BU URBAN Graduate Program in Urban Biogeoscience and Environmental Health

Trainee Handbook

2020/2021 Academic Year
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About the Program

Half of the world’s population lives in cities and this proportion will grow in the next few decades. People living in cities can face elevated levels of air and water pollution and extreme weather events such as heat waves and storm surges. To solve these complex challenges and to plan for more sustainable cities, we need a new workforce equipped with interdisciplinary technical knowledge and communication skills.

The Boston University Graduate Program in Urban Biogeoscience and Environmental Health (“BU URBAN”) is an NSF-funded research traineeship (NRT) that trains Ph.D. students in Biogeoscience, Environmental Health, and Statistics to address urban environmental challenges. This NRT program prepares Ph.D. students to tackle the major environmental problems confronting cities using an interdisciplinary approach that fuses Biogeoscience and Environmental Health, with an emphasis on data analysis, field research methods, and engagement and communication with policy makers, the private sector, and the broader community.

Trainees design research projects whose results are scientifically transformative and useful for decision-makers. Topics are interdisciplinary and include, but are not limited to, assessments of greenhouse gas emissions, evaluation of air and water pollution, and understanding the threats to human health from urban heat waves or other extreme weather events. As part of the Boston University Graduate Program in Urban Biogeoscience and Environmental Health, trainees participate in workshops and are embedded in cities through internships with government offices, non-governmental organizations (NGOs), and/or the private sector.

Core participating faculty from the Biogeoscience Program (Departments of Biology and Earth & Environment) have expertise in biogeochemistry in terrestrial and aquatic systems, microbial and plant ecology, hydrology, geomorphology, biogeophysics, and remote sensing. Core participating faculty from the Department of Environmental Health have expertise in epidemiology, exposure science, risk assessment, and toxicology, with applications that span air pollution and climate change, chemicals in soil, water and food, as well as non-chemical hazards such as noise, heat, and social stressors. Core participating faculty from the Department of Mathematics & Statistics have expertise in hierarchical modeling, spatial and temporal modeling of data, multivariate analysis, network analysis, Bayesian statistics, and computational biology.
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Policies and Procedures

Participation in the Program

Upon notification that you have been selected to participate in the BU URBAN Graduate Program in Biogeoscience and Environmental Health (BU URBAN), you will be asked to sign an agreement to complete all required program elements throughout your participation in the program. Your enrollment in the program starts in the semester that you are accepted and lasts until the completion of your Ph.D. at Boston University.

Advising

The BU URBAN Program provides interdisciplinary training for graduate students interested in a variety of career options. To ensure proper balance of coursework, research interests, professional development, and other activities, we provide BU URBAN Trainees and their advisors with an Annual Activities Report Form, which explains program requirements and tracks trainee progress. The Annual Activities Report Form is populated from the Self Report Survey that trainees complete at the end of the Fall and Spring semesters.

Commuting between Campuses

Due to the interdisciplinary nature of this program and the layout of Boston University, trainees often commute between the Charles River Campus (CRC), where the Biology, Earth & Environment, and Mathematics & Statistics Departments are housed, and the Boston University Medical Campus (BUMC), where the Department of Environmental Health is housed. To help you plan your travel between campuses we created this list of options:

Option 1: Take the BU Shuttle (BUS). The BUS runs approximately every 10-20 minutes and stops at several locations on the Charles River and the BU Medical Campuses to provide transportation between the two. The trip takes approximately 30 minutes, but varies with traffic. Keep in mind that during the summer months the BU Shuttle does not operate as frequently as during the academic year.

Option 2: There is a bike lane that connects the two campuses along Massachusetts Avenue. The trip takes between 15 and 20 minutes.

Option 3: Take a nice 45-minute walk between the two campuses.

Option 4: Uber/Lyft. Install the App and hail a ride. The App will tell you how long your trip will take, but count on approximately 20-30 minutes.

Option 5: Drive and park.

On the Medical Campus parking is available at 710 Albany Street. After you park:

- If you have a BU parking permit, bring your BU parking permit and ticket with you
- When you are ready to leave, enter Parking Office of 710 Albany street (it’s the office to the left of where people pay for parking, towards Stoughton Street) and show both your parking ticket and your parking permit. They will check your parking permit and stamp your parking ticket.
- Go to cashier next door, towards Concord St, to show them your stamped parking ticket

On the Charles River Campus parking is available at 700 Commonwealth Ave (Warren Towers Garage, Lot K; entrance on Hinsdale Mall).

- If you have a BU parking permit pull up to the parking lot attendant and show them your parking permit and BU ID to enter the parking garage free of charge.

Class Registration and Course Petitions

Due to the interdisciplinary nature of the program, trainees enroll in classes outside of their discipline and may encounter conflicts due to specific course prerequisites. If this is the case, email the course instructor and copy your advisor, program Director (Pamela Templer; ptempler@bu.edu) and Program Manager (Evan Kuras; URBAN@bu.edu) and explain your concerns and/or questions.
We carefully created a suite of required courses that provide a broad background in urban Biogeoscience and Environmental Health. If you think that a non-BU URBAN listed course you have taken should count towards your requirements, please complete a [course petition form](#). Please be aware that filling out this petition does not guarantee approval.

**NSF Acknowledgement**

All presentations and publications generated during your enrollment in this program must acknowledge funding support from NSF with the following statement: “This work was supported by a National Science Foundation Research Traineeship (NRT) grant to Boston University (DGE 1735087).”

**Funding**

**Scholarships and Stipends:** As a Ph.D. student at Boston University you are guaranteed five (5) years of funding through various sources, including teaching fellowship, research grants, and training grants. There are also external financial sources you can apply for to support your work (e.g. NSF GRFP, Switzer Fellowship). As a BU URBAN Trainee, you are eligible to apply for up to two years of a 12-month NSF stipend that covers basic BU health insurance, tuition, and fees. The application for this stipend support is due in early May. The NSF-NRT fellowships are available to U.S. citizens, U.S. nationals, or permanent residents only.

**Research and Travel Awards:** There are competitive funds set aside for BU URBAN Trainees to carry out individual interdisciplinary research projects and/or for conference participation. Calls for application to these competitive funds are only open to BU URBAN Trainees and have deadlines in October, March, and June, annually.

**Broadening Participation Awards:** These competitive funds seek to advance diversity and inclusion in STEM by supporting BU URBAN trainees to participate in 1) public engagement activities that specifically reach under-represented groups and/or 2) participation in educational activities (e.g., conferences, trainings, reading groups) that build capacity for scientific research and/or communication centered on inclusion, equity, and intersectionality. Broadening Participation Awards are capped at $500 and proposals can be submitted at any time.

**Summer Internship Funding:** As part of the BU URBAN program requirements each trainee has to complete an internship (more details below). If you decide to complete your internship during summer months and are not currently receiving a non-service 12-month stipend from the BU URBAN program or a different training grant, we can provide summer funding for the duration of your internship. We put out a call for summer internship stipend applications in Spring each year. For all trainees we are also able to reimburse internship related travel expenses up to $300 (e.g. travel from and to an internship location). To request internship related travel expenses please contact Evan Kuras, [URBAN@bu.edu](mailto:URBAN@bu.edu).

**External Advisory Board**

The BU URBAN advisory board consists of leaders from government, academia, non-governmental organizations, and the private sector. Input from our advisory board is critical to the effective design and management of the BU URBAN program. The BU URBAN leadership team hosts meetings with the advisory board annually to discuss progress, challenges, evolving program needs, and seek recommendations for ensuring continued program relevancy and engagement.

**External Evaluation**

The BU URBAN Program has partnered with a professional evaluation team housed at Claremont Graduate University. The evaluation team contributes to the program by ensuring that the objectives of the program align with our short-, medium-, and long-term goals. On occasion, representatives from the evaluation team will attend meetings and symposia where they will also engage with trainees and faculty to measure progress. For this reason, if you are contacted by any representatives from the evaluation team, please respond as this will only help improve our program!
Program Requirements

Coursework
• Colloquium in Urban Biogeoscience and Environmental Health (Fall, 2 credits)
• Applied Research Methods in Urban Biogeoscience and Environmental Health (Spring, 2 credits)
• One course in Biogeoscience (4 credits)
• One course in Environmental Health (4 credits)
• One course in Statistics (4 credits)
• Urban Biogeoscience and Environmental Health: From Research to Policy (variable credits, see internship below)

The courses are designed to provide trainees with a foundation in Biogeoscience, Environmental Health, and Statistics across topics that span air, water, and climate in urban environments. For a complete listing of courses please see the next page and check the program website.

Seminars
Both the Biogeoscience and Environmental Health programs have seminar series that you are encouraged to attend. You can find relevant seminar listings on the program website calendar and in monthly newsletters. You can attend many of the seminars remotely via a Zoom weblink that will be made available prior to each seminar. Some seminars are recorded and made available on our program website.

Workshops
Participation in all five workshops is required for trainees in their first year of the program. Following the first year, trainees are required to participate in at least one of the following each year: Science Communication, Urban Governance Series, or Professional Development.
• Introduction to the BU URBAN Program – half day workshop, Fall semester
  o Workshop introduces trainees to each other, the leadership team, and the program.
• Science Communication – half day workshop, Fall semester
  o This short workshop has a rotating theme each year, covering anything from communicating with a journalist, to writing a blog post or news story, or making short videos.
• Urban Governance Series – 3-4 lectures, events, and/or workshops, Spring semester
  o A multi-part lecture and discussion series held by BU's Initiative on Cities
• Professional Development – 1-2 hour workshop, Fall or Spring semester
  o This workshop has a different focus each year, ranging from career panels to networking or making a personal website. Trainees are also encouraged to participate in Professional Development opportunities provided by BU Professional Development & Postdoctoral Affairs and BU’s BEST.
• Responsible Conduct of Research (held by the BU Provost’s office)
  o All trainees are required by the National Science Foundation to complete a multi-part training focused on responsible conduct of research. The BU Office of Research offers the introductory and intermediate workshops online, whereas the final, advanced workshop consists of a 4-part in-person series offered on both campuses. More information is available on the BU Research Office website.

Internship
Each trainee is required to carry out an internship with a city government office, NGO, and/or the private sector. The internship is required to be a minimum of 80 hours and are flexible in terms of number of days per week and timing. Trainees are required to simultaneously enroll in the companion internship course (GRS BI/EE 795 or SPH EH 795). The course covers professional development associated with the internship experience, lessons about science policy integration, and science communication skills.
Ph.D. Dissertation Research
Trainees fulfill dissertation research requirements of their home department and are required to form an interdisciplinary dissertation committee. Trainees in the Departments of Biology and Earth & Environment must form a dissertation committee with at least one faculty member from Environmental Health. Trainees in the Department of Environmental Health must form a dissertation committee with at least one faculty member from Biology or Earth & Environment. Trainees in the Department of Math & Statistics must form a dissertation committee with at least one faculty member from either Biology, Earth & Environment, or Environmental Health.

Required Courses

Colloquium and Practicum (both required in the first year)
GRS BI/EE 764 or SPH EH 799: Colloquium in Urban Biogeoscience and Environmental Health
GRS BI/EE 765 or SPH EH 797: Applied Research Methods in Urban Biogeoscience and Environmental Health

Internship Course (required, co-currently with internship. If completing internship in summer, course meetings are in summer but you enroll in the course in Fall.)
GRS BI/EE 795 or SPH EH 795: Urban Biogeoscience and Environmental Health: From Research to Policy

Biogeoscience
GRS BI/GE 675: Urban Ecology
GRS BI/ES 643: Terrestrial Biogeochemistry
CAS BI/GE 523: Marine Urban Ecology (BU Marine Program Course)
CAS EE 512: Urban Climate

Environmental Health
SPH EH 730: Methods in Environmental Health Sciences (more general overview)
SPH EH 804: Exposure Assessment
SPH EH 866: Risk Assessment

Statistics
CAS GE 585: Ecological Forecasting and Informatics
CAS GE 529: Modeling and Monitoring Terrestrial Ecosystem Processes
CAS GE 509: Applied Environmental Statistics
CAS GE 516: Multivariate Analysis for Geographers
SPH BS 723: Introduction to Statistical Computing
SPH BS 730: Introduction to R: Software for Statistical Computing
SPH BS 805: Intermediate Statistical Computing & Applied Regression Analysis
SPH BS 852: Statistical Methods in Epidemiology
SPH BS 857: Analysis of Correlated Data
SPH BS 820: Logistic Regression and Survival Analysis
SPH BS 853: Generalized Linear Models with Applications

