



Northeastern University
College of Engineering

Engineering for Society

Boldly innovating to better our world

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2016 | 2017

SCHOLARSHIP REPORT

Civil and Environmental Engineering



**WE ARE A LEADER
IN EXPERIENTIAL
EDUCATION AND
INTERDISCIPLINARY
RESEARCH, FOCUSED
ON ENGINEERING
FOR SOCIETY**

Dear Friends,

This fourth annual scholarship report reflects the exceptional academic and professional accomplishments of the civil and environmental engineering faculty and PhD candidates for the 2016-2017 year. Our department has more than doubled in size of the faculty over the last seven years, with 46 faculty in civil and environmental engineering, and has more than doubled in size of the graduate program over the last seven years, with over 230 graduate students. Building out the research infrastructure of the university, this past spring the university opened the new 220,000 square foot Interdisciplinary Science and Engineering Complex that provides state-of-the art laboratories in engineering and science.

This year the department launches a new BS in Environmental Engineering, with plans for it to be ABET accredited for our first graduates. This degree program reflects our significant growth and expansion of scope in environmental engineering and water resources engineering and includes several new courses. Last year we also launched two new graduate degrees, including an MS in Environmental Engineering (MSEnE) and an MS in Engineering and Public Policy (MSEPP) with two concentrations, including Energy and Environment, and Infrastructure Resilience. These degrees focus on topics of significant national need, with the MSEnE integrating environmental engineering and science with public health, water sustainability, and water-energy-nexus, and the MSEPP degree providing students with the core skills needed to address engineering solutions while recognizing the impact of public policy and societal constraints on these solutions.

The department continues to expand its research presence across all fields, and is currently leading the PROTECT Center, funded by the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health, and the CRECE Center, funded by NIEHS and the Environmental Protection Agency, to study the relationship between environmental contamination and preterm birth.

Our scholars strive to use today's discovery and research to make tomorrow happen. You can see some highlights of our civil and environmental engineering faculty members at northeastern.edu/tomorrow. We hope you enjoy this report, and we look forward to sharing our future accomplishments in our annual scholarship reports.

Sincerely,

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



QUICK FACTS — Civil and Environmental Engineering

3
FEDERALLY
FUNDED
RESEARCH
CENTERS

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

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

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

8
NATIONAL SCIENCE
FOUNDATION CAREER
Awards

2016 WINNER:

Andrew Myers for “Advancing Multi-hazard Assessment and Risk-based Design for Offshore Wind Energy Technology”

46
TENURED/
TENURE-TRACK
Including
Affiliated Faculty

RECENT HIRES:

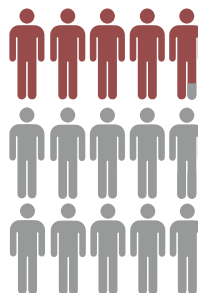
Michael Kane
PhD, University of Michigan

Samuel Muñoz
PhD, University of Wisconsin-Madison

Aron Stubbins
PhD, Newcastle University

166
masters students

33% female



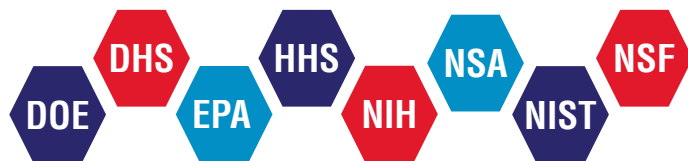
70
doctoral students

46% female



QUICK FACTS — College of Engineering

13 MULTI-INSTITUTIONAL RESEARCH CENTERS
funding by eight federal agencies



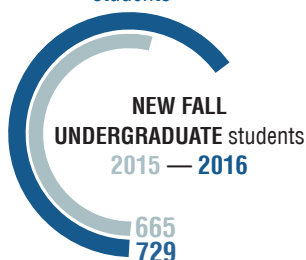
173
TENURED/
TENURE-TRACK
Faculty

40
NSF CAREER
Awards

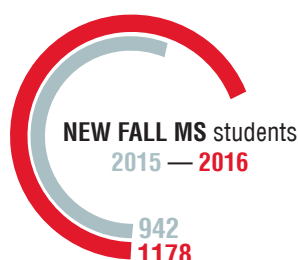
5 ENGINEERING
DEPARTMENTS

Bioengineering
Chemical Engineering
Civil and Environmental Engineering
Electrical and Computer Engineering
Mechanical and Industrial Engineering

3566
UNDERGRADUATE
students



3177
GRADUATE
students



77
YOUNG
INVESTIGATOR
Awards

FACULTY HONORS AND AWARDS



Professor **Peter Furth** received an Innovation in Education Award from the Institute of Transportation Engineers' Transportation Education Council in recognition of his highly regarded

Dialogue of Civilizations course, which other transportation engineering educators around the country have learned about, envied, and in some cases, emulated.



Professor **Mark Patterson**, Assistant Professor **Loretta Fernandez**, and Affiliated Professor **Brian Helmuth** were awarded a \$300K National Science Foundation grant for "Tide Gate Modulation

of Wetland Function: Decision Support through Engineering Best Practices" to develop best practices for the operation of tide gates, which serve as valves designed to protect life and property but often negatively affect wetlands.

Associate Professor **Edward Beighley** received a \$651K grant from NASA for research supporting the Surface Water and Ocean Topography Satellite Mission. SWOT will make the first global survey of Earth's surface water, providing understanding of how water bodies change over time.

College of Engineering Distinguished Professor **Ming Wang**, PhD graduate **Nicole Martino**, **Ken Maser** of the VOTERS research center, and former research faculty member Ralf Birken won the 2017 Outstanding Paper in Research Award from the American Society for Nondestructive Testing for an article published in the May 2016 issue of Research in Nondestructive Evaluation. The article, titled "Quantifying Bridge Deck Corrosion using Ground Penetrating Radar," highlights some of the key work produced in the VOTERS center related to automated detection of damage in roadways and bridge decks using sensors mounted on vehicles driving through traffic.



Professor **April Gu** has been elected to the Association of Environmental Engineering and Science Professors (AEESP) Board of Directors. The AEESP is made up of professors in academic

programs throughout the world who provide education in the sciences and technologies of environmental protection. Gu has also been selected as a Water Environment Federation (WEF) Fellow for her professional achievement, stature and contributions to the preservation and enhancement of the global water environment.

Professor **Auroop Ganguly** was awarded a grant from NASA, through its contractor Bay Area Environmental Research Institute (BAERI). This represents the latest in a series of grants awarded to Ganguly's Sustainability and Data Sciences Laboratory, and will contribute to developing machine-learning approaches for the earth sciences to improve satellite and earth systems data through advances in estimation, forecasting, and modeling of the earth and its climate.



Professor **Ali Touran** was awarded a \$235K grant from the Construction Industry Institute for research on the application of integrated project delivery for industrial projects. Northeastern

University and Iowa State University, along with representatives from 17 major North American companies, are collaborating on the project.

Northeastern is taking part in a \$157M NIH study called Environmental Influences on Child Health Outcomes (ECHO). The NIH awarded \$157 million in its fiscal year 2016 to launch the seven-year initiative. Top research institutions will examine the effects of a variety of environmental factors—from air pollution and chemicals to stress and diet—on the health of children and adolescents. Taking part in the study are the Puerto Rico Testsite for Exploring Contamination Threats (PROTECT) Center and the Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE), which are multi-institutional research centers led by **Akram Alshawabkeh**, George E. Snell

Professor of Engineering and Associate Dean for Research at Northeastern's College of Engineering.



Professor **Haris Koutsopoulos**, in collaboration with MIT's Transit Group, has received funding from international partner, Mass Transit Railway (Hong Kong), to study innovations

in public transportation. This research seeks to improve the way the MTR system operates at near capacity and investigates ways of addressing capacity constraints more effectively, mitigating the impacts of these constraints for commuters and the MTR itself.

Northeastern University has been designated by the U.S. Department of Transportation as a Beyond Traffic Innovation Center (BTIC); one of 18 "forward thinking and influential institutions" to lead research aimed at solving some of the nation's pressing transportation challenges over the next three decades. BTIC will be led by Professors **Sara Wadia-Fascetti**, **Haris Koutsopoulos**, and **Matthias Ruth**.

Associate Professor **Mehrdad Sasani** won the 2016 Clemens Herschel Award from the Boston Society of Civil Engineers Section of the American Society of Civil Engineers in recognition of their paper "Analytical and Experimental Evaluation of Progressive Collapse Resistance of a Flat-Slab Posttensioned Parking Garage."

STUDENTS

PhD student **Maria Sevillano** won the "Best Student Presentation" award at the Association of Science Engineering & Science Professors (AEESP) research and education conference in Michigan for her presentation, titled "Incidence of Antimicrobial Resistance Genes in Municipal Drinking Water Samples from the United Kingdom." Sevillano was one of four winners chosen from more than 200 student presenters.

PhD student **Babak Jalalzadeh Fard** won first place at the American Geophysical Union's 2017 spring Virtual Poster Showcase for his research poster, titled "Effective Mitigation and Adaptation Strategies for Public Health Impacts of Heatwaves for Brookline, Mass."

FACULTY BY RESEARCH THRUSTS



CIVIL INFRASTRUCTURE SECURITY

George Adams
Joseph Ayers
Dionisio Bernal
Luca Caracoglia
Steven Cranford
Daniel Dulaski
Stephen Flynn
Peter Furth
Auroop Ganguly
Jerome Hajjar
Michael Kane
Haris Koutsopoulos
Sinan Müftü
Andrew Myers
Mark Patterson
Mehrdad Sasani
Thomas Sheahan
Craig Shillaber
Michael B. Silevitch
Ali Touran
Sara Wadia-Fascetti
Ming Wang
Qi Ryan Wang
Mishac Yegian



ENVIRONMENTAL HEALTH

Akram Alshawabkeh
Edward Beighley
Matthew Eckelman
Loretta Fernandez
Auroop Ganguly
Edgar Goluch
Tarik Gouhier
Jonathan Grabowski
April Gu
Ferdinand Hellweger
Brian Helmuth
A. Randall Hughes
Philip Larese-Casanova
Amy Mueller
Samuel Muñoz
Annalisa Onnis-Hayden
Mark Patterson
Ameet Pinto
Matthias Ruth
Thomas Sheahan
Aron Stubbins
Geoffrey Trussell
Kai-Tak Wan



SUSTAINABLE RESOURCE ENGINEERING

Luca Caracoglia
Daniel Dulaski
Matthew Eckelman
David Fannon
Peter Furth
Auroop Ganguly
Tarik Gouhier
Jonathan Grabowski
Jerome Hajjar
Brian Helmuth
A. Randall Hughes
Michael Kane
Haris Koutsopoulos
Michelle Laboy
Mark Patterson
Matthias Ruth
Craig Shillaber
Jennie C. Stephens
Ali Touran
Geoffrey Trussell
Ming Wang
Qi Ryan Wang

GEORGE ADAMS



COE Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty, Civil and Environmental Engineering, Electrical and Computer Engineering

PhD, University of California at Berkeley, 1975
mie.neu.edu/people/adams-george

Scholarship focus: contact mechanics including adhesion, friction, and plasticity; modeling and analysis of MEMS; modeling and analysis in nanomechanics

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, Society of Tribologists and Lubrication Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

F. Oweiss, G.G. Adams

Adhesion of an Axisymmetric Elastic Body: Ranges of Validity of Monomial Approximations and a Transition Model, *Tribology International*, 100, 2016, 287-292

G. Stan, G.G. Adams

Adhesive Contact Between a Rigid Spherical Indenter and an Elastic Multi-Layer Coated Substrate, *International Journal of Solids and Structures*, 87, 2016, 1-10

Hu, G.G. Adams

Adhesion of a Micro-/Nano- Beam/Plate to a Sinusoidal/Grooved Surface, *International Journal of Solids and Structures*, 99, 2016, 40-47

G.G. Adams

Frictional Slip of a Rigid Punch on an Elastic Half-Plane, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, A 472, 2016, 20160352

G.G. Adams

Critical Value of the Generalized Stress Intensity Factor for a Crack Perpendicular to an Interface, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 471, 2015, 20150571

S. Berger, N.E. McGruer, G.G. Adams

Simulation of Dielectrophoretic Assembly of Carbon Nanotubes Using 3D Finite Element Analysis, *Nanotechnology*, 26, 2015, 155602

G.G. Adams

Adhesion and Pull-off Force of an Elastic Indenter from an Elastic Half-Space, *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 470, 2014, 20140317

G.G. Adams

Stick, Partial Slip and Sliding in the Plane Strain Micro Contact of Two Elastic Bodies, *Royal Society Open Science*, 1, 2014, 140363

AKRAM ALSHAWABKEH



George A. Snell Professor of Engineering, Civil and Environmental Engineering; Associate Dean for Research; Director, PROTECT Superfund Research Center; affiliated faculty, Bioengineering

PhD, Louisiana State University, 1994
civ.neu.edu/people/alshawabkeh-akram

Scholarship focus: geoenvironmental engineering, soil and groundwater remediation; electrokinetic and electrochemical processes; contaminant fate and transport; environmental restoration

Honors and awards: Fellow, American Society of Civil Engineers; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

L. Rajic, R. Nazari, N. Fallahpour, A.N. Alshawabkeh

Electrochemical Degradation of Trichloroethylene in Aqueous Solution by Bipolar Graphite Electrodes, *Journal of Environmental Chemical Engineering*, 4(1), 2016, 197-202

N. Fallahpour, S. Yuan, L. Rajic, A.N. Alshawabkeh

Hydrodechlorination of TCE in a Circulated Electrolytic Column at High Flow Rate, *Chemosphere*, 144, 2016, 59-64

N. Yang, J. Cui, L. Zhang, W. Xiao, A.N. Alshawabkeh, X. Mao

Iron Electrolysis-Assisted Peroxymonosulfate Chemical Oxidation for the Remediation of Chlorophenol-contaminated Groundwater, *Journal of Chemical Technology and Biotechnology*, 91(4), 2016, 938-947

X. Yu, R. Ghasemizadeh, I.Y. Padilla, D. Kaeli, A.N. Alshawabkeh

Patterns of Temporal Scaling of Groundwater Level Fluctuation, *Journal of Hydrology*, 536, 2016, 485-495

A.M. Aker, D.J. Watkins, L.E. Johns, K.K. Ferguson, O.P. Soldin,

L.V. Anzalota Del Toro, A.N. Alshawabkeh, J.F. Cordero, J.D. Meeke
Phenols and Parabens in Relation to Reproductive and Thyroid Hormones in Pregnant Women, *Environmental Research*, 151, 2016, 30-37

SELECTED RESEARCH PROJECTS

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth

Principal Investigator, National Institutes of Health

The Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE) studies how mixtures of environmental exposures and other factors affect the health and development of infants and children living in Puerto Rico

Director and Principal Investigator, National Institutes of Health/ Environmental Protection Agency

Induced Partial Saturation (IPS) Through Transport and Reactivity for Liquefaction Mitigation

Co-Principal Investigator, National Science Foundation

JOSEPH AYERS



Professor, Marine and Environmental Sciences; affiliated faculty: Bioengineering, Civil and Environmental Engineering, Electrical and Computer Engineering

PhD, University of California, Santa Cruz, 1975
bioe.neu.edu/people/ayers-joseph

Scholarship focus: development of underwater robots for civil infrastructure and explosive sensing; neurophysiology and behavior biomimetics

SELECTED PUBLICATIONS

L.L. McGrath, S.V. Vollmer, S.T. Kaluziak, J. Ayers
De Novo Transcriptome Assembly for the Lobster *Homarus americanus* and Characterization of Differential Gene Expression Across Nervous System Tissues, *BMC Genomics*, 17, 2016, 3-12

J. Ayers
Underwater Vehicles Based on Biological Intelligence, *ASME Journal of Dynamic Systems, Measurement and Control*, 138, 2016, 1-5

L. Zhu, A.I. Selverston, J. Ayers
The Role of Ih in Differentiating the Dynamics of the Gastric Mill and Pyloric Neurons in the Stomatogastric Ganglion of the Lobster, *Homarus americanus*, *Journal of Neurophysiology*, 115(5), 2016, 2434-45

J. Lu, J. Yang, Y.-B. Kim, J. Ayers, K.K. Kim
Implementation of Excitatory CMOS Neuron Oscillator for Robot Motion Control Unit, *Journal of Semiconductor Technology and Science*, 14(4), 2014, 383-390

L. Lewis, J. Ayers
Temperature Preference and Acclimation in the Jonah Crab, *Cancer Borealis*, *Journal of Experimental Marine Biology and Ecology*, 455, 2014, 7-13

J. Ayers, D. Blustein, A. Westphal
A Conserved Biomimetic Control Architecture for Walking, Swimming and Flying Robots, *Lecture Notes in Artificial Intelligence*, 2012, 1-12

SELECTED RESEARCH PROJECTS

Biomimetics of Jellyfish Tentacles
Principal Investigator, Schlumberger Doll, Inc

RoboBees: A Convergence of Body, Brain and Colony
Principal Investigator, National Science Foundation

Modernization and Enhancement of the Seawater System and Research Infrastructure at Northeastern University's Marine Science Center

Co-Principal Investigator, National Science Foundation

Utilizing Synthetic Biology to Create Programmable Micro-Bio-Robots

Co-Principal Investigator, Office of Naval Research

R. EDWARD BEIGHLEY



Associate Professor and Associate Chair for Undergraduate Studies, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences

PhD, University of Maryland, 2001
civ.neu.edu/people/beighley-edward

Scholarship focus: hydrologic and hydraulic modeling; remote sensing of the hydrologic cycle; hydrologic impacts of climate and/or land use change; flood hazard and risk assessment

Honors and awards: College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

F. Hossain, E. Beighley, S. Burian, J. Chen, A. Mitra, D. Niyogi, R.A. Pielke, D. Wegner

A Review of Approaches and Recommendations for Improving Resilience of Water Management Infrastructure: The Case for Large Dams, *ASCE Journal of Infrastructure Systems*, 23(4), 2017, 02517001

A.R. Hughes, F.R. Schenck, J. Bloomberg, T.C. Hanley, T.C. Gouhier, R.E. Beighley, D.L. Kimbro, D. Feng
Biogeographic Gradients in Ecosystem Processes of the Invasive Ecosystem Engineer *Phragmites Australis*, *Biological Invasions*, 18(9), 2016, 2577-2595

Y. Yoon, P.A. Garambois, R.C.D. Paiva, M. Durand, H. Roux, R.E. Beighley

Improved Error Estimates of a Discharge Algorithm for Remotely Sensed River Measurements: Test Cases on Sacramento and Garonne Rivers, *Water Resources Research*, 52, 2016, 278-294

D. Alsdorf, R.E. Beighley, A. Laraque, H. Lee, R. Tshimanga, F. O'Loughlin, G. Mahe, B. Dinga, G. Moukandi, R. Spencer
Opportunities for Hydrologic Research in the Congo Basin, *Reviews of Geophysics*, 2016

M. Sorribas, R.C.D. Paiva, J. Melack, C. Jones, L. Carvalho, J.M. Bravo, R.E. Beighley, B. Forsberg, M.H. Costa
Projections of Climate Change Effects on Discharge and Inundation in the Amazon River Basin, *Climatic Change*, 136(3-4), 2016, 555-570

SELECTED RESEARCH PROJECTS

Decomposing the Water Storage Signal from Basins in Varied Climate Settings with Remote Sensing and Modeling
Principal Investigator, National Aeronautics and Space Administration

Integrating Lateral Contributions and Longitudinal Controls Along River Reaches to Improve SWOT Discharge Estimates
Principal Investigator, National Aeronautics and Space Administration, SWOT Science Team

Integration of SWOT Measurements into Global Hydrologic Models

Co-Principal Investigator, National Aeronautics and Space Administration, SWOT Science Team

DIONISIO BERNAL



Professor, Civil and Environmental Engineering

PhD, University of Tennessee, 1979
civ.neu.edu/people/bernal-dionisio

Scholarship focus: system identification, fault detection and fault localization, earthquake engineering, soil structure interaction, structural stability

Honors and awards: Moisseiff Award, American Society of Civil Engineers

SELECTED PUBLICATIONS

- D. Bernal
 Analytical Minimization of Synchronicity Errors in Stochastic Identification, *Mechanical Systems and Signal Processing*, 98, 2017, 415-424
- Y. Zhang, D. Bernal
 Damage Localization from Projection of Free Vibration Signals, *Journal of Sound and Vibration*, 394, 2017, 146-154
- D. Bernal
 Non-Recursive Sequential Input Deconvolution, *Mechanical Systems and Signal Processing*, 2016
- D. Bernal, A. Kunwar
 Steady State Shift Damage Localization, *Meccanica*, 2016, 1-11

SELECTED RESEARCH PROJECTS

- Monitoring the Health of Structural Systems from the Geometry of Sensor Traces
 Principal Investigator, National Science Foundation
- Algorithm-Fused High Performance Damage Detector: Optimal Sensor Distributions
 Principal Investigator, National Science Foundation
- Assessment of Seismic Provisions on Effects of Multi-Component Excitation Using Instrumental Data and Adaptive Principal Component Reconstruction Scheme
 Principal Investigator, California Strong Motion Instrumentation Program

LUCA CARACOGLIA



Associate Professor, Civil and Environmental Engineering; affiliated faculty, Mechanical and Industrial Engineering

PhD, University of Trieste, 2001
civ.neu.edu/people/caracoglia-luca

Scholarship focus: structural dynamics; wind engineering; wind energy; wind-induced vibration; linear and nonlinear cable dynamics; climate change

Honors and awards: National Science Foundation Early CAREER Development Award

SELECTED PUBLICATIONS

- G.F. Giaccu, L. Caracoglia
 A Displacement-Based Approach for Determining Non-Linear Effects on Pre-Tensioned-Cable Cross-Braced Structures, *Journal of Sound and Vibration*, 394, 2017, 465-481
- L. Caracoglia, G.F. Giaccu, B. Barbiellini
 Estimating the Standard Deviation of Eigenvalue Distributions for the Nonlinear Free-Vibration Stochastic Dynamics of Cable Networks, *Meccanica – An International Journal of Theoretical and Applied Mechanics AIMETA*, 52(1), 2017, 197-211
- L. Caracoglia
 Comparison of Reduced-Order Models to Analyze the Dynamics of a Tall Building under the Effects of Along-Wind Loading Variability, *ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering*, 2(2), 2016, C4015002
- L. Caracoglia
 Examining Monetary Losses due to Transient-Wind-Load Damage on Tall Building Envelopes by Stochastic Modeling, *Wind Engineers - Official Journal of the Japan Association for Wind Engineering*, 41(4), 2016, 325-329
- W. Cui, L. Caracoglia
 Exploring Hurricane Wind Speed along US Atlantic Coast in Warming Climate and Effects on Predictions of Structural Damage and Intervention Costs, *Engineering Structures*, 122, 2016, 209-225
- P. Pourazarm, L. Caracoglia, M. Lackner, Y. Modarres-Sadeghi
 Perturbation Methods for the Reliability Analysis of Wind-Turbine Blade Failure due to Flutter, *Journal of Wind Engineering and Industrial Aerodynamics*, 156, 2016, 159-171

SELECTED RESEARCH PROJECTS

- Collaborative Research: Active Control of Nonlinear Flow-Induced Instability of Wind Turbine Blades under Stochastic Perturbations
 Principal Investigator, National Science Foundation
- Wavelet-Galerkin Analysis Method for the Dynamic Response of Vertical Structures against Transient Winds with a Focus on Tall Buildings and Wind Turbines
 Principal Investigator, National Science Foundation

STEVEN CRANFORD



Assistant Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 2012
civ.neu.edu/people/cranford-steven

Scholarship focus: materiomics and material design; full atomistic molecular modeling of materials; molecular dynamics; multiscale modeling and model development; nanomechanics and molecular mechanics; structural mechanics and engineering

Honors and awards: Civil and Environmental Engineering Excellence in Teaching Award

SELECTED PUBLICATIONS

S. Cranford

When is 6 Less Than 5? Penta- to Hexa-Graphene Transition, *Carbon*, 96, 2016, 421-428

R.E. Roman, K. Kwan, S. Cranford

Mechanical Properties and Defect Sensitivity of Diamond Nanothreads, *Nano Letters*, 15(3), 2015, 1585-1590

J. Meng, Y. Zhang, S. Cranford, M. Minus

Nanotube Dispersion and Polymer Conformational Confinement in a Nano-composite Fiber: A Joint Computational Experimental Study, *Journal of Physical Chemistry B*, 118(31), 2014, 9476-9485

SELECTED RESEARCH PROJECTS

Multi-Phase Topologically Controlled Structural Fuses Inspired by Nature

Principal Investigator, Haythornthwaite Research Initiation

Disease Diagnosis and Monitoring Using Breath and Saliva Based Nano-Bio Sensing System

Co-Principal Investigator, Northeastern University

MATTHEW ECKELMAN



Assistant Professor, Civil and Environmental Engineering; affiliated faculty, Chemical Engineering, Marine and Environmental Sciences, Public Policy and Urban Affairs

PhD, Yale University, 2009
civ.neu.edu/people/eckelman-matthew

Scholarship focus: environmental engineering and sustainability; life cycle assessment; energy efficiency and emissions modeling; environmental assessment of bio and nanomaterials; material and energy use in urban buildings and infrastructure

Honors and awards: National Science Foundation CAREER Award; International Laudise Prize in Industrial Ecology

SELECTED PUBLICATIONS

R. Phillips, L. Troup, D.J. Fannon, M.J. Eckelman

Do Resilient and Sustainable Design Strategies Conflict in Commercial Buildings?, *Building and Environment*, 146, 2017, 295-311

M.J. Eckelman, J.S. Sherman

Environmental Impacts of the US Healthcare System and Effects on Public Health, *PLoS ONE*, 11(6), 2016, e0157014

S.M. Rahman, M.J. Eckelman, A. Onnis-Hayden, A.Z. Gu

Life-Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, *Environmental Science and Technology*, 50(6), 2016, 3020-3030

M.J. Eckelman

Life-Cycle Inherent Toxicity: A Novel LCA-Based Algorithm for Evaluating Chemical Synthesis Pathways, *Green Chemistry*, 18(11), 2016, 3257-3264

M. Montazeri, L. Soh, P. Pérez-López, J.B. Zimmerman, M.J. Eckelman

Time-Dependent Life Cycle Assessment of Microalgal Biorefinery co-Products, Biofuels, Bioproducts, and Biorefining, 2016

M. Saha, M.J. Eckelman

Geospatial Assessment of Potential Bioenergy Crop Production on Urban Marginal Land, *Applied Energy*, 159, 2015, 540-547

SELECTED RESEARCH PROJECTS

Air Climate and Energy Center—SEARCH: Solutions for Energy Air Climate and Health

Senior Personnel, Environmental Protection Agency

CAREER: Building Chemical Synthesis Networks for Life Cycle Hazard Modeling

Principal Investigator, National Science Foundation

Ethics Education in Life Cycle Design, Engineering, and Management

Principal Investigator, National Science Foundation

RSB: A Decision and Design Framework for Multi-Hazard Resilient and Sustainable Buildings

Co-Principal Investigator, National Science Foundation

DAVID FANNON



Assistant Professor, School of Architecture; jointly appointed, Civil and Environmental Engineering

MS, University of California, Berkeley, 2015
civ.neu.edu/people/fannon-david

Scholarship focus: sustainable and high performance building design; development of sustainable building technologies; human

comfort within the built environment

SELECTED PUBLICATIONS

R. Philips, L. Troup, D. Fannon, M. Eckelman

Do Resilient and Sustainable Design Strategies Conflict in Commercial Buildings? A Critical Analysis of Existing Resilient Building Frameworks and Their Sustainability Implications, *Energy and Buildings*, 146, 2017, 295-311

D. Fannon, M. Laboy

Teaching Building Science in Design Studio, *Journal of the National Institute of Building Science*, 4(6), 2016, 22-25

M. Laboy, D. Fannon

Theory and Praxis: a Critical Framework for Architecture, *Enquiry the Architectural Research Centers Consortium Journal*, 13(2), 2016

H. Zhang, E. Arens, M. Taub, D. Dickerhoff, F. Bauman,

M. Fountain, W. Pasut, D. Fannon, Y. Zhai, M. Pigman

Using Footwarmers in Offices for Thermal Comfort and Energy Savings, *Energy and Buildings*, 104, 2015, 233-243

SELECTED RESEARCH PROJECTS

Building Resilience: A Tool for Adaptability Planning and Decision-Making

Co-Principal Investigator, Northeastern University

Decision Frameworks for Resilient and Sustainable Buildings

Co-Investigator, National Science Foundation

Future-Use Architecture: Design for Persistent Change

Principal Investigator, Latrobe Prize, American Institute of Architects, College of Fellows

LORETTA FERNANDEZ



Assistant Professor, Civil and Environmental Engineering; jointly appointed, Marine and Environmental Sciences

PhD, Massachusetts Institute of Technology, 2010

civ.neu.edu/people/fernandez-loretta

Scholarship focus: environmental organic chemistry; passive sampling methods for organic contaminants in water and sediments; transport, transformation, and biological exchange of organic contaminants in the environment

Honors and awards: National Research Council, Research Associateship; National Science Foundation, Graduate Research Fellowship

SELECTED PUBLICATIONS

B.D. Drollette, K. Hoelzer, N.R. Warner, T.H. Darrah,

O. Karatum, M.P. O'Connor, R.K. Nelson, L.A. Fernandez,

C.M. Reddy, A. Vengosh, R.B. Jackson, M. Elsner, D.L. Plata

Elevated Levels of Diesel Range Organic Compounds in Groundwater Near Marcellus Gas Operations are Derived from Surface Activities, *Proceedings of the National Academies of Science*, 112(43), 2015, 13184-13189

L. Fernandez, P.M. Gschwend

Predicting Bioaccumulation of Polycyclic Aromatic Hydrocarbons in Soft-Shelled Clams (*Mya arenaria*) Using Field Deployments of Polyethylene Passive Samplers, *Environmental Toxicology and Chemistry*, 34(5), 2015, 993-1000

L. Fernandez, W. Lao, K.A. Maruya, R.M. Burgess

Calculating the Diffusive Flux of Persistent Organic Pollutants Between Sediments and the Water Column on the Palos Verdes Shelf Superfund Site Using Polymeric Passive Samplers, *Environmental Science & Technology*, 48, 2014, 3925-3924

SELECTED RESEARCH PROJECTS

Non-Equilibrium Passive Sampling for Quantitative Thermodynamic Exposure Assessment (Q-TEA)

Principal Investigator, US Army Environmental Laboratory

STEPHEN FLYNN



Professor, Political Science; Founding Director, Global Resilience Institute; affiliated faculty, Civil and Environmental Engineering

PhD, Tufts University, 1991
civ.neu.edu/people/flynn-stephen

Scholarship focus: critical infrastructure resilience; public policy

SELECTED PUBLICATIONS

S. Flynn

Boston Under Snow: Resilience Lessons for the Nation, A Center for Resilience Studies Assessment, Northeastern University, 2016

S. Flynn

The South Carolina Deluge: Lessons from a Watershed Disaster, A Center for Resilience Studies Assessment, Northeastern University, 2016

S. Flynn

The Role of Community Resilience in Advancing Security, State, Society, and National Security: Challenges and Opportunities in the 21st Century, Jayakumar, S. (Ed.) Singapore: World Scientific Publishing, 2016

S. Flynn

Bolstering Critical Infrastructure Resilience After Superstorm Sandy: Lessons for New York and the Nation, Northeastern University, 2015

S. Flynn

International Resilience Symposium: Understanding Standards for Communities and Built Infrastructure Resilience, National Institute of Standards and Technology, 2015

I. Linkov, D. Eisenberg, M. Bates, D. Chang, M. Convertino, J. Allen, S. Flynn, T. Seager

Measurable Resilience for Actionable Policy, Environmental Science and Technology, 47(18), 2013, 10108-10110

SELECTED RESEARCH PROJECTS

Bolstering Counter-Proliferation Efforts within Global Supply Chains

Principal Investigator, MacArthur Foundation

CRISP Type 2: Interdependent Network-based Quantification of Infrastructure Resilience (INQUIRE)

Co-Principal Investigator, National Science Foundation

Learning from Major Disasters that Disrupt Lifeline-infrastructure

Principal Investigator, U.S. Department of Homeland Security

Resilience Governance for Infrastructure Dependencies and Interdependencies

Principal Investigator, Critical Infrastructure Resilience Institute

PETER FURTH



Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1981
civ.neu.edu/people/furth-peter

Scholarship focus: traffic signal control; bicycle transportation; transit operations modeling; transit data collection and sampling

SELECTED PUBLICATIONS

M.B. Lowry, P. Furth, T. Hadden-Loh

Prioritizing New Bicycle Facilities to Improve Low-Stress Network Connectivity, Transportation Research, 86, 2016, 124-140

B. Cesme, P. Furth

Self-Organizing Traffic Signals using Secondary Extension and Dynamic Coordination, Transportation Research Part C, 48, 2014, 1-15

P. Furth, B. Cesme, T.H.J. Muller

Lost Time and Cycle Length for an Actuated Traffic Signal, Transportation Research Record: Journal of the Transportation Research Board, 2009, 2128, 152-160

P. Furth, T.H. Muller

Conditional Bus Priority at Signalized Intersections: Better Service with Less Traffic Disruption, Journal of the Transportation Research Board, 1731, 2000, 23-30

SELECTED RESEARCH PROJECTS

Self-Organizing Traffic Signals

Principal Investigator, National Science Foundation

Bicycle Network Analysis

Principal Investigator, Delaware Department of Transportation

AUROOP GANGULY



Professor, Civil and Environmental Engineering;
affiliated faculty, Marine and Environmental
Sciences

PhD, Massachusetts Institute of
Technology, 2002
civ.neu.edu/people/ganguly-aurop

Scholarship focus: climate extremes
and water sustainability; critical
infrastructures security and resilience; applied data sciences
for complex systems

Honors and awards: College of Engineering Faculty Fellow

SELECT PUBLICATIONS

- T.J. Vandal, E. Kodra, S. Ganguly, A. Michaelis, R. Nemani,
A.R. Ganguly
DeepSD: Generating High Resolution Climate Change
Projections through Single Image Super-Resolution, Knowledge
Discovery and Data mining, Halifax, Nova Scotia, Canada, 2017
- A. Karpatne, G. Atluri, J. Faghmous, M. Steinbach, A. Banerjee,
A. Ganguly, S. Shekhar, N. Samatova, V. Kumar
Theory-Guided Data Science: A New Paradigm for Scientific
Discovery from Data, IEEE Transactions on Knowledge and Data
Engineering, 2017
- P. Ganguli, A.R. Ganguly
Space-Time Trends in US Meteorological Droughts, Journal of
Hydrology: Regional Studies, 8, 2016, 235-259
- A.R. Ganguly, D. Kumar, P. Ganguli, G. Short, G. Klausner,
J. Klausner
Climate Adaptation Informatics: Water Stress on Power
Production, Computing in Science & Engineering, 17(6),
2015, 53-60
- D. Wang, T.C. Gouhier, B.A. Menge, A.R. Ganguly
Intensification and Spatial Homogenization of Coastal Upwelling
Under Climate Change, Nature, 518, 2015, 390-394

SELECTED RESEARCH PROJECTS

- Deep Machine Learning in the Earth Sciences
Principal Investigator, National Aeronautics and Space
Administration
- High-Dimensional Statistical Machine Learning for Spatio-
Temporal Data, with applications to Climate Science
Principal Investigator, National Science Foundation
- Interdependent Network-Based Quantification of Infrastructure
Resilience (INQUIRE)
Co-Principal Investigator, National Science Foundation
- Spatio-Temporal Extremes & Association: Marine Adaptation
and Survivability under Climate change and Rising Ocean
Temperatures
Co-Principal Investigator, National Science Foundation
- Understanding Climate Change: A Data-Driven Approach
Co-Principal Investigator, National Science Foundation

EDGAR GOLUCH



Associate Professor, Chemical Engineering;
affiliated faculty, Bioengineering, Civil and
Environmental Engineering

PhD, University of Illinois, 2007
che.neu.edu/people/goluch-edgar

Scholarship focus: detection of biomolecules
at the nanoscale, specifically inside micro
and nanofluidic channels. This is applied to a broad range of
scientific fields including: biophysics, micro and systems biology,
ecology, environmental sensing, and analytical instrumentation

SELECTED PUBLICATIONS

- H.J. Sismaet, A.J. Pinto, E.D. Goluch
Electrochemical Sensors for Identifying Pyocyanin Production
in Clinical Pseudomonas Aeruginosa Isolates, Biosensors and
Bioelectronics, 97, 2017, 65-69
- H.J. Sismaet, A. Banerjee, S. McNish, Y. Choi, M. Torralba,
S. Lucas, A. Chan, V.K. Shanmugam, E.D. Goluch
Electrochemical Detection of Pseudomonas in Wound Exudate
Samples from Patients with Chronic Wounds, Wound Repair
and Regeneration, 24(2), 2016, 366-372 *featured in a George
Washington University press release
- T.A. Webster, H.J. Sismaet, I.J. Chan, E.D. Goluch
Electrochemically Monitoring the Antibiotic Susceptibility of
Pseudomonas aeruginosa Biofilms, Analyst, 140, 2015, 7195-7201
- P.N. Abadian, N. Yildirim, A.Z. Gu, E.D. Goluch
SPRi-Based Adenovirus Detection using a Surrogate Antibody
Method, Biosensors and Bioelectronics, 74, 2015, 808-814
- K. Mathwig, T. Albrecht, E.D. Goluch, L. Rassaei
Challenges of Biomarker Detection at the Nanoscale: Nanopores
and Microelectrodes, Analytical Chemistry, 87, 2015, 5470-5475
- T.A. Webster, H.J. Sismaet, A.F. Sattler, E.D. Goluch
Improved Monitoring of P. aeruginosa on Agar Plates,
Analytical Methods, 7, 2015, 7150-7155 *emerging investigator
themed issue
- G.E. Aninwene II, P.N. Abadian, V. Ravi, E.N. Taylor, D.M. Hall,
A. Mei, G.D. Jay, E.D. Goluch, T.J. Webster
Lubricin: A Novel Means to Decrease Bacterial Adhesion and
Proliferation, Journal of Biomedical Materials Research, Part A,
103, 2015, 451-462
- P.N. Abadian, E.D. Goluch
Using Surface Plasmon Resonance Imaging (SPRi) to Evaluate
Bacterial Adhesion on Surface Coatings, Analytical Methods, 7,
2015, 115-122, *featured as a hot article in Analytical Methods

SELECTED RESEARCH PROJECTS

- EAGER: Bio-Inspired Electrochemical Sensing of Small Molecules
Using Antibodies
Principal Investigator, National Science Foundation
- IDBR: TYPE A Nano-Constriction Devices for Isolation and
Cultivation of Environmental Microbes
Principal Investigator, National Science Foundation

TARIK GOUHIER



Assistant Professor, College of Science; affiliated faculty, Civil and Environmental Engineering

PhD, McGill University, 2010
civ.neu.edu/people/gouhier-tarik

Scholarship focus: dynamical models of ecological and environmental processes for marine species; adaptive management strategies of interconnected coastal ecosystems

SELECTED PUBLICATIONS

- P. Pillai, T.C. Gouhier, S.V. Vollmer
 Ecological Rescue of Host-Microbial Systems Under Environmental Change, *Theoretical Ecology*, 10, 2017, 51-63
- B. Spiecker, T.C. Gouhier, F. Guichard
 Reciprocal Feedbacks Between Spatial Subsidies and Reserve Networks in Coral Reef Meta-Ecosystems, *Ecological Applications*, 26(1), 2016, 264-278
- D. Wang, T.C. Gouhier, B.A. Menge, A.R. Ganguly
 Intensification and Spatial Homogenization of Coastal Upwelling Under Climate Change, *Nature*, 518, 2015, 390-394
- P. Pillai, T.C. Gouhier, S.V. Vollmer
 The Cryptic Role of Biodiversity in the Emergence of Host-Microbial Mutualisms, *Ecology Letters*, 17(11), 2014, 1437-1446
- T.C. Gouhier, F. Guichard, B.A. Menge
 Designing Effective Reserve Networks for Non-equilibrium Metacommunities, *Ecological Applications*, 23(6), 2013, 1488-1503
- T.C. Gouhier, F. Guichard, B.A. Menge
 Ecological Processes Can Synchronize Marine Population Dynamics Over Continental Scales, *Proceedings of the National Academy of Sciences of the United States of America*, 107(18), 2010, 8281-8286

SELECTED RESEARCH PROJECTS

- Coral-Microbial Interactions as Determinants of Disease Dynamics
 Principal Investigator, National Science Foundation
- The Effects of Fine-Scale Temperature and Desiccation Variability on the Distribution of Marine Species
 Co-Principal Investigator, National Science Foundation
- Integrating Broad-Scale Regional Variation in Environmental Forcing and Benthic-Pelagic Coupling
 Co-Principal Investigator, National Science Foundation
- Spatio-Temporal Extremes and Association: Marine Adaptation and Survivability Under Climate change and Rising Ocean Temperatures
 Co-Principal Investigator, National Science Foundation

JONATHAN GRABOWSKI



Associate Professor, Marine and Environmental Sciences; affiliated faculty, Civil and Environmental Engineering

PhD, University of North Carolina at Chapel Hill, 2012
civ.neu.edu/people/grabowski-jonathan

Scholarship focus: environmental science and policy, fisheries, ecological economics

SELECTED PUBLICATIONS

- P.S.E. Zu Ermgassen, J.H. Grabowski, J.R. Gair, S.P. Powers
 Quantifying Fish and Mobile Invertebrate Production from a Threatened Nursery Habitat, *Journal of Applied Ecology*, 53, 2016, 596-606
- L.F. Dodd, J.H. Grabowski, M.F. Piehler, I. Westfield, J.B. Ries
 Ocean Acidification Impairs Crab Foraging Behavior, *Proceedings of the Royal Society B*, 282, 2015
- D.L. Kimbro, J.E. Byers, J.H. Grabowski, A.R. Hughes, M.F. Piehler
 The Biogeography of Trophic Cascades on U.S. Oyster Reefs, *Ecology Letters*, 17, 2014, 845-854
- A.B. Rodriguez, F.J. Fodrie, J.T. Ridge, N. Lindquist, E.J. Theuerkauf, S.E. Coleman, J.H. Grabowski, et al.
 Will Oyster Reefs Keep their Heads Above Water?, *Nature Climate Change*, 2014, 493-497
- M.D. McMahan, D.C. Brady, D. Cowan, J.H. Grabowski, G.D. Sherwood
 Using Fine-Scale Acoustic Telemetry to Observe the Effects of a Groundfish Predator (Atlantic cod, *Gadus morhua*) on the Movement Behavior of the American Lobster (*Homarus americanus*), *Canadian Journal of Fisheries and Aquatic Sciences* 70(11), 2013, 1625-1634
- J.H. Grabowski, R.D. Brumbaugh, R. Conrad, A.G. Keeler, et al.
 Economic Valuation of Ecosystem Services Provided by Oyster Reefs, *BioScience*, 632, 2012, 900-909
- P.S.E. Zu Ermgassen, M.D. Spalding, B. Blake, L.D. Coen, B. Dumbauld, S. Geiger, J.H. Grabowski, et al.
 Historical Ecology with Real Numbers: Past and Present Extent and Biomass of an Imperiled Estuarine Habitat, *Proceedings of the Royal Society B*, 279, 2012, 3393-3400

SELECTED RESEARCH PROJECTS

- Aligning Coastal Restoration with Ecological and Societal Needs
 Principal Investigator, National Center for Ecological Analysis and Synthesis
- Assessing Social Impacts in Groundfish Fishing Communities
 Principal Investigator, National Oceanic and Atmospheric Administration
- Social and Ecological Factors Influencing Shoreline Hardening in the Northeast: Implications for Vulnerability, Resilience and Informed Decision Making
 Principal Investigator, Northeast Sea Grant College Consortium

APRIL GU



Professor and COE Faculty Scholar, Civil and Environmental Engineering; affiliated faculty, Bioengineering, Marine and Environmental Sciences

