Environmental factors directly impact the health and well-being of people throughout the world. Water, air, soil, and food are shared resources that transcend geographic boundaries, economic status, and industrial development. From pollution to disasters, global environmental health encompasses the impact of environmental factors on human health. Assessing and controlling environmental factors is pivotal to protecting health, managing natural resources, and preventing disease. The Department of Global Environmental Health Sciences carries out its mission of research, teaching, and service to characterize, manage, reduce, and communicate hazards and risks posed by the environment to populations globally, especially those most vulnerable.

The Department of Global Environmental Health Sciences’ overarching focus areas encompass factors influencing water and air quality, sustaining natural resources, and managing disaster impacts and recovery. Health endpoints of specific interest are: cancer, respiratory disease including asthma, gastro-intestinal disorders, workplace illnesses, and adverse reproductive effects.

MASTER’S PROGRAMS
The department offers programs leading to both a master of public health and a master of science in public health. A specialized, ABET-accredited MSPH in environmental health sciences/industrial hygiene is also offered. Coursework provides students the fundamentals needed to assume leadership roles as environmental health professionals in research and practice. The MPH focuses on disaster management and environmental policy while the MSPH is geared to the technical aspects of environmental health sciences.

Master of Science in Public Health (MSPH)
The MSPH in Global Environmental Health Sciences is a 45-credit applied-science degree designed to equip students with the knowledge and skills to accomplish the following:
• recognize, evaluate, and control global environmental health problems;
• apply quantitative and qualitative methods to evaluate environmental data;
• intervene to mitigate and, where possible, prevent exposures to hazards in the environment;
• and manage the delivery of global environmental health services.
Students pursuing the MSPH in Global Environmental Health Sciences can focus their studies on water quality; air pollution; hazardous and toxic materials control and management; toxicology and risk assessment; or ecosystem resources.

ADMISSION REQUIREMENTS
Prospective students must meet all requirements for admission into the School of Public Health and Tropical Medicine. Students entering this program will typically have a baccalaureate degree in a life or physical science, or engineering.

COURSE REQUIREMENTS

School Core Course Requirements (Page 22)
EHS Departmental MSPH Core (10 credits):
GEHS 6600: Principles of Toxicology 3
GEHS 7620: Environmental Health Risk Assessment 3
GEHS 6100: Fundamentals of Environmental Contamination 3
GEHS 7000: Environmental Health Seminar 1

Electives (17 credits) selected in consultation with advisor:
GEHS 6040: Environmental Health for Developing Countries 3
GEHS 6110: Global Climate Change Issues in Public Health Policy & Governance 3
GEHS 6310: Cancer: Causes, Treatment & Disparities 3
GEHS 6400: Elements of Environmental Health 3
GEHS 6410: Water & Sanitation Field Operations 3
GEHS 6470: Management of Natural Resources 3
GEHS 6500: Toxic & Hazardous Waste Management 3
GEHS 6520: Fundamentals of Environmental Chemistry 3
GEHS 6540: Occupational Health 3
GEHS 6550: Environmental Health Management 3
GEHS 6560: Environmental Microbiology 3
GEHS 6590: Air Pollution 3
GEHS 6610: Toxicology of Environmental Agents 3
GEHS 6620: Physical Agents & Ergonomic Hazards in the Workplace 3
GEHS 6620: Environmental Monitoring, Sampling & Analysis in a Disaster 3
GEHS 6430: Crisis Communication Management 3
GEHS 6960: Public Health Law 3
GEHS 7020: Wastewater Management & Treatment 3
GEHS 7030: Water Treatment & Supply 3
GEHS 7500: Air Sampling & Analysis 3
GEHS 7750: Environmental Policy 3

PRACTICUM REQUIREMENT
The practicum is designed to provide students with practice experience related to their field of study. The practicum is a minimum of 200 hours at a governmental, industrial, or commercial site or practice setting locally or abroad under the direction of a preceptor. A practicum report summarizes the field experiences.

CULMINATING EXPERIENCE
MSPH students in Global Environmental Health Sciences are required to prepare an applied or basic research thesis in fulfillment of the culminating experience. The thesis must investigate an environmental health science gap or issue.

Master of Science in Public Health—Environmental Health Science/Industrial Hygiene
The mission of the MSPH program in Environmental Health Science/Industrial Hygiene is to prepare students to: anticipate, recognize, evaluate, and manage workplace exposure to chemical, biological, and physical stressors; attain positions as industrial hygienists and occupational safety and health specialists; and qualify for professional certification by the American Board of Industrial Hygiene. This is accomplished through a balanced mix of didactic and laboratory courses, field experiences, and directed research.

The MSPH Environmental Health Science/Industrial Hygiene program is accredited by the Applied Science Accreditation Commission of ABET (ASAC of ABET).

ADMISSION REQUIREMENTS
In addition to the requirements for admission into the School of Public Health and Tropical Medicine, MSPH-IH students must also meet the following requirements:
- A baccalaureate degree based on a minimum of 120 semester hours or the equivalent, that shall include 60 or more credits in undergraduate or graduate level courses in mathematics, engineering, science, and technology, with at least 15 of those at the upper (junior, senior, graduate) level.
- A minimum Graduate Record Examination (GRE) combined score of 1000 preferred.
- Those students applying for admission in the distance learning format must also have a minimum of three years of professional experience in industrial hygiene or closely related field.

COURSE REQUIREMENTS
Total of 45 credits required
School Core Course Requirements (Page 22)
GEHS Departmental MSPH Core (9 credits):
GEHS 6600: Principles of Toxicology 3
GEHS 7620: Environmental Health Risk Assessment 3
GEHS 7000: Environmental Health Seminar 1

Specialty Coursework
GEHS 6540: Occupational Health 3
**GEHS 6620: Physical Agents & Ergonomic Hazards in the Workplace 3
GEHS 6500: Toxic & Hazardous Waste Management 3
GEHS 7110: Industrial Ventilation & Chemical Hazard Control 3
GEHS 7500: Air Sampling & Analysis 3
**GEHS 6390: Radiological Health 3
**GEHS 6700: Principles of Safety 3
Electives (choose from the following): 1-2
- GEHS 7140  Industrial Hygiene Aspects of Plant Operations 2
- GEHS 7050  Field Trips in Industrial Hygiene 1
- GEHS 7210  Occupational (OSHA) Regulations 1

Other electives as approved by advisor
* required for on-campus students only
** offered only in the distance learning format

In addition to completing the practicum and thesis, MSPH Environmental Health Science/Industrial Hygiene students must successfully pass the program’s industrial hygiene comprehensive exam. Those students who attain the ABIH certification (CIH) prior to graduation are eligible for waiver of the program comprehensive exam.

Master of Public Health in Disaster Management

Students earning an MPH in Disaster Management will be prepared to apply scientific principles to prevent, detect, and mitigate environmental public health problems and threats both locally and globally that are associated with natural and technological disasters; and implement population-based interventions to protect communities, particularly vulnerable populations, from natural and intentional disasters.

ADMISSION REQUIREMENTS

Students must meet all the requirements for admissions to the MPH program at the School of Public Health and Tropical Medicine.

“In my doctoral training at Tulane University, I applied a truly interdisciplinary approach to assess the potential for toxicity and genetic damage caused by extractable chemicals present in wood dusts. Wood dusts are known to cause cancer, but the actual carcinogens remain unknown. My research addressed this uncertainty using a combination of cell culture assays and molecular techniques paired with detailed chemical analysis of various wood dusts. I was fortunate to have guidance from toxicologists, industrial hygienists, and chemists in the Tulane community.”

—MARK WILSON, MPH, PHD, ENVIRONMENTAL HEALTH SCIENCES

COURSE REQUIREMENTS

Total of 45 credits required

School Core Course Requirements (Page 22):

EHS Departmental MPH Core (10 credits):
- GEHS 6600  Principles of Toxicology 3
- GEHS 7620  Environmental Health Risk Assessment 3
- GEHS 7750  Environmental Policy 3
- GEHS 7000  Environmental Health Seminar 1

GEHS Specialty Coursework in Disaster Management: 15
- GEHS 6110  Global Climate Change Issues in Public Health Policy & Governance 3
- GEHS 6410  Water & Sanitation Field Operations 3
- GEHS 6550  Environmental Health Management 3
- GEHS 6760  Environmental Ethics 3
- GEHS 6940  Environmental Aspects of Disaster 3
- GEHS 6960  Public Health Law 3
- GEHS 7910  Environmental Disaster Response Planning & Implementation 3
- GEHS 7930  Special Needs in Disaster Response 3
- GEHS 7950  Psychosocial Interventions in Disaster or Crisis 3

Elective Coursework in Disaster Management: 2-3
- GEHS 6920  Environmental Sampling, Monitoring and Analysis in a Disaster 3

COMBINED DEGREE AND SPECIAL PROGRAMS

Doctor of Medicine/Master of Public Health (MD/MPH)

Juris Doctor/Master of Public Health (JD/MPH)

Master of Social Work/Master of Public Health (MSW/MPH)

See more information about these combined degree programs beginning on page 12.

Bachelor of Science/Master of Science in Public Health (BSPH/MPH)

See page 19 for more information.

DOCTORAL PROGRAM

PhD in Global Environmental Health Sciences

The Department offers a PhD degree with advanced coursework and research in toxicology and risk assessment, industrial hygiene, water quality, air pollution, disaster management, or environmental oncology.

ADMISSION REQUIREMENTS

Students must meet all the requirements for admissions to PhD program at the School of Public Health and Tropical Medicine.
Program Requirements

Students entering the program with a master’s degree from the school must complete at least 30 additional didactic credits in advanced coursework beyond the master’s degree. Course work will include the school’s required courses, basic and advanced courses in environmental health sciences, and supplemental courses from other departments of the university. Students entering the GEHS PhD program from other departments or institutions will be required to take any courses at the masters level that are needed to make up any training deficiencies. These master’s level courses will not count toward the 30 didactic credits needed for the PhD degree.

The incoming student will be assigned to an academic advisor to help with course selection and monitor progress. The student is expected to spend the first two to three years of this program performing coursework, with an increasing emphasis on doctoral level courses in the latter stages. A grade of “B” or better is required in all courses.

Distance Learning Program

The Center for Applied Environmental Public Health delivers MPH programs for mid-career professionals through distance learning in: occupational health and safety management, occupational and environmental health, and disaster management. The center also offers the MSPH in Environmental Health Science/Industrial Hygiene through distance learning. For more information about distance learning or mid-career degrees in environmental health sciences, see page 17.

Career Opportunities

Graduates have found career opportunities and employment in diverse settings such as:

- Academic and private research institutions
- State departments of health and environmental quality
- Local, national, and international homeland security and emergency preparedness agencies
- Health and safety departments in industry
- Private consultancies
- United States Environmental Protection Agency
- United States Department of Energy
- United States Department of Defense
- Ministries of health and environment in several countries including Thailand, Indonesia, and Jordan

Research

The faculty and students of the department are actively engaged in research in key areas including global environmental health, toxicology and risk assessment, industrial hygiene, environmental oncology, environmental policy, and disaster management and epidemiology. Please note that these are just a sampling of current and recent research.

Global Environmental Health

- Coastal restoration and hazard mitigation – a Tulane multidisciplinary initiative
- Wetlands assimilation pilot demonstration of wastewater and biosolids reuse for Orleans and St. Bernard Parishes

Toxicology and Risk Assessment

- Head-off Environmental Asthma in Louisiana (HEAL)
- Detection and health effects of chlorinated dioxins, polycyclic aromatic hydrocarbons, and related compounds in the environment
- Development and use of novel yeast-based bioassays to detect toxic agents
- Impact of seaport related air pollution on the health of neighboring communities
- Impact of chronic low-dose radiation exposure on lung development within a Chernobyl radiation affected community

Industrial Hygiene

- Respiratory effects in workers from post-Katrina related airborne exposures
- Methods for determination of inhalable wood dust in industrial environments

Environmental Oncology

- Carcinogenic mechanisms of wood dusts and other phytocompounds
- Development of biomarkers to monitor people exposed to asthma- and/or cancer-causing agents

Disaster Management and Environmental Policy

- Impacts of disasters on vulnerable populations including children and women of childbearing age
- Building emergency preparedness through social networking
- Reusable treatment of human waste from displacement communities: a prototype system for Haiti
Suriname
The Department of Global Environmental Health Sciences offers an annual summer course in Suriname, “Public Health Threats in Suriname: From Ecosystem to Human Health.” Chair Maureen Lichtveld, a native of Suriname, coordinates the course and shares teaching with faculty from Global Health Systems and Development. A memorandum of understanding between the school and the Anton de Kom Universiteit van Suriname provides opportunities for joint research, educational exchanges, and courses like this one.

Faculty and Research Interests

Assaf Abdelghani, ScD, MSPH
global environmental health
impact of toxicants on human health
and the environment
environmental health in developing countries

Ann Anderson, PhD
public health practice
education training programs
education of public health professionals

Joseph J. Contiguglia, MD, MPH&TM, MBA
disaster management
preventive medicine

Andrew J. Englande Jr., PhD, P.E., D.E.E
water quality management
wastewater and water treatment bioremediation

L. Faye Grimsley, PhD, CIH
occupational hygiene
indoor air quality
bioaerosols, specifically molds

Elizabeth James, PhD
biochemistry
technology and teaching/learning
distance learning

Maureen Lichtveld, MD, MPH
environmentally induced disease:
asthma, cancer
environmental health policy
community-based participatory
health disparities research
disaster management
global health disparities

Charles Miller III, PhD
molecular and mechanistic toxicology
receptor-mediated toxicity

Kenneth K. Orie, JD, LL.M., DrCL
environmental policy and management
public health law and global health regulations
international environmental law
and management systems

Roy J. Rando, ScD, CIH
occupational and environmental lung disease
exposure assessment
industrial hygiene chemistry

Robert Reimers, PhD, QEP, FAC
biosolids treatment, disinfection,
stabilization, and reuse
sustainable resource development
innovative process development
usage of applied-fields to enhance existing processes

Gabriele Sabbioni, PhD
environmental and occupational toxicology
biomarkers
environmental carcinogenesis

Erik Svendsen, PhD
environmental epidemiology
disaster epidemiology
air pollution

He Wang, PhD
environmental oncology
occupational and environmental respiratory disorders
toxicology of particles

LuAnn White, PhD, DABT
occupational and environmental toxicology
children’s health
environmental assessments of disasters

Jeffrey Wickliffe, PhD
environmental and molecular toxicology
mechanisms of genetic damage and mutagenesis
gene-environment interactions in environmental disease