

HANA O KE KAI “Work of the Ocean”

NEWSLETTER OF THE OCEAN AND RESOURCES ENGINEERING DEPARTMENT, Fall 2021, Volume 24, Issue 2

Chair’s Message

Eva-Marie Nosal, Chair



It’s wonderful to be part of a thriving, dynamic and impactful ORE Ohana. In very good news, we expect that the ORE MS program will be successfully re-accredited by ABET, read more about it in this edition of Hana O Ke Kai. Several large extramurally-funded projects led by ORE faculty and students are just getting off the ground, a few are featured here. Our student numbers are trending upward and we have all hands on deck for faculty and staff. Our budget is strong, and we’ll soon be making some exciting upgrades, including to the wave flume and student computers. And in breaking news, we’ve just been allocated space for a dedicated ORE research and teaching laboratory, with space for a computer lab and offices in the works – stay tuned for developments. I’d say we’re blazing through this pandemic!

I’m very pleased to welcome Dustin Lee onboard as the new ORE office administrator. Dustin stepped into this key departmental role with the experience, energy, and positive “can-do” attitude that will help carry ORE (and himself!) far. Dustin is one of a special group of folks who joined ORE during the pandemic. This group also includes Prof. Briggs and students from several incoming cohorts (F20, S21, F21, and soon S22), and in part those who started in S20 (Prof. Gedikli and the S20 student cohort, since they really only had a couple months of “normal”). I recognize and appreciate that this was (and is) an especially difficult time for folks to operate, let alone to come onboard. I applaud and appreciate you all – those who’ve pushed forward through the pandemic, those who’ve graduated or moved on, and those who’ve joined us – for your strength and persistence, and for your kindness toward and support of one another. I’m hopeful that the situation will continue to improve, and that we’ll be soon be able to see more of each other back on campus.

After five and a half good years, Fall 2021 was my last semester as Department Chair. I’ll be taking a sabbatical in the Spring 2022 semester to recharge and re-focus on research (including co-chairing a [passive acoustic monitoring workshop](#) that you’re all invited to attend!), and am handing off the helm to Prof. Zhenhua Huang. I’m very grateful to Zhenhua for stepping up to the plate, and glad that the department is healthy and in capable hands. Looking back on my tenure as chair, I feel a strong sense of pride in where we’ve come as a department, and a deep sense of gratitude to the people who helped carry us forward. So many wonderful people! I’ll mention just a few...

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Editor’s Corner

Grant Peel, ORE TA



Another semester is in the books. While Covid-19 has continued to keep us physically separated, and Zoom still fills most of our days, we finally have a light at the end of the proverbial tunnel. With vaccinations becoming more widespread and case numbers beginning to decline; it is looking like we will be able to enjoy a more traditional semester with campus opening up for in-person classes. I’d like to thank the ORE department as a whole for making my time as one of the department TA’s truly wonderful. I hope you all enjoy this version of Hana O Ke Kai!

Inside ORE

Chair’s Message

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Thank you to Brooks Bays, for helping ORE rebrand, and to helping build and maintain our new website; to Helen Saito for supporting our programs and fielding my (endless) questions about databases and access; to Katrina Ing Shum and Eirik Lohr from the SOEST Dean’s office for being ever-organized, helpful, positive, and patient; to Marcie Grabowsky, for spearheading our new Science and Engineering Communication module and helping us communicate our news stories and successes; to Deb Eason and Barb Bruno, for developing the SOEST Individual Development Plans and helping us modify them for ORE; to Phil Rapoza and Grant for helping clean out and upgrade ORE spaces and hallways; to Juanita Andaya, Theresa Medeiros, Gary Kabazawa, and Kellie Terada for their herculean efforts to organize and run the ORE office through several challenging years; to the many, many folks from the College of Engineering – from students, technicians, faculty, staff and the CoE Dean’s office – for working closely and openly with ORE on multiple levels; to my fellow SOEST department chairs over the years – Steven Businger, Ken Rubin, Frank Sansone, Paul Wessel, Niklas Schneider, Margaret McManus, Garrett Ito – for being an energetic group to turn to with questions, for support, and with ideas and initiatives; to SOEST Associate Dean for Academic Affairs Chip Fletcher, for pulling this motley crew of Chairs together; to SOEST Associate Deans for Research – formerly Sandy Shor, currently Chris Sabine – for supporting ORE research, Kilo Nalu, and for spearheading postdoc and new faculty mentoring initiatives; to Dean Taylor for supporting ORE on multiple levels, especially via seed funds for the revival of Kilo Nalu, renewed and newly-secured faculty positions, recruitment of our several outstanding new faculty members, and steady and capable leadership; to UHM leaders – especially Provost Bruno – for guiding us through uncertain times, for initiating changes to improve our climate, and for supporting engineering at UHM; to the many ORE students and postdocs who’ve come through to remind me how wonderful and exciting the world is and to revive my resolve and energy to keep pushing for improvements for ORE; to my colleagues for support, initiatives, patience and ever-positive, collegial and forward moving attitudes (you make ORE a great place to work!); to Prof. Howe for taking on the Kilo Nalu revival with the unique talent, experience, and persistence that we needed to make it happen; to Prof. Cheung, to whom I owe and especially big thank you for steadily leading the department as ORE Graduate Chair and ABET chair and for guiding and supporting my chairship as a truly exceptional colleague and mentor; to, on a personal note, my family for being understanding, patient, supportive, and for being my home, my health, and my happiness.

These continue to be exciting times of growth and energy for ORE. Stay tuned – via this newsletter, the [ORE website](#), and the ORE social media accounts. Keep in touch – it’s wonderful to hear from you and we warmly welcome your involvement. And please do consider supporting ORE if/as you can – our students, programs, and initiatives will continue to flourish with your support.

Student News

- Andi Erickson** presented her MS Plan B Paper “Extreme wave height estimation from a global wave hindcast ensemble” in May 2021
- Giannicola Tumino Di Costanzo** presented his MS Plan B Paper “Modeling of Hurricane Waves for Design of Coastal Infrastructure” in May 2021
- Stefan Mrozewski** presented his MS Plan B Paper “Simulation and Validation of the Effects of Thermally Buoyant Flow on Subsea Laser Transmission” in August 2021
- Julianne Kalksma** defended her MS Thesis “Morphodynamic Changes due to Calm-Moderate Wave Forcing: A Case Study of Waikiki Beach” in August 2021
- Kei Manabe** defended his MS Thesis “Detecting Spinner Dolphin (*Stenella longirostris*) Clicks in Noisy and Low Sampling Rate Hydrophone Recordings” in December 2021
- Nic Ulm** was awarded an Achievement Rewards for College Scientists (or ARCS) Foundation scholarship. [Read more.](#)

Inside ORE

Deep sea projects endorsed by United Nations Decade of Ocean Science

Marcie Grabowski
SOEST Outreach Specialist
(adapted from a [SOEST announcement](#))



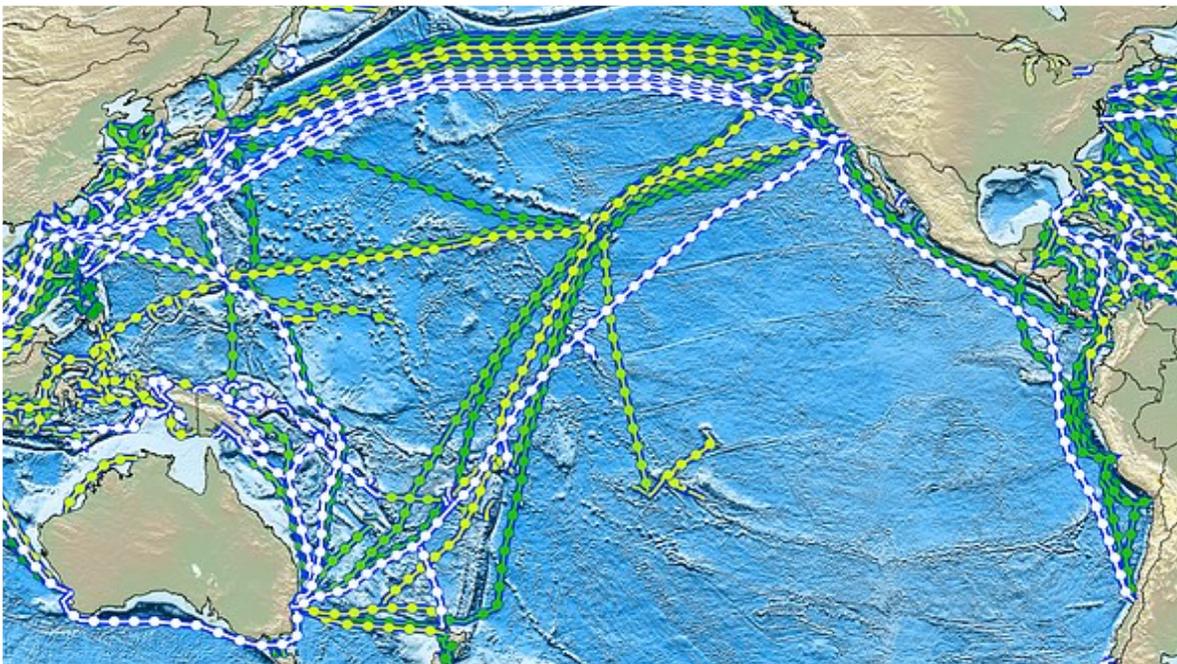
Two research projects involving ORE faculty, Bruce Howe and Justin Stopa, have been endorsed as part of the United Nations (UN) Decade of Ocean Science for Sustainable Development (the “Ocean Decade”) program. The projects focus on the deep sea—a dynamic, poorly known realm that is a vast repository for biodiversity, provides critical climate regulation, and houses a wealth of hydrocarbon, mineral, and genetic resources. The UN proclaimed the Ocean Decade to support efforts to reverse the cycle of decline in ocean health and gather ocean stakeholders worldwide behind a common framework that will ensure ocean science can fully support countries in creating improved conditions for sustainable development of the ocean.

According to UNESCO’s Intergovernmental Oceanographic Commission announcement, the endorsed actions “were selected for their focus on solutions and their ability to accelerate the generation and uptake of ocean knowledge for sustainable development; for their use of innovative technology; their trans disciplinary efforts to co-design solutions between scientists and users of ocean knowledge; and their respect for inclusivity, empowering women, early-career professionals and indigenous knowledge holders.”

SMART subsea cables

Howe is the chairperson of the [Joint Task Force for Science Monitoring and Reliable Telecommunications](#) (SMART) subsea cables, one of the endorsed projects. The Joint Task Force is facilitating the integration of environmental sensors into commercial telecommunications cables that crisscross the globe on the seafloor. The project goal is to connect a worldwide array of sensors that monitor the sparsely observed deep ocean environment, ocean climate, and sea level rise. “In addition to climate and ocean monitoring, the network will revolutionize real-time warning systems for earthquake and tsunami disaster mitigation,” said Howe. The SMART subsea cables task force provides coordination between the program and ocean science, operational oceanography, hazard early warning centers, industry, and relevant government agencies. It is presently funded by NASA through the Caltech Jet Propulsion Laboratory. The first major SMART project is underway in Portugal, with others in various stages of planning.

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SMART cables will connect scientific sensors to telecommunications cables that criss-cross the oceans.

Inside ORE

Deep sea projects endorsed by UN Decade of Ocean Science

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Implementing a Deep Ocean Observing System

Also [endorsed](#) through the UN Ocean Decade is a new National Science Foundation-funded project to implement a [Deep Ocean Observing Strategy](#) – iDOOS, with Howe and Stopa contributing as co-investigators; the project is led by the University of Texas at Austin. “Observing the deep ocean at a level required to inform sustainable development and management faces significant technical and logistical challenges,” said ORE Assistant Professor Stopa. “To address these challenges, the project will bring together U.S. and international networks engaged in sustained deep-ocean observing, mapping, exploration, modeling, research, and management to leverage each other’s efforts, knowledge, and resources.”

Through engagement with policy makers, regulators, and science coordinators, this project will raise awareness and support for deep-ocean science, and bring science into critical decisions regarding climate, biodiversity and sustainability. One of the project’s goals is to galvanize the broader communities associated with understanding and monitoring the ocean’s health and build an all-inclusive community beyond the typical sciences. Consequently, a key element of project is the mentorship and training of a diverse and inclusive next generation of deep-ocean leaders.

“Endorsement by the Ocean Decade program will help us make connections to all stakeholders, become much more an integral part of the Global Ocean Observing System, and possibly lead to funding avenues for SMART cable projects, for example, with investment and development banks, as part of the Blue Economy,” said Howe. “It is a real opportunity for us to take these efforts to the next level and to impact change in how we approach using the ocean in a sustainable manner.”

Computation of Lateral Erosion Rates for Coastal Road Program

Zhenhua Huang
ORE Associate Professor



Sea level rise and climate change have worsened coastal erosion, threatening our coastal highways. Most of the coastlines in Hawaii are fronted by coral reefs, which makes the shoreline erosion in Hawaii unique. Supported by the Hawaii Department of Transportation (HDOT), this research project will study the beach erosion rates at selected sites with the aid of numerical models specifically developed for the sites and field surveys. The surveyed beach erosion rates at the project sites will provide data for model verification and validation. The aim of this project is to develop a modelling framework that can be used to improve the estimation of the coastal erosion rate for HDOT’s mid-term and long-term planning purpose. Dr. Zhenhua Huang is leading the project and the co-PIs on the project are Professor Kwok Fai Cheung, Dr. Oceana Francis (CEE), and Professor Phillip Ooi (CEE). Three graduate assistants will work on the project and receive technical and professional training.



Coastal erosion threatens a section of Kamehameha highway

Inside ORE

Ocean and Naval Engineering Challenges in The New Arctic

Deniz Gedikli
ORE Assistant Professor



*The interaction between the built and natural environment
shapes social and economic realities in the Arctic in observable ways* — Deniz Gedikli

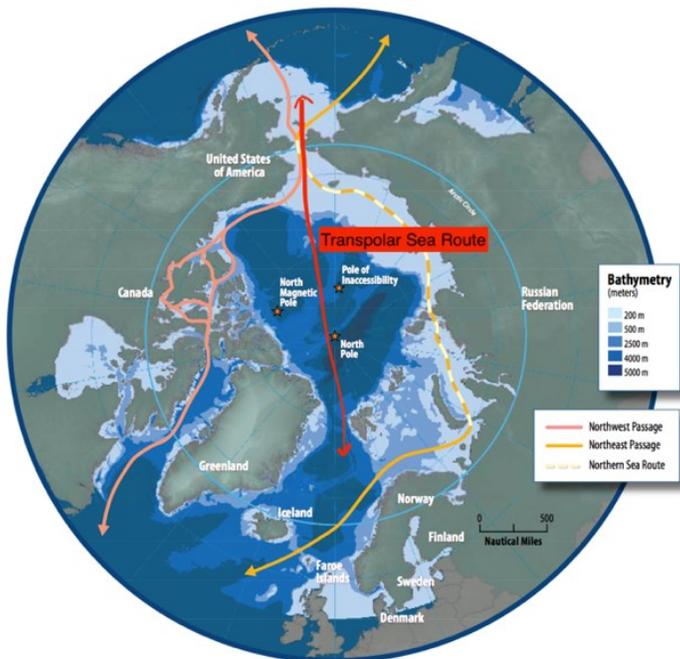


Figure 1 The Transpolar Sea Route (Red), compared to the Northwest Passage and Northeast Passage.

tool for shipping and other operations in the Arctic. The research team will use a combination of data from field experiments, models, satellites and observations to explore complex interactions between ice and marine structures in the Arctic to provide safe shipping and operations in the region. The most significant effect of the proposed efforts will be understanding the governing dynamics of ice-structure interactions during marine operations in the region. This research will lead to a better understanding of the dynamics of maritime structures under various ice conditions. The ice forces and resulting structural dynamics will be investigated, and a database containing the most critical parameters that govern the ISI will be created using an unique ROM framework. In addition, the newly produced dataset will be utilized to create a set of nonlinear equations that characterize the entire system. This ROM approach has various potential uses in Arctic research, including a novel data-informed navigation tool in ice-infested regions and the development of standards for safe marine structures. The research team is collaborating with two large fishing companies from Alaska, which kindly agreed to test the proposed framework.

Arctic sea ice is thinning due to rapid climate change, potentially increasing access to Arctic waters for economic activities including shipping, exploration, and resource exploitation. The increase in maritime operations in the region generates concerns regarding their environmental impact (e.g., oil spills, structural damage on ships and marine structures, etc.). Transpolar Sea Route (TSR) is an example of an Arctic maritime route that will soon connect the Atlantic and Pacific Oceans (see Figure 1). This route is crucial since it avoids Arctic states' territorial seas and is in international waters. At this time, only heavy icebreakers can navigate the route (see Figure 2). Due to the continuous loss of Arctic sea ice, the route is predicted to become the principal Arctic maritime route by 2030. It has enormous geopolitical relevance for nations interested in the Arctic as a potential trading route.

The National Science Foundation awarded nearly \$800,000 to ORE researchers (Deniz Gedikli, PI; and Oceana Francis, co-investigator and associate professor of Civil and Environmental Engineering and ORE cooperating faculty member) to develop an integrated nonlinear reduced-order modeling (ROM) framework and a simple risk assessment



Figure 2 An ice breaker is moving in ice-infested waters.

Inside ORE

Major step toward the global network of SMART seafloor cables: Climate, ocean, sea level, earthquake and tsunami early warning seafloor cables, early warning systems

Bruce Howe, ORE Professor
 Adapted from the [SOEST announcement](#) by
Marcie Grabowski
 SOEST Outreach Specialist



The University of Hawai‘i (UH) at Mānoa is leading an effort to advance a global network of SMART seafloor cables and develop early warning systems for tsunamis and earthquakes around Vanuatu and New Caledonia. The international team recently received support of over \$7M from the [Gordon and Betty Moore Foundation](#).

“Through this project, we are developing a new ocean and Earth observing capability—sensors integrated in subsea telecommunications cables—and developing simulations and scientific protocols to provide earthquake and tsunami early warnings,” said Bruce Howe, lead investigator of the new grant and professor of [Ocean and Resources Engineering](#) in the UH Mānoa [School of Ocean and Earth Science and Technology](#) (SOEST).

The [Science Monitoring And Reliable Telecommunications \(SMART\) Subsea Cables](#) initiative is gaining momentum around the world. This effort aims to integrate ocean temperature, pressure and seismic sensors into commercial submarine telecommunications systems that crisscross the ocean floor. As new systems are installed, researchers and communities hope to cost-effectively transform the current telecom network into a combined telecom and planetary-scale ocean, climate and geophysical sensor array capable of informing early warning systems.

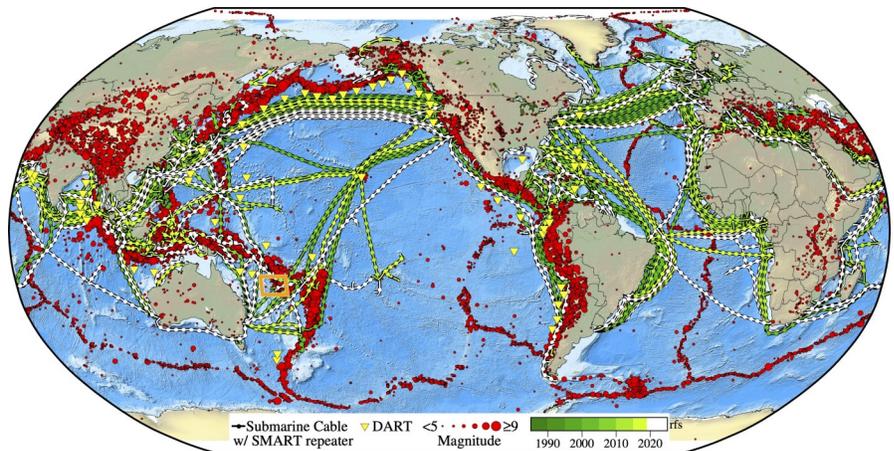
“This brilliant project will transform the practical cables that link communications and commerce into a world-wide scientific instrument of profound importance to every person on Earth. We are delighted to help the University of Hawai‘i pioneer this game-changing effort,” said Robert Kirshner, Chief Program Officer for Science at the Gordon and Betty Moore Foundation.

Project goals

The overarching goal of the newly funded, five-year project is to help bridge the perilous gap between concept and implementation. The team aims to have sensor integration into subsea telecommunications cables become the world standard, leading to a global network for sustained ocean observation, geophysical study of earthquakes, and earthquake and tsunami warning in a world with rising sea levels.

To do this, the team will lay groundwork for the science and early warning use of undersea cables by simulations of the observing system before deployment, data analysis after deployment, and sustained scientific operation.

They will apply results of the simulations to optimize the proposed Vanuatu-New Caledonia cable system and its operation. This will demonstrate the capability of the earthquake and tsunami early warning system based on the SMART sensors in one of the world’s most at-risk country for natural disasters due to its location in the seismically active “Ring of Fire.”



The 1.4 Mm of operational submarine telecommunications cable spanning the globe with 20,000 repeaters every ~70 km that could host sensors—initially, temperature, pressure, seismic acceleration. Current cables (green lines); in progress/planned cables (white); and historical earthquakes (red). SMART repeaters are shown every 300 km, actual about 70 km (rfs = year ready for service).

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Major step toward the global network of SMART seafloor cables: Climate, ocean, sea level, earthquake and tsunami early warning seafloor cables, early warning systems

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A significant aspect of the project is training staff in the region to increase local expertise in related science, data management to create early warnings and predictions, and telecommunication processes. Included are workshops and courses for [Vanuatu Meteorology and Geohazards Department](#) professionals and funding for education of graduate students at the [National University of Vanuatu](#) (NUV), UH Mānoa, and partner institutions—providing the science and technical foundation of a lasting observing system.

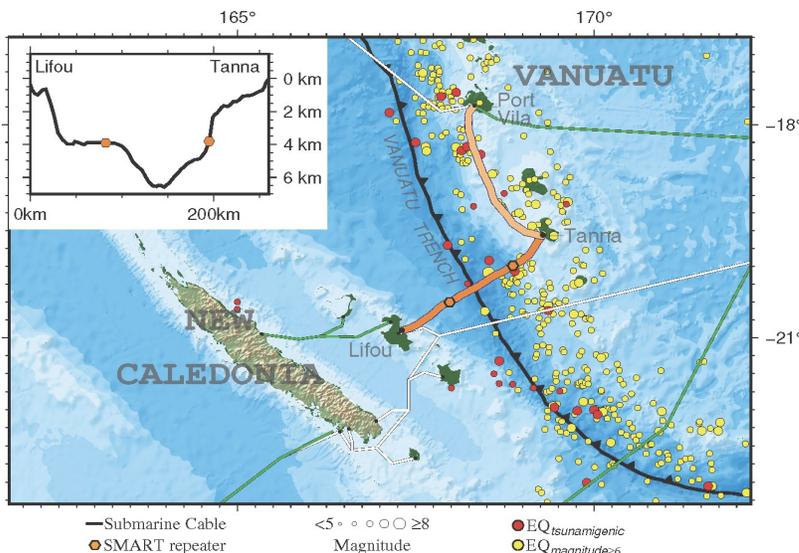
Professors Kwok Fai Cheung (ORE) and Helen Janiszewski (Earth Sciences) will advise graduate students working on tsunami prediction and inundation and geophysics in “young” subduction zones, both in general and as applied to the Vanuatu-New Caledonia scenario. It is critical to have a robust science and early warning ecosystem in preparation for the new SMART cable system and these activities and others will ensure operation and maintenance of the early warning systems which will help mitigate the risks of earthquake and tsunami hazards.

Lastly, the project will support the international project office of the [Joint Task Force Scientific Monitoring And Reliable Telecommunications cables](#), working to facilitate adoption of scientific sensors in all new subsea telecommunications cables to reach a global scale. This Joint Task Force, recently [endorsed](#) by the United Nations Ocean Decade for Sustainable Development, is sponsored by the International Telecommunication Union, World Meteorological Organization and UNESCO-Intergovernmental Oceanographic Commission; The JTF Secretariat resides in ITU in Geneva.

Reducing risk through science, innovation, partnership

“Ideally the incorporation of SMART capability would become a routine function for the submarine cable industry,” said Howe. “Achieving this goal will generate key reductions in human and planetary risk. We hope this project is a demonstration for the global audience about how communities and science can benefit from SMART cables.”

Securing the new funding required local and international collaboration. [UH Foundation](#) facilitated working with Gordon and Betty Moore Foundation, thus bringing the project headquarters to UH Mānoa. Project partners include: in the U. S., [University of Texas – Austin](#), [Louisiana State University](#), [California Institute of Technology](#), [Subsea Data Systems](#) and [Los Alamos National Laboratory](#); in the South Pacific [University of Otago](#) (New Zealand), [French Institute for Research and Sustainable Development](#), National University of Vanuatu, Vanuatu Meteorological and Geohazards Department and [The Pacific Community](#) (SPC); and the [International Tsunami Information Center](#).



Proposed international SMART cable route between Lifou, New Caledonia and Tanna, Vanuatu.

About the Moore Foundation

The Gordon and Betty Moore Foundation fosters path-breaking scientific discovery, environmental conservation, patient care improvements and preservation of the special character of the Bay Area. This research is funded by the Gordon and Betty Moore Foundation through Grant GBMF10787 to the University of Hawai‘i. Visit [Moore.org](#) or follow @MooreFound for more information.

Inside ORE

ORE MS Program ABET Review

J Stopa, ABET committee Co-Chair
EM Nosal, ORE Chair
KF Cheung, ABET committee Chair



In November 2021, the ORE MS program was reviewed by the Engineering Accreditation Commission (EAC) of the [Accreditation Board for Engineering and Technology](#) (ABET). ABET accreditation ensures that the ORE MS program meets international standards, while allowing us flexibility to tailor our program to student- and institution- specific goals and strengths. We are pleased to report that the ORE MS program was favorably reviewed, so we are expecting full accreditation by the EAC of ABET for another six years! It is a continuous process to maintain ABET accreditation and to actively adjust our programs to provide the highest-quality education and training possible for our students in a changing world. So while we celebrate our positive review, we also turn our attention right back to seeking feedback, to assessing and evaluating our program, and to making adjustments in response.

ORE's ongoing success and growth is made possible by the many people who support our programs. An especially positive component of the ORE MS program - which was recognized and highlighted by our ABET program evaluator - is ORE's close ties with industry. We extend a very big mahalo to our [Affiliate Faculty members](#) from the engineering and scientific communities for volunteering their time to bring individual expertise, external perspectives and real-world engineering experience to our academic programs as well as the engineering firms who have provided financial support and on-job training to our graduate students through the Ocean Engineering Internship Program. Thank you also to the [ORE Advisory Panel](#) of 15 engineering experts from academia, industry, and government for regularly reviewing the ORE MS program and for providing valuable feedback that helps ORE prepare and equip our graduates for successful careers in a constantly evolving field. We also thank Barb Bruno and Deb Eason for helping us adapt our Individual Development Plans - which were also recognized as a program strength - that help our students set and achieve their academic and career goals.

The review itself involved many hours of preparation, and cooperation and organization on multiple levels. We are grateful to our colleagues in the College of Engineering (CoE) and to CoE's Dean's office for their exceptionally collegial, informative, and organized leadership throughout the preparation and review process. We thank Ron Riggs for providing his professional feedback on an initial draft of our self-study report; Dusin Lee, ORE office administrator, for his hand in organizing and facilitating the review; and the many folks who met with the review team to help paint as complete a picture of ORE as possible, including ORE faculty and students, Jim Jolly, ORE affiliate faculty members, the ORE external advisory board, the SOEST fiscal office, and SOEST Dean Taylor.

Last, but definitely not least, we extend a very warm mahalo to Prof. Thomas DeNucci, ORE program evaluator, and the UHM ABET review team for conducting the review in an organized and professional manner, and for constructive and thorough feedback on our program. We recognize that the (COVID-induced) virtual nature of the visit must have made it especially challenging from their perspective. If you read this - thank you! And we hope you can come in person one day to enjoy some of Hawaii's beautiful sunshine and warm water - ORE's doors (including to our Kilo Nalu nearshore observatory, lab facilities, and classrooms) are always open.

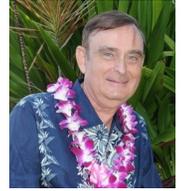


The POST and Holmes Hall Buildings looking spiffy for our virtual ABET review

Inside ORE

Affiliate faculty profile: Dan Greeson

Dan Greeson
Captain, USN (Ret.)
ORE Affiliate Faculty member



A letter to ORE students.

Hello! Let me introduce myself since I am rarely on campus. My name is Dan Greeson, and I’m an Affiliate Graduate Faculty member in ORE. Like each of you, I studied for my graduate degree in Ocean Engineering at the University of Hawaii Manoa, earning a Ph.D. in 1997. After graduation, I served on the faculty, teaching Dynamics of Offshore Structures. At the same time I served as Chief Engineer for the Hawaii Undersea Research Laboratory (HURL). HURL operated two deep diving manned research submersibles and a remote operated vehicle, and it provided ocean research diving operations as far away as New Zealand. HURL was supported primarily with “soft money” from NOAA, and unfortunately this source of funding ended about five years ago.

Prior to coming to the University, I served in the U.S. Navy as a submarine officer, so I have experience in submarines, as well as submersibles and remote operated vehicles. I have advised graduate students on a variety of other offshore research projects, from offshore platforms to underwater gliders. I am available to serve on MS and Ph.D. committees, and I welcome the opportunity to help whenever I can.

Currently, I work at the Pearl Harbor Naval Shipyard as a Nuclear Engineer. The Shipyard is an excellent employer with opportunities available in many fields, including ocean engineering, project management, and environmental protection. Contact me (greeson [at] hawaii [dot] edu) if you have any questions in this regard.

On a personal basis, I am married and have two daughters. I am a life-long sailor, having sailed in everything from Star Class two-man boats to large oceangoing sailboats. I am also an amateur radio operator, have enjoyed that hobby since I was fourteen years old, and have made friends via the airwaves all over the world.

ORE has several Affiliate Faculty members with extensive experience in ocean engineering. Please consider using our expertise in your committees as you work towards your degree.

You can find a list of ORE cooperating, affiliate, adjunct and emeritus faculty on the ORE website:

<https://www.soest.hawaii.edu/ore/people/other-faculty/>

New in ORE

Dustin Lee, ORE Department Administrator

Dustin graduated from Gonzaga University with a Bachelor’s degree in Political Science and Psychology. Although this is Dustin’s first DA position, he comes to ORE with over 10 years of administrative experience, including about 3 years within the University System, transferring from the Kapiolani Community College’s Human Resources Department. When Dustin is not at work, he likes to watch movies and other shows with his Disney+ account.



Welcome aboard Dustin!

New in ORE

Wyatt Burkley, ORE MS Student

Wyatt Burkley is a first year graduate student in the Ocean and Resource Engineering Department focusing on Offshore Structures. Wyatt enjoys exploring the various nooks and crannies of the island through surfing, hiking, and free diving in his spare time.



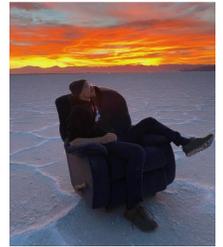
Jonathan Chase, ORE MS Student

Jonathan Chase is a first year Ocean and Resource Engineering student focusing his studies on Sediment transport, Coastal Engineering and Beach Erosion. When Jon isn't in class or studying, he likes to spend his time surfing, fishing or hitting the hiking trails.



Jesse Gray, ORE MS Student

Jesse Gray is a first year student in the Ocean and Resource Engineering Department. Jesse plans to focus his studies on wave energy conversion and renewable energy. In his free time, he enjoys playing the guitar, philosophy and a rousing game of chess with friends.



Lauren Heslop, ORE MS Student

Lauren Heslop is a first year Ocean and Resource Engineering Student and one of the Department's 2 Teaching Assistants. Lauren is focusing her studies on Ocean Renewable Energy. In her spare time, Lauren enjoys exploring the islands hiking trails, swimming in the ocean and yoga.



Ally Morris, ORE PhD Student

Ally Morris is a first year Ocean and Resource Engineering Student. Ally is focusing her studies on Chemical Oceanography and Sensor Development. In her spare time, she likes to go for a hike, read a good book or paint.



Malia Selman, ORE MS Student

Malia Selman is a first year Ocean and Resource Engineering Graduate Student. Malia is focusing her studies on Nearshore Processes, Coastal Engineering and Wave Inundation Modeling. When Malia isn't hard at work, she likes to spend her free time surfing, cooking and gardening.



Last Page

Some Recent ORE Publications

Yamazaki Y, T Lay T, KF Cheung (2021). A compound faulting model for the 1975 Kalapana, Hawaii, earthquake, landslide and tsunami. *Journal of Geophysical Research: Solid Earth*, 126(11), e2021JB022488.

Li N, G García-Medina, KF Cheung, and Z Yang (2021). Wave climate and energy resources in the multi-modal sea state of Hawaii. *Renewable Energy*, 174, 1036-1055.

Hoyland K, T Nord, J Turner, V Hornnes, **ED Gedikli, M Bjerkas, H Hendrikse, TC Hammer, G Ziemer, T Stange, S Ehlers, M Braun, T Willems, C Fischer** (2021). Fatigue damage from dynamic ice action-The FATICE project, Proceedings of the 26th International Conference on Port and Ocean Engineering under Arctic Conditions

Gedikli ED, JM Dahl (2021) Investigating the effectiveness of piezo stripe actuators on flexible cylinder's dynamic response under vortex-induced vibrations. Proceedings of OCEANS 2021

Lee CH and **Huang ZH** (2021). Effects of grain size on subaerial granular landslides and resulting impulse waves: experiment and multi-phase flow simulation. *Landslides*. <https://doi.org/10.1007/s10346-021-01760-z>

Gruden P, E-M Nosal, E Oleson (2021). Tracking time differences of arrivals of multiple sources in the presence of clutter and missed detections. *JASA* 150(5), 3399-3416.

Barkley Y, **E-M Nosal, E Oleson** (2021). Model-based localization of deep-diving cetaceans using towed line array acoustic data. *JASA* 150 (2) 1120-1132.

Madhusudhana S, Y Shiu, H Klinck, E Fleishman, X Liu, **E-M Nosal, T Helble, D Cholewiak, D Gillespie, A Širović, MA Roch** (2021). Improve automatic detection of animal call sequences with temporal context. *Journal of Royal Society Interface* 18: 20210297.

ORE is under full sail! We're powering forward strong and fast. Our faculty and student numbers are up, our office is in full swing, we have an exciting array of well-funded projects, our programs are being guided and supported by industry, and we now have the space and some department funds to jump-start our plans for an improved teaching lab, a computing lab/facility, and improvements to our student and researcher spaces. This is an exciting time for ORE—a time of expansion and impact. We've pulled people and resources together to make some exciting improvements, and we need your support! Your gift will be used directly in support of our programs, resources and infrastructure, and to help talented students reach their potential for impactful contribution to the Ocean State of Hawaii, and to a dynamic world that increasingly relies on well-trained engineers who are prepared to work in, on, and around the ocean. Please consider donating to ORE today:

<https://giving.uhfoundation.org/funds/12373104>

To pay by check, please make payable to University of Hawaii Foundation, indicate the donation is for “ORE 12373104”, and send to:

ORE Enrichment Fund Administrator
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