PhD, University of Washington, 2003
civ.neu.edu/people/gu-april

Scholarship focus: application of biotechnology for water quality improvement; biological treatment processes and bioremediation;

ecotoxicology and toxicity assessment; biosensors for water quality monitoring

Honors and awards: Fellow, Water Environment Federation; College of Engineering Faculty Fellow; National Science Foundation CAREER Award; National Science Foundation Education BRIGE Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

J. Lan, N. Gou, S. Rahman, C. Gao, M. He, A. Gu
A Quantitative Toxicogenomics Assay for High-Throughput and Mechanistic Genotoxicity Assessment and Screening of Environmental Pollutants, *Environmental Science and Technology*, 50(6), 2016, 3202–3214

S. Rahman, M. Eckelman, A. Onnis-Hayden, A. Gu
Life Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, *Environmental Science and Technology*, 50(6), 2016, 3020–3030

D. Li, S. Zeng, M. He, A. Gu
Water Disinfection Byproducts Select for Antibiotic Resistance-Role of Environmental Pollutants in Resistance Phenomena, *Environmental Science and Technology*, 50(6), 2016, 3193–3201

Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanical Properties and Cell-Surface Integration Forces with Microbial Deposition and Transport Behavior, *Environmental Science and Technology*, 48(3), 2014, 1769–1778

N. Yildirim, F. Long, C. Gao, M. He, H.C. Shi, A. Gu
Aptamer-Based Optical Biosensor for Rapid and Sensitive Detection of 17 β -Estradiol in Water Samples, *Environmental Science and Technology*, 46(6), 2012, 3288–3294

SELECTED RESEARCH PROJECTS

CRECE-Center for Research on Early Childhood Exposure and Development in Puerto Rico
Project Principal Investigator, National Institute of Environmental Health Sciences

Exploring Analysis of Environment and Health Through Multiple Alternative Clustering

Co-Principal Investigator, National Science Foundation

PROTECT-The Puerto Rico Testsite for Exploring Contamination Threats Program

Co-Principal Investigator, National Institute of Environmental Health Sciences

Mechanistic and Predictive Genotoxicity Assessment of Nanomaterials
Principal Investigator, National Science Foundation

JEROME HAJJAR



CDM Smith Professor and Chair, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences

PhD, Cornell University, 1988
civ.neu.edu/people/hajjar-jerome

Scholarship focus: steel and composite steel/concrete structures; earthquake engineering; structural stability; large-scale experimental

testing of structures; regional simulation

Honors and awards: Fellow, American Society of Civil Engineers; Fellow, Structural Engineering Institute; Norman Medal, American Society of Civil Engineers; Shortridge Hardesty Award, American Society of Civil Engineers; Moisseiff Award, American Society of Civil Engineers; T.R. Higgins Lectureship Award, American Institute of Steel Construction; Special Achievement Award, American Institute of Steel Construction; Walter L. Huber Civil Engineering Research Prize, American Society of Civil Engineers; Breakthrough Award, Popular Mechanics; Clemens Herschel Award, Boston Society of Civil Engineers

SELECTED PUBLICATIONS

D. Deniz, J. Song, J.F. Hajjar
Energy-Based Seismic Collapse Criterion for Ductile Structural Frames, *Engineering Structures*, 141, 2017, 1–13

T.H. Nguyen, C.H. Le, J.F. Hajjar
Topology Optimization Using the P-Version of the Finite Element Method, *Structural and Multidisciplinary Optimization*, 2017

M.D. Denavit, J.F. Hajjar, T. Perea, R.T. Leon
Seismic Performance Factors for Moment Frames with Steel-Concrete Composite Columns and Steel Beams, *Earthquake Engineering and Structural Dynamics*, Special Issue on Earthquake-Induced Collapse of Structural Systems, 45(10), 2016, 1685–1703

J.S. Steelman, L.A. Fahnestock, J.F. Hajjar, J.M. LaFave
Performance of Non-Seismic PTFE Sliding Bearings when Subjected to Seismic Demands, *Journal of Bridge Engineering*, ASCE, 21(1), 2016

V. Valamanesh, A.T. Myers, S.R. Arwade, J.F. Hajjar, E.M. Hines, W. Pang
Wind-Wave Prediction Equations for Probabilistic Offshore Hurricane Hazard Analysis, *Natural Hazards*, 2016, 1–22

M.R. Eatherton, X. Ma, H. Krawinkler, G.G. Deierlein, J.F. Hajjar
Quasi-static Behavior of Controlled Rocking Steel Frames, *Journal of Structural Engineering*, 140(11), 2014

SELECTED RESEARCH PROJECTS

Collaborative Research: Transforming Building Structural Resilience Through Innovation in Steel Diaphragms

Co-Principal Investigator, National Science Foundation

Deconstructable Systems for Sustainable Design of Steel and Composite Structures

Principal Investigator, National Science Foundation

Fast and Accurate Infrastructure Modeling and Inspection with Low-Flying Robots

Principal Investigator, National Science Foundation

FERDI HELLWEGER



Associate Professor, Civil and Environmental Engineering; affiliated faculty, Bioengineering, Marine and Environmental Sciences

ScD, Columbia University, 2004
civ.neu.edu/people/hellweger-ferdinand

Scholarship focus: surface water quality, microbial ecology and systems bioecology (the combination of systems biology and systems ecology)

Honors and awards: Environmental Merit Award, U.S. Environmental Protection Agency

SELECTED PUBLICATIONS

F.L. Hellweger

75 Years Since Monod: It is Time to Increase the Complexity of Our Predictive Ecosystem Models (opinion), *Ecological Modelling*, 346, 2017, 77-87

F.L. Hellweger, R.J. Clegg, J. Clark, C.M. Plugge, J.-U. Kreft
 Advancing Microbial Research by Simulation: Technologies for Individual-based Modelling, *Nature Reviews Microbiology*, 14, 2016, 461-471

F.L. Hellweger, N.D. Fredrick, M.J. McCarthy, W.S. Gardner, S. Wilhelm, H.W. Paerl

Dynamic, Mechanistic, Molecular-Level Modeling of Cyanobacteria: *Anabaena* and Nitrogen Interaction, *Environmental Microbiology*, 18(8), 2016, 2721-2731

F.L. Hellweger, E. van Sebille, B.C. Calfee, J.W. Chandler, E.R. Zinser, B.K. Swan, N.D. Fredrick

Ocean Currents Distort Temperature Selection of Plankton: Insights from an Individual-Based Model, *PLoS ONE*, 11(12), 2016, e0167010

F.L. Hellweger

100 Years Since Streeter and Phelps: It is Time to Update the Biology in Our Water Quality Models, *Environmental Science and Technology*, 49(11), 2015, 6372-6373

F.L. Hellweger, N. Fredrick, J.A. Berges

Age-correlated Stress Resistance Improves Fitness of Yeast: Support from Agent-Based Simulations, *BMC Systems Biology*, 8(18), 2014, 1-10

F.L. Hellweger, E. Van Sebille, N.D. Fredrick

Biogeographic Patterns in Ocean Microbes Emerge in a Neutral Agent-Based Model, *Science*, 345(6202), 2014, 1346-1349

SELECTED RESEARCH PROJECTS

Charles River Swimming Water Quality Monitoring and Assessment
 Principal Investigator, Charles River Conservancy

Development of a Next Generation Model for Predicting Cyanobacterial Toxicity: Integrating Molecular, Cellular, and Environmental Dynamics

Principal Investigator, Environmental Protection Agency/Science to Achieve Results

BRIAN HELMUTH



Professor, Marine and Environmental Sciences; jointly appointed, School of Public Policy and Urban Affairs; affiliated faculty, Civil and Environmental Engineering

PhD, University of Washington, 1997
civ.neu.edu/people/helmuth-brian

Scholarship focus: ecological forecasting and resilience of coastal environments

Honors and awards: Google Science Communications Fellow

SELECTED PUBLICATIONS

C.D.G. Harley, S.D. Connell, Z.A. Doubleday, B. Kalaher, B.D. Russell, G. Sará, B. Helmuth

Conceptualizing Ecosystem Tipping Points within a Physiological Framework, *Ecology and Evolution*, 2017

K.J. Kroeker, E. Sanford, J.M. Rose, C.A. Blanchette, F. Chan, F.P. Chavez, B. Gaylord, B. Helmuth, T.M. Hill, G.E. Hofmann, M.A. McManus, B.A. Menge, K.J. Nielsen, P.T. Raimondi, A.D. Russell, L. Washburn

Interacting Environmental Mosaics Drive Geographic Variation in Mussel Performance and Species Interactions, *Ecology Letters*, 19, 2016, 771-779

B. Helmuth, B.D. Russell, S.D. Connell, Y. Dong, C.D.G. Harley, F.P. Lima, G. Sará, G.A. Williams, N. Mieszkowska

Beyond Long-Term Averages: Making Biological Sense of a Rapidly Changing World, *Climate Change Responses*, 1, 2014, 10-20

L.E. Petes, J.F. Howard, B. Helmuth, E.K. Fly

Science Integration into US Climate and Ocean Policy, *Nature Climate Change*, 4(8), 671-677

R. Griffis, J. Howard, E. Babij, B. Helmuth, A. Himes-Cornell, P. Niemier, M. Orbach, L. Petes, et. al

Oceans and Marine Resources in a Changing Climate: A Technical Input to the 2013 National Climate Assessment, Island Press, 2013

M. Kearney, A. Matzelle, B. Helmuth

Biomechanics Meets the Ecological Niche: The Importance of Temporal Data Resolution, *Journal of Experimental Biology*, 215, 2012, 922-933

SELECTED RESEARCH PROJECTS

Predicting how Fine-Scale Temperature Variation will Affect the Spatial Distribution and Temporal Stability of Species and Communities Under Climate Change

Principal Investigator, National Science Foundation

Using an Energetics Framework to Forecast the Interactive Effects of Abiotic and Biotic Stressors on Intertidal Mussels

Principal Investigator, National Science Foundation

A Temperature Sensor Network to Study Public Health and Community Resilience Impacts of Heat Waves at Micro-Spatial Levels in the Town of Brookline

Co-Principal Investigator, Northeastern University

A. RANDALL HUGHES



Associate Professor, Marine and Environmental Sciences; affiliated faculty, Civil and Environmental Engineering

PhD, University of California-Davis, 2006
civ.neu.edu/people/hughes-randall

Scholarship focus: marine community ecology and biodiversity

SELECTED PUBLICATIONS

- R. Zerebecki, G.M. Crutsinger, A.R. Hughes
Spartina alterniflora Genotypic Identity Affects Plant-Plant and Plant-Animal Interactions in an Experimental Marsh Community, *Journal of Ecology*, 2017
- A.R. Hughes, F.R. Schenck, J. Bloomberg, T.C. Hanley, D. Feng, T.C. Gouhier, R.E. Beighley, D.L. Kimbro
 Biogeographic Gradients in Ecosystem Processes of the Invasive Ecosystem Engineer *Phragmites australis*, *Biological Invasions*, 18(9), 2016, 2577-2595
- A.R. Hughes, T.C. Hanley, F.R. Schenck, C.G. Hays
 Genetic Diversity of Seagrass Seeds Influences Seedling Morphology and Biomass, *Ecology*, 97, 2016, 3538-3546
- T.C. Hanley, A.R. Hughes, B. Williams, H. Garland, D.L. Kimbro
 Effects of Intraspecific Diversity on Survivorship, Growth, and Recruitment of the Eastern Oyster Across Sites, *Ecology*, 97, 2016, 1518-1529
- A.R. Hughes, T.C. Hanley, N.P. Orozco, R.A. Zerebecki
 Consumer Trait Variation Influences Tritrophic Interactions in Salt Marsh Communities, *Ecology and Evolution*, 5, 2015, 2659-2672
- A.R. Hughes, D.A. Mann, D.L. Kimbro
 Predatory Fish Sounds can Alter Crab Foraging Behavior and Influence Bivalve Abundance, *Proceedings of the Royal Society B*, 281, 2014
- A.R. Hughes, A.F.P. Moore, M.F. Piehler
 Independent and Interactive Effects of Two Facilitators on Their Habitat-Providing Host Plant, *Spartina alterniflora*, *Oikos* 123, 2014, 488-499

SELECTED RESEARCH PROJECTS

- Alabama Center for Ecological Resilience
 Principal Investigator, Gulf of Mexico Research Initiative
- CAREER: Linking Genetic Diversity, Population Density, and Disease Prevalence in Marine Foundation Species: Integrating Research, Education, and Stakeholder Knowledge to Enhance Resilience of Seagrass and Oyster Ecosystems
 Principal Investigator, National Science Foundation
- Biological Oceanography
 Effects of Genetic Diversity, Epigenetic Change, and Root-Associated Fungal Colonization on Trait Variation in the Foundation Plant *Spartina alterniflora*
 Principal Investigator, National Science Foundation

MICHAEL KANE



Assistant Professor, Civil and Environmental Engineering

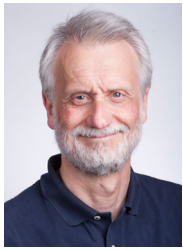
PhD, University of Michigan 2014
civ.neu.edu/people/kane-michael

Scholarship focus: model predictive control; wireless control systems; automatic control of complex infrastructure systems

SELECTED PUBLICATIONS

- M.W. Häckell, R. Rolfes, M.B. Kane, J.P. Lynch
 Three-Tier Modular Structural Health Monitoring Framework Using Environmental and Operational Condition Clustering for Data Normalization: Validation on an Operational Wind Turbine System, *Proceedings of the IEEE*, 108(8), 2016, 1-15
- M.B. Kane, J. Scruggs, J.P. Lynch
 Model-predictive Control Techniques for Hydronic Systems Implemented on Wireless Sensor and Actuator Networks, 2014 American Control Conference, 2014, 3542-3547

HARIS KOUTSOPOULOS



Professor and Associate Chair of Graduate Studies,
Civil and Environmental Engineering

PhD, Massachusetts Institute of
Technology, 1986
civ.neu.edu/people/koutsopoulos-haris

Scholarship focus: urban transportation
networks and informatics, urban mobility,
intelligent transportation systems, public
transportation operations

Honors and awards: Traffic Simulation Lifetime Achievement
Award, Transportation Research Board

SELECTED PUBLICATIONS

- C. Viggiano, H.N. Koutsopoulos, N.H.M. Wilson, J. Attanucci
Journey-Based Characterization of Multi-Modal Public
Transportation Networks, Public Transport Planning and
Operations, 9(1-2), 2017, 437-461
- Y. Zhu, H.N. Koutsopoulos, N.H. Wilson
A Probabilistic Passenger-to-Train Assignment Model Based on
Automated Data, Transportation Research B, 2017
- Z. Ma, S. Zhu, H.N. Koutsopoulos, L. Ferreira
Quantile Regression Analysis of Transit Travel Time Reliability
Using Automatic Vehicle Location and Fare Card Data,
Transportation Research Record: Journal of the Transportation
Research Board, 2017, 2652
- G.E. Sánchez-Martínez, N.H.M. Wilson, H.N. Koutsopoulos
Schedule-Free High-Frequency Transit Operations, Public
Transport Planning and Operations, 9(1-2), 2017, 285-305
- E. Jenelius, H.N. Koutsopoulos
Urban Network Travel Time Prediction Based on a Probabilistic
Principal Component Analysis Model of Probe Data, IEEE
Transactions on Intelligent Transportation Systems, 2017
- Z. Ma, H.N. Koutsopoulos, L. Ferreira, M. Mesbah
Estimation of Trip Travel Time Distribution Using a Generalized
Markov Chain Approach, Transportation Research Part C, 74,
2016, 1-21
- E. Jenelius, H.N. Koutsopoulos
Travel Time Estimation for Urban Road Networks Using Low
Frequency Probe Vehicle Data, Transportation Research Part B,
53, 2013, 64-81 *list of most cited papers since 2012

SELECTED RESEARCH PROJECTS

- Transport for London (TfL) Research Partnership
Principal Investigator, TfL
- Mass Transit Railway (MTR) Research Partnership
Principal Investigator, MTR

MICHELLE LABOY



Assistant Professor, School of Architecture; affiliated
faculty, Civil and Environmental Engineering

MArch, MUP University of Michigan,
Ann Arbor, 2005
civ.neu.edu/people/laboy-michelle

Scholarship focus: building and site systems
integration; structures and landscape
performance; building and urban resilience; green infrastructure;
ecological concepts in design

Honors and awards: Latrobe Prize, American Institute of
Architects College of Fellows

SELECTED PUBLICATIONS

- M. Laboy
On Groundwater: Invisible Architectural Environments, Journal
of Architectural Education, 71(2), 2017
- M. Laboy
Landscape as a Conceptual Space for Architecture: Shifting
Theories and Critical Practices, The Plan Journal, 0(0),
2016, 71-90
- M. Laboy, D. Fannon
Resilience Theory and Praxis: A Critical Framework for
Architecture, Edited by Architectural Research Centers
Consortium, Enquiry: The ARCC Journal of Architectural
Research, 13(1), 2016, 39-53
- D. Fannon, M. Laboy
Teaching Building Science in Design Studio, Journal of the
National Institute of Building Sciences, 2016

SELECTED RESEARCH PROJECTS

- Boston LightWells
Principal Investigator, Boston Groundwater Trust and AutoDesk
BUILD Grant
- College of Fellows, Latrobe Prize
Co-Principal Investigator, College of Fellows of the American
Institute of Architects
- Future-Use Architecture: Design for Persistent Change
Co-Principal Investigator, American Institute of Architects
- Resilient Home Online Design Assistant
Principal Co-Investigator, American Institute of Architects
Upjohn Research Initiative

PHILIP LARESE-CASANOVA



Associate Professor, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences

PhD, University of Iowa, 2006
civ.neu.edu/people/larese-casanova-philip

Scholarship focus: environmental chemistry and mineralogy; transformation and

remediation of water pollutants; nanomaterial sorbents for water treatment

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

N. Cai, P. Larese-Casanova

Application of Positively-Charged Ethylenediamine-Functionalized Graphene for the Sorption of Anionic Contaminants from Water, *Journal of Environmental Chemical Engineering*, 4, 2016, 2941-2951

N. Cai, D. Peak, P. Larese-Casanova

Factors Influencing Natural Organic Matter Sorption onto Commercial Graphene Oxides, *Chemical Engineering Journal*, 273, 2015, 568-579

A.E.P. Schellenger, A. Onnis-Hayden, D. Jaisi, P. Larese-Casanova

Oxygen Kinetic Isotope Effects in Selenate during Microbial Reduction, *Applied Geochemistry*, 63, 2015, 261-271

P. Paydary, P. Larese-Casanova

Separation and Quantification of Quantum Dots and Dissolved Metal Cations by Size Exclusion Chromatography-ICP-MS, *International Journal of Environmental Analytical Chemistry*, 95(15), 2015, 1450-1470

N. Cai, P. Larese-Casanova

Sorption of Carbamazepine by Commercial Graphene Oxides: A Comparative Study with Granular Activated Carbon and Multiwalled Carbon Nanotubes, *Journal of Colloid and Interface Science*, 426, 2014, 152-161

SELECTED RESEARCH PROJECTS

CAREER: Quantum Dot Degradation in Aquatic Environments

Principal Investigator, National Science Foundation

Insights to Selenium Cycling and Remediation Revealed by Stable Oxygen Isotopes

Principal Investigator, National Science Foundation

Recrystallization of Stable Iron Oxides in Reducing Environments

Principal Investigator, National Science Foundation

AMY MUELLER



Assistant Professor, Civil and Environmental Engineering; jointly appointed, Marine and Environmental Sciences; affiliated faculty, Electrical and Computer Engineering

PhD, Massachusetts Institute of Technology, 2012
civ.neu.edu/people/mueller-amy

Scholarship focus: biogeochemistry of natural and engineered systems; in-situ sensors and instrumentation for high-resolution process characterization; remediation and sustainability in natural and built coastal environments; sensor-driven closed-loop controls for resource optimization in engineered systems; signal processing and machine learning, embedded systems, and sensor networks

Honors and awards: National Science Foundation Ocean Sciences Postdoctoral Research Fellowship

SELECTED PUBLICATIONS

A.V. Mueller, H.F. Hemond

Statistical Generation of Training Sets for Measuring NO₃-, NH₄⁺, and Major Ions in Natural Waters by an Ion Selective Electrode Array, *Environmental Science: Processes and Impacts*, 18(5), 2016, 590-599

A.V. Mueller, M.S. Orosz, A. Narasimhan, R. Kamal, H. Hemond, Y. Goswami

Evolution and Feasibility of Decentralized Concentrating Solar Thermal Power Systems for Modern Energy Access in Rural Areas, *MRS Energy and Sustainability*, 2016

M.S. Orosz, A.V. Mueller

Dynamic Simulation of Performance and Cost of Hybrid PV-CSP-LPG Generator Micro Grids with Applications to Remote Communities in Developing Countries, *Proceedings of the ASME 2015 Power and Energy Conference*, 2015, San Diego

A.V. Mueller, H.F. Hemond

Extended Artificial Neural Networks: Incorporation of a Priori Chemical Knowledge Enables use of Ion Selective Electrodes for in-situ Measurement of Ions at Environmentally-Relevant Levels, *Talanta*, 117, 2013, 112-118

A.V. Mueller, H.F. Hemond

Towards an Automated, Standardized Protocol for Determination of Equilibrium Potential of Ion-Selective Electrodes, *Analytica Chimica Acta*, 690(1), 2011, 71-78

SELECTED RESEARCH PROJECTS

Examining the Role of Anoxic Events on Coastal Micronutrient (Fe) Supplies from a Novel High-Resolution Profiling Sampler

Principal Investigator, National Science Foundation

Remus-ISS: Enabling Adaptive in-Flight Sampling for High Resolution Studies of Trace Metals

Co-Principal Investigator, Royalty Research Fund; University of Washington

SİNAN MÜFTÜ



Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Civil and Environmental Engineering

PhD, University of Rochester, 1994
mie.neu.edu/people/muftu-sinan

Scholarship focus: mechanics and tribology of axially moving materials, webs; numerical simulation of tissue healing and bone remodeling; high velocity impact of micron scale particles

Honors and awards: Fellow, American Society of Mechanical Engineers; Søren Buus Outstanding Research Award, College of Engineering; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

- B. Yildirim, H. Yang, A. Gouldstone, S. Müftü
Rebound Mechanics of Micrometre-Scale, Spherical Particles in High Velocity Impacts, *Proceedings of the Royal Society of London A*, 473, 2017, 20160936
- T. Kaşıkci, M.-C. Weng, A. Nayak, T. Goker, S. Müftü
Contact Mechanics of a Thin, Tensioned, Translating Tape with a Grooved Roller, *Journal of Tribology*, 2017
- W. Xie, A. Alizadeh-Dehkharghani, Q. Chen, V.K. Champagne, X. Wang, A. Nardi, S. Kooi, S. Müftü, J.-H. Lee
Dynamics and Extreme Plasticity of Metallic Microparticles in Supersonic Collisions, *Nature Scientific Reports*, 2017
- Q. Sheng, A.J. White, S. Müftü
Indentation of Polytetrafluoroethylene (PTFE) Thin-Film: Simulations by Using Continuum Damage Mechanics, *Tribology Transactions*, 60(1), 2017, 114-120
- H. Yang, J.B.C. Engelen, W.A. Haberle, M. Lantz, S. Müftü
Lateral Friction Behavior of a Thin, Tensioned Tape Wrapped over a Grooved-Roller: Experiments and Theory, *Journal of Tribology*, 139(2), 2017, 021605
- Q. Chen, F.C. Meral, S. Müftü, M. Akcakaya, K. Tuncali
Model-based Optimal Planning of Hepatic Radiofrequency Ablation, *Mathematical Medicine and Biology*, 2016

SELECTED RESEARCH PROJECTS

- Collaborative Research: Mechano-Lipidomics and Mechano-Cytosis of Drug Delivery Liposomes
Co-Principal Investigator, National Science Foundation
- Improving Theoretical Models of Advanced Tape Transport Systems
Principal Investigator, Oracle Corporation
- Multi-Scale Investigations of Particle Impact in Cold-Spray
Technical Point of Contact, Army Research Laboratory

SAMUEL MUÑOZ



Assistant Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering

PhD, University of Wisconsin-Madison, 2015
civ.neu.edu/people/munoz-samuel

Scholarship focus: sedimentary records of environmental change, paleoclimate and climate change, rivers and fluvial processes, hydroclimatic extremes

SELECTED PUBLICATIONS

- S.E. Munoz, S.G. Dee
El Niño Increases the Risk of Lower Mississippi River Flooding, *Scientific Reports*, 7, 2017, 1772
- J.R. Walsh, S.E. Munoz, M.J. Vander Zanden
Outbreak of an Undetected Invasive Species Triggered by a Climate Anomaly, *Ecosphere*, 7(12), 2016, 1-17
- S.E. Munoz, K. Gruley, A. Massie, D.A. Fike, S.S. Schroeder, J.W. Williams
Cahokia's Emergence and Decline Coincided with Shifts of Flood Frequency on the Mississippi River, *Proceedings of the National Academy of Sciences*, 112(20), 2015, 6319-6324
- V.C. Radeloff, J.W. Williams, B.L. Bateman, K.D. Burke, S.K. Carter, E.S. Childress, K.J. Cromwell, C. Gratton, A.O. Hasley, B.M. Kraemer, A.W. Latzka, E. Marin-Spiotta, C.D. Meine, S.E. Munoz, et al.
The Rise of Novelty in Ecosystems, *Ecological Applications*, 25(8), 2015, 2051-2068
- S.E. Munoz, S. Schroeder, D.A. Fike, J.W. Williams
A Record of Sustained Prehistoric and Historic Land use from the Cahokia Region, Illinois, USA, *Geology*, 42(6), 2014, 499-502

SELECTED RESEARCH PROJECTS

- Fingerprinting Mississippi River Sediment Flux to the Gulf of Mexico
Principal Investigator, Ocean and Climate Change Institute, Woods Hole Oceanographic Institution

ANDREW MYERS



Associate Professor, Civil and Environmental Engineering

PhD, Stanford University, 2009
civ.neu.edu/people/myers-andrew

Scholarship focus: offshore wind structures; multi-scale experimental testing of structures; computational simulation; fracture and damage mechanics of metals; probabilistic modeling

Honors and awards: National Science Foundation CAREER Award; Civil and Environmental Engineering Excellence in Teaching Award

SELECTED PUBLICATIONS

A. Jay, A.T. Myers, F. Mirzaie, A. Mahmoud, S. Torabian, E. Smith, B.W. Schafer

Large-Scale Bending Tests of Slender, Tapered Spirally Welded Steel Tubes, *Journal of Structural Engineering*, ASCE, 2016

A. Jay, A.T. Myers, S. Torabian, A. Mahmoud, E. Smith, N. Agbayani, B.W. Schafer

Spirally Welded Steel Wind Towers: Buckling Experiments, Analyses and Research Needs, *Journal of Constructional Steel Research*, Elsevier, 125, 2016, 218-226

S. Hallowell, A.T. Myers

Site-Specific Variability of Load Extremes of Offshore Wind Turbines Exposed to Hurricane Risk and Breaking Waves, *Wind Energy*, Wiley, 2016

V. Valamanesh, A.T. Myers, S.R. Arwade

Multivariate Analysis of Extreme Metocean Conditions for Offshore Wind Turbines, *Structural Safety*, Elsevier, 2015

S. Hallowell, A.T. Myers

Variability of Breaking Wave Characteristics and Impact Loads on Offshore Wind Turbines Supported by Monopiles, *Wind Energy*, 19(8), 2015, 1553

SELECTED RESEARCH PROJECTS

CAREER: Advancing Multi-Hazard Assessment and Risk-based Design for Offshore Wind Energy Technology

Principal Investigator, National Science Foundation

Enabling Advanced Wind Turbine Tower Manufacturing with Reliability-Based Design

Principal Investigator, National Science Foundation

Reliability-Based Hurricane Risk Assessment for Offshore Wind Farms

Principal Investigator, National Science Foundation

Risk and Decision-Making for the Hurricane Threat to Offshore Wind Farms

Principal Investigator, Massachusetts Clean Energy Center

Optimization of Tapered Spiral Welding for Wind Turbine Towers
 Co-Principal Investigator, National Science Foundation

ANNALISA ONNIS-HAYDEN



Associate Teaching Professor, Civil and Environmental Engineering

PhD, University of Cagliari, Italy, 2004
civ.neu.edu/people/onnis-hayden-annalisa

Scholarship focus: biological treatment processes; ecotoxicology and toxicity assessment; microbial population dynamics and ecology in engineered biological systems

Honors and awards: Civil and Environmental Engineering Excellence in Teaching Award; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

Y. Men, P. Han, D.E. Helbling, N. Jehmlich, C. Herbold, R. Gulde, A. Onnis-Hayden, A.Z. Gu, D.R. Johnson, M. Wagner, K. Fenner
 Biotransformation of two Pharmaceuticals by the Ammonia-Oxidizing Archaeon *Nitrososphaera gargensis*, *Environmental Science and Technology*, 2016, 50(9), 4682-4692

S.M. Rahman, M.J. Eckelman, A. Onnis-Hayden, A. Gu
 Life Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, *Environmental Science and Technology*, 2016, 50, 3020-3030

A.E. Schellenger, A. Onnis-Hayden, D.P. Jaisi, P. Larese-Casanova
 Oxygen Kinetic Isotope Effects in Selenate During Microbial Reduction, *Applied Geochemistry*, 63, 2015, 261-271

Y. Li, X. Wang, A. Onnis-Hayden, K.T. Wan, A.Z. Gu
 Universal Quantifier Derived from AFM Analysis Links Cellular Mechanical Properties and Cell-Surface Integration Forces with Microbial Deposition and Transport Behavior, *Environmental Science and Technology*, 48(3), 2014, 1769-1778

A. Onnis-Hayden, N. Majed, A.Z. Gu
 Decoupling the Microbial Populations for Phosphorus and Nitrogen Removal in Integrated Fixed-Film Activated Sludge Enhanced Biological Phosphorus Removal (IFAS-EBPR) System, *Water Research*, 45, 2011, 3845-3854

A. Onnis-Hayden, H. Weng, M. He, S. Hansen, V. Ilyin, et al.
 Prokaryotic Real-Time Gene Expression Profiling for Toxicity Assessment, *Environmental Science and Technology*, 43(12), 2009, 4574-4581

SELECTED RESEARCH PROJECTS

Insights to Selenium Cycling and Remediation Revealed by Stable Oxygen Isotopes

Co-Principal Investigator, National Science Foundation

Investigate Mechanisms for Optimization and Design of Sidestream EBPR Processes as a Sustainable Approach for Achieving Stable and Efficient P Removal

Co-Principal Investigator, Water Environment Research Foundation

MARK PATTERSON



Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering; Associate Director and Chief Technology Officer, Global Resilience Institute

PhD, Harvard University, 1985
civ.neu.edu/people/patterson-mark

Scholarship focus: development of autonomous underwater robots for civil infrastructure and marine sensing; decision support tools for gray/green infrastructure like tide gates; environmental fluid mechanics; biomechanics and mass transfer in living systems

Honors and awards: Member of the Year Award, Association of Unmanned Vehicle Systems International; Lockheed Martin Award for Excellence in Ocean Science and Engineering

SELECTED PUBLICATIONS

- A.C. Trembanis, A.L. Forrest, B.M. Keller, M.R. Patterson
Mesophotic Coral Ecosystems: A Geoacoustically Derived Proxy for Habitat and Relative Diversity for the Leeward Shelf of Bonaire, Dutch Caribbean, *Frontiers in Marine Science*, 4(51), 2017
- R.H. Certner, A.M. Dwyer, M.R. Patterson, S.V. Vollmer
Zooplankton as a Potential Vector for White Band Disease Transmission in the Endangered Coral, *Acropora cervicornis*, *PeerJ*, 5, 2017, e3502
- J. Elliott, M. Patterson, N. Summers, C. Mitermque, E. Montocchio, E. Vitry
How Does the Proliferation of the Coral-Killing Sponge *Terpios hoshinota* Affect Benthic Community Structure on Coral Reefs?, *Coral Reefs*, 2016, 1-13
- E.C. Edson, M.R. Patterson
MantaRay: A Novel Autonomous Sampling Instrument for In Situ Measurements of Environmental Microplastic Particle Concentrations, *Proceedings of the IEEE/Marine Technology Society OCEANS 2015*, 2015, 1-6
- J. Elliott, M. Patterson, E. Vitry, N. Summers, C. Mitermque
Morphological Plasticity allows Coral to Actively Overgrow the Aggressive Sponge *Terpios hoshinota* (Mauritius, Southwestern Indian Ocean), *Marine Biodiversity*, 2015, 1-5
- W.S. Howard, A. Gu, M.M. Garcia, M. Patterson, E. Izzo
State of the World Report 2015: Water Challenges, *Fédération Internationale Des Ingénieurs-Conseils (FIDIC) (International Federation of Consulting Engineers)*, Geneva, 2015, 46

SELECTED RESEARCH PROJECTS

- MantaRay Microplastics Sampler
Co-Principal Investigator, Schmidt Marine Technology Partners, Schmidt Family Foundation
- Tide Gate Modulation of Wetland Function: Decision Support Through Engineering Best Practices
Principal Investigator, National Science Foundation Environmental Sustainability

AMEET PINTO



Assistant Professor, Civil and Environmental Engineering; affiliated faculty, Marine and Environmental Sciences

PhD, Virginia Tech, 2009
civ.neu.edu/people/pinto-ameet

Scholarship focus: microbial ecology and physiology, drinking water treatment and distribution, wastewater treatment, public health microbiology, molecular microbiology, 'omics analyses

Honors and awards: Bright IDEAS Award, Engineering and Physical Sciences Research Council

SELECTED PUBLICATIONS

- I. Bradley, A.J. Pinto, J.S. Guest
Design and Evaluation of Illumina MiSeq Compatible 18S rRNA Primers for Improved Characterization of Mixed Phototrophic Communities, *EApplied and Environmental Microbiology*, 89(19), 2016, 5878-5891
- Q.M. Bautista, J. Schroeder, M.C.R. Sevilano, R. Sungthong, U. Ijaz, W.T. Sloan, A.J. Pinto
Emerging Investigator Series: Microbial communities in Full Scale Drinking Water Systems- A Meta-Analysis, *Environmental Science: Water Research and Technology*, 2016, 631-644
- A.J. Pinto, D.N. Marcus, U.Z. Ijaz, Q.M. Bautista, G.J. Dick, L. Raskin
Metagenomic Evidence for the Presence of Comammox Nitrospira-like Bacteria in a Drinking Water System, *mSphere Journal*, 1, 2015
- J. Schroeder, M. Lunn, A.J. Pinto, L. Raskin, W.T. Sloan
Probabilistic Models to Describe the Dynamics of Migrating Microbial Communities, *PLoS One*, 10, 2015, e0117221
- A.J. Pinto, J. Schroeder, M. Lunn, W.T. Sloan, L. Raskin
Spatial-Temporal Survey and Occupancy-Abundance Modeling to Predict Bacteria Community Dynamics in the Drinking Water Microbiome, *mBio Journal*, 5(3), 2014
- A.J. Pinto, C. Xi, L. Raskin
Bacterial Community Structure in the Drinking Water Microbiome is Governed by Filtration Processes, *Environmental Science and Technology*, 46, 2012, 8851-8859
- A.J. Pinto, L. Raskin
PCR Biases Distort Bacterial and Archaeal Community Structure in Pyrosequencing Datasets, *PLoS One*, 7(8), 2012

SELECTED RESEARCH PROJECTS

- Estimating the Comammox Contribution to Ammonia Oxidation in Nitrogen Removal Systems
Principal Investigator, Water Environment & Reuse Foundation

MATTHIAS RUTH



Professor, School of Public Policy and Urban Affairs; jointly appointed, Civil and Environmental Engineering

PhD, University of Illinois, 1992
civ.neu.edu/people/ruth-matthias

Scholarship focus: dynamic modeling of social, economic and environmental systems, and their interactions; urban infrastructure

systems analysis and modeling; urban climate impacts and adaptation; energy and resources economics and policy

SELECTED PUBLICATIONS

S. Dhakal, M. Ruth

Creating Low-Carbon Cities, Springer International Publishing, 2017, 208

B. KC, M. Ruth

Estimation and Projection of the Institutional Building Electricity Consumption, *Energy and Buildings*, 143, 2017, 43-52

V.B.K. Olsen, B. Momen, S.M. Langsdale, G.E. Galloway, L. Link, K.L. Brubaker, M. Ruth, R.L. Hill

An Approach for Improving Flood Risk Communication Using Realistic Interactive Visualization, *Journal of Flood Risk Management*, 2016

S. Motesharrei, J. Rivas, E. Kalnay, G. Asrar, A. Busalacchi, R. Cahalan, M. Cane, R. Colwell, K. Feng, R. Franklin, K. Hubacek, F. Miralles-Wilhelm, T. Miyoshi, M. Ruth, R. Sagdeev, A. Shirmohammadi, J. Shukla, J. Srebric, V. Yakovenko, N. Zeng
 The Essential Need for Bidirectional Coupling of Earth System and Human System Models, *National Science Review*, 3, 2016, 470-494

S. Königstein, M. Ruth, S. Gössling-Reisemann
 Stakeholder-informed Ecosystem Modeling of Ocean Warming and Acidification Impacts in the Barents Sea Region, *Frontiers in Marine Science*, June 2016, 3(93), 2016, 1-13

R. Fazeli, M. Ruth, B. Davidsdottir

Temperature Response Functions for Residential Energy Demand - A Review of Models, *Urban Climate*, 2016, 45-59

T. Yuanhong, M. Ruth, D. Zhu

Using the IPAT Identity and Decoupling Analysis to Estimate Water Footprint Variations for Five Major Food Crops in China from 1978 to 2010, *Environment, Development and Sustainability*, 16(5), 2016, 1-21

SELECTED RESEARCH PROJECTS

RSB: A Decision and Design Framework for Multi-Hazard Resilient and Sustainable Buildings

Co-Principal Investigator, National Science Foundation

Incentives and Governance, Critical Infrastructures Resilience Center

Principal Investigator, Department of Homeland Security

The Effect of Energy-Saving Regulations on the Location of Manufacturing

Principal Investigator, National Science Foundation

MEHRDAD SASANI



Associate Professor, Civil and Environmental Engineering

PhD, University of California at Berkeley, 2001
civ.neu.edu/people/sasani-mehrdad

Scholarship focus: progressive collapse of structures; earthquake engineering; structural resilience, integrity and reliability

Honors and awards: Fellow, American Society of Civil Engineers; Fellow, Structural Engineering Institute; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

J.A. Murray, M. Sasani

Collapse Resistance of a 7-Story Structure with Multiple Shear-Axial Column Failures Using Hybrid Simulation, *Journal of Structural Engineering*, ASCE, 04017012, 143(5), 2017, 1-13

J.A. Murray, M. Sasani

Seismic Hybrid Simulation of a Nonductile RC Building with Severe Damage to Multiple Columns, *Earthquake Engineering and Structural Dynamics*, 46, 2017, 733-752

C. Wan, C. Audi, M. Sasani

Modeling Floor Systems for Collapse Analysis, *Engineering Structures*, 127, 2016, 278-286

J.A. Murray, M. Sasani

Near-Collapse Response of Existing RC Building Under Severe Pulse Type Ground Motion using Hybrid Simulation, *Earthquake Engineering and Structural Dynamics*, 45(7), 2016, 1109-1127

L. Keyvani, M. Sasani

Analytical and Experimental Evaluation of Progressive Collapse Resistance of a Flat-slab Posttensioned Parking Garage, *Journal of Structural Engineering*, ASCE, 141(11), 2015

J.A. Murray, M. Sasani, X. Shao

Hybrid Simulation for System-Level Structural Response, *Engineering Structures*, 103, 2015, 228-238

S. Sagioglu, M. Sasani

Progressive Collapse Resisting Mechanisms of Reinforced Concrete Structures and Effects of Initial Damage Locations, *Journal of Structural Engineering*, ASCE, 140(3), 2014, 1-12

J.A. Murray, M. Sasani

Seismic Shear-Axial Failure of Reinforced Concrete Columns Versus System Level Structural Collapse, *Journal of Engineering Failure Analysis*, 32, 2013, 382-401

SELECTED RESEARCH PROJECTS

A Decision and Design Framework for Multi-Hazard Resilient and Sustainable Buildings (RSB)

Principal Investigator, National Science Foundation

Near Collapse Performance of Existing RC Concrete Frame Buildings (NEESR)

Principal Investigator, National Science Foundation

THOMAS SHEAHAN



Sr. Associate Dean for Academic Affairs; Professor, Civil and Environmental Engineering; Training Core Leader, PROTECT Center

ScD, Massachusetts Institute of Technology, 1991
civ.neu.edu/people/sheahan-thomas

Scholarship focus: soft ground engineering, coastal adaptation, education and training for engineers and scientists

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

- D. Meric, F. Hellweger, A.N. Alshawabkeh, T.C. Sheahan
 Nonlinear Nonequilibrium One-Dimensional Large-Strain Consolidation-Coupled Contaminant Transport Model of Capped Sediments, *American Society of Civil Engineers Journal of Geotechnical and Geoenvironmental Engineering*, 143(8), 2017
- S. Barbuto, T.C. Sheahan, J.P. Shine, A. Alshawabkeh, et al.
 Benchscale Assessment of the Efficacy of a Reactive Core Mat to Isolate PAH-spiked Aquatic Sediments, *Soil and Sediment Contamination: An International Journal*, 23(1), 2014
- D. Meric, A.N. Alshawabkeh, J.P. Shine, T.C. Sheahan
 Bioavailability of Hydrophobic Organic Compounds in Thin-Layered Sediments, *Chemosphere*, 103, 2014, 281-289
- M.A. Kenney, E. Hamin, T.C. Sheahan
 Reconceptualizing the Role of Infrastructure in Resilience, *EOS Meeting Report*, 95(33), 2014
- D. Cheney, L. Rajicb, E. Sly, D. Meric, T.C. Sheahan
 Uptake of PCBs Contained in Marine Sediments by the Green Macroalga *Ulva Rigida*, *Marine Pollution Bulletin*, 88(1-2), 2014, 207-214

SELECTED RESEARCH PROJECTS

Sustainable Adaptive Gradients in the Coastal Environment: Reconceptualizing the Role of Infrastructure in Resilience
 Co-Principal Investigator, National Science Foundation

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth
 Training Core Leader, National Institutes of Health

CRAIG SHILLABER



Assistant Teaching Professor, Civil and Environmental Engineering

PhD, Virginia Tech, 2016
civ.neu.edu/people/shillaber-craig

Scholarship focus: geotechnical subsurface characterization through in-situ and laboratory methods; quantification of construction energy and carbon; sustainable geotechnics

SELECTED PUBLICATIONS

- C.M. Shillaber, J.K. Mitchell, J.E. Dove
 Energy and Carbon Assessment of Ground Improvement Works I: Definitions and Background, *Journal of Geotechnical and Geoenvironmental Engineering*, 142(3), 2016
- C.M. Shillaber, J.K. Mitchell, J.E. Dove
 Energy And Carbon Assessment of Ground Improvement Works. II: Working Model And Example, *Journal of Geotechnical and Geoenvironmental Engineering*, 142(3), 2016
- E.K. Phillips, C.M. Shillaber, J.K. Mitchell, J.E. Dove, G.M. Filz
 Sustainability Comparison of a Geosynthetic-Reinforced Soil Abutment and a Traditionally-Founded abutment: A Case History, *Proceedings of the Geotechnical and Structural Engineering Congress, ASCE, Reston, VA, 2016*, 699-711
- C.M. Shillaber, J.K. Mitchell, J.E. Dove
 Sustainability Considerations in Deep Mixing Applications, with Examples from LPV 111 in New Orleans, LA., *Proceedings, Deep Mixing, Deep Foundations Institute*, 2015, 511-520
- C.M. Shillaber, J.K. Mitchell, J.E. Dove
 Assessing Environmental Impacts in Geotechnical Construction: Insights from the Fuel Cycle, *Proceedings, GeoCongress 2014, Geo-Characterization and Modeling for Sustainability, Geotechnical Special Publication No. 234, ASCE, Reston, VA, 2014*, 3516-3525
- J.E. Dove, C.M. Shillaber, T. Becker, A. Wallace, P. Dove
 Biologically Inspired Silicification Process for Improving Mechanical Properties of Sand, *Journal of Geotechnical and Geoenvironmental Engineering*, 137(10), 2011, 949-957

MICHAEL B. SILEVITCH



Robert D. Black Professor, COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Civil and Environmental Engineering; Director, CenSSIS

PhD, Northeastern University, 1971
coe.neu.edu/people/silevitch-michael

Scholarship focus: subsurface sensing and imaging systems, detection of explosives related anomalies, engineered system development and engineering leadership

Honors and awards: Life Fellow, Institute of Electrical and Electronics Engineers; 2015 National Academy of Engineering Gordon Prize, for developing an innovative method to provide graduate engineers with the necessary personal skills to become effective engineering leaders

SELECTED RESEARCH PROJECTS

ALERT: Awareness and Localization of Explosives Related Threats, A Department of Homeland Security Center of Excellence. ALERT seeks to conduct transformational research, technology and educational development for effective characterization, detection, mitigation and response to the explosives-related threats facing the country and the world

Director and Principal Investigator, Department of Homeland Security

CenSSIS: Center for Subsurface Sensing and Imaging Systems, Gordon-CenSSIS, a graduated NSF Engineering Research Center, was created to develop new technologies to detect hidden objects, and to use those technologies to meet real-world subsurface challenges in areas as diverse as noninvasive breast cancer detection and underground pollution assessment

Director and Principal Investigator, National Science Foundation

Research and Development of Reconstruction Advances in CT Based Object Detection Systems

Principal Investigator, Department of Homeland Security

JENNIE C. STEPHENS



Dean's Professor of Sustainability Science and Policy, School of Public Policy and Urban Affairs; affiliated faculty, Civil and Environmental Engineering; Associate Director of Strategic Research Collaborations, Global Resilience Institute

PhD, California Institute of Technology, 2002
coe.neu.edu/people/stephens-jennie

Scholarship focus: renewable energy transformation, reducing fossil fuel reliance, energy resilience, energy democracy, integrating social justice with climate and energy innovations

SELECTED PUBLICATIONS

J.C. Stephens, D. Kopin, E.J. Wilson, T.R. Peterson
 Framing of Customer Engagement Opportunities and Renewable Energy Integration by Electric Utility Representatives, *Utilities Policy*, 47, 2017, 69-74

N. Markusson, M.D. Gjefsen, J.C. Stephens, D. Tyfield
 The Political Economy of Technical Fixes: The (mis)alignment of Clean Fossil and Political Regimes, *Energy Research and Social Science*, 23, 2017, 1-10

P.C. Frumhoff, J.C. Stephens
 The Siren Call of US Funding for Solar Geoengineering Research, *Forum on US Solar Geoengineering Research*, Harvard University and University of California, Los Angeles School of Law, 2017

A.M. Feldpausch-Parker, T.R. Peterson, J.C. Stephens, E.J. Wilson
 Smart Grid Electricity System Planning and Climate Disruptions: A Review of Climate and Energy Discourse Post-Superstorm Sandy, *Renewable and Sustainable Energy Reviews*, 2017

E.M. Cody, J.C. Stephens, J.P. Bagrow, P.S. Dodds, C.M. Danforth
 Transitions in Climate and Energy Discourse Between Hurricanes Katrina and Sandy, *Journal of Environmental Studies and Science*, 2016

R. Pearl-Martinez, J.C. Stephens
 Toward a Gender Diverse Workforce in the Renewable Energy Transition, *Sustainability: Science, Practice and Policy*, 12(1), 2016

J.C. Stephens, E.J. Wilson, T.R. Peterson
 Smart Grid (R)Evolution: Electric Power Struggles, Cambridge University Press, 2015

ARON STUBBINS



Associate Professor, Marine and Environmental Sciences; jointly appointed, Civil and Environmental Engineering, Chemistry and Chemical Biology (joining January 2018)

PhD, Newcastle University, 2002
civ.neu.edu/people/stubbins-aron

Scholarship focus: aquatic environmental chemistry; carbon cycle; freshwater, coastal and ocean biogeochemistry; feedbacks between natural biogeochemical cycles and climate change; aquatic microplastics

SELECTED PUBLICATIONS

- A. Stubbins, P.J. Mann, L. Powers, T.B. Bittar, T. Dittmar, C. McIntyre, T.I. Eglinton, N. Zimov, R.G.M. Spencer
Low Photolability of Yedoma Permafrost Dissolved Organic Carbon, *Journal of Geophysical Research - Biogeosciences*, 122(1), 2017, 200-211
- A. Stubbins, L.M. Silva, T. Dittmar, J.T. Van Stan
Molecular and Optical Properties of Tree-Derived Dissolved Organic Matter in Throughfall and Stemflow from Live Oaks and Eastern Red Cedar, *Frontiers in Earth Science*, 5, 2017
- A. Stubbins
A Carbon for Every Nitrogen, *Proceedings of the National Academy of Sciences*, 113(39), 2016, 10736-10738
- M.A. Moran, E.B. Kujawinski, A. Stubbins, R. Fatland, et. al.
Deciphering Ocean Carbon in a Changing World, *Proceedings of the National Academy of Sciences*, 113(12), 2016, 3143-3151
- R. Jaffé, Y. Ding, J. Niggemann, A.V. Vähätalo, A. Stubbins, R.G.M. Spencer, J. Campbell, T. Dittmar
Global Charcoal Mobilization from Soils via Dissolution and Riverine Transport to the Oceans, *Science*, 340(6130), 2013, 345-347

SELECTED RESEARCH PROJECTS

- Linking Microbial Diversity, Gene Expression, and the Transformation of Terrestrial Organic Matter in Major U.S. Rivers
Principal Investigator, National Science Foundation
- The Pulse-Shunt Concept: A Conceptual Framework for Quantifying and Forecasting Watershed DOM Fluxes and Transformations at the MacroSystem Scale
Principal Investigator, National Science Foundation
- Transforming our Understanding of Carbon Dioxide Photoproduction in Oceanic Waters
Principal Investigator, National Science Foundation

ALI TOURAN



Professor, Civil and Environmental Engineering

PhD, Stanford University, 1980
civ.neu.edu/people/touran-ali

Scholarship focus: risk assessment; construction cost/schedule uncertainty; project delivery systems; simulation; construction productivity

Honors and awards: Fellow, American Society of Civil Engineers; President's Award, Boston Society of Civil Engineers

SELECTED PUBLICATIONS

- R. Tapia, D.D. Gransberg, A. Touran
Managing Scheduling Risk due to Geotechnical Uncertainty Using Linear Scheduling, *Proceedings of the Transportation Research Board, Washington, D.C.*, 2017
- R. Masoumi, A. Touran
A Framework to Form Balanced Project Portfolios, *Proceedings of the Construction Research Congress, San Juan, Puerto Rico*, 2016
- A. Touran, J. Liu
A Method for Estimating Contingency based on Project Complexity, *Procedia Engineering, Elsevier*, 123, 2015, 574-580
- A.P. Gurgun, A. Touran
Public-Private Partnership Experience in the International Arena: Case of Turkey, *Journal of Management in Engineering*, 30(6), 2014

SELECTED RESEARCH PROJECTS

- Integrated Project Delivery in Industrial Projects
Co-Principal Investigator, Construction Industry Institute
- Managing a Portfolio of Projects – Metrics for Improvement
Principal Investigator, Construction Industry Institute

GEOFFREY C. TRUSSELL



Professor and Chair, Marine and Environmental Sciences; Director, Marine Science Center; affiliated faculty, Civil and Environmental Engineering

PhD, College of William & Mary, 1998
civ.neu.edu/people/trussell-geoffrey

Scholarship focus: evolutionary and community ecology; coastal sustainability

Honors and awards: Ray Lankester Investigatorship; Sigma Delta Tau Outstanding Professor

SELECTED PUBLICATIONS

- M.E.S. Bracken, J.G. Douglass, V. Perini, G.C. Trussell
 Environmental Context and Scale Mediate the Effects of Biodiversity on Marine Primary Producers, *Ecology*, 98, 2017, 1434-1443
- G.C. Trussell, C.M. Matassa, P.J. Ewanchuk
 Moving Beyond Linear Food Chains: Trait-Mediated Indirect Interactions in a Rocky Intertidal Food Web, *Proceedings of the Royal Society B*, 284(1851), 2017
- S.C. Donelan, J.H. Grabowski, G.C. Trussell
 Refuge Quality Impacts the Strength of Nonconsumptive Effects on Prey, *Ecology*, 98, 2017, 403-411
- O.J. Schmitz, G.C. Trussell
 Connecting Prey Traits and Adaptation to Communities and Ecosystems, *Current Opinion on Behavioral Science*, 12, 2016, 6-11
- C.M. Matassa, S.C. Donelan, B. Luttbeg, G.C. Trussell
 Resource Levels and Prey Body Size Influence Antipredator Behavior and the Strength of Nonconsumptive Predator Effects, *Oikos*, 125, 2016, 1478-1488
- C.M. Matassa, G.C. Trussell
 Effects of Predation Risk Across a Latitudinal Temperature Gradient, *Oecologia*, 177, 2015, 775-784
- S.M. Donelan, G.C. Trussell
 Parental Effects Enhance Risk Tolerance and Performance in Offspring, *Ecology*, 96(8), 2015, 2049-2055

SELECTED RESEARCH PROJECTS

- Collaborative Research: Intertidal Community Assembly and Dynamics: Integrating Broad-scale Regional Variation in Environmental Forcing and Benthic-pelagic Coupling
 Principal Investigator, National Science Foundation
- Collaborative Research: Using an Energetics Framework to Forecast the Interactive Effects of Abiotic and Biotic Stressors on Intertidal Mussels
 Co-Principal Investigator, National Science Foundation

SARA WADIA-FASCETTI



Vice Provost, PhD Network; Professor, Civil and Environmental Engineering

PhD, Stanford University, 1994
civ.neu.edu/people/wadia-fascetti-sara

Scholarship focus: condition assessment methodologies for infrastructure systems; life cycle and life span analysis; nondestructive testing and evaluation; structural and earthquake engineering uncertainty

Honors and awards: American Society of Engineering Education Sharon Keillor Award for Women in Engineering Education; Minorities in Engineering Award, American Society of Engineering Education; National Science Foundation CAREER Award; Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, selected by President Bush and awarded at the White House

SELECTED PUBLICATIONS

- A. Ganguli, C.M. Rappaport, D. Abramo, S. Wadia-Fascetti
 Synthetic Aperture Imaging for Flaw Detection in a Concrete Medium, *NDT & E International*, 45(1), 2012, 79-90
- K. Belli, S. Wadia-Fascetti, C. Rappaport
 Integrated Sensor and Media Modeling Environment Developed and Applied to Ground-Penetrating Radar Investigation of Bridge Decks, *Journal of Computing in Civil Engineering*, 25(1), 2011, 10-20
- K. Belli, C. Rappaport, S. Wadia-Fascetti
 A Time Domain Equivalent Source Model of an Impulse GPR Antenna Based on Measured Radiation Field, *Research in Nondestructive Evaluation*, 22(4), 2011, 197-207

SELECTED RESEARCH PROJECTS

- Northeastern ADVANCE
 Principal Investigator, National Science Foundation
- IGERT: Intelligent Diagnostics for Aging Civil Infrastructure
 Principal Investigator, National Science Foundation
- VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
 Co-Principal Investigator/Deputy Director, National Institute of Standards and Technology

KAI-TAK WAN



Professor, Mechanical and Industrial Engineering;
affiliated faculty, Bioengineering, Civil and
Environmental Engineering

PhD, University of Maryland at College
Park, 1993
civ.neu.edu/people/wan-kai-tak

Scholarship focus: cellular biomechanics;
water filtration; thin film adhesion and
characterization; subsurface mechano-sensing; shell adhesion;
fundamental intersurface forces

Honors and awards: National Science Foundation CAREER
Award; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

- T. Zhu, G. Li, S. Müftü, Kai-Tak Wan
Revisiting the Constrained Blister Test to Measure Thin Film
Adhesion, *Journal of Applied Mechanics*, 84, 2017, 071005
- X. Wang, B. Li, J. Hao, Y.J. Jung, K.-T. Wan
Mechanical Characterization of Suspended Strips of Meshed
Single-Walled Carbon Nanotubes, *Journal of Applied Physics*,
119, 2017, 045305
- M. Robitaille, N. Belisle, S. Dang, E. Faigle, C. Morck, P. Uth,
K.-T. Wan
An Optical Topographic Technique to Map the 3-D Deformed
Profile of a Convex Lens Under External Loading, *Experimental
Mechanics*, 55, 2015, 641-646
- L. Sallaway, S. Magee, J. Shi, F. Quivira, K. Tgavalekos, D.H.
Brooks, S. Muftu, W. Meleis, R.H. Moore, D. Kopans, K.-T. Wan
Detecting Solid Masses in Phantom Breast Using Mechanical
Indentation, *Experimental Mechanics*, 54, 2014, 935-942
- Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A.Z. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular
Mechanic Properties and Cell-Surface Integration Forces with
Microbial Deposition and Transport Behavior, *Environmental
Science and Technology*, 48, 2014, 1769-1778

SELECTED RESEARCH PROJECTS

- Mechanics of Fusion of Dissimilar Lipid BiLayers and Multi-
Lamellar Vesicles
Principal Investigator, National Science Foundation
- Mechanical Integrity and Long Term Reliability of
Photovoltaic Panels
Principal Investigator, National Institute of Standards and
Technology/Department of Energy
- A Novel Biomechanical Model of Bacterial Adhesion
and Aggregation
Principal Investigator, National Science Foundation

MING WANG



COE Distinguished Professor, Civil and
Environmental Engineering

PhD, University of New Mexico, 1983
civ.neu.edu/people/wang-ming

Scholarship focus: network-wide pavement
and bridge deck inspections: sensor
technology for infrastructure; saliva-based
sensor technology for disease diagnosis and
monitoring; structural health monitoring for bridges; subsurface
fault detection using air-coupled GPR systems

Honors and awards: Fellow, SPIE; Søren Buus Outstanding
Research Award, College of Engineering

SELECTED PUBLICATIONS

- Y. Du, W. Zhang, M.L. Wang
An On-Chip Disposable Salivary Glucose Sensor for Diabetes
Control, *Journal of Diabetes Science and Technology*, 2016
- Y. Du, W. Zhang, M.L. Wang
Sensing of Salivary Glucose Using Nano-structured Biosensors,
Biosensors, 6(1), 2016, 10
- W. Zhang, M.L. Wang, S. Khalili, S. Cranford
Materiomics for Oral Disease Diagnostics and Personal Health
Monitoring: Designer Biomaterials for the Next Generation
Biomarkers, *OMICS: A Journal of Integrative Biology*, 20,
2016, 12-29
- W. Zhang, M.L. Wang, S. Cranford
Ranking of Molecular Biomarker Interaction with Targeted DNA
Nucleobases via Full Atomistic Molecular Dynamics, *Scientific
Report*, Nature Publishing Group, 6, 2016, 18659
- N. Martino, K. Maser, R. Birken, M.L. Wang
Quantifying Bridge Deck Corrosion Using Ground Penetration
Radar, *Research in Nondestructive Evaluation*, 27(2),
2016, 112-124
- W. Zhang, Y. Du, M.L. Wang
Noninvasive Glucose Monitoring using Saliva Nano-biosensor,
Sensing and Biosensing Research, 4, 2015, 23-29
- M. Lee, R. Vilbig, D. Busuioc, R. Birken, N. Sun, M.L. Wang
Novel Miniaturized Designs for In-traffic Air-coupled Ground
Penetration Radar Systems, *Journal of Environmental and
Engineering Geophysics*, 20(1), 2015, 71-79
- Y. Zhang, G. McDaniel, M.L. Wang
Pavement Microtexture Measurement using Tire/Road Noise,
Journal of Civil Structural Health Monitoring, 5(3), 2015, 253-261

SELECTED RESEARCH PROJECTS

- VOTERS: Versatile Onboard Traffic Embedded Roaming Sensors
Principal Investigator, National Institute of Standards
and Technology
- Breath and Saliva Based Nano-Bio Sensing System for Disease
Diagnosis and Monitoring
Principal Investigator, Northeastern University

QI RYAN WANG



Assistant Professor, Civil and Environmental Engineering

PhD, Virginia Tech, 2015
civ.neu.edu/people/wang-ryan

Scholarship focus: urban and social resilience; geo-social networking; coupled, human-natural systems, natural disaster response and evacuation; urban computing

SELECTED PUBLICATIONS

- Q. Wang, J.E. Taylor
 Patterns and Limitations of Urban Human Mobility Resilience Under the Influence of Multiple Types of Natural Disaster, *PLoS one*, 11(1), 2016
- Q. Wang, J.E. Taylor
 Process Map for Urban-Human Mobility and Civil Infrastructure Data Collection Using Geosocial Networking Platforms, *Journal of Computing in Civil Engineering*, 30(2), 2015
- Q. Wang, J.E. Taylor
 Energy Saving Practice Diffusion in Online Networks, *Energy and Buildings*, 76, 2014, 622-630
- Q. Wang, J.E. Taylor
 Quantifying Human Mobility Perturbation and Resilience in Hurricane Sandy, *PLoS ONE*, 9(11), 2014

SELECTED RESEARCH PROJECTS

- Neighborhood Connectivity and Social Inequality: Urban Travel Imbalances Based on Google Traffic Data
 Principal Investigator, Northeastern University
- Urban Geosocial Network Resilience
 Principal Investigator, Northeastern University Global Resilience Institute Seed-Funding Program and Microsoft Azure for Research

MISHAC YEGIAN



COE Distinguished Professor, Civil and Environmental Engineering

PhD, Massachusetts Institute of Technology, 1976
civ.neu.edu/people/yegian-mishac

Scholarship focus: geotechnical earthquake engineering; soil dynamics; geosynthetics; seismic response of landfills; base isolation; liquefaction; bridge engineering; use of shaking table in earthquake engineering

Honors and awards: Fellow, American Society of Civil Engineers

SELECTED PUBLICATIONS

- E. Eseller-Bayat, S. Gokyer, M.K. Yegian
 Earthquake Engineering Experimental Facility for Research and Public Outreach, *Seismic Evaluation and Rehabilitation of Structures*, 26, 2014, 379-387
- E. Eseller-Bayat, S. Gokyer, M.K. Yegian, O. Deniz, A. Alshawabkeh
 Bender Elements and Bending Disks for Measurement of Shear and Compression Wave Velocities in Large Fully and Partially Saturated Sand Specimens, *ASTM Geotechnical Testing Journal*, 36(2), 2013, 1-8
- E. Eseller-Bayat, S. Gokyer, M.K. Yegian, E. Ortakci, A. Alshawabkeh
 Design and Application of Simple Shear Liquefaction Box, *ASTM Geotechnical Testing Journal*, 36(3), 2013, 1-9
- E. Eseller-Bayat, S. Gokyer, M.K. Yegian, A. Alshawabkeh
 Liquefaction Response of Partially Saturated Sands: An Empirical Model, *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, 139(6), 2013, 872-879

SELECTED RESEARCH PROJECTS

- Field Application of Induced Partial Saturation (IPS) for Liquefaction Mitigation
 Principal Investigator, National Science Foundation

Wei Cui

PhD 2017, Civil Engineering; Advisor, Luca Caracoglia

PERFORMANCE-BASED DESIGN FRAMEWORK FOR 3D COUPLED WIND- INDUCED RESPONSE OF TALL BUILDINGS IN TURBULENT WINDS

In this study, a novel performance-based analysis framework for tall building structures, located in hurricane-prone regions of the United States, is proposed and introduced. This framework consists of four integral parts: (1) long-term hurricane wind speed prediction model, (2) probabilistic 3D coupled aerodynamic and structural response for tall buildings, (3) wind tunnel testing procedure and protocols to examine the effect of wind load experimental errors on the predictions of building response, (4) numerical analysis method to combine and integrate the results of the three initial parts.

See full dissertation at coe.neu.edu/17/WeiCui

Noushin Fallahpour

PhD 2016, Environmental Engineering;
Advisor, Akram K. Alshawabkeh

ELECTRIC CONDUCTIVITY FOR LABORATORY AND FIELD MONITORING OF INDUCED PARTIAL SATURATION (IPS) IN SANDS

In this study, a series of experiments are conducted to (1) evaluate of the effect of co-existing organic and inorganic compounds on the electrochemical dechlorination of trichloroethylene (TCE) in simulated karst media; and (2) assessment of the impacts of high groundwater flow rates in the presence of palladium (Pd) catalyst on TCE transformation rate and the accumulation of precipitates.

See full dissertation at coe.neu.edu/17/NoushinFallahpour

Reza Ghasemizadeh

PhD 2016, Civil and Environmental Engineering;
Advisor, Akram N. Alshawabkeh

MODELING GROUNDWATER FLOW AND CONTAMINANT TRANSPORT IN THE NORTH COAST LIMESTONE KARST AQUIFER SYSTEM OF PUERTO RICO

Our first study applies an Equivalent Porous Media (EPM) approach to simulate groundwater hydraulics and contaminant transport in NPR karst aquifers. The water-table fluctuation results indicate that the model can practically reflect the steady-state groundwater hydraulics (normalized RMSE of 12.4%) and long-term variability (normalized RMSE of 3.0%) at regional and intermediate scales. Additionally, the EPM approach is capable to reproduce the spreading of a TCE plume at intermediate scales with sufficient accuracy (normalized RMSE of 8.45%). While the field data sparsity often limits the ability to locate and characterize the conduit system, a method is introduced in our second study for modeling the karst conduits. Connecting sinkholes and springs, implemented drain cells improve the developed regional model by simulating the drainage effects of conduit networks on local groundwater table.

See full dissertation at
coe.neu.edu/17/RezaGhasemizadeh

Angelina Louise Jay

PhD 2017, Civil Engineering; Advisor, Andrew T. Myers

EXPERIMENTAL INVESTIGATION OF THE LOCAL BUCKLING AND FATIGUE BEHAVIOR OF SLENDER AND TAPERED SPIRALLY WELDED STEEL TUBES TO ENABLE TALLER WIND TOWERS

The research completed in this dissertation provides an experimental foundation for the design of slender spirally welded tubes for use as wind towers. The work includes large scale testing to assess flexural local buckling strength and performance, including experimental assessment of residual stress fields, detailed measurements of the initial imperfect geometry of the tube, measurements of local deformation during and after the completion of each test to enable analysis of the onset and evolution of local buckling, and an experimental investigation into the fatigue behavior of the weld intersection detail. These experimental results are intended to inform existing codified design methodologies and to enable non-existing, but more sophisticated design procedures.

See full dissertation at coe.neu.edu/17/AngelinaLouiseJay

Anshuman Kunwar

PhD 2017, Civil Engineering; Advisor, Dionisio Bernal

SYSTEM IDENTIFICATION FREE DAMAGE LOCALIZATION

One of the most widely used frameworks for vibration based structural damage identification involves characterizing damage as changes in the modal parameters of the structure between reference and damaged states respectively. Modal parameters are derived from the responses measured from the structure by implementing system identification. The sensitivity of the identified modal parameters to noise and lack thereof to the damage lead to inaccurate identification of parameters and incorrect damage characterization. As an obvious approach to circumvent problems associated with system identification, system identification free damage localization seems a worthwhile venture.

Steady State Shift Damage Localization (S3DL) is the major damage localization technique developed in this thesis. S3DL operate with two different frequency domain vector spaces. One of the vector spaces are derived from the Fourier transform of the measured responses in undamaged and damaged states and regarded as experimental subspace and the other one is called model subspace, formed by using the model of the undamaged structure and the postulated damage. The method operates under the premise that the spatial distribution of loads is invariant in undamaged and damaged state. The method does not require the time histories of the loads.

See full dissertation at coe.neu.edu/17/AnshumanKunwar

Yifeng Lu

PhD 2016, Interdisciplinary; Advisor, Ming L. Wang

MOBILE ACOUSTIC SENSING OF SURFACE WAVES FOR ROAD SUBSURFACE ASSESSMENT

Efficient and economical solutions for monitoring the conditions of transportation infrastructure are in urgent and critical demand in United States. The current state of road and bridge network health of United States has fallen into disturbing circumstances according to recent report cards administered by the American Society of Civil Engineering (ASCE). In 2013, road conditions scored a D and bridges received a grade of C+. The national transportation infrastructure conditions affect not only the lives of average people utilizing roadways, but also the economic efficiency and security of the country. Efforts to monitor the health of transportation infrastructure include examinations of both surface and subsurface levels. Diagnosing problems at the subsurface level is equally as vital for transportation infrastructure as identifying surface level issues. One major technique used to study the state of subsurface infrastructure is the surface wave method which uses mechanical vibration measurements nondestructively. The subsurface profile information, such as stiffness and layer thickness, is measured from the dispersion characteristics of the ground by exciting surface waves and then picking up their vibration responses.

See full dissertation at coe.neu.edu/17/YifengLu

Justin Adam Murray

PhD 2016, Civil Engineering; Advisor, Mehrdad Sasani

EVALUATING SEISMIC COLLAPSE RESISTANCE OF NON-DUCTILE RC FRAME STRUCTURES

In this project, to evaluate the seismic response of nonductile RC frame structures at both the element and system levels, a series of four hybrid simulations were conducted on RC structures representative of pre-1970s construction under severe seismic ground motion. Hybrid simulation is a method which combines physical test specimens with an analytical model to capture the response of an entire system. In each simulation, multiple full-scale RC columns were tested at the Multi-Axial Full Scale Sub-Structured Testing & Simulation (MUST-SIM) lab at the University of Illinois at Urbana Champaign. The remainder of the full three-dimensional structural system was modeled analytically in the computer program OpenSees. Shear-axial failures occurred in the physical specimens as a result of the ground motion, and the hybrid nature of the test allowed for study of the system-level response of the surrounding structural system.

See full dissertation at coe.neu.edu/17/JustinAdamMurray

Leila Pourzahedi

PhD 2016, Environmental Engineering;
Advisor, Matthew J. Eckelman

ENVIRONMENTAL IMPACT ASSESSMENT OF NANOPARTICLES AND NANO-ENABLED PRODUCTS USING LCA FRAMEWORKS

This work makes meaningful contributions to the field of nano-LCA through generation of consistent and comparative life cycle inventory data sets on manufacturing nanoparticles and nano-enabled products, as well as model development through function-based expression of results. Findings of these studies could potentially influence material and process selection, help prioritize of research and development measures including green chemistry efforts, and guide evolving policy discussions on nano labeling and regulation.

See full dissertation at coe.neu.edu/17/LeilaPourzahedi

Mithun Saha

PhD 2016, Environmental Engineering;
Advisor, Matthew J. Eckelman

GEOSPATIAL MODELING OF URBAN BUILDINGS AND LAND USE FOR CLIMATE CHANGE IMPACTS AND RESOURCE PRODUCTIVITY

Urbanization is expected to continue, with more than two-thirds of the world's population likely to live in urban areas by 2050, leading to a net urban influx of approximately 2.5 billion people. Existing infrastructure must be equipped to address this dramatic urban growth while also adapting to potential adverse impacts of climate change and other natural hazards. To be sustainable, cities must themselves, become efficient users of materials and energy as well as respond to future climatic conditions. Two main urban engineering strategies are to map how current stocks may respond to climate change and to identify resources that could be used to improve local productive capacity and reduce dependencies on distant resources. The dissertation herein addresses these two overarching strategies through a series of specific case studies for the Boston area using GIS based urban stock assessment as a framework.

See full dissertation at coe.neu.edu/17/MithunSaha

Alexandra Eileen Penney Schellenger

PhD 2016, Environmental Engineering;
Advisor, Philip Larese-Casanova

OXYGEN ISOTOPE EFFECTS IN SELENATE DURING SELENIUM REDOX CYCLING

This work develops the applicability of oxygen stable isotope analysis for the purpose of identifying and examining selenium oxyanion transformations and immobilization in natural systems. Oxygen isotopes may be used in conjunction with selenium isotopes to provide a more complete picture of selenium cycling. The immobilization of selenate via reduction by the layered double hydroxide (LDH) chloride green rust was found to cause a fractionation in the oxygen isotope of selenate, resulting in enrichment of the heavier isotope (22.7‰) much larger than the one identified for selenium isotopes for reduction by green rust. The biotic reduction of selenate by the bacterium *Sulfurospirillum barnesii* resulted in enrichment of the heavy oxygen isotope (1.5-5.8‰) that was distinct from the value found for reduction by green rust, indicating that these isotopes may be useful for distinguishing between the two dominant methods of selenate reduction in natural systems. These experiments also suggest that mass transfer prior to reduction may have a muting effect on fractionation of the oxygen isotope. Kinetic questions raised by the isotope work with chloride green rust were addressed through sorption experiments of selenate and selenite by the non-reducing LDH pyroaurite.

See full dissertation at
coe.neu.edu/17/AlexandraEileenPenneySchellenger

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DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

400 Snell Engineering Center
Northeastern University
360 Huntington Avenue
Boston, MA 02115

P 617.373.2444
F 617.373.4419

civ.neu.edu
coe.neu.edu

COVER IMAGE

Ameet Pinto, assistant professor, and Maria Sevillano, PhD'20, work on preparing samples for DNA extraction to characterize nitrifying bacteria in full-scale wastewater treatment plants.