Any graduate-level statistics course from the Department of Math & Statistics, especially
GRS MA 681: Accelerated Introduction to Statistics for Quantitative Research
GRS MA 703: Statistical Analysis of Network Data
CAS MA 585: Time series
CAS MA 578: Bayesian Statistics
GRS MA 751 Statistical Learning
Other Resources for BU URBAN Trainees

The BU URBAN Program is committed to help trainees complete their graduate work and forge their career. Below are programs and resources that Boston University offers its students to succeed in graduate school and beyond.

**Stay current.** For the most up-to-date BU URBAN activities, the seminar schedule, and events of interest, please see our News and Events website. Trainee-authored news pieces, news about the accomplishments of our trainees and faculty, and reports of BU URBAN activities are also found in the news section of our program website (sites.bu.edu/URBAN). We also email a weekly URBAN UPDATE that includes information on upcoming program events, relevant webinars, interesting events on campus, and other useful information. Subscribe to our listserv at https://sites.bu.edu/urban/subscribe/.

Follow us on Social Media. Follow BU URBAN on Twitter @BU_URBAN and on Instagram @BU_URBAN. Feel free to tag our handle and #NSFNRT in your own Tweets so we can amplify your posts or send us information about something you are working on so we can tweet it for you. We also suggest adding @BU_URBAN to your twitter bio.

**Stay in Touch!** If you know of relevant upcoming events on campus or elsewhere, we want to know so we can share them with the community. If you have any newsworthy items (e.g. you won an award, published a paper, presented at a conference), please tell us so we can post it on our website! Please send all news to URBAN@bu.edu. BU URBAN Trainees also stay connected with our BU URBANites slack channel. New students will be invited to join by the Program Manager.

**Other BU Resources**

In addition to the professional development opportunities that the BU URBAN program offers, there are many other resources on campus:

- **ARROWS – Advance, Recruit, Retain, and Organize Women in STEM** ([https://www.bu.edu/arrows/](https://www.bu.edu/arrows/)) keeps a current list of funding sources and career resources for graduate students.
- **Broadening Experience in Scientific Training** ([http://www.bu.edu/best/](http://www.bu.edu/best/)) is a network of 17 academic organizations in the country selected by the National Institutes of Health that enhance career development for biomedical trainees. Boston University belongs to this network and offers several resources for Ph.D. students to explore careers both inside and outside standard academic research.
- **BU Career Center** ([http://www.bu.edu/careers/](http://www.bu.edu/careers/)) offers many career resources and professional development opportunities for STEM graduate students.
- **BU Professional Development and Postdoctoral Affairs** ([https://www.bu.edu/postdocs/professional-development/](https://www.bu.edu/postdocs/professional-development/)) A community for socializing, networking, and advocacy at Boston University.
- **Office of the Associate Provost for Graduate Affairs and Professional Development & Postdoctoral Affairs** ([https://www.bu.edu/grad/](https://www.bu.edu/grad/)) A central place to connect with information and resources for graduate students at Boston University. Find information here to tap into available resources and to connect with the graduate community at BU.

Boston University is home to numerous resources and organizations that can support you in other ways:

- **BU Sexual Assault Response & Prevention Center** ([www.bu.edu/cgsa/resources/sexual-assault-resources/](http://www.bu.edu/cgsa/resources/sexual-assault-resources/))
- **Center for Gender, Sexuality, and Activism (CGSA - [http://www.bu.edu/cgsa/](http://www.bu.edu/cgsa/))**
- **Graduate Women In Science and Engineering (GWISE - [https://www.bu.edu/gwise/](https://www.bu.edu/gwise/))**
- **Howard Thurman Center for Common Ground (HTC - [https://www.bu.edu/thurman/](https://www.bu.edu/thurman/))**
- **Out in STEM ([ostem - https://sites.bu.edu/ostem/](https://sites.bu.edu/ostem/))**
- **Underrepresented Graduate Students Organization (UGSO - [https://sites.google.com/view/buugso/](https://sites.google.com/view/buugso/))**

And many more: [https://www.bu.edu/grad/community/](https://www.bu.edu/grad/community/)