

# HANA O KE KAI “Work of the Ocean”

NEWSLETTER OF THE OCEAN AND RESOURCES ENGINEERING DEPARTMENT, Spring 2020, Volume 23, Issue 1

## Chair’s Message

Eva-Marie Nosal, Chair



**A**loha ORE ‘Ohana. I hope and trust that you and your loved ones are safe and healthy in these challenging and dynamic times. The end of the Spring 2020 semester was unprecedented, with nearly all ORE operations moved online, teaching included. I extend my sincere regard and appreciation to faculty, researchers and staff for adjusting and navigating their duties creatively and tirelessly to keep ORE sailing, and to our students who responded to the disruption and change with dedication, perseverance and courage. Thank you all. I extend an extra special Mahalo to Juanita Andaya (SOEST Dean’s office), Teresa Medeiros (SOEST Admin), ORE student office assistant Matthew Spencer (who graduated in S20 from the Shidler College of Business – congratulations and best wishes!), to Karynne Morgan, and especially to Kellie Terada for their critical “on the ground” work in keeping the ORE office running smoothly. We will continue to navigate through the summer and into the Fall 2020 semester, which will again be mostly remote for the safety and wellbeing of the campus community (updates for UH Manoa response and planning are available [here](#)). One positive outcome is that those of you off-island will be able to join some of our defenses, seminars, and meetings which are now remote – keep an eye on our [website](#), or sign up to our seminar mailing list [here](#).

### In this issue

|                               |    |
|-------------------------------|----|
| Chair’s Message               | 1  |
| Kilo Nalu Observatory         | 2  |
| SOEST Open House              | 4  |
| Pitching, rolling, & tracking | 6  |
| MTS Reboot                    | 7  |
| New faculty! Michael Kreig    | 8  |
| New Faculty! Deniz Gedikli    | 9  |
| New in ORE                    | 10 |
| Publications                  | 11 |
| Alumni Profile                | 12 |

We’ve seen several big changes in the department since the last newsletter. John Wiltshire retired and became ORE emeritus in Fall 2018, and Gérard Nihous retired in Summer 2019 – thank you both for your service, and we look forward to your continued involvement in a new capacity. We welcomed new faces to the ORE ‘Ohana – some of whom are introduced below – including two new faculty members who joined as Assistant Professors: [Mike Krieg](#) in Fall 2019, and [Deniz Gedikli](#) in Spring 2020. Also featured in this edition, the Nearshore Observatory Kilo Nalu was revived in April 2020 and is now operational. This accomplishment took a village effort. Mahalo to extraordinary initiative and leadership from ORE powerhouse [Bruce Howe](#); to the SOEST Dean’s office for seed funds; to the [Hawaii Natural Energy Institute](#) (esp. Pat Cross), the [Applied Research Lab](#) (esp. Ben Jones), and the [Pacific Islands Ocean Observing System](#) (esp. Melissa Iwamoto) for partnering in the endeavor; to the [Honolulu Department of Parks and Recreation](#), [Sea Engineering](#), and [53 by the Sea](#) for support; and to the many faculty, researchers, engineers, technicians, students, and staff who worked together to get KNO back in the water. We look forward to using KNO in ORE lab classes and research; to cross-unit projects and collaboration including with colleagues in [Oceanography](#) and the [College of Engineering](#); to providing data products for local users (surfers, fishermen, coastguard etc.); to supporting other stakeholders, organizations and users in the ocean community interested in connecting to the near-shore observatory; and to expanding engineering and observing capabilities at KNO.

As we move into a new semester and year of continued growth and change in ORE, I’m confident that we will continue to rise and adapt to the challenges that will inevitably come our way. And as we continue to adjust, let’s pull together to support each other, which starts by keeping lines of communication open and clear. My (virtual) door is always wide open – reach me anytime at nosal [at] hawaii.edu or 808-956-7686. I look forward to hearing from you.

## Inside ORE

### Kilo Nalu Observatory – Installed and working!

Bruce M. Howe



**K**ilo Nalu Observatory (KNO) is a shallow water cabled ocean sensor network off Kakaako Park, Point Panic, Honolulu, on the island of Oahu, immediately west of Waikiki. It was installed in April 2020, ~400 m offshore with Primary Node 1 (PN1) in 12 m of water. The shore station and PN1 are shown in the photos.

