NSF ASCENT Conference:

Accelerating integrated

Seabed

Characterization for clean

ENergy

Transition

November 19-20, 2024   Boston, Massachusetts

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CREDIT: NORTON / DOE

ASCENT Conference

Project Title

Accelerating integrated Seabed Characterization for clean Energy Transition (ASCENT)

Conferences on Clean Energy Topics

US National Science Foundation (NSF) DCL 23-108
NSF Division of Chemical, Bioengineering, Environmental and Transport Systems (ENG/CBET)
NSF Program Manager: Carole Read
NSF Award Number 2346179

Principal Investigator:

Zack Westgate, University of Massachusetts Amherst

Co-Principal Investigators and Collaborators:

Jimi Oke, University of Massachusetts Amherst
Julie Brigham-Grette, University of Massachusetts Amherst
Don DeGroot, University of Massachusetts Amherst
George Hagerman, National Renewable Energy Laboratory
Charles Aubeny, Texas A&M University
Robert Gilbert, University of Texas Austin

Venue

UMass University Club, 1 Beacon Street
32nd Floor
Boston, Massachusetts
19 and 20 November 2024

Photo: UMass Club

Overview

Annual installations of offshore wind in the United States are anticipated to reach close to 50 GW by 2030, with the aim to reach 2,000 GW and net zero emissions by 2050. Scaling up such a transition without further contribution to climate change and ecological harm in the process requires technological innovation in geoscience and engineering. Offshore site characterization include technical, economic, and environmental challenges related to ground model definition, in situ data recovery, uncertainty in stratigraphy soil parameterization, and supply chain constraints, and noise emissions. Revolutionizing the seabed characterization process based on integrated cross-disciplinary scientific understanding offers an opportunity to reshape the offshore energy industry's approach to data collection, testing, analysis, and interpretation, unlocking opportunities to streamline the site characterization process and minimize economic and environmental impacts (Figure 1).
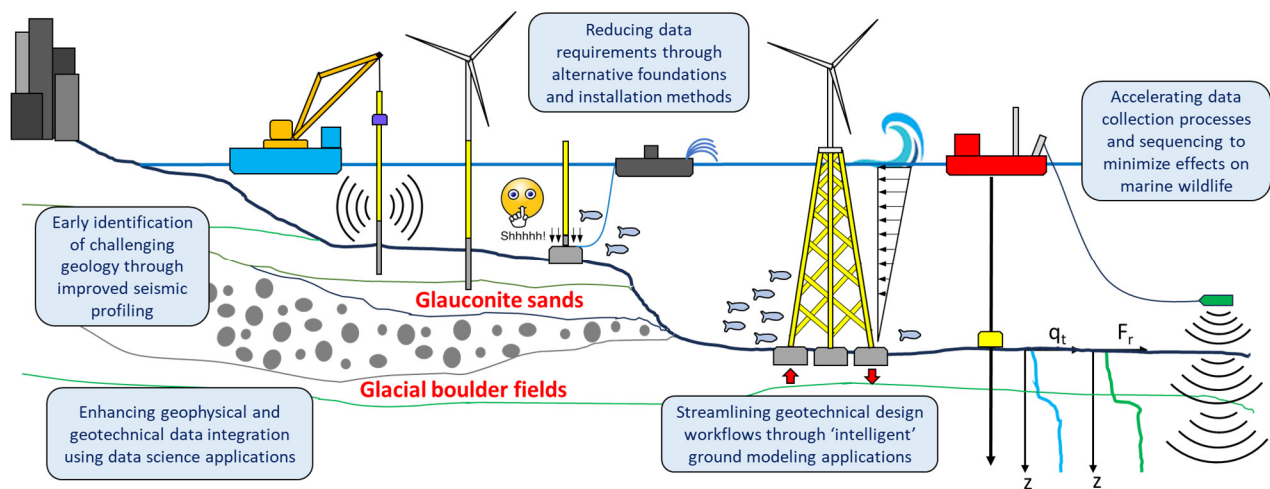
Figure 1. Offshore wind site characterization challenges and opportunities

Geodata is currently required at every offshore foundation location as per Bureau of Ocean Energy Management requirements. Offshore wind farms can now exceed 400 square kilometers, an order of magnitude larger than early offshore wind farm developments and most oil and gas developments. The conventional approach to seabed characterization is not fit for purpose given the scale of the clean energy transition. Managing seabed uncertainty through traditional means over the next decade will require an unprecedented volume of geophysical and geotechnical data, the sheer scale of which is well beyond the capacity of the existing vessel fleet. Significant innovation opportunities lie with smarter seabed characterization through integration of data science, geoscience, engineering, and decision making with a high potential for transformative change to develop more intelligent site characterization methods.

This conference aims to promote transformative cross-disciplinary innovation in integrated seabed characterization methods that will (1) chart a smart, energy-driven course on a pathway to net zero, (2) influence policy and industry guidelines in data collection requirements and data science integration, and (3) deliver tangible positive outcomes in ocean space equity. The overarching challenge we are seeking to address is how the advancement of seabed characterization through improved quantification of geodata uncertainty and ground model reliability can minimize the use of raw materials in foundation construction, minimize survey and installation vessel supply chain constraints, minimize impacts on marine wildlife and other ocean space users, and maximize design life to lower the carbon footprint and economic cost of offshore renewables development.

Conference participants (Figure 2) represent a geographically diverse group of US-based and international stakeholders comprising offshore wind developers, consultants, contractors, and government regulators. Academic participants include a diverse selection of established experts in offshore site characterization, geosciences and geotechnics across all levels of academia. Discussion will focus on the urgent regional challenges in the US related to seabed characterization for monopile foundation design of fixed bottom turbines, maximizing local societal benefits while ensuring that broader knowledge advancements are globally applicable. Participant engagement will be used to understand regulatory perspectives on project data requirements, challenge state of practice methods on data collection and interpretation, and promote advances in state of art approaches to data integration through application of data science techniques.

Figure 2. Conference participants

Conference Agenda

The structure of the conference comprises a series of panel discussions and breakout sessions covering four overall themes spanning seabed characterization: (i) data requirements, (ii) data collection and interpretation, (iii) data integration, and (iv) data science application. The conference agenda is presented below. The conference will conclude with discussion of the breakout sessions with the aim of identifying aspects of existing data science technologies not yet utilized in geoscience and geotechnical engineering applications, with the aim of outlining future research needs and establish new collaborative connections between participants.

Day 1 - Tuesday 19 November 2024 – UMass Club Amherst Room

Start	End	Agenda		Participants
		Welcome		
7:00	8:00	***Breakfast***		
8:00	8:05		Welcome and opening address	Zack Westgate
8:05	8:15		Conference objectives and overview	Zack Westgate
Data Requirements Session				George Hagerman
8:15	8:30		Presentation	Betsy Andrews
8:30	9:15		Panel session	Betsy Andrews Eric Empey Wright Frank Nick Izzo Yiorgos Perikleous
9:15	10:00		Breakout sessions	All attendees
10:00	10:15		Breakout summary	Session moderators
10:15	10:30	***Refreshment break***		
Data Collection and Interpretation Session				Julie Brigham-Grette
10:30	10:45		Presentation	James Fisher
10:45	11:30		Panel session	Diane Baxter Laura Brothers Brandon Dugan James Fisher John Madsen
11:30	12:15		Breakout sessions	All attendees
12:15	12:30		Breakout summary	Session moderators
12:30	13:30	***Lunch***		

Day 1 - Tuesday 19 November 2024 - continued

Start	End	Agenda		Participants
Data Integration Session				Don DeGroot
13:30	13:45		Presentation	Maarten Vanneste
13:45	14:30		Panel session	Chuck Aubeny Deanne Hargrave Rodolfo Sancio Tor Inge Yetginer-Tjelta Maarten Vanneste
14:30	14:45	*Refreshment break*		
14:45	15:30		Breakout sessions	All attendees
15:30	15:45		Breakout summary	Session moderators
Daily Wrap-up				
15:45	16:00		Session summary and actions	Zack Westgate
16:00	18:00	*Cocktail Reception – Lowell Room*		

Day 2 – Wednesday 20 November 2024 – UMass Club Amherst Room

Start	End	Agenda		Participants
		Welcome		
7:30	8:30	*Breakfast*		
8:30	8:35		Welcome address	Zack Westgate
4. Data Science Session				Jimi Oke
8:35	8:50		Presentation	Zenon Media-Cetina
8:50	9:35		Panel session	Nezam Bozorgzadeh Haibin Di Arghavan Louhghalam Zenon Media-Cetina
9:35	10:20		Breakout sessions	All attendees
10:20	10:35		Breakout summary	Session moderators
10:35	10:50	*Refreshment break*		
Daily Wrap-up				
10:50	11:50		Session summary and actions	Session moderators
11:50	11:50	**Close**		
11:50	12:00		Closing address	Zack Westgate

Breakout Session Groups

Group 1	Group 2	Group 3
Chuck Aubeny	Don DeGroot	Betsy Andrews
Julie Brigham-Grette	Eric Empey	Diane Baxter
Laura Brothers	George Hagerman	Haibin Di
Nezam Bozorgzadeh	Deanne Hargraves	Brandon Dugan
Ophelia Christoph	Shengmin Luo	Mertcan Geyin
Claire Delaney	John Madsen	Dongdong Guo
James Fisher	Zenon Medina-Cetina	Ning Lou
Wright Frank	Aldiyar Mukhatzhanov	Monica Maher
Fei Han	Yiorgos Perikleous	Jimi Oke
Nick Izzo	Tor Inge Yetginer-Tjelta	Renee Richards
Arghavan Louhghalam	Maarten Vanneste	Morteza Shafiei
Gopu Potty	Yuanjing Zou	Rodolfo Sancio

Planning & Analysis	**Leasing**	**Site Assessment**	**Construction & Operations**
~ 2 YEARS	~ 1-2 YEARS	UP TO 5 YEARS	~ 2 YEARS (+25)
• Intergovernmental Task Force	• Publish Leasing Notices	• Site Characterization	• Construction and Operations Plan
• Request for Information or Call for Information and Nominations	• Conduct Auction or Negotiate Lease Terms	• Site Assessment Plan	• Facility Design Report and Fabrication and Installation Report
• Area Identification	• Issue Lease(s)		• Decommissioning
• Environmental Reviews			• Environmental and Technical Reviews

BOEM offshore wind project regulatory framework (circa 2023)

Panel Discussion and Breakout Session Topics and Questions

1. DATA REQUIREMENTS

Panel Discussion: Optimization of Data Collection Programs and Timelines for Seabed Characterization

Panel questions	
1	How do stakeholders drive the definition of the ground model structure and need for ground data quantities? Are they driving meaningful requirements? Should/how should they evolve?
2	Do we standardize site characterization at earlier stages collecting data required for all assets (turbine locations, cable routes, benthic habitat, archeologically sensitive areas?)
3	How can we move away from multi-phased site investigations? Do we have the right tools to meaningfully tailor requirements to ground condition variability?

Breakout Session Questions:

Theme 1 Data informing project timelines/budgets (risks/opportunities – next steps)	
1	Is the current project design envelope approach helping to reduce timelines, or is just more work for developers and regulators?
2	Are there specific site investigation-related supply chain constraints on the critical path which risk controlling the project timelines/undermining business cases/threatening compliance?
3	NYSERDA experimented with the Dutch model for site characterization of lease areas. Did it work?

Theme 2 Is there a point of diminishing returns? (cost/benefit)	
1	Can we leverage economy of scale in site investigations?
2	How do we ensure value-for-investment? Can we in the geophysical and geotechnical space (survey contractors, consultants, developers) influence this?

2. DATA COLLECTION AND INTERPRETATION

Panel Discussion: Addressing Uncertainty in Geotechnical and Geophysical Data Collection Methods, Processing Techniques, and Interpretation Approaches

Panel questions	
1	How can we improve the reliability and efficiency of geophysical (seismic/sub-bottom profiler) interpretation for ground model development?
2	How can we reduce uncertainty in cone penetration testing / other in-situ data for better geotechnical characterization?

Breakout Session Questions:

Theme 1 Improving the reliability and efficiency of geophysical data	
1	What is the role of acquisition and processing high-quality data production?
2	What should the industry consider as standardization of geophysical data collection methods?
3	Can we define "good" geophysical interpretation while addressing the non-unique nature of geophysical data?
4	How do we streamline assessment and manual picking of horizons in seismic data within complex geological settings?
5	Can we use advanced software tools and computing power for large datasets?

Theme 2 Reducing uncertainty in CPT/in situ data	
1	Importance of ground-truthing CPT data to address uncertainty of interpreted CPT parameters
2	Integration of CPT and seismic data considering lateral and vertical variability
3	Balancing risk reduction (reducing uncertainty) with cost and schedule impacts, especially as data volumes are increasing
4	Importance of geodata uncertainty for insights on advanced analysis techniques (e.g., use of AI for predicted CPT data generation)

3. DATA INTEGRATION

Panel Discussion: Collaboration Between Geosciences and Geotechnical Engineering and Defining Ground Model Uncertainties

Panel questions	
1	Is there enough collaboration between geosciences and geotechnics in the 3D ground model development?
2	How do we weigh uncertainties when collating multiple sources into geotechnical design profiles?

Breakout Session Questions:

Theme 1 Ground model development	
1	How do we define predictive CPT and associated uncertainties?
2	What is the role of geostatistics in building the ground model?

Theme 2 Soil unit definition and parameterization	
1	How do we reduce reliance on (index vs advanced) geotechnical lab data?
2	US east coast geology is extremely complex. How do we balance the risk-cost tradeoff of too many soil units versus insufficient precision?

Theme 3 CPT tools and design approaches	
1	How reliable are CPT-based approaches for soil parameterization and site characterization when considering the high degree of variability along the US east coast?
2	How far can engineering tools (e.g. direct CPT design approach) bolted onto 'intelligent' ground models be taken into detailed design?

4. DATA SCIENCE

Panel Discussion: Increasing Reliability in Offshore Wind Characterization Through Data Science Applications

Panel questions	
1	What types of data analysis methodologies / techniques are best suited to our data sets and producing probabilistic predictions?
2	Can data science applications improve risk management in order to reduce project development timelines?

Breakout Session:

Theme 1 Predictive model selection and definition	
1	What is driving the functional form of our models? Should they be physics-based or data-driven?
2	What components of uncertainty are we trying to reduce (epistemic) or quantify (aleatoric) with data science applications?

Theme 2 Predictive model application	
1	What shortcomings exist in producing predictive CPTs using machine learning?
2	What is the difference between interpolated/extrapolated data and predictive CPT data, e.g. as it relates to vertical and lateral stratigraphic variation?
3	When do we begin using predictive models? How do these differ depending on the data or phase? Are there multiple opportunities to inject new data?
4	How do we best manage the risk due to uncertainty in site conditions through balancing efforts to reduce the uncertainty before design, to adapt to uncertain conditions during construction, and to account for the uncertainty in design?

Suggested Reading Material

There is extensive literature on each of the four conference themes. Recent papers / guidelines describing the state of practice and art in each of the main areas are listed below.

Data requirements:

DeGroot, D.J., Westgate, Z. and Yetginer-Tjleta, T.I. (2023). **Geological and geotechnical challenges of the East Coast United States for offshore energy transition**. Keynote Lecture/Paper. *Proc. 9th Int. Offshore Site Investigations and Geotechnics Conference*, London, Sept 2023. https://www.youtube.com/watch?v=xi2MSY99cR0.

Data collection / interpretation:

Cook, M., et al. (2022). **Guidance notes for the planning and execution of geophysical and geotechnical ground investigations for offshore renewable energy developments,** SUT Offshore Site Investigation and Geotechnics Committee, September 2022, 71p.

Data integration:

Vanneste, M., Sauvin, G., Dujardin, J-R, Forsberg, C.F., Klinkvort, R.T., Forsberg, C.S., and Hansen, R.C. (2022). **Data-driven ground models: the road to fully-integrated site characterization and design.** Keynote Lecture/Paper. *Proc. 2nd Vietnam Symp. on Advances in Offshore Engineering*, Ho Chi Minh City, Oct 2022.

Data science application:

Stuyts, B., and Suryasentana, S. (2023). **Applications of data science in offshore geotechnical engineering**. Keynote Lecture/Paper. *Proc. 9th Int. Offshore Site Investigations and Geotechnics Conference*, London, Sept 2023.

Participants should familiarize themselves with this background material prior to the conference.

## ASCENT Conference Attendees Bios

Dr. Elizabeth Dewing Andrews is the Director of Offshore Development for Avangrid Renewables. She has a doctorate in geospatial analysis in maritime archaeology from University of Southampton, UK and over 13 years of industry experience in offshore wind. She has previously held roles as lead geophysicist for offshore survey contractor, EGSi, for Ørsted in their UK/EU and US portfolios and, most recently, for Avangrid Renewables where she also supported their geotechnical discipline. In her current role, she integrates her technical background with management of project permitting, siting, business case and pathway to market considerations. LinkedIn - Andrews

Dr. Charles Aubeny is a professor of civil engineering at Texas A&M University and a registered engineer. He has over 40 years of experience in geotechnical engineering, including foundations and anchor for traditional oil-gas facilities and offshore renewable energy. He recently founded as start-up company, Deep Anchor Solutions to develop efficient anchors for floating renewable energy systems. His research focuses on the performance of all aspects of offshore geotechnics, including piles, suction caissons, drag anchors, pipelines, and mat foundations. He received the ASCE Middlebrooks Award is a Fellow in ASCE.

Dr. Diane Baxter is the US Engineering Manager for Cathie Group. She is responsible for project delivery, building client relations, business development, and driving new initiatives in the US market. She is a registered professional engineer with 26 years of geotechnical engineering experience with offshore, marine, and land based geotechnical projects. In the past 3 years she has worked at Cathie Group on various US offshore wind projects providing geotechnical interpretive reports, laboratory testing and borehole positioning strategies, cable routing studies, cable burial risk assessment, and Marine Site Investigation Reports submitted as part of the COPs. LinkedIn - Baxter
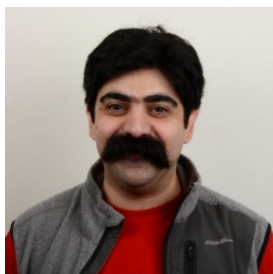
Dr. Nezam Bozorgzadeh has a Ph.D. in Civil Engineering from University of Toronto, and further research experience from post-doctoral fellowships at Geo-Engineering Centre at Queen's-RMC (Canada) and the Norwegian Geotechnical Institute (NGI). He has been working at NGI since 2022. His research interest and expertise include probabilistic (reliability-based) soil and rock engineering design, calibration of partial/resistance factor for design standards, and applied Bayesian data analysis, currently focusing on uncertainty quantification and propagation for offshore windfarm foundation design. Google scholar; LinkedIn

Prof. Julie Brigham-Grette is a Professor of Quaternary Geology at UMass Amherst with 40 years of research expertise in Arctic climate change recorded in the ocean and terrestrial sediment records of Alaska, NE Arctic Russia and the Arctic seas. She is especially knowledgeable about climate change over the last few million years, including the history of Arctic sea ice, sea level, continental shelf stratigraphy, and western Arctic landscape change. She is currently engaged with the people of Mekoryuk and Kongiganak AK via the NSF Navigating the New Arctic Program and landscape change. LinkedIn - Brigham-Grette

Dr. Laura Brothers is a marine geologist at the USGS Woods Hole Coastal and Marine Science Center. She studies how the seafloor, and the earth beneath the seafloor change with time and major events. Laura leads USGS projects focused on defining the geologic framework offshore of the Delmarva peninsula, geologically mapping the state waters of Massachusetts, as well as inter-agency projects with BSEE and BOEM to characterize seabed hazards and habitats associated with offshore wind sites and cabling.

Ophelia Christoph is a dedicated Ph.D. student in Geological Sciences at the University of Delaware with a research focus on offshore wind energy and geological modeling for foundation recommendations on the Mid-Atlantic Bight. Her work integrates advanced sonar mapping techniques and subsurface analysis, with a strong emphasis on environmental impact and foundation stability for wind farm installations. Ophelia is an active member of scientific communities, presenting frequently and engaging in research on innovative mapping and AI tools for marine studies. She has a proven track record in collaborative research and fieldwork and is committed to advancing sustainable energy solutions. Ophelia's LinkedIn

Claire Delaney is a masters student at the University of Massachusetts Amherst. She holds a bachelor's degree in civil and environmental engineering also from UMass Amherst. She began lab work in the junior year of her undergraduate studies, working to quantify sample disturbance of silt. She now works with varved clay in the Connecticut valley and has assisted works involving glauconitic sand samples from the eastern continental shelf of the US. LinkedIn – Claire Delaney
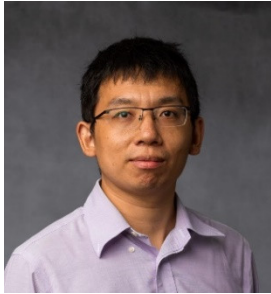
Dr. Haibin Di is a Senior Data Scientist of Digital Subsurface Solutions at SLB based in Houston, Texas. His work focuses on developing deep learning solutions to multiple subsurface challenges, including seismic anomaly detection, seismic well tie, and property inversion, with applications to both hydrocarbon exploration and windfarm site characterization. He is active within Society of Applied Geophysics (SEG), and European Associate of Geoscientists & Engineers (EAGE) as a Member of SEG Research Committee and IMAGE Technical Program Committee as well as an Associate Editor of Geophysics, Geophysical Prospecting, and IEEE Geoscience and Remote Sensing Letters.
Haibin Di | LinkedIn

Dr. Brandon Dugan is a Professor of Geophysics and Baker Hughes Chair at Colorado School of Mines. Dugan's research couples theory, experiments, and models to understand the interactions of fluids and solids in Earth's shallow crust. His current research emphasizes onshore-offshore groundwater systems and submarine landslides. To ground truth this marine-based research, he regularly participates in geophysical, geological, and field programs (12 total field projects, 4 as co-chief scientist). For his contributions to marine geosciences, Dugan received the 2018 Asahiko Taira International Scientific Ocean Drilling Research Prize by the American Geophysical Union/Japan Geoscience Union.

Dr. Don J. DeGroot is a professor of Civil Engineering at UMass Amherst and a registered professional engineer. His 35 years of teaching and research experience is primarily in soil behavior with an emphasis on field and laboratory measurements for geotechnical engineering site characterization programs. He has served and continues to serve as PI/Co-PI on numerous offshore wind geotechnical engineering research projects including the current Joint Industry Project on piling in glauconite sands. He has been a consultant to developers for several commercial offshore wind projects and is Chair of the Subcommittee on Laboratory Testing for the ISO Marine Soils Investigations Standard. LinkedIn - DeGroot

Eric H. Empey is the Director of Operations for the Belgian based contractor DEME GROUP, leading operations for DEME's US projects, including Vineyard Wind 1 (Foundations, Scour & Turbines), Coastal Virginia Offshore Wind Project (Foundations, Scour & Cables) South Fork Wind, (Export & Array Cables) and Empire Wind (Array Cables). Eric is a Massachusetts native with over 25 years of experience working overseas on offshore EPCI projects in Oil & Gas, specializing in the installation of subsea pipelines, installation and removal of fixed bottom platforms and subsea intervention works across the Globe. He made the transition into renewables in 2021 with DEME's entrance into the blossoming US Wind industry and facilitating his return to the region after years abroad.

Robert Gilbert P.E., Ph.D., D.GE, NAE is Chair of the Maseeh Department of Civil, Architectural and Environmental Engineering at The University of Texas at Austin. He joined the faculty in 1993 after practicing as a geotechnical engineer for five years with Golder Associates Inc. His technical focus is the assessment, evaluation and management of risk for civil engineering systems. He has worked on a variety of large infrastructure projects, including the New Orleans levee system, the east span of the San Francisco Bay Bridge, the Rocky Mountain Arsenal waste disposal project, and many of the world's largest offshore energy production systems. He was elected to the National Academy of Engineering in 2020.

James Fisher has over 15 years of professional experience with marine infrastructure projects involving geoscience and geotechnical engineering. His project experience includes the offshore renewable energy, oil and gas, and transportation/infrastructure industries, with projects in Australia, Southeast Asia, Africa, Canada, Europe, South America, and the US (Atlantic OCS, Gulf of Maine, Gulf of Mexico, and Pacific OCS). He has led integrated geophysical and geotechnical site investigations and characterization (ground model development) projects, acted as a program manager for offshore wind projects, and conducted geohazard and geological assessments. James earned his MS Engineering Geology from Kent State University (Kent, Ohio) and his BS Geophysics from SUNY Fredonia (Fredonia, New York). LinkedIn Profile – James Fisher

Wright J. Frank is the Chief of the Renewable Energy Policy Group in the Bureau of Ocean Energy Management at the Department of the Interior. His team provides strategic and practical leadership on a host of issues facing the program, from rulemakings and standard operating procedures to lease sales and bidding credits. Wright started with the renewable energy program in 2009 and was the auction manager for BOEM's first seven offshore wind lease sales. Before moving to BOEM, he was an energy attorney focused on Federal energy law in Washington DC.

Dr. Mertcan Geyin is a geotechnical engineer at NGI Boston office, specializing in earthquake engineering, liquefaction hazard assessment, and site characterization. His research spans from sand particle interactions to regional geohazard modeling, utilizing extensive datasets. He completed his master's research at Virginia Tech on experimental modeling of sand particles and his PhD on liquefaction analytics, where he curated the world's largest CPT-based liquefaction case-history database and developed fragility and vulnerability functions in the context of Performance-Based Earthquake Engineering. During his postdoctoral studies at the University of Washington, he integrated artificial intelligence into complex geotechnical problems. He has co-authored over 15 peer-reviewed papers in international journals and conferences. LinkedIn - Geyin | Google Scholar - Geyin
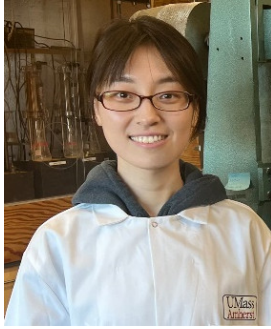
Dr. Dongdong Guo completed her PhD in geotechnical engineering in July 2024 at the University of Chinese Academy of Sciences on the engineering behavior of modified bentonite-based materials in barrier systems. During the latter part of her PhD studies, she was also a visiting graduate student in geotechnical engineering at UMass Amherst working under the supervision of Professors Don DeGroot and Zachary Westgate. At UMass Amherst she has been conducting research on the direct simple shear and thixotropic behavior of degraded glauconite sands. In Dec 2024, she will commence a Postdoctoral Scholar appointment in geotechnical engineering at UMass Amherst continuing her research on the behavior of glauconite sands.

Mr. George Hagerman is Offshore Wind Techno-Economic Lead at the National Renewable Energy Laboratory (NREL). He has over forty years' experience in desktop evaluation and techno-economic analysis of ocean renewable energy systems. During the past 18 years, his research has focused on offshore wind. This includes leading a team of five state universities in Virginia's first offshore wind study. Published in April 2010, the study included a recommendation for design and construction of a demonstration project, and this contributed to Dominion Energy's decision to install the 12-MW Coastal Virginia Offshore Wind pilot project on Virginia's research lease in June 2020. LinkedIn - Hagerman

Dr. Fei Han is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of New Hampshire (UNH). He received his Ph.D. degree in 2017 at Purdue University in Indiana, where he continued to work as a post-doctoral researcher before joining UNH. Dr. Han works on geomechanics, AI/ML for infrastructure asset management, transportation safety, and urban system design and planning. Dr. Han serves as the secretary of the Technical Committee (TC205 safety and Serviceability in Geotechnical Design) for ISSMGE. He is a member of two technical committees (Deep Foundations, and Engineering Geology and Site Characterization) at ASCE. He also serves on the Standing Committee (Foundations of Bridges and Other Structures) at Transportation Research Board (TRB).Google Scholar | LinkedIn

Deanne Hargrave, P.E. is Geoscience Manager for Atlantic Shores Offshore Wind, a joint venture between EDF Renewables and Shell Renewable Energy Solutions, Deanne is a recognized expert in marine shallow hazards and offshore development surveys with more than 25 years experience leading teams, planning, executing and delivering large complex geoscience projects. Deanne is an active member in the geoscience community, currently a panel member of The NOAA Hydrographic Services Review Panel and several Society of Underwater Technology working groups. As an early adopter of new technology, Deanne brings technical insight to these working groups and to the offshore wind industry. LinkedIn - Hargrave

Nick Izzo is a senior geotechnical engineer with Ørsted in Providence, Rhode Island. He has 10 years of experience in onshore, nearshore, and offshore geotechnics including site characterization and ground modelling, foundation design and installation, and cable design and installation. He currently leads geotechnical site investigation campaigns and geotechnical site characterization for Ørsted's US development portfolio. He is a registered professional engineer in New York and Louisiana. Nicholas Izzo, P.E. | LinkedIn

Dr. Arghavan Louhghalam is an Associate Professor of Civil Engineering at UMass Lowell. Her research focuses on developing innovative solutions to enhance the sustainability and resilience of civil infrastructure systems. By leveraging advanced modeling techniques and data-driven approaches, she aims to improve the understanding of how infrastructure systems perform under extreme conditions while also assessing the environmental impact of design and maintenance decisions at the system level. She is a recipient of the NSF CAREER award, and her work on citizen-enabled crowdsourced monitoring of civil infrastructure has been recognized nationally and featured in media outlets such as *The New York Times.* LinkedIn - Louhghalam

Dr. Ning Luo is an assistant professor in civil engineering at Texas A&M University-Corpus Christi. He obtained his Ph.D. degree in geotechnical engineering from Queen's University in 2017. Dr. Luo's research interests include Coastal/Offshore Geotechnics, Transportation Geotechnics, Risk and Reliability Analysis, Extreme Climate Events on Geotechnical Infrastructures, Field Instrumentation and Monitoring. He is currently an Associate Member of the Offshore Site Investigation and Geotechnics Committee (SUT-OSIG-US), a member of the Risk Assessment Management Committee (GI-ASCE), and the Nearshore Extreme Events Reconnaissance (NEER) and Geotechnical Extreme Events Reconnaissance (GEEN) Associations sponsored by NSF. https://www.professor-ning-luo.com/
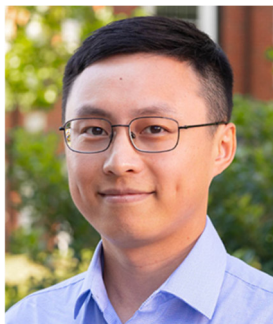
Dr. Shengmin Luo is an assistant professor in Civil and Environmental Engineering at Western New England University, specializing in geotechnical engineering. His current research interests mainly center on soil behavior under extreme weather conditions and offshore site characterization, with an emphasis on challenging subsurface conditions including the presence of boulders. He has been involved in several NSF and industrial projects, during which he authored a few journal articles. He is an associate editor for Vadose Zone Journal and a member/associate member on several technical committees including the SUT Offshore Site Investigations and Geotechnics.

Dr. John A. Madsen is an associate professor of Earth Sciences at the University of Delaware (UD). His research on offshore wind is focused on the influence of the geological/geotechnical setting of continental margins on the siting and development of offshore wind projects. He is the Associate Director for Education Programs for UD's Center for Research in Wind (CReW) and a Co-Director of UD's Offshore Wind Skills Academy. He is also a Co-PI of the Massachusetts Clean Energy Center's funded KidWind Academy, a summer week-long program for high school students from Massachusetts gateway cities to learn about wind energy and the offshore wind industry.

Monica M. Maher, PE is an offshore wind energy senior technical advisor at Lindahl Reed supporting DOE's Wind Energy Technologies Office which funds research nationwide to enable the development and deployment of wind energy technologies. She oversees research and technology development projects and provides strategic program planning to advance and expand the offshore wind energy portfolio. Her background includes structural engineering, ocean engineering, power systems, and construction.
LinkedIn - Maher

Dr. Zenon Medina-Cetina is associate professor at the Zachry Department of Civil & Environmental Engineering at Texas A&M University. He has over 28 years of experience on probabilistic site characterization and design of geo-systems (onshore and offshore); and on the risk modelling of regional social, economic, and environmental interdependent systems. He currently serves as the Chair of the Risk Assessment and Management technical committee (RAM) of the ASCE's Geo-Institute. He is a Fellow of the Society for Underwater Technology (SUT), former President of the SUT in the US, and former Chair of SUT-US' Offshore Site Investigations and Geotechnics Committee (OSIG). LinkeIn - Medina-Cetina

Aldiyar Mukhatzhanov is a PhD candidate in the Department of Earth and Planetary Sciences at Rutgers University. His research focuses on the Quaternary – Miocene sedimentation history of the New Jersey Continental Shelf, utilizing 2D and 3D seismic reflection and ocean drilling data. He has 12 years of experience as a geoscientist in the oil and gas industry and is interested in offshore wind site characterization and risk assessment.
LinkedIn - Mukhatzhanov

Dr. Jimi Oke is the Director of the Networks for Accessibility, Resilience and Sustainability Laboratory (NARS Lab) and Assistant Professor at the Department of Civil and Environmental Engineering, University of Massachusetts (UMass) Amherst. Prior to this, he was a postdoctoral associate at the Intelligent Transportation Systems (ITS) Lab, Massachusetts Institute of Technology. His research interests lie in advancing machine learning, optimization and decision-making for sustainable and equitable infrastructure systems. He received his PhD from Johns Hopkins University in 2016 and his research has been funded by the NSF, US DOT, MassDOT.

Mr. Yiorgos Perikleous is a Principal geotechnical engineer with 15 years of experience in offshore wind industry working with offshore windfarm developers (Orsted), engineer consultants (Cathie Group) and certification bodies (DNV). He holds a civil engineering degree from the National Technical University of Athens (NTUA), Greece and a master's degree in geotechnical engineering from University of California, Davis (UCD), USA. During his career he has worked in various topics including foundation design and installation (monopiles, jacket piles, suction buckets), anchor design, site investigation and cable routing/ trenching. LinkedIn - Perikleous

Renee Richards is a Geophysicist in the Office of Renewable Energy Programs with the Bureau of Ocean Energy Management. Renee has experience in regulatory compliance for offshore wind projects with a focus on site characterization, geohazards, and technical feasibility. Renee has contributed technical expertise to several of BOEM's renewable energy guidelines and serves as the Unexploded Ordinance (UXO)/Munitions and Explosives of Concern (MEC) Subject Matter Expert. LinkedIn- Richards

Dr. Rodolfo B. Sancio is a Senior Principal geotechnical engineer with Geosyntec Consultants in Houston, Texas. He has more than 25 years of geotechnical practical experience, including in onshore and offshore geotechnical characterization for geohazards and foundations. For the last 21 years, he has focused on addressing onshore and offshore geotechnical engineering issues for the energy industry. Rodolfo has been a member of the API/ISO TP6 Committee and is currently the Treasurer of the Society of Underwater Technology – US Branch. He has been a professional engineer in Texas since 2006 and is licensed to practice in ten other US states. LinkedIn – Sancio

Morteza Shafiei is a Ph.D. student of geotechnical Engineering under the supervision of Professor DeGroot and Professor Westgate at UMass Amherst. His research primarily focusses on evaluating the degradation of glauconite sand under static and cyclic loading. He earned his Master's degree from Amirkabir University of Technology - Tehran Polytechnic. During his professional experience, Morteza has worked in two companies. In an advanced soil laboratory, he contributed to the design and development of various laboratory equipment at Global MTM. Additionally, Morteza worked as a Field and lab testing Supervisor at PGE. linkedin-Morteza Shafiei

Tor Inge Yetginer-Tjelta is a geotechnical specialist with more than 40 years of experience from oil & gas and renewables industry. Since 2010 he has been mostly working on offshore wind projects. He is highly experienced in seabed survey management, geohazards, foundation engineering and technology development. Some of his work has been acknowledged in 2012 as part of OTC Hall of Fame, for his work with field testing at Gullfaks C, and in 2015 when he won the Suction Pile | Pioneering Technology Award, for his work with suction pile technology spanning 30 years. Recently during the 2023 OSIG conference in London he also received the Mick Cook Marine Site Investigation Award. Tor Inge is the Chair of the Subcommittee on Laboratory Testing for the ISO Marine Soils Investigations Standard

Dr. Maarten Vanneste is a Technical Expert within Geosciences, Geohazards and Ground Modelling at NGI with more than 25 years of experience. His main interests lie in the integration of geophysical, geological, and geotechnical data into quantitative ground models for offshore wind developments (e.g., Ten noorden van de Waddeneilanden, IJmuiden Ver, Baltyk II and III, Empire Wind, UKX, Dogger Bank, etc.). He combines his skillsets in geophysics, geology, modelling and programming to create state-of-the-art results and tools for societal applications. He also chairs various international conferences on near surface geophysics (e.g., EAGE and SUT) and is a core member of ISO 19901-10 (Marine Geophysical Site Investigations).LinkedIn - Vanneste

Dr. Zachary J. Westgate is an associate professor in Civil and Environmental Engineering at UMass Amherst, working in their geotechnical group. He has 18 years of experience consulting in offshore geotechnics for energy projects, including site characterization, foundation installation and design, and pipeline/cable/riser-seabed interaction. His recent research focuses on challenging seabeds for US offshore wind, specifically glauconite sands, where he leads a joint industry project funded by offshore wind developers. He is active on several industry committees, including as Chair of the SUT Offshore Site Investigations and Geotechnics committee. He is a registered professional engineer in New York and Texas. LinkedIn - Westgate
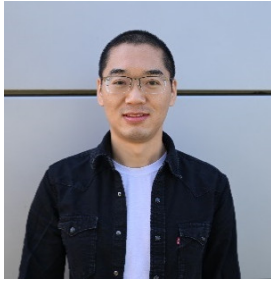
Yuanjing Zou is a Ph.D. candidate in Civil and Environmental Engineering at UMass Amherst, working in geotechnical group under supervision of Prof Zachary Westgate. He was monitoring engineer of China Communications Construction Company and participated in the construction of highway and subway tunnels before starting PhD study at UMass Amherst. Currently, he is working on the Joint Industry Project: The Piling in Glauconitic Sands, focusing on pile-soil interaction of driven pile in glauconite sand during driving and axial loading.

Getting to Omni Parker Hotel
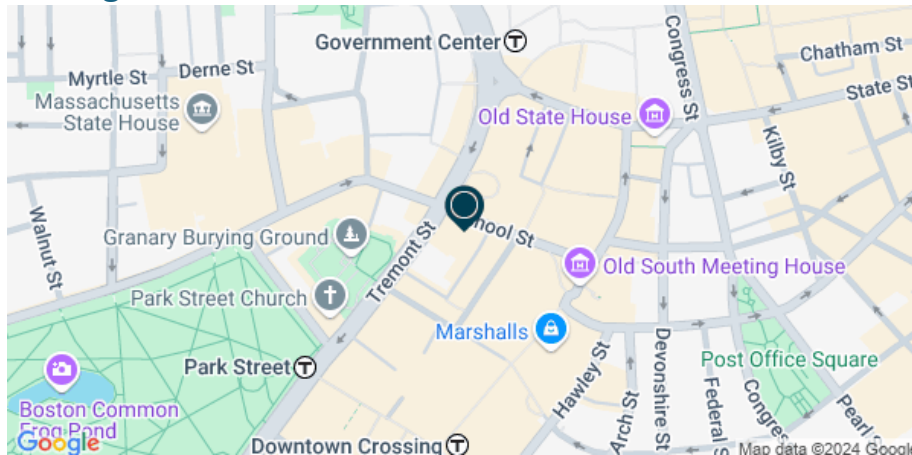
Driving Directions

Transportation

Boston's MBTA train service is located only one block from the hotel. From Logan Airport, take the Blue Line to State Street station, which is only a three-minute walk to the hotel. Bus #22 stops at Terminals A and B and the Airport subway station. Bus #33 stops at Terminals C and E and the Airport subway station. Take the Logan Airport Terminal A shuttle bus towards the loop. Take the Bus Walk 1 minute to the Airport Station and take the MBTA Blue Line to State Street, which is a two minute walk to our hotel. All MBTA stations close to our hotel:

- MBTA Park Street Station (Red or Green line) is a four-minute walk
- MBTA State Street Station (Blue or Orange Line) is a two-minute walk
- MBTA Downtown Crossing Station (Red or Orange Line) is a four minute walk

Parking

Overnight valet parking with in-and-out privileges is $65 per vehicle, per night. Please note that there is a Late Exit fee of $20 if the car is left after 2 PM the next day. The garage can accommodate vehicles up to 6'8" in height. Guests with over-height vehicles should call the hotel prior to arrival for directions to other garages nearby that can accommodate their vehicle. The closest nearby parking garage is Pi-Alley Garage, located 500 feet from the hotel at 275 Washington St, Boston MA 02108. Rates vary based on length of parking, time of day, and time of week. Can accommodate electric vehicles with charging stations through the ChargePoint network. Guests needing to charge their vehicle must self-park in this garage to use this service.

US National Science Foundation Conferences on Clean Energy Topics

Accelerating integrated **S**eabed **C**haracterization for clean **EN**ergy **T**ransition (ASCENT)

UMass University Club, Boston, MA
19-20 November 2024

PI: Associate Professor Zachary Westgate
UMass Amherst