<td>BS</td>
<td>1980</td>
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<tr>
<td>Emory University</td>
<td>Medicine</td>
<td>MD</td>
<td>1984</td>
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<tr>
<td>Johns Hopkins University</td>
<td>Occupational Health</td>
<td>MPH</td>
<td>1990</td>
</tr>
</tbody>
</table>

(b)  Appointments

2005- Adjunct Associate Professor, UGA
1998- Medical Director, Athens Regional Hospital Occupational Medicine
1997-2004 Associate Professor, University of Alabama Schools of Medicine & Public Health
1993-1997 Assistant Professor, University of Alabama Schools of Medicine & Public Health
1991-1993 Instructor, University of Alabama School of Public Health

(c)  Publications (Selected 10)


(d)  Synergistic Activities

1. Diplomate, National Board of medical Examiners, in Georgia (1987-) and Alabama (1991-).
2. American Board of Preventive Medicine, Certified in Occupational Medicine, 1992.
3. Fellow, American College of Preventive Medicine, 1993.

(e) Collaborators & Other Affiliations
N/A
BIOGRAPHICAL SKETCH

Ken Jones

a. Professional preparation
Colorado State University  Wildlife Biology  B.S., 1995
Texas A&M University – Kingsville  Wildlife Biology  M.S., 1998
University of Illinois – Chicago  Biology  Ph.D., 2003
Kansas State University  Ecological Genomics  Postdoc, 2003-2007
University of Georgia  Environmental Genetics  Postdoc, 2007-2009

b. Appointments
2009 to present  Assistant Research Scientist, Georgia Genomics Facility and the Department of Environmental Health Science, University of Georgia, Athens, GA.
2009 to present  Adjunct Professor, Department of Biological Sciences, University of New Orleans, New Orleans, Louisiana.
2008 to 2009  Research Associate/Postdoctoral Fellow, Department of Environmental Health Science, University of Georgia, Athens, GA.
2007 to 2008  Research Associate/Postdoctoral Fellow, University of Georgia, Savannah River Ecology Lab, Aiken SC.
2003 to 2007  Research Associate/Postdoctoral Fellow, Division of Biology, Kansas State University, Manhattan, KS.

c. Publications (32 published, 1 in press)


d. Synergistic activities

Genetic Advisor and Genealogist to the US Fish and Wildlife Service Masked Bobwhite Quail Recovery Team.

Genetic Advisor and Genealogist to the joint US Fish and Wildlife Service and Canadian Wildlife Service Whooping Crane Recovery Team.

I mentored Julie Wall (2004), Tiara Perez (2005), and Erika Pabon (2006) during their summer internship with KSU’s Summer Undergraduate Research Opportunities Program (SUROP). I also mentored Kaitlen Wagner (2007) through the NSF REU program, as well as mentor two University of Georgia undergraduates Sheena Zhang and Nicole Jozwiak, 2008-current).

e. Collaborators and other affiliations

(i) Collaborators:
Ashley M (UIC), Blair J (KSU), Brandt D. (USGS), Chavez-Ramirez F (TAMUK), Carroll JP (UGA), Casey AE (KSU), Coolon J (MU), Eo SH (UGA), French JO (USC), Gibson JP (OU), Glenn T (UGA), Hagen C (UGA), Heincelman TJ (USC), Hereford S (USFWS), Herman M (KSU), Howard J (NOU), Jagoe C (UGA), Jones JM (OU), Jumpponen A (KSU), Krapu G (USGS), Lance S (UGA), Lee EJ (SNU), Lee WS (SNU), Leibo S (ACRES), Ma H (UGA), Mattox J (KSU), McCann K (SACWG), Miller SR (UMt), Moore J (UGA), Myrold, D (OSU), Narayanan S (KSU), Nguyen TH (UIUC), Park YS (SNU), Peterson D (UGA), Rhim SJ (CAU), Rodwell L (SACWG), Sandercock B (KSU), Sawyer R (USC), Strong AL (UMt), Thompson A. (UGA), Todd T (KSU), Ungerer MC (KSU), Verdoorn G (SACWG), Wall-Beam JL (KSU), Wells L (UGA), Williams PL (UGA), Wisely S (KSU), Yaege C

(ii) Advisors:
MS graduate advisor: Felipe Chavez-Ramirez (Texas A&M University-Kingsville)
PhD graduate advisor: Mary V. Ashley (University of Illinois-Chicago)
Postdoctoral advisor: Michael Herman (Kansas State University)
Postdoctoral advisor: Travis Glenn (University of Georgia)

(iii) Thesis Advisor:
Graduate Students (1)
MS graduate student: Jessica Henkel (University of New Orleans), Postdoctoral Scholars (0)
BIOGRAPHICAL SKETCH    Ron Riley

a. Professional Preparation:
University of California, Davis, CA  BA  1967  Biology
California State University, Humboldt, CA  MA  1973  Biology
Oregon State University, Corvallis, OR  Ph.D.  1978  Biology

b. Appointments
1980 - present  Research Toxicologist (GS-15) and Lead Scientist, USDA, Agricultural Research Service, Russell Research Center, Athens, GA
1978-1980  National Research Council Postdoctoral Research Associate, Corvallis Environmental Research Laboratory, Corvallis, OR
1976-1978  USEPA Graduate Research Assistant, Oregon State University, Corvallis, OR
1973-1976  Sea Grant Program Graduate Research Assistant Oregon State University, Corvallis, OR
1970-1972  Graduate Teaching Assistant, California State University, Humboldt, Arcata, CA.

c. Recent Publications


d. Selected Synergistic Activities

1. 1999 -2008 Editorial Board Member, Mycopathologia
2. 1995- Present Editorial Board Member, Environmental Toxicology and Pharmacology
4. 2001 Co- Guest Editor Aflatoxin/Fumonisin Eliminator and Fungal Genomics Workshops.
5. 2007 Guest –Co-Editor special issue of animal Feed Science and Technology.
6. 2009-210 Invited member of the “Editor Group” for the International Agency for Research on cancer.

Collaborators and Other Affiliations

e. Collaborators and other affiliations for the past five years.

<table>
<thead>
<tr>
<th>Research collaborators</th>
<th>Graduate students and postdocs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Julia Cabrera Valverde, Universidad Francisco Marroquin</td>
<td>Hwansoo Yoo, Ph.D. 1994</td>
</tr>
<tr>
<td>Christopher Cortop, Chemical Industry Institute of Toxicology</td>
<td>Lonnie D. Williams, Ph.D. 2006</td>
</tr>
<tr>
<td>James Pestka, Michigan State University, Roger Coulombe, Utah State University, Cooperative Western Regional Research Project</td>
<td></td>
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<tr>
<td>Janee Gelineau Van Waes, Creighton University</td>
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<tr>
<td>Marcy Speer, Duke University</td>
<td></td>
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<tr>
<td>Sarah Pruett, Emory University</td>
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<tr>
<td>Steve Saunders, Frito-Lays</td>
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**BIOGRAPHICAL SKETCH**  

Ted Simon

**Professional Preparation**

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<th>Institution</th>
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<th>Degree</th>
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<tbody>
<tr>
<td>Middlebury College</td>
<td>Biology</td>
<td>BA</td>
<td>1971</td>
</tr>
<tr>
<td>Georgia State University</td>
<td>Neurobiology</td>
<td>PhD</td>
<td>1989</td>
</tr>
</tbody>
</table>

**Appointments**

- **2004 – present:** Principal, Ted Simon, LLC, Winston, GA
- **2006 – present:** Adjunct Professor, Environmental Health Science, University of Georgia, Athens
- **1996 - 2006:** Toxicologist, US EPA, Region IV
- **2003:** Instructor, Georgia State University, Atlanta, GA

**Publications (selected)**


**Synergistic Activities**

2009 Consultation and statistical modeling regarding dose response of perfluorooctanoic acid (PFOA)

2009 Consultation regarding USEPA’s new arsenic cancer slope factor

2009 Assessment of the relative susceptibility of monkeys and humans to PCBs

2009 EPA dioxin workshop
**BIOGRAPHICAL SKETCH**  
Lili Tang

(a)  
**Professional Preparation**

<table>
<thead>
<tr>
<th>Institution</th>
<th>Major(s)</th>
<th>Degree</th>
<th>Year</th>
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<tbody>
<tr>
<td>Southeast University School of Medicine</td>
<td>Preventive Medicine</td>
<td>M.B.</td>
<td>1987</td>
</tr>
<tr>
<td>Jiangnan University</td>
<td>Food Science</td>
<td>M.S.</td>
<td>1997</td>
</tr>
<tr>
<td>Fudan University School of Medicine</td>
<td>Toxicology</td>
<td>Ph.D.</td>
<td>2001</td>
</tr>
</tbody>
</table>