KNO presently has a single 1200 kHz TRDI acoustic Doppler current profiler (ADCP) with pressure and temperature sensors, with data flowing and publically available in real time

(<http://aco-ssds.soest.hawaii.edu/dataDisplay.php> tab KNO; [http://aco-ssds.soest.hawaii.edu/kno\\_plots.html](http://aco-ssds.soest.hawaii.edu/kno_plots.html)); some plots and tables are tailored to the surfing community.



Figure 1. Location of KNO at Point Panic, Kakaako.

This is a re-incarnation of previous similar systems installed by ORE Hans Krock (starting 1987) and Geno Pawlak (2006-2012). This new system – hardware, software, data management, web services are all based on and shared with the ALOHA Cabled Observatory (ACO) and are consistent with de facto international “observatory standards.” ACO uses KNO as a test bed.

Continued on p.3

### Editor’s Corner

Andi Erickson, ORE TA



**T**his past year has been different in many ways from what the ORE department have been use to. Half way through the spring semester Covid-19 spread across the globe, leading to the entire campus finishing their courses via Zoom. While this was not how we expected to finish the semester, the entire ORE department meet the challenge head on and finished out the semester strong. Finally, I would like to extend a special mahalo to ORE for providing me this opportunity as the department TA. I’ve had the pleasure of getting to know the department and field throughout this past academic year and working on the newsletter. Mahalo and enjoy this version of Hana O Ke Kai.

### Department News

- **Sitthichat Sukpholtham** defended his MS Plan A Thesis “Mapping the Ocean Sound Speed at The Aloha Cabled Observatory Using Reliable Acoustic Path Tomography” in May 2019
- **Bradley Beeksma** presented his MS Plan B Paper “Hydroelasticity of the Inflatable Assault Craft during Slamming Events” in May 2019
- ORE and Oceanography are hiring a data manager for the Aloha Cabled Observatory and Kilo Nalu. Details are available [here](#).

## Inside ORE

### Kilo Nalu Observatory – Installed and working! continued from p.2

The input to the primary node from shore is 400 V (2 A / 800 W maximum total) and 1 GigE ethernet. Precise timing (better than 200 ns) is distributed using IEEE-1588v2 Precise Time Protocol (PTP) over ethernet and (subsea) this is used to derive a 1 pulse per second (1 PPS) and time-of-day (TOD) string that is delivered in parallel to the ethernet. With the present system, 3 ports (in addition to the ADCP) are available on the primary node. Expansion is planned for, e. g., a second primary node and daisy chaining using science instrument interface modules to aggregate cluster of instruments. We expect that in the next year there will cameras, CTDs, AUV with docking station, small wave energy conversion devices, class projects, and more. KNO is open to the community.

The KNO Team stands ready to assist prospective users to define their requirements with respect to KNO and then to assist in the implementation.

Kilo Nalu Observatory is a project of the Department of Ocean and Resources Engineering (ORE) and the School of Ocean and Earth Science and Technology (SOEST), University of Hawaii at Manoa (UHM). HNEI/WETS, PacIOOS and ARL are partners. MBARI donated the cable. SOEST made available the resources for the installation.

Please contact the KNO Team for more detailed information (Bruce Howe, [bhowe@hawaii.edu](mailto:bhowe@hawaii.edu), +1-808-469-0553).

The deployment team:

|                             |                  |
|-----------------------------|------------------|
| Tyler Borge                 | Sea Engineering  |
| Pat Caldwell                | JIMAR            |
| Aaron Castellano            | 53 by the Sea    |
| Brian Chee                  | SOEST            |
| Max Cremer                  | UHMC             |
| Blue Eisen                  | ORE              |
| Ian Fernandez               | PacIOOS          |
| Joe Gilmore                 | PacIOOS          |
| Bruce Howe                  | ORE              |
| Olivia Hughes               | PacIOOS          |
| Jim Jolly                   | ORE              |
| Jason Klem                  | Sea Level Center |
| Ken Kohnfelder              | Sea Engineering  |
| Ning Li                     | HNEI/WETS        |
| Kimball Millikan            | PacIOOS          |
| Jim Potemra                 | HIGP             |
| Andreia Queima              | PacIOOS          |
| Phil Rapoza                 | SOEST            |
| Andrew Rocheleau            | Sea Engineering  |
| Fernando Santiago-Mandujano | OCN              |
| Nicholas Ulm                | ORE              |
| Robin Vye                   | UHMC             |
| Gordon Walker               | PacIOOS          |
| Greg West                   | Sea Engineering  |



Figure 2. Deploying from the Kilo Kai.

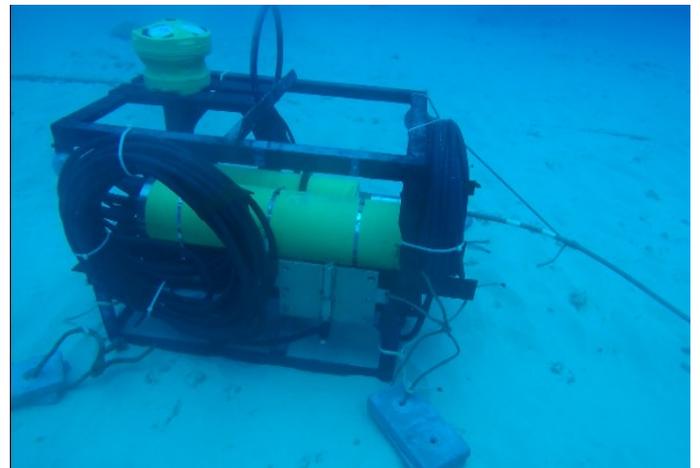


Figure 3. KNO node on the seafloor.

## Inside ORE

### SOEST Open House

Zhenhua Huang



**S**OEST had its the 15th biennial open house event on October 25 and 26, 2019. ORE's exhibit "Coastal Waves and Beach Profile Changes" is one of the most loved exhibits, which attracted a large number of students from kindergarten through high school and community members. ORE students Nicholas Ulm, Lin Sun, Julianne Kalksma, David Leyva, Shijie Huang and Cameron Morrow participated in the ORE's open-house activities.

ORE's exhibit focused on basic concepts and principles of wave breaking, Stokes drift, undertow, sediment report, offshore sandbars and shoreline erosion. Visitors also learned how a wave-maker works and what coastal and ocean engineering is about.

ORE student exhibitors put in a lot of efforts to prepare our posters and the demonstration. The wave flume and the sand were thoroughly washed before the open-house day. Our student exhibitors that participating in ORE's open-house activities is a very valuable and rewarding experience. Below is feedback from Julianne and David about participating in ORE's Open-house activities.

Dr. Kanesa Duncan Seraphin from the Center for Marine Science Education, Hawai'i Sea Grant, produced a 25-minute episode of Voice of the Sea focused on the SOEST Open House 2019. Kanesa's interview with Nicholas is one of the highlights of this episode. The SOEST Open House 2019 Episode won a bronze Telly Award. The full, 25-minute, episode is now [online](#).



Figure 1. Nicholas Ulm, PhD Candidate, explains beach profile change.



Figure 2. Dr. Huang shows visitors how to operate the wave maker.



Figure 3. Nicholas Ulm, PhD candidate, and David Leyva, MS student, explain Stokes drift and undertow.

Continued on page 5

## Inside ORE

### SOEST Open House

Continued from page 4



Figure 4. MS student Lin Sun explains wave generation.



Figure 5. MS student Julianne Kalksma answers questions from visiting students.

**Julianne Kalksma, ORE MS student:** *The SOEST open house was a great experience to connect with the community and to share an appreciation for the sciences with the next generation. From talking to high school students interested in pursuing a degree studying the ocean, to seeing the younger kids light up with excitement at the wave flume, and to learning more about how the teachers are implementing relevant lessons into their curriculum- it was so great to see everyone come together. Not to mention, I left feeling inspired myself. These students are learning about the coasts, the ocean, and ways to protect it from such a young age and they have such passion.*

**David Leyva, ORE MS student:** *Volunteering for the SOEST 2019 Open House was a very rewarding experience. All my life I have enjoyed going to the beach and swimming in the ocean. From those experiences I understood things such as sandbars and rip-currents on a very basic level. However, in my time at UH in the Ocean and Resources Engineering Department I have been able to study and learn about these phenomena at a much deeper level. During the open house I observed young students who were interested in the wave making machine and how it formed a sandbar below the surface. It was very fun to be able to demonstrate these principles and explain them from a scientific perspective, especially because the young audience was so engaged in the topic. I felt that this demonstration helped to show students that science is not simply something that is conducted indoors in a lab, but it is all around us. I know many young students left that demonstration with a new found interest in science and how it can explain the world around them.*



Figure 6. Dr. Kanesa Duncan Seraphin interviews Nic

Dr. Zhenhua Huang organized the ORE's Open-house activities. ORE student Kei Manabe helped take photos.

## Inside ORE

### Pitching, rolling, and tracking

Pina Gruden



**H**awaiian waters are home to a rich variety of marine mammal species, among which is the false killer whale (*Pseudorca crassidens*), Fig. 1. This species is known to interact and depredate catch in the local pelagic longline fisheries, which can lead to whale mortality or serious injury. In order to learn more about this species and to help estimate its abundance, researchers in NOAA and University of Hawaii collect acoustic and visual data during dedicated line transect surveys.

In many ways acoustics offers advantages over traditional visual surveys, since it can operate during night time and during adverse environmental conditions (which are typical during wintertime in Hawaiian waters), and since this particular species is not often sighted by visual observers. The acoustic recordings are taken by towing a linear system of hydrophones behind a research vessel. From these recordings the individual or group locations, as represented by their bearing angles, are manually estimated by trained acousticians with the help of a dedicated program. Due to the subjectivity of the manual process, the estimated tracks can differ across analysts. In addition, the estimation is complicated by the presence of noise, animals' overlapping vocalizations and their dynamic movement in relation to the vessel.

My research focuses on developing multi-target tracking algorithms that will track these bearing angles automatically by utilizing signal processing and machine learning techniques. We start by cross-correlating signals from two hydrophones, which enables us to obtain the bearings to the animals from the peaks in the cross-correlation function. As the animals move through space, their bearings in relation to the hydrophone array change over time. Since there are often multiple animals vocalizing at the same time, there are multiple peaks present in the function; some of which are due to sources and some of which are due to clutter (false alarms). In addition, sometimes a source does not have a corresponding peak in the function (missed detection). The job of the multitarget tracker is then to extract individual bearing tracks that correspond to a group or individual animal as they move through space and time, while simultaneously contending with false alarms and missed detections. The multi-target tracker I am working on is based on a Random Finite Set Statistics (RFS) framework, since it allows for an efficient joint estimation of multiple targets in the presence of clutter and missed detections. One example of the algorithm tracking subgroups of false killer whales from peaks in the cross-correlation functions is shown in Fig. 2, where the vertical axis corresponds to the bearing and horizontal axis to time. While still a work in progress, this algorithm already shows promise in eliminating the subjectivity from the manual tracking, and speeding up the analysis of large data sets.



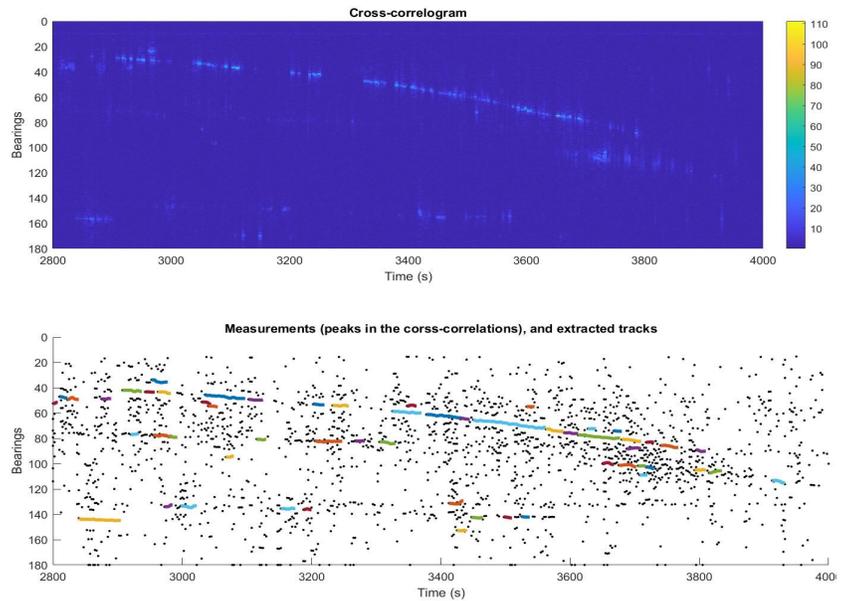
Figure 1. False killer whale (*Pseudorca crassidens*). Photo: Pina Gruden; taken under NMFS ESA/MMPA take-permit 20311 issued to Pacific Islands Fisheries Science Center.

Continued on p.7

## Inside ORE

### Pitching, rolling, and tracking continued from p.6

Recently, I was given an opportunity to join the data collection efforts in the 2020 Winter Hawaiian Islands Cetacean and Ecosystem Assessment Survey (WHICEAS) conducted by NOAA Pacific Islands Fisheries Science Center. On this survey we were collecting acoustic data with three different acoustics systems; towed hydrophone array, drifting acoustic recorders and sonobuoys. We were also performing real time monitoring, species identification and localization on the towed array system. As discussed, this process requires a significant human input: a trained and experienced acoustician classifies the species, and then manually tracks individuals or subgroups. This is an intensive process, and it can be even more challenging when trying to operate the various detection and tracking screens while the vessel pitches and rolls! All the acquired data and localizations are refined after the survey finishes, requiring even further manual labor. Having had this experience helps to illustrate the importance of developing automated trackers to make this process easier, faster and more consistent.



**Figure 2: Multi-target tracking of bearings based on whistles corresponding to subgroups of false killer whales. Cross-correlogram is shown (top), and measurements (black dots) extracted from the cross-correlogram with corresponding extracted bearing tracks (lines) (bottom).**

## Marine Technology Society (MTS) Reboot

Liz Corbin

**A**n active MTS Hawaii section that provides a big tent for everyone interested in any aspect of marine science, technology, engineering and policy. In August 2019 MTS kicked off their membership drive with a traditional "Beer on the Pier". Nearly 70 past, current and future members met on Makai Pier to catch up with old friends and colleagues, meet a new crop of students and get to know some of the young professionals that have joined Hawaii's marine industry. The membership drive resulted in almost doubling total membership from 46 to 86. Most importantly, members located in Hawaii nearly quadrupled from 15 to 55. The drive included an incentive - the Beer on the Pier event was free to members and after that, the first event for new members was free. Some of the growth is attributed to renewals, but there are many that are new to MTS, including enough new students to reactivate the Student Section under the leadership of Dr. Eva-Marie Nosal, Chair of the UH Dept. of Ocean and Resources Engineering. In February 2020, a general election was held and the following member were elected as the MTS Hawaii Officers:

- Chair: Noriko Shoji. Director of the Science Operations Division, [NOAA/NMFS Pacific Islands Fisheries Center](#).
- Vice Chair: Reb Bellinger. Retired Vice President of [Makai Ocean Engineering](#) focused on business development.
- Secretary: Dr. Patrick Cross. Program Manager - Marine/Ocean Energy at the [Hawaii Natural Energy Institute](#).
- Treasurer: Dr. Thomas B. Reed IV. President of [Oceanic Imaging Consultants, Inc.](#)

To get involved and for more information, visit the MTS Hawaii [website](#)

New in ORE

Michael Krieg, ORE Assistant Professor



**D**r. Krieg joined ORE in the Fall of 2019 as Assistant Professor. Prof. Krieg received his BS and PhD degrees in aerospace engineering sciences from the University of Colorado in 2006 and 2012, respectively. His graduate research focused on unsteady underwater jet propulsion, inspired by the locomotion of squid and jellyfish. In this work Prof. Krieg developed models for pressure dynamics and energy/impulse transfer associated with unsteady jetting, vortex ring formation, and nozzle geometry. He became adept at several experimental techniques in order to validate these models. Prof. Krieg also created the first prototype AUVs using unsteady jet thrusters to demonstrate improved maneuvering capabilities. During both his graduate studies and postgraduate appointment at the University of Florida, he developed several generations of bioinspired AUVs. During this time his research branched out into underwater robots and their control systems, testing on how the new thrusters alter vehicle dynamics, as well as un-restrained propulsive efficiency testing.

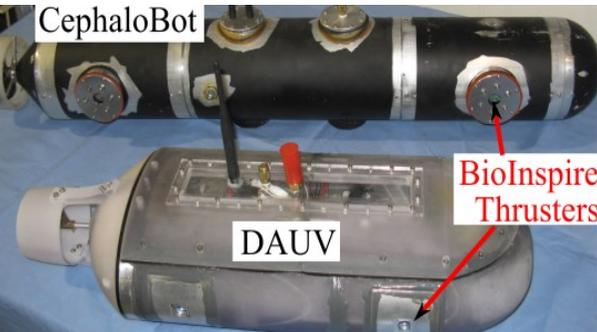


Figure 2. Two of the AUV prototypes developed by Prof. Krieg to demonstrate bioinspired jet propulsion at his previous appointment .

Machine Intelligence.

Krieg's post graduate research has diverged into the field of soft robotics. Inspired by squid mantle structures, which contain a complex system of reinforcing collagen fibers in order to passively drive jetting-optimal deformations, he developed a theory of using fiber reinforcement to control planar strain relationships of highly deformable soft composites, which led to creation of a patent.

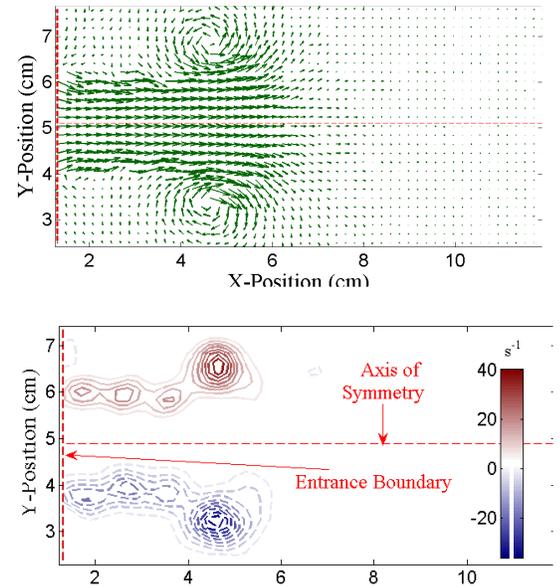


Figure 1. Sample PIV images of the velocity and

Just prior to joining ORE, Prof. Krieg worked to incorporate distributed hydrodynamic sensing, inspired by the fish lateral line, into a novel motion controller. In this technique, fluid interaction forces are measured using distributed sensors on the surface of an AUV and compensated directly, significantly improving position tracking accuracy for vehicles in chaotic flows. This work was featured as the cover article for Nature:

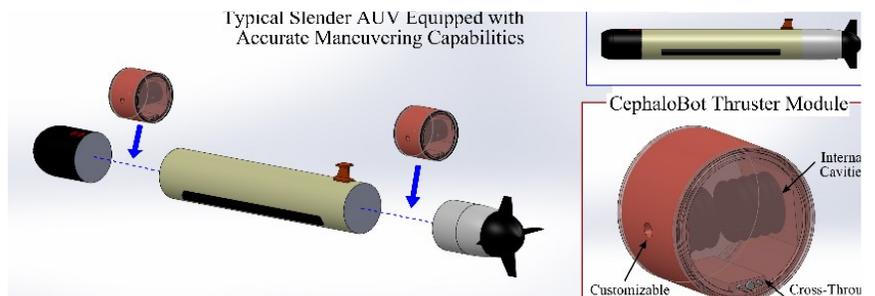


Figure 3. Conceptual diagram of future research, whereby bioinspired thruster modules are installed on commercial AUVs.

## New in ORE

### Deniz Gedikli, ORE Assistant Professor

**O**RE welcome Deniz Gedikli as an Assistant Professor of ORE in January 2020. Dr. Gedikli’s research interests span the areas of experimental fluid-structure interactions, nonlinear dynamical systems, and data science with a focus in offshore marine structures. In particular, he is interested in dynamics of offshore marine structures and ocean renewable energy devices from flow induced vibrations.

After obtaining his PhD from the Department of Ocean Engineering at the University of Rhode Island in 2017, Dr. Gedikli worked at the Norwegian University of Science and Technology (NTNU)’s Marine Civil Engineering Group, one of the premier groups in offshore engineering in the world. His work at NTNU focused on understanding the complex dynamic loads on offshore wind turbines in Arctic and Sub-Arctic regions. While in Norway, he closely worked with several offshore companies in designing offshore wind turbines and developing guidelines for safer operations in harsh environmental conditions.

Dr. Gedikli recently published an article in the Journal of Cold Regions Science and Technology which offers a comprehensive analysis of wave-induced ice-ice collisions in an advanced laboratory setting and discusses the contribution of wave-induced ice-floe collisions to the attenuation of surface gravity waves. In addition to his research, Dr. Gedikli serves the field of ocean and offshore engineering through his involvement in the International Society of Offshore and Polar Engineers (ISOPE); as a member of Technical Program Committee (TPC), he takes an active part in organizing the annual ISOPE conference, which has been the world’s largest technical conference of its kind with peer-reviewed papers.

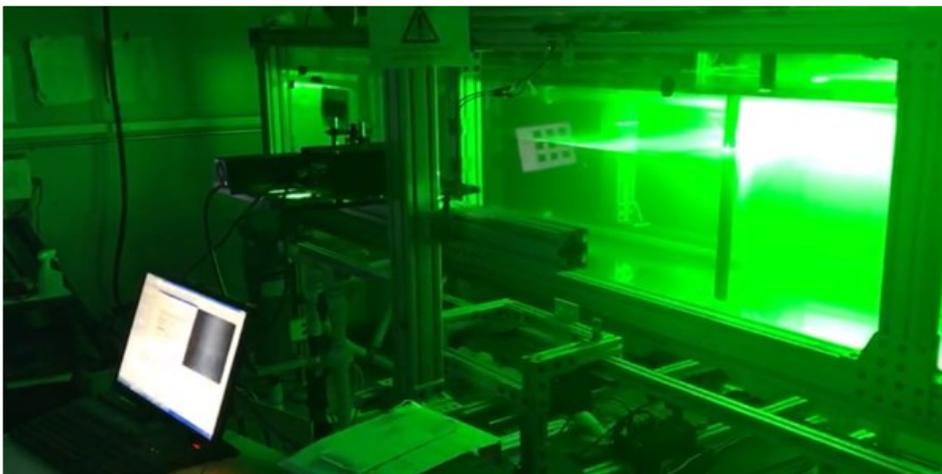


Figure 1. Experimental test setup analyzing the wake pattern behind a circular cylinder using Particle Image Velocimetry.

Dr. Gedikli is excited to join the University of Hawai’i at Manoa and to collaborate with faculty and students from various disciplines, departments, and schools at UH. At ORE, he is establishing a hydrodynamics research group focused on offshore marine structures and ocean renewable energy technology.

## New in ORE

### Pina Gruden, ORE Postdoctoral Fellow

Dr. Gruden is a Cetacean Acoustic Researcher. Pina joined JIMAR in May 2019 as a pos-doctoral acoustic researcher, and she is working on developing automated methods for acoustic multi-target tracking. She is an acoustical engineer with fifteen years of experience in marine mammal field data collection and data analysis, and is specialized in signal processing and machine learning for underwater sound. She obtained her PhD at the Institute of Sound and Vibration Research (ISVR), University of Southampton, UK, and her research interests include signals processing, underwater acoustics, marine mammals and automating analysis processes for studying cetaceans.



### Yoshiki Yamazaki, ORE Assistant Researcher

Dr. Yamazaki became Assistant Researcher and a Graduate Faculty in ORE in Fall 2018. He has been studying tsunami for 16 years since his studies in ORE as an MS student in 2003. His research interests include numerical model development, tsunami source mechanism, ocean and coastal wave dynamics, flood hazards mitigation, and computer vision for coastal applications.



### Zhuoyuan Song, ORE Cooperating Faculty

Dr. Song joined ORE as Cooperating Graduate Faculty in July 2019. He is an Assistant Professor with the Mechanical Engineering Department in the College of Engineering at UH Manoa since August 2018. Dr. Song received his Doctor's degree from the University of Florida in Gainesville, where he developed the embedded systems for several custom autonomous underwater vehicles. His research interests include autonomous navigation in GPS-denied environments, large-scale multi-robot systems, dynamics and control, and, most recently, resident mobile robot systems. When he is not working on robots, he enjoys basketball, hiking, and cooking.



### Benjamin Jones, ORE Adjunct Faculty

Dr. Jones is the Associate Director of the Applied Research Laboratory and Director of Data, Modeling and Decision Technologies. He joined ARL in July of 2018. Ben Jones, an oceanographer and a former career naval officer, joined the Applied Research Laboratory in 2018. He has a varied background serving as a helicopter pilot, Force Oceanographer for the U.S. submarine community, and chief oceanographer for the Navy's Fifth Fleet. In his current position, Ben is ARL's lead for ocean science and technology as well as the lab's Associate Director. He holds a Ph.D. in physical oceanography from the Naval Postgraduate School and a S.M. in Oceanographic Engineering from the Massachusetts Institute of Technology-Woods Hole Oceanographic Institution (MIT-WHOI) Joint Program in Oceanography. Dr. Jones has conducted research on bio-sonar, acoustic scattering by marine organisms and active sonar statistics. He lives in Kailua with his wife and two daughters.



## New in ORE

### John Mark Melve, ORE MS Student

John Mark Melve is a native Pacific islander from the beautiful islands of Vanuatu. John plans to focus on Offshore and Marine Resources engineering. After spending a fall semester here at UH Manoa, he started to develop a keen interest in ocean waves studies. During his free time, John enjoys playing soccer or cricket, or go swimming in the ocean. -Ka'a biah-



### Julianne Kalksma, ORE MS Student

Julianne Kalksma is a first year Ocean and Resource Engineer. Julianne plans to focus on nearshore processes, coastal resiliency, and oceanographic instrumentation. In her spare time, she enjoys partaking in water sports, hiking, and doing art.



### Giannicola Tumino Di Costanzo, ORE MS Student

Giannicola Tumino Di Costanzo Ocean is a first year Ocean and Resource Engineer. Giannicola plans on focusing on ocean acoustics, marine renewable energy, and nearshore/coastal engineering. During his free time, Giannicola enjoys going surfing, diving, fishing, anything related to water sports.



## Some Recent ORE Publications

- Li L and Cheung KF (2019). Numerical dispersion in non-hydrostatic modeling of long-wave propagation. *Ocean Modelling*, 138, 68-87.
- Wood N, Jones J, Yamazaki Y, Cheung KF, Brown J, Abdollahian N (2019). Population vulnerability to tsunami hazards informed by previous and projected disasters: a case study of American Samoa. *Natural Hazards*, 95(3), 505-528
- Huang Z, Huang S, Xu C. (2020). Characteristics of the flow around a circular OWC-type wave energy converter supported by a bottom-sitting C-shaped structure. *Applied Ocean Research*, Volume 101, article 102228
- Liu C and Huang Z (2020). A Flexible Membrane Breakwater with a Piezoelectric Layer for Providing Harborage and Wave-Energy Conversion. *Journal of Coastal Research* 36 (1): 148–156.
- Howe BM et al. (2019). The SMART Cables Joint Task Force, SMART Cables for Observing the Global Ocean: Science and Implementation, *Frontiers in Marine Science*, OceanObs'19 Special Issue.
- Howe BM, J Miksis-Olds, E Rehm, H Sagen, PF Worcester, and G Haralabus (2019) Observing the Oceans Acoustically, *Frontiers of Marine Science*, OceanObs'19 Special Issue.
- Taniguchi N, C-F Huang, M Arai, BM Howe (2018). Variation of Residual Current in the Seto Inland Sea Driven by Sea Level Difference Between the Bungo and Kii Channels, *J. Geophys. Res. Oceans*, 123, 4, pp 2921-2933.
- Baggeroer AB, BM Howe, PN Mikhalevsky, JA Orcutt, and H Schmidt (2018). Ocean Observatories: An Engineering Challenge, *The Bridge*, National Academy of Engineering, 48, 3, pp 17-34.
- Krieg M and K Mohseni (2020). Transient Pressure Modeling in Jetting Animals, *Journal of Theoretical Biology*, 494(7): 1-14
- Sholl N, A Moss, M Krieg, and K Mohseni (2020). Controlling the deformation space of soft membranes using fiber reinforcement, *The International Journal of Robotics Research*, Online Format, DOI:10.1177/0278364919897134
- Shiu Y, KJ Palmer, MA Roch, E Fleishman, X Liu, E-M Nosal, T Helble, D Cholewiak, D Gillespie, H Klinck (2020). Deep neural networks for automated detection of marine mammal species. *Scientific Reports* 10(1):607.
- Young J, A Høst-Madsen, E-M Nosal (2019). Deinterleaving of Mixtures of Renewal Processes. *IEEE Transactions on Signal Processing* 67(4), 885-898.
- Scherrer S, BP Rideout, G Giorli, E-M Nosal, KC Weng (2018). Depth- and range-dependent variation in the performance of aquatic telemetry systems: Understanding and predicting the susceptibility of acoustic tag–receiver pairs to close proximity detection interference. *PeerJ* 6:e4249.
- Wang CP, A Tandeo, A Mouche, JE Stopa, V Gressani, N Longepe, D Vandemark, RC Foster, B Chapron (2019). Classification of the global Sentinel-1 SAR vignettes for ocean surface process studies, *Remote Sensing of Environment*, 234, 111457.
- Ardhuin F, JE Stopa, B Chapron, F Collard, R Husson, RE Jensen, J Johannessen, A Mouche, M Passaro, GD Quartley, V Swail, I Young (2019). Observing sea states. *Frontiers in Ocean Science: