

2020 | 2021

SCHOLARSHIP REPORT CIVIL AND ENVIRONMENTAL ENGINEERING

THE EASTERN .
REGION .



**We are a leader
in experiential
education and
interdisciplinary
research, focused
on Engineering
for Society**

DEAR COLLEAGUES AND STUDENTS,

After the events of 2020, we begin the 2021-2022 Academic Year with renewed purpose and increased appreciation of the importance our profession has in building a more resilient and sustainable society. At Northeastern University, civil and environmental engineering education and research are focused on Urban Engineering: the interconnected topics of environmental health, civil infrastructure security, and sustainable resource engineering.

Our department is rapidly expanding to integrate computational and social sciences into our efforts to solve pressing problems related to the design and operation of the urban environment. This year, we are making crucial investments in forwarding this vision, including the hiring of new faculty and the launch of our Smart Cities Laboratory. This state-of-the-art facility will feature CEE faculty engaged in cyber-physical-social systems research. The lab will complement the recent launch of our new graduate concentration in Data and Systems, a program that allows civil and environmental engineering MS and PhD students to explore and gain expertise in these emerging interconnected themes.

We are pleased to welcome three new professors: Jack Lesko, who will serve as the Director of Engineering Research at the Roux Institute in Portland, Maine; Julia Varshavsky, an expert in environmental health jointly appointed with the Bouvé College of Health Sciences; and Fatemeh Ghoreishi, our first joint appointment with the Khoury College of Computer Sciences.

Our scholars are engineering a resilient and sustainable future through cutting-edge research, education, and national and international leadership. This annual scholarship report details the exceptional academic and professional accomplishments of our faculty and students for the 2020-2021 year. For more updates and highlights, please visit us at cee.northeastern.edu. We look forward to building a better world together.

**For the latest highlights, please visit us at
CEE.NORTHEASTERN.EDU.**



Sincerely,

Jerome F. Hajjar, PhD, P.E.
CDM Smith Professor and Department Chair
Civil and Environmental Engineering
jf.hajjar@northeastern.edu

QUICK FACTS CIVIL AND ENVIRONMENTAL ENGINEERING

45

**TENURED/
TENURE-TRACK**
Including
Affiliated Faculty

14

**Young
Investigator
Awards**

10

**National Science
Foundation
CAREER Awards**

11

**Professional
Society
Fellowships**

18

**Distinguished
Research and
Service Awards**

\$28M

**External Research
Awards
(2019-2021)**

41% of Total Students
are Women

7723 Alumni

Promotion
Aron Stubbins,
Full Professor



3 Federally Funded
Research Centers

PROTECT,
Puerto Rico Testsite
for Exploring
Contamination Threats,
funded by NIEHS

CRECE,
Center for Research
on Early Childhood
Exposure and
Development, funded
by EPA and NIEHS

ECHO, Environmental
Influences on Child
Health Outcomes,
funded by NIH

Notable Recognitions

CDM Smith Professor and Chair **Jerome Hajjar** received the 2021 Lifetime Achievement Award from the American Institute of Steel Construction

Professor **Peter Furth** received the 2020 Lifetime Achievement Award from the Association of Pedestrian & Bicycle Professionals

Assistant Professor **Michael Kane** received a 2021 National Science Foundation CAREER Award

Assistant Professor **Kelsey Pieper** was named a 2021 member of the Early-Career Research for New Human Health and Community Resilience track Fellowship from the National Academies of Sciences, Engineering, and Medicine's Gulf Research Program

QUICK FACTS COLLEGE OF ENGINEERING

With 200 tenured/tenure-track faculty and 17 multidisciplinary research centers and institutes with funding by eight federal agencies, the College of Engineering is a leader in experiential education and interdisciplinary research, with a focus on discovering solutions to global challenges to benefit society.

5 Engineering
Departments

104 YOUNG
INVESTIGATOR
Awards

Including 58 NSF CAREER Awards, and 18 DOD Young Investigator Awards

84 Professional
Society
Fellowships

949 Graduate Students
Placed on Co-op
(2020-2021)

TOTAL ENROLLMENT (Fall 2020)
7873 49.8% Graduate
50.2% Undergraduate

Enrollment Growth
(2015 to 2020)

52% MS

34% PhD

16% BS



New Academic Programs

BS in Chemical Engineering and Environmental Engineering

BS in Civil Engineering and Computer Science

New Data and Systems Concentration

To meet the evolving needs in the field, the Department of Civil and Environmental Engineering now offers a data and systems concentration for the MS in Civil Engineering and the PhD in Civil and Environmental Engineering programs.

Our world is being transformed by data. Artificial intelligence and machine learning have opened exciting new opportunities for researchers to learn from and leverage data, changing the way we measure and monitor our cities and the environment. Buildings, transportation networks, energy utilities, and water resource infrastructure are designed with increasingly comprehensive smart technology. The engineers of tomorrow will need interdisciplinary technical and analytical skills to build, maintain, and learn from these systems and the large quantities of data they produce.

The data and systems concentration is an interdisciplinary program that serves all civil and environmental engineering (CEE) disciplines by providing a solid foundation in modern programming languages, developing data analytics skills, promoting a systems perspective, and honing these skills in the context of data-driven CEE problem solving. This highly interdisciplinary concentration draws from course options across Northeastern engineering departments and colleges. This concentration is available as a series of interdisciplinary course requirements for MS in Civil Engineering students, and in the form of a specialized Qualifying Exam for participating PhD students.

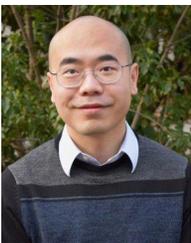
Smart Cities Laboratory



Auroop Ganguly,
professor, civil
and environmental
engineering



Michael Kane,
assistant professor,
civil and environmental
engineering



Ryan Wang, assistant
professor, civil
and environmental
engineering



Fatemeh Ghoreishi,
assistant professor,
civil and environmental
engineering, jointly
appointed in Khoury
College of Computer
Sciences

Located in the heart of Boston, the Smart Cities Laboratory is a new interdisciplinary coworking, research, and meeting space designed to advance the Department of Civil and Environmental Engineering's (CEE) vision for urban engineering and the future of our field. In order to meet the needs of a rapidly urbanizing society and a changing planet, the cities of the future will need to utilize emerging technologies to create resilient, sustainable, and highly livable urban spaces. The Smart Cities Lab envisions a unique facility in the nation to enable the interdisciplinary research necessary to couple disciplines within civil and environmental engineering with the advancing methods of artificial intelligence, machine learning, big data analytics, and computer sciences.

The Smart Cities Laboratory's inaugural cohort includes Professor **Auroop Ganguly**, an expert in infrastructure resilience and data sciences for climate change and civil engineering applications; Assistant Professor **Michael Kane**, who researches automation and human comfort in the built environment; Assistant Professor **Ryan Wang**, who studies geosocial networks in big cities and human movement perturbation under the influence of natural and manmade disasters; Professor **Ming Wang**, an expert in the areas of structural health monitoring, urban infrastructure sensing, and data processing; and Assistant Professor **Fatemeh Ghoreishi**, whose research focuses on using machine learning methods to improve decision making for large-scale problems, and is our department's first joint hire with the Khoury College of Computer Sciences. As the Smart Cities Lab grows, more faculty from both the CEE department and the College of Engineering's Department of Electrical and Computer Engineering will join the space.

The over 5,000 sq.ft. of space will feature a "living lab" for urban environmental temperature experimentation and control, 500 sq. ft. of support space for virtual reality/drone research, a 300 sq. ft. electronic fabrication and build space, graduate and post-doctoral associate seating, office space for research staff, professors and visiting academics, multiple conference and meeting rooms, and much more.

RECENT FACULTY HIRES



FATEMEH GHOREISHI
Assistant Professor, Civil and Environmental Engineering, jointly appointed in Khoury College of Computer Sciences

PhD, Texas A&M University, 2019
Scholarship focus: Design and decision-making under uncertainty, machine learning and data analysis, multidisciplinary design optimization, autonomous and cyber-physical systems



JULIA VARSHAVSKY
Assistant Professor, Civil and Environmental Engineering, jointly appointed in Bouve College of Health Sciences

PhD, University of California, Berkeley, 2017
Scholarship focus: Environmental exposures and maternal-child health outcomes and will continue to work on biomonitoring studies and advancing risk assessment in vulnerable communities



JULIA HOPKINS
Assistant Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 2017
Scholarship focus: Coastal morphodynamics, including effects of extreme weather events on sediment transport in the surf zone; wavecurrent interactions in the nearshore; developing and implementing field-verified numerical models to study coastal processes, informing coastal management with process-based research



YANG ZHANG
Professor and Distinguished Fellow, Civil and Environmental Engineering

PhD, University of Iowa, 1994
Scholarship focus: Atmospheric and environmental research at the interface of earth system sciences that crosses traditional disciplinary boundaries including energy, air, water, forest, ocean, soil, food, and health



JACK LESKO
Professor, Mechanical and Industrial Engineering, jointly appointed in Civil and Environmental Engineering, and Director for Engineering Research at the Roux Institute

PhD, Virginia Tech, 1994
Scholarship focus: Emerging interdisciplinary design involving lightweight polymeric multifunctional materials, structural design and reliability, with additional experience in distributed energy systems (storage, power transfer, packaging, and manufacturing), polymeric separation membranes, building energy efficiency design and construction, technology transfer

FACULTY BY RESEARCH AREAS

Civil Infrastructure Security

Joseph Ayers	Sinan Müftü
Dionisio P. Bernal	Andrew Myers
Luca Caracoglia	Mark Patterson
Qin Jim Chen	Mehrdad Sasaki
Stephen Flynn	Thomas Sheahan
Peter Furth	Craig Shillaber
Auroop R. Ganguly	Michael B. Silevitch
Fatemeh Ghoreishi	Ali Touran
Jerome F. Hajjar	Sara Wadia-Fascetti
Michael Kane	Ming L. Wang
Haris Koutsopoulos	Qi "Ryan" Wang
Jack Lesko	Mishac Yegian
Yiannis Levendis	

Environmental Health

Akram Alshwabkeh	Philip Larese-Casanova
R. Edward Beighley	Amy Mueller
Qin Jim Chen	Samuel Munoz
Matthew J. Eckelman	Annalisa Onnis-Hayden
Loretta A. Fernandez	Mark Patterson
Auroop R. Ganguly	Kelsey Pieper
Edgar D. Goluch	Thomas Sheahan
Tarik Gouhier	Aron Stubbins
Jonathan Grabowski	Geoffrey C. Trussell
Brian Helmuth	Julia Varshavsky
Julia Hopkins	Yang Zhang
Randall Hughes	

Sustainable Resource Engineering

Luca Caracoglia	Haris Koutsopoulos
Matthew J. Eckelman	Michelle Laboy
David Fannon	Mark Patterson
Peter Furth	Craig Shillaber
Auroop R. Ganguly	Jennie C. Stephens
Tarik Gouhier	Ali Touran
Jonathan Grabowski	Geoffrey C. Trussell
Jerome F. Hajjar	Ming L. Wang
Brian Helmuth	Qi "Ryan" Wang
Julia Hopkins	Yang Zhang
Randall Hughes	
Michael Kane	



Photo by Matthew MODOONO

Mark Patterson, professor, marine and environmental sciences, and civil and environmental engineering

Fulbright U.S. Scholar Award to Study Kelp Forests and Climate Change in Canadian Arctic

Mark Patterson, professor of marine and environmental sciences, and civil and environmental engineering, developed Fetch, the autonomous underwater robot, in 1998 to compile data about the ocean more efficiently than human divers. In the past two decades, Fetch has investigated krill populations in the Antarctic ocean and coral-killing sea sponges in reefs in the Caribbean.

Now, Fetch will travel to the Canadian Arctic to explore kelp forests, an ecosystem largely uncharted by marine biologists. Patterson recently received a Fulbright U.S. Scholar Award to facilitate this research, which will be conducted in partnership with Université Laval in Quebec City.

The primary goal of Patterson's research is to map the kelp forests. "First we need to know where they are," he says. "Then we can look at how climate change affects the beds. It could be that kelp forests actually expand and do better under this warming scenario in the Arctic."

Additionally, Patterson and his team will investigate whether changes to the kelp forests affect Canada's First Nations people, who rely on species that live in the kelp beds for food.

"There are a lot of fish and other species that use the kelp beds as a habitat," says Patterson. "The Arctic cod are a good example. The First Nations people rely a lot on cod for food."

Patterson also hopes to involve the local First Nations communities in the research. "I want to let the people interact with the robots," he says. "I think that's the fun part. Most people are interested in robots on some level."

Patterson, who will conduct this research during his sabbatical, is looking forward to living in Canada, where he has family roots. "As a Fulbright Scholar, I'll be representing the United States, but I'm a dual national, so it'll be nice to be in my other country," he says.



Michael Kane, assistant professor, civil and environmental engineering

NSF CAREER Award for a Smart and Energy Efficient Home Thermostat

In the Automation in the Built and Living Environment (ABLE) Lab at Northeastern, Assistant Professor **Michael Kane**, civil and environmental engineering, and his students look at how people and automation interact in man-made environments such as buildings and transportation. The ABLE Lab's latest project—of which he received a prestigious \$763K National Science Foundation CAREER Award, titled “Human-Centric Automation in the Built Environment”—is focused on improving the automation of the home thermostat to not only use less energy, but eventually to anticipate comfort needs.

“The ‘brains’ of thermostats as we know them today are simple rules that help your home hold a temperature,” says Kane. “People don’t really know how much energy they’re consuming until about a month later when their utility bill arrives, making it hard to know how to save energy. We want to shorten that feedback loop to real-time, and to use human-centric automation to make it something you don’t have to worry about.”

The science behind Kane’s work is to understand all the physiological and psychological factors that affect how people perceive their home’s temperature in that moment and change it to make them comfortable. This data could help build artificial intelligence (AI) that predicts how comfortable they are feeling—even before they know it themselves—and it helps them understand how to work with the AI to make their

energy consumption friendlier to an electric grid with variations in available renewable energy.

Kane and his team are partnering with Professor Misha Pavel from the Bouvé College of Health Sciences at Northeastern, an expert on health behavior and using smart technology, as well as ecobee, a company that creates smart thermostats and other home technologies.

“Human comfort is a very personal and subjective thing,” says Kane. “Sixty-five degrees Fahrenheit in March in Boston feels very different than 65 degrees in August in San Diego. In order to get accurate data, we can’t study thermal comfort only in a lab setting.”

With the funding from the NSF, Kane seeks to overcome this limitation by recruiting 100 homes across the U.S. for a pilot study. Over a period of several years, they will track their home heating and cooling data with ecobee thermostats. Real-time algorithms will monitor irregular changes in the environment or user behavior and prompt participants to take a second to answer a question with a swipe on their smart watch.

“With this info, we can probe into all of the physical and psychological factors that contribute to a person’s comfort,” says Kane. “The ultimate goal is to understand these personal internal processes using data from the large cohort of participants to homes comfortable to the people living there while using energy when the grid is clean and cheap, and holding off on heating and cooling for short periods when the grid is dirty and expensive.”

Kane is aiming to collect three years of data from this pilot study, which will then be combined with an existing data set from 100,000 ecobee users who have opted in to anonymously donate their temperature data to science. He hopes to start experimenting with different control algorithms within one to two years.



Sara Wadia-Fascetti, vice provost, PhD Network, and professor, civil and environmental engineering



Luca Caracoglia, associate professor, civil and environmental engineering

One Program, Two PhDs, Two Continents

Northeastern's new international doctorate program—the Global Experiential PhD—provides students with an opportunity to earn separate PhDs from two universities in two continents while dramatically expanding the breadth of their research.

Because students spend half of their time at each institution, they are exposed to two different research cultures and the expertise of faculty with different areas of specialization. The program is also intentionally flexible to enable interdisciplinary research, thereby allowing students to pursue research in different fields at each institution. They must apply to each program independently and fulfill all of the academic requirements of both programs. Under the supervision of a research supervisor from each institution, they write a single dissertation that earns them a separate PhD in each country.

The first two partners with the Northeastern program are Sapienza University of Rome and the University of Hong Kong. There are additional partnerships in the works.

“Northeastern is building a selective network of educational institutions around the globe,” says Vice Provost **Sara Wadia-Fascetti**, who is head of Northeastern's PhD Network and professor of civil and environmental engineering. “We are a global institution—a networked institution. This increases

mobility for our students and further extends our research outside Boston.”

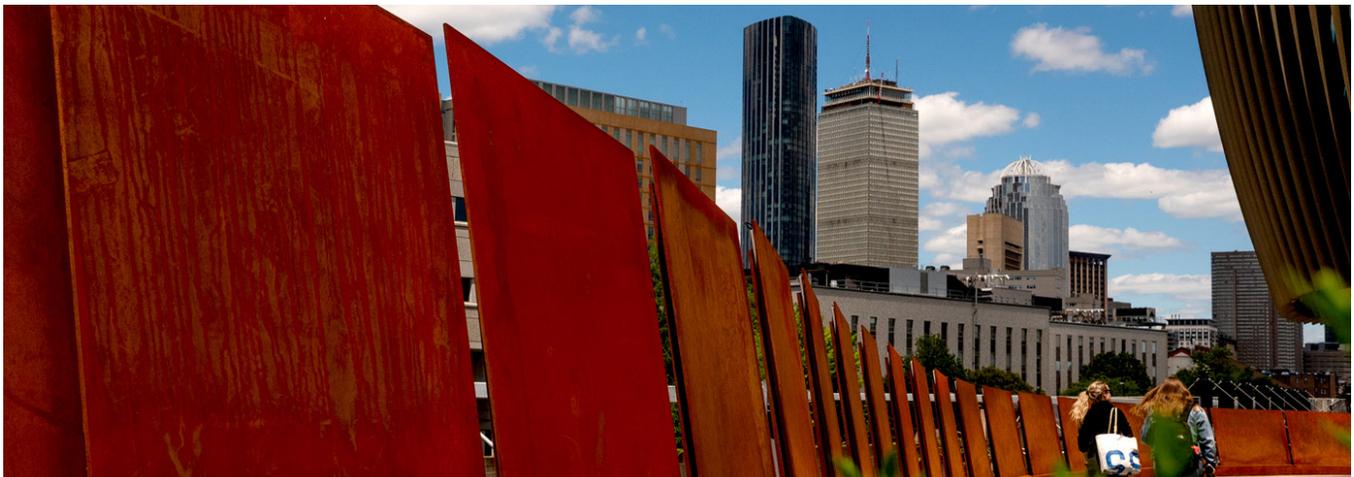
“This program is based on the concept of convergence, which is a key component of interdisciplinary research,” says Wadia-Fascetti. “It's important to maximize a student's exposure to many different concepts and cultural experiences that connect ideas to one another and translate disciplines to one another. This exposure influences both the scope and direction of their research.”

Students are not the only ones who benefit from these partnerships, says Associate Professor of Civil and Environmental Engineering **Luca Caracoglia**, who has a longstanding relationship with Sapienza University and helped spearhead the new partnership.

Caracoglia, who is an expert on wind engineering and wind load effects, recently hosted a workshop bringing together Northeastern and Sapienza faculty who focus in structural engineering and geotechnical/geo-environmental engineering and who are currently advising civil engineering PhD students.

“For faculty, it's a way to bring new perspectives to our research ideas and collaborate with experts in Italy through our students,” Caracoglia says.

The program also provides benefits to the university as a whole. It is a way to attract the best students from universities around the world while enhancing Northeastern's international visibility and connectedness.





Pioneering a Human-Centric Artificial Intelligence Research and Applications Hub

Northeastern University has allocated \$50 million to the new Institute for Experiential AI, a pioneering research hub that places human skills and intelligence at the forefront of artificial intelligence applications. Leading experts in computer science, engineering, ethics, humanities, law, public policy, health, security, and sustainability will collaborate to develop applied human-centric AI solutions that tackle the world's toughest challenges.

The Institute for Experiential AI is university-wide, based out of the Roux Institute at Northeastern—a graduate education and research campus in Portland, Maine, born from a \$100 million investment in the university by David and Barbara Roux. Designed to educate generations of talent in the digital and life sciences sectors, the Roux Institute also acts as a driving force for sustained economic growth in Portland, the state of Maine, and northern New England.

“Northeastern has committed to building the top research institute in the world focused on Experiential AI,” says founding Executive Director **Usama Fayyad**. “No one has claimed this space yet and I’m excited for our chance to lead this field.”

To accelerate research and advance practical applications of AI in several domains, the Institute for Experiential AI is recruiting 30 new research and teaching faculty, data scientists, and postdoctoral fellows. In addition, faculty from colleges within the university such as the College of Engineering and Khoury College of Computer Sciences will conduct and collaborate on multidisciplinary research as part of the institute.

The Institute for Experiential AI will partner with industry, government, and academia to educate the next generation of AI professionals and lead efforts to create ethical and responsible human-centric AI. The institute also plans to be a prominent contributor to the global AI ecosystem and a key driver of experiential AI in New England through targeted activities in the region.

Faculty Highlights



Jerome Hajjar, CDM Smith Professor and Chair of the Department of Civil and Environmental Engineering, has been honored with the **American Institute of Steel Construction 2021 Lifetime Achievement Award** for his impact on AISC

and the structural industry as a whole. The award bestows a special recognition to individuals who have provided outstanding leadership over a sustained period of years to AISC and the structural steel design, construction, and academic community. Hajjar has made significant contributions to the development of innovative steel and composite steel/concrete structures through experimental testing, computational simulation, and the development of design concepts and criteria. He has developed new resilient and sustainable structural systems, strength and stability design provisions for steel and composite structures, and nonlinear analysis formulations for structural stability and performance-based seismic design of steel and composite structures.



Professor **Peter Furth**, civil and environmental engineering, was awarded the **2020 Lifetime Achievement Award by the Association of Pedestrian & Bicycle Professionals (APBP)**. The award was conferred for Furth's "enthusiasm as an educator, advocate, and researcher who elevated the discourse for better bicycling and walking while empowering professionals with proven research." Furth is a leading voice in the effort to improve transportation systems in the U.S. and make cities more friendly towards bicycles and pedestrians. His pioneering work developing the Bicycle Level of Traffic Stress was a main driver behind his being honored with the award. The award stated that Furth's development of the Bicycle Level of Traffic Stress tool gave practitioners a new approach to assess community bicycling conditions.



Assistant Professor **Kelsey Pieper**, civil and environmental engineering, was named an inaugural member of the **Early-Career Research for New Human Health and Community Resilience track Fellowship by the National Academies of Sciences, Engineering, and Medicine's Gulf Research Program**. She is one of seven fellows selected for this honor. Fellows in this cohort will conduct research that advances health equity and explores social detriments to health in the U.S. Gulf Coast states and Alaska.



A research paper, titled, "Plastics in the Earth System" by Professor **Aron Stubbins**, marine and environmental sciences (MES), chemistry and chemical biology (CCB), College of Science, and civil and environmental engineering (CEE), and Assistant Professor **Samuel E. Muñoz**, MES/CEE, was published in the journal **Science**. The research covers plastics in the air and water, and their growing importance to geochemists given their abundance and ubiquity in our environment.

Abstract: Plastic contamination of the environment is a global problem whose magnitude justifies the consideration of plastics as emergent geomaterials with chemistries not previously seen in Earth's history. At the elemental level, plastics are predominantly carbon. The comparison of plastic stocks and fluxes to those of carbon reveals that the quantities of plastics present in some ecosystems rival the quantity of natural organic carbon and suggests that geochemists should now consider plastics in their analyses. Acknowledging plastics as geomaterials and adopting geochemical insights and methods can expedite our understanding of plastics in the Earth system. Plastics also can be used as global-scale tracers to advance Earth system science. *Science*, 02 Jul 2021: Vol. 373, Issue 6550, pp. 51-55, DOI: 10.1126/science.abb0354



Assistant Professor **Samuel Muñoz** (PI), marine and environmental sciences (MES), jointly appointed in civil and environmental engineering (CEE), and CEE/MES Professor **Qin Jim Chen** (co-PI), in collaboration with Woods Hole Oceanographic Institution, were awarded a **\$590K National Science Foundation grant** for "Morphodynamic Simulations of Coastal Storms and Overwash to Characterize Back-Barrier Lake Stratigraphies." The research will help understand the behavior of severe storms in a variety of historic climate conditions, and thus aid in predicting the effects of climate change on future hurricane frequency, intensity, and behavior.

Faculty Highlights



Associate Professor **Luca Caracoglia**, civil and environmental engineering, was selected as a **Fellow of the American Society of Civil Engineers** for his contributions in research,

education, and outreach in the areas of structural engineering, structural dynamics, probabilistic mechanics, wind engineering and wind energy.

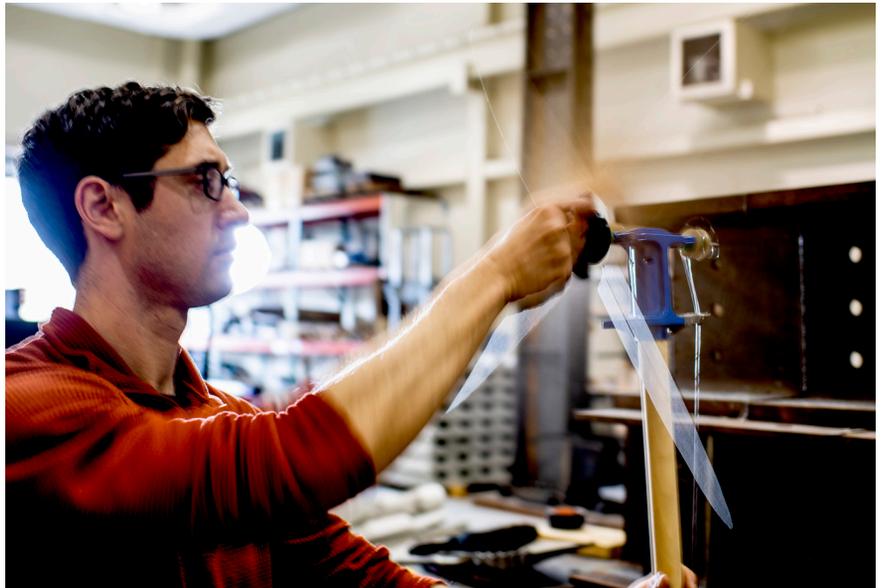


Professor **Yang Zhang**, civil and environmental engineering, published a **training book commissioned by the World Meteorological Organization (WMO)** on best practices

for air quality monitoring and forecasting. It represents knowledge from the world's leading atmospheric scientists in a concerted effort to strengthen society's tools for understanding the complex and at times enigmatic science of our atmosphere. The 576-page training manual, titled "Training Materials and Best Practices for Chemical Weather/Air Quality Forecasting," encompasses the combined efforts of 49 coauthors from 15 countries, 35 case providers from 15 countries, and additional 15 reviewers from WMO and other countries.



Assistant Professor **Julia Hopkins**, civil and environmental engineering, was named the lead scientist on a **National Science Foundation Small Business Innovation Research grant** for research and development of a nearshore solution for coastal flooding. She is developing a wave mitigation system originally conceived for the Massachusetts Bay area referred to as "Emerald Tutu," which is an interconnected system of floating wetland and walkways that hug the shoreline in half-ring formations.



Associate Professor **Andrew Myers** was a winner of the **2020 Cleantech Open Northeast startup accelerator program**, which featured 47 startups focused on various aspects of sustainability, including green tech, agriculture, clean energy, and more. Myers' startup, T-Omega Wind, features an **innovative floating wind turbine** based around technology and research developed and patented at Northeastern along with co-founder Jim Papadopoulos. The most common design for offshore wind turbines is a large structure affixed to the sea bed. This presents a variety of obstacles for rapid and large-scale realization of U.S. and global wind potential and is limited to relatively shallow water depths. Given that there is enough wind power off the U.S. eastern seaboard to power the entire country, Myers reimagined wind turbine floats to be purposefully redesigned for ocean use. His startup's solution is a reimagined floating wind turbine that is lightweight but strong and easy to move because of its shallow draft. It is also low-cost and can be manufactured and launched in shallow ports using capabilities and infrastructure presently available in Massachusetts and the U.S. It's designed intentionally to be buildable with only modest marine fabrication capabilities that exist in abundance all over the world. This is essential to scaling the technology, so turbines can be built quickly and in huge volumes to decarbonize significant portions of the global energy sector.



Assistant Professor **Qi "Ryan" Wang**, civil and environmental engineering, and **Arman Akhman**, PhD'22, interdisciplinary engineering, published a paper in the journal **Nature Human Behavior**, titled "Banks, Alternative Institutions and Spatial-Temporal Ecology of Temporal Ecology of Racial Inequality in U.S. Cities." The research shows that the race of a community was a stronger predictor than income of proximity to a traditional banking institution.



Learn more about our accomplished faculty

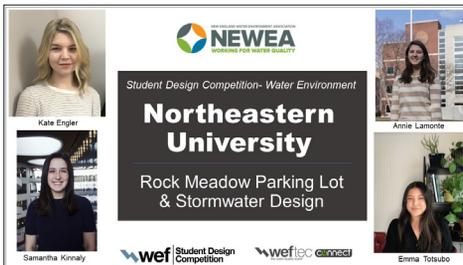
Student Highlights



Michael Eck, PhD'24, civil and environmental engineering, was awarded a **National Science Foundation Graduate Research Fellowship**.

The prestigious NSF GRFP will support his ongoing research with Assistant Professor Amy Mueller on miniature 3D-printed

nutrient sensor arrays for marine environments.



A civil and environmental engineering **2020 capstone team placed second in the International Water Environment Federation Student Design Competition in the Environment Competition** for their project: Rock Meadow Parking Lot and Stormwater Design. There were 28 participating schools, representing 22 member associations and five countries.

Bayley St. Jacques, E'21, and **Julia Szabla**, E'21, civil engineering, were each awarded a **2020 Education Foundation Scholarship by the American Institute of Steel Construction (AISC)**. The fund is part of a program dedicated to support 37 college juniors, seniors, and master's-level graduate students studying civil engineering, architectural engineering, construction engineering, construction management, and architecture at schools in the United States.



The Structural Engineering Institute selected the **Northeastern Graduate Structural Engineering Association for the 2021 SEI Graduate Student Chapter of the Year Award** for their commitment to structural engineering through their innovation and creativity in providing unique events that engage members and promote the structural engineering profession.



Venkata Shashank Konduri, PhD'21, interdisciplinary engineering, took classes from various departments like civil engineering, marine science, policy, electrical engineering, and others. His research consisted of elements from AI, machine learning, data science, computing, remote sensing, ecology, and hydrology. Advised by Professor **Auroop Ganguly**, civil and environmental engineering, Konduri worked at **Oak Ridge National Laboratory** since 2018, examining the spatial distribution of plant communities in Alaska and their environmental drivers. After graduation, he **joined NASA's Goddard Space Flight Center** as a research associate surveying savannah ecosystems using spaceborne Lidar imagery.



Louiza Wise, E'21, environmental engineering, won a **2021 Compass Award**, which recognizes exemplary students from the senior class who, during their time on campus, have demonstrated a true dedication to a core set of values: leadership, volunteerism, academic integrity, and commitment to Northeastern.



Max Rome, PhD'21, civil engineering, recently led a team of four who were awarded a grant from the inaugural **Sasaki Foundation Design Awards**. Their entry of "Charles River Floating Wetlands" was one of five winners chosen from proposals submitted by teams from seven countries. The competition focuses on creating innovative solutions to environmental, economic, and social challenges facing greater Boston. His team's proposal will create a visually impactful floating wetland on the Charles River designed to reduce harmful algal blooms.



Cassie Nickles, PhD'21

CIVIL ENGINEERING

Advised by Edward Beighley, Professor of Civil and Environmental Engineering

Originally from Los Angeles, Cassie Nickles began her PhD journey with Northeastern's Department of Civil and Environmental Engineering in 2017 after graduating from Loyola Marymount University with her bachelor's in civil engineering. The same year, she received the Cochrane Fellowship, and in 2019 was awarded the prestigious National Science Foundation Graduate Research Fellowship. In her time working under the guidance of Professor Edward Beighley, Nickles' research focused on large-scale river networks and hydrologic applications enabled by NASA's upcoming Surface Water and Ocean Topography (SWOT) mission. Her dissertation specifically found that, while SWOT observations are irregular in space and time, derived discharges can be used to estimate river discharge frequency distributions, calibrate hydrologic models, and inform regional hydrology. In the four years of her PhD, she published four articles in top journals: *Remote Sensing*, *Water Resources Research*, and *Geophysical Research Letters*. She also presented her findings at ten conferences, nationally and internationally. From connections made at these conferences, she had the opportunity to intern at NASA's Jet Propulsion Laboratory in the summer of 2020. In addition to academic success, Nickles served as both a member and then president of the Civil and Environmental Engineering Department Graduate Student Council, facilitating and cultivating community between students, faculty, and the department with social events, orientations, and town hall meetings. In her future endeavors, Nickles seeks to continue combining her passions for service and intellectual stimulation, benefiting society through hydrologic and remote sensing applications.



With over 195 tenured/tenure-track faculty, 17 multidisciplinary research centers and institutes, and funding by eight federal agencies, the College of Engineering is a leader in experiential education and interdisciplinary research, with a focus on discovering solutions to global challenges to benefit society.

Northeastern University

Founded in 1898, Northeastern is a global research university and the recognized leader in experience-powered lifelong learning. Our world-renowned experiential approach empowers our students, faculty, alumni, and partners to create impact far beyond the confines of discipline, degree, and campus.

Our locations—in Boston; the Massachusetts communities of Burlington and Nahant; Charlotte, North Carolina; London; Portland, Maine; San Francisco; Seattle; Silicon Valley; Toronto; and Vancouver—are nodes in our growing global university system. Through this network, we expand opportunities for flexible, student-centered learning and collaborative, solutions-focused research.

Northeastern's comprehensive array of undergraduate and graduate programs—in on-campus, online, and hybrid formats—lead to degrees through the doctorate in nine colleges and schools. Among these, we offer more than 140 multidisciplinary majors and degrees designed to prepare students for purposeful lives and careers.

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

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coe.northeastern.edu

COVER IMAGE

Andrew Myers, associate professor and associate chair for graduate studies, civil and environmental engineering, received a grant as part of the Massachusetts Clean Energy Center's (MassCEC) Catalyst and InnovateMass programs, which will support the development of an innovative floating wind turbine.