(b)  
**Appointments**

- 2009- Associate Research Scientist
- 2008-2009  Professor, Nutrition and Food Safety, Jiangnan University, PRC
- 2004-2008  Research Assistant Professor, TIEHH, Texas Tech University, TX, USA
- 2002-2004  Postdoctoral Research Associate, Texas Tech University, TX, USA
- 1999-2002  Associate Professor of Food Nutrition and Safety, Wuxi University of Light Industry, Wuxi, PRC.
- 1993-1998  Lecturer of Food Nutrition and Safety, Wuxi University of Light Industry, Wuxi, PRC.
- 1987-1993  Assistant professor of Nutrition, Nanjing Railway Medical College, Nanjing, PRC.

(c)  
**Publications**

**Five Most Recent Publications:**


**Five Other Significant Publications:**


(d) Synergistic Activities

3. Co-Investigator for the National Cancer Institute RO1 grant titled “chemoprevention of green tea polyphenols on liver cancer” (2003-2010).

(e) Collaborators & Other Affiliations

<table>
<thead>
<tr>
<th>Research collaborators (recent 5 years)</th>
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<th>Graduated Ph.D students</th>
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<tbody>
<tr>
<td>Dr. Timothy Phillips (Texas A&amp;M U.), Dr. Pauline Jolly (UAB), Dr. Dan Brown (Cornell U.), Dr. J-Y Hong (Rutgers), Dr. Leslie Shen (Texas Tech U), Dr. Guiju Sun (Southeast U.), Dr. Jianjia Su (Guangxi Cancer Inst.)</td>
<td>Xiaoling Ding (Jiangnan U) Taiyi Jin (Fudan U.) Jia-Sheng Wang (UGA)</td>
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</table>
Appendix 3. Summary of current (active) grants among the core faculty in the Dept. of Environmental Health Science

<table>
<thead>
<tr>
<th>Primary EHS Investigator</th>
<th>Role</th>
<th>Grant Title</th>
<th>Grant Agency</th>
<th>Grant Total</th>
<th>Years Awarded</th>
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</thead>
<tbody>
<tr>
<td>Black, Marsha C.</td>
<td>Principal Investigator</td>
<td>Oyster Spat Sticks to Improve Coastal Water Quality</td>
<td>Georgia Sea Grant</td>
<td>$129,919</td>
<td>2</td>
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<tr>
<td></td>
<td>Co-Investigator</td>
<td>Georgia Oceans and Health Initiative (GOHI) Graduate Training Consortium</td>
<td>NOAA</td>
<td>$518,196</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Co-Investigator</td>
<td>Environmental behaviors of solubilized carbon nanotubes in aquatic systems: transformation, sorption and toxicity exposure</td>
<td>EPA</td>
<td>$383,375 ($183,227 to MB)</td>
<td>3</td>
</tr>
<tr>
<td>Glenn, Travis C.</td>
<td>Multi-PI project</td>
<td>Collaborative Research: The Evolution of Heterostylous Breeding Systems in Populations of Oxalis alpina in the Sky Islands of the United States and Mexico.</td>
<td>NSF</td>
<td>$140,363 (UGA portion)</td>
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<td></td>
<td>Co-Investigator</td>
<td>PIRE: Genetics of invasive species exchanged between the Southeastern U.S. and China, Taiwan &amp; Hong Kong</td>
<td>NSF</td>
<td>$2.5 M</td>
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<tr>
<td>Lipp, Erin K.</td>
<td>Principal Investigator</td>
<td>Georgia Oceans and Health Initiative (GOHI) Graduate Training Consortium</td>
<td>NOAA</td>
<td>$518,196</td>
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<td></td>
<td>Principal Investigator</td>
<td>Watershed scale transport of Salmonella, Campylobacter, and indicator organisms in the Satilla River Basin</td>
<td>USDA</td>
<td>$384,097</td>
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<td></td>
<td>Co-Investigator</td>
<td>Collaborative Research: Ecology of a Reverse Zoonosis: Human-Environment Interactions in the Transmission, Persistence, and Virulence of White Pox Disease in Elkhorn Coral</td>
<td>NSF</td>
<td>$2.2 M ($622,686 to EKL)</td>
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<td></td>
<td>Co-Investigator</td>
<td>Oyster Spat Sticks to Improve Coastal Water Quality</td>
<td>Georgia Sea Grant</td>
<td>$129,919</td>
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<td></td>
<td>Co-Investigator</td>
<td>Human fecal microflora as a source of coral pathogens in the Dry Tortugas National Park: Are coral pathogens invasive or endemic?</td>
<td>DOI (Nat'l Park Service)</td>
<td>$69,958 ($24,592 to EKL)</td>
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<tr>
<td>Naether, Luke P.</td>
<td>Principal Investigator</td>
<td>Biomarkers of Exposure to and Health Effects from SHS in Outdoor Smoking Areas</td>
<td>NIH</td>
<td>$408,183</td>
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<td></td>
<td>Principal Investigator</td>
<td>Natural and Man-made Radiological Levels in Smoke and Surface Fuels in Relation to Prescribed Fires at Savannah River Site and Other Southeastern Forests</td>
<td>USDA</td>
<td>$89,805</td>
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<td></td>
<td>Co-Investigator</td>
<td>International Training and Research in Environmental and Occupational Health (Peru)</td>
<td>NIH</td>
<td>$755,000 ($77,153 to LPN)</td>
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<td>Smith, Mary Alice</td>
<td>Principal Investigator</td>
<td>Probiotics to prevent Cronobacter sakazakii (Enterobacter sakazakii)</td>
<td>Mead Johnson</td>
<td>$45,743</td>
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<tr>
<td>Principal Investigator</td>
<td>Co-Investigator</td>
<td>Description</td>
<td>Funding Agency</td>
<td>Amount</td>
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<td>Jia-Sheng Wang (PI)</td>
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<td><strong>Chemoprevention of green tea polyphenols on liver cancer</strong></td>
<td>NCI/NIH</td>
<td>$1.84M</td>
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<td>Principal Investigator</td>
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<td><strong>Development of methods for establishing a global network for aflatoxin exposure</strong></td>
<td>USAID/Peanut CRSP</td>
<td>$1.0M</td>
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<td>Co-Investigator</td>
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<td><strong>GTP and Tai Chi for Bone Health: a Pilot Study</strong></td>
<td>NCCAM/NIH</td>
<td>$572,720</td>
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<td>Principal Investigator</td>
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<td><strong>Distinguished Cancer Scholarship</strong></td>
<td>Georgia Cancer Coalition</td>
<td>$750,000</td>
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<td>Phillip L. Williams</td>
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<td><strong>Endowed Chair (Georgia Power Professor)</strong></td>
<td>Georgia Power</td>
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<td>Anne Marie Zimeri</td>
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<td><strong>N/A</strong></td>
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Appendix 4. Library holdings (print journals) relevant to Environmental Health Science. Additional journals are available in electronic format.

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<td>Ambio</td>
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<td>American Pharmacy</td>
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<td>Analytical Biochemistry</td>
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<td>Annual Review of Biochemistry</td>
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<td>Applied and Theoretical Electrophoresis</td>
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<td>Aquaculture</td>
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<td>Aquaculture and Fisheries Management</td>
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<td>Aquatic Toxicology</td>
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<tr>
<td>Archives of Biochemistry and Biophysics</td>
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<tr>
<td>Archives of Environmental Contamination and Toxicology</td>
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<tr>
<td>Archives of Toxicology</td>
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<tr>
<td>Australian Journal of Ecology</td>
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<tr>
<td>Biochemical and Biophysical Research Communications</td>
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<tr>
<td>Biochemical Society Transactions</td>
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<td>Biochemistry</td>
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<td>Biological Bulletin</td>
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<tr>
<td>Biology of Reproduction</td>
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<td>Biomarkers</td>
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<tr>
<td>Bulletin of Environmental Contamination Toxicology</td>
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<tr>
<td>Canadian Journal of Fisheries and Aquatic Sciences</td>
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<tr>
<td>Carcinogenesis</td>
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<td>Cell Biology and Toxicology</td>
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<td>Chemico-Biological Interactions</td>
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<td>Chemosphere</td>
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<td>Comparative Biochemistry and Physiology</td>
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<td>Conservation Biology</td>
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<td>Critical Reviews in Toxicology</td>
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<td>Developmental Biology and Teratology</td>
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<tr>
<td>Drug and Chemical Toxicology</td>
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<td>Ecological Applications</td>
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<td>Ecotoxicology and Environmental Safety</td>
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<td>Electrophoresis</td>
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<td>Environmental Contamination and Toxicology</td>
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<td>Environmental Health Perspectives</td>
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<td>Environmental Management</td>
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<td>Environmental and Molecular Mutagenesis</td>
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<td>Environmental Research</td>
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<td>Environmental Science and Technology</td>
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<td>Environmental Toxicology and Chemistry</td>
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<td>Environmental Toxicology and Water Quality</td>
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<td>Estuaries</td>
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Proposal for Ph.D. in Environmental Health Science
European Journal of Toxicology
FEBS Letters
Fisheries
Food and Chemical Toxicology
Free. Radicals Biology Medicine
Free Radical Research Communications
Freshwater Biology
Functional Ecology
Fundamental and Applied Toxicology
GA Water Resources
Hazard Assessment of Chemicals
Hydrobiologia
International Review of Cytology
Journal of the American College of Toxicology
Journal of Applied Toxicology
Journal of Biochemical Toxicology
Journal of Biological Chemistry
Journal of Comparative Neurology
Journal of Environmental Engineering
Journal of Environmental Health
Journal of Environmental Quality
Journal of Environmental Pathology, Toxicology and Oncology
Journal of Environmental Science and Health
Journal of Experimental Marine Biology & Ecology
Journal of Experimental Zoology
Journal of Fish Biology
Journal of Food Science
Journal of Great Lakes Research
Journal of Molecular Evolution
Journal of the North American Benthological Society
Journal of Plankton Research
Journal of Toxicology and Environmental Health
Limnology and Oceanography
Marine Ecology Progress Series
Marine Biology
Marine Environmental Research
Marine Pollution Bulletin
Molecular Cell Biology
Mutagenesis
Mutation Research
Nature
Neurobehavioural Toxicology and Pharmacology
Nucleic Acids Research
Oecologia
Pesticide Biochemistry and Physiology
Pharmacology and Toxicology
Polar Biology
Polish Archives of Hydrobiology
Proceedings of the GA Water Resources Conference
Radiation Research

Proposal for Ph.D. in Environmental Health Science
<table>
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<th>Periodicals</th>
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<tr>
<td>Regulatory Toxicology and Pharmacology</td>
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<td>Reproductive Toxicology</td>
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<td>Reviews in Fisheries Science</td>
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<td>Science of the Total Environment</td>
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<td>Teratogenesis, Carcinogenesis and Mutagenesis</td>
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<td>Toxicology and Applied Pharmacology</td>
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<td>Water, Air and Soil Pollution</td>
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<td>Water Science Technology</td>
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<td>Xenobiotica</td>
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Appendix 5: Organizational Structure of the EHS Department
November 10, 2010

Dr. Erin K. Lipp, Ph.D.
Associate Professor and Graduate Coordinator
Department of Environmental Health Science
College of Public Health

Dear Dr. Lipp,

Thank you for the opportunity to review the proposal by the Department of Environmental Health Science (EHS) to establish a doctoral program in Environmental Health Science. I also asked the executive committee of the Interdisciplinary Toxicology Program (ITP) to review the document and provide feedback. As you are aware, many EHS faculty are members of the ITP and currently participate as mentors for ITP masters and doctoral students in diverse aspects of toxicology, including environmental toxicology. The ITP executive committee recognizes the need for EHS to have a doctoral program that focuses on the environmental aspects (e.g., epidemiology, microbiology, air and water quality, environmental fate) of public health. In reviewing the proposal the committee considered the features/characteristics that distinguish environmental health from environmental toxicology. After careful consideration, the ITP executive committee fully supports an EHS proposal to train doctoral students in aspects of environmental health that lie outside of toxicology, and that clearly limits duplication with the established ITP doctoral program. As always, we look forward to continuing to work with EHS faculty in training doctoral students in toxicology.

Sincerely,

Julie A. Coffield, Ph.D.
Associate Professor, Dept. of Physiology and Pharmacology
Director and Executive Committee Chair
Interdisciplinary Toxicology Program

Athens, Georgia 30602-7389
toxinfo@uga.edu = www.toxicology.uga.edu
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