

M.S. IN CLIMATE AND HEALTH

Master of Science in Climate and Health

The Master of Science in Climate and Health (MSCH) degree is offered in partnership between the Department of Public Health Sciences (Miller School of Medicine) and the Department of Atmospheric Sciences (Rosenstiel School of Marine and Atmospheric Sciences). The MSCH program will prepare future generations of professionals, research analysts, planners, decision-makers and leaders, who will have a deep understanding of the intricate relationship between human health and climate change, weather and weather anomalies (C^2W^2), and the ability to decipher and quantify this relationship at multiple scales ranging from gene-expression, to individual's susceptibility to community response to region-wide morbidity and mortality burden.

The MSCH program has three specific aims. First, to provide students with conceptual, theoretical and applied understanding of the direct and indirect impacts of C^2W^2 on human health. Second, to train students in understanding, evaluating, and assessing short- and long-term climate and weather changes, and their direct and indirect impact on disease and disability burden across different communities. And third, to prepare students to develop adaptation, mitigation, healthcare and communication strategies in the light of adaptation and infrastructure capacity of different communities to manage the health effects of C^2W^2 .

The degree offers the following MSCH tracks. Students must choose a track with approval from their academic advisor:

- Public Health Sciences
- Marine and Atmospheric Sciences
- Climate and Health - Analytical
- Toxicology

Admission Requirements

- **Application** - Applicants must submit their application online through SOPHAS (<https://sophas.org/>), the centralized application service of the Association of Schools and Programs of Public Health (ASPPH) (<https://www.aspph.org/>). All application materials, including transcripts, test scores, statement of purpose/personal statement, resume/CV, and letters of recommendations, must be submitted directly through SOPHAS.
- **Transcripts** – Applicants must submit official transcripts from all previously attended colleges and universities. All foreign transcripts must be official and submitted in the original language. If the original language is not English, an official translation must be submitted along with the transcript. All non-U.S. transcripts must be evaluated by the World Education Service (<https://www.wes.org/>) (WES) using ICAP course-by-course evaluation service.
- **Pre-requisite Courses** – The following courses should be taken as pre-requisites: One year of college Calculus and Physics courses, and one Biology course.
- **English Proficiency Exam** - International students are required to take the Test of English as a Foreign Language (TOEFL) (<https://www.ets.org/toefl/>) or the International English Language Testing System (IELTS) (<https://www.ielts.org/en-us/>). If English is *not* a student's native language, the TOEFL/IELTS requirement *may be waived* if the applicant holds an undergraduate or graduate degree from an academic institution within the United States or from a select list of English-speaking countries.
- **Resume/Curriculum Vitae** – Applicants must include a detailed resume including employment, public health experiences, community service, research, and academic or professional honors. Prior public health experience is not required in order to be considered for admission.
- **Statement of Purpose/Personal Statement** – Applicants are required to submit a statement of purpose that details their academic interest in the program. The statement should discuss any experiences in public health including field experience, research, training, education or other related qualifications. Applicants should discuss how earning the degree will contribute to their future professional and career goals, as well as to the future of public health. Applicants should also address any academic deficiencies, if applicable.
- **Letters of Recommendation**– Applicants must provide three letters of recommendation from individuals who are best able to assess their ability to be successful in a graduate degree program. Ideally, recommenders are recent professors, researchers or employers in a related field. Letters should be signed and on letterhead. Applicants will be asked to include the contact information of their recommenders on the SOPHAS application and recommenders will be sent an online form to complete via email.

For more information about our application process, please click here (<https://graduatestudies.publichealth.med.miami.edu/admissions/application-process/>). To obtain detailed curricula on all our program offerings, please visit our website (<http://publichealth.med.miami.edu/>).

For further information, please contact:

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Curriculum Requirements

Code	Title	Credit Hours
Core Courses		
EPH 600	Introduction to the Science Practice of Public Health	3
EPH 646	Climate and Health	3
EPH 657	Toxicology: Climate and Health	3
ATM 614	Introduction to Weather and Climate	3
EPH 727	Climate, Environment, and Health: Data Integration and Management	3
EPH 633	Policy Management of the Health Effects of Climate	3
EPH 729	Analysis of the Health Effects of Climate	3
Thesis ¹		
EPH 810	Master's Thesis (Master's Thesis)	6
Track Coursework		9
Students must complete one track.		
Public Health Sciences Track		
Select from the following:		
ATM 634	Introduction to Atmospheric Chemistry	
ATM 637 or MPO 637 or OCE 637	Natural Hazards: Atmosphere and Ocean Natural Hazards: Atmosphere and Ocean Natural Hazards: Atmosphere and Ocean	
ATM 653	Climate Change	
BST 630	Longitudinal and Multilevel Data	
ECO 645	Regulations Economics	
EPH 612	Global Health	
EPH 639	Ecology and Control of Vector-Borne Diseases	
EPH 640	Urban Environment and Public Health	
EPH 641	Environmental Health	
EPH 643	Introduction to Occupational Health	
EPH 724	Molecular and Genetic Epidemiology	
LAW 213	Environmental Law	
LAW 555	Climate Change Law and Policy	
LAW 854	ENVIR JUSTICE CLIN PRACTICUM I	
Marine and Atmospheric Science Track		
Select from the following:		
ATM 624	Applied Data Analysis	
ATM 634	Introduction to Atmospheric Chemistry	
ATM 636	Hurricanes	
ATM 637 or MPO 637 or OCE 637	Natural Hazards: Atmosphere and Ocean Natural Hazards: Atmosphere and Ocean Natural Hazards: Atmosphere and Ocean	
ATM 653	Climate Change	
ATM 654	Climate Variability	
ATM 662	Advanced Weather Forecasting	
ATM 731	Air-Sea Interaction	
ATM 732	Climate Dynamics	
ATM 765	General Circulation of the Atmosphere	

Climate and Health--Analytical Track	
Select from the following:	
ATM 653	Climate Change
BST 605	Statistical Principles of Clinical Trials
BST 630	Longitudinal and Multilevel Data
BST 650	Topics in Biostatistical Research
EPH 703	Advanced Statistical Methods I
EPH 705	Advanced Statistical Methods II
EPH 724	Molecular and Genetic Epidemiology
LAW 555	Climate Change Law and Policy
Toxicology Track	
Select from the following:	
ATM 653	Climate Change
HGG 631	Genes in Populations
MBS 601	Biochemistry for the Biosciences
MBS 603	Gross Anatomy and Histology
MBS 604	Advanced Molecular and Cell Biology
MBS 605	Cell Physiology
MBS 608	Basic Pathobiology
MIC 728	Principles of Immunology
MIC 751	Advance Topics in Microbiology and Virology
MIC 775	Advanced Topics in Immunology
PIB 702	Scientific Reasoning
TOTAL	36

¹ The MS Thesis requires an individual investigation of a current public health problem and allows the student to demonstrate competency in the development and implementation of a research question. Students will work closely with a faculty advisor and the thesis committee during their investigation. The master's thesis process, requirements, format and deadlines follows the Electronic Thesis and Dissertation (ETD) requirements of the Graduate School. Students should register for 1-3 credits to complete the proposal and form a committee in one semester, and register the remaining master's thesis credit in a later semester to defend the thesis and complete all requirements.

Plan of Study

This is a sample plan of study. Your actual course sequence may vary depending on your previous academic experience as well as current course offerings. Students should meet with their academic advisor each semester to determine the appropriate course selection.

The degree offers the following MSCH tracks. Students must choose a track with approval from their academic advisor:

- Public Health Sciences
- Marine and Atmospheric Science
- Climate and Health - Analytical
- Toxicology

Year One		Credit Hours
Fall		
EPH 646	Climate and Health	3
EPH 657	Toxicology: Climate and Health	3
EPH 600	Introduction to the Science Practice of Public Health	3
Credit Hours		9
Spring		
ATM 614	Introduction to Weather and Climate	3
EPH 727	Climate, Environment, and Health: Data Integration and Management	3
Selected Track Coursework		3
Credit Hours		9

Year Two		
Fall		
EPH 729	Analysis of the Health Effects of Climate	3
Selected Track Coursework		3
EPH 810	Master's Thesis (Master's Thesis (Proposal))	3
Credit Hours		9
Spring		
EPH 633	Policy Management of the Health Effects of Climate	3
Selected Track Coursework		3
EPH 810	Master's Thesis (Master's Thesis (Defense))	3
Credit Hours		9
Total Credit Hours		36

Mission

As global warming intensifies, not only will it result in a shifting burden of disease and disability, but it will also result in unprecedented changes in the physical and biochemical characteristics of the environment. The MSCH graduate program will prepare future generations of research analysts, planners, decision-makers and leaders who will have deep understanding of the intricate relationship between climate and health, and ability to decipher this relationship.

Goals

The MSCH program has three specific aims:

- Provide students conceptual and theoretical understanding of the direct and indirect impacts of short- and long-term climate changes on health and well-being;
- Train students in evaluating and assessing short- and long-term climate changes and their direct impact, in turn, on the burden of disease and disability, and indirect impact on burden of disease and disability through the physical and biochemical changes in the environmental characteristics due to climate changes, and
- Prepare students to evaluate (existing) and develop adaptation, mitigation, communication and healthcare strategies to manage the health effect of C^2W^2 across different populations with respect to their differential health risks, infrastructure and adaptation capacity.

Student Learning Outcomes

Upon completion of the Master of Science in Climate and Health (MSCH) degree, all graduates will be able to:

- Explain physical processes that control global and regional climate, and global and regional weather patterns and extreme weather patterns;
- Explain interplay between health and C^2W^2 , the burden of disease/disability different communities and populations associated with weather and climate, and weather and climate mediated changes in the environment;
- Examine bio-physiological responses with respect to short- and long-term climate changes and weather patterns;
- Develop skills in collecting, managing and analyzing health, climate and associated data sets to quantify the health effects of climate incorporating hierarchical (including individual, community and region-specific) socio-physical environmental characteristics;
- Explain the structure and administration of public health organizations and the policies that impact health programs and health services for different communities,
- Identify direct and indirect roles of different stakeholders in the surveillance and management of the health effects of climate,
- Assess disparities in the health effects of climate and extreme weather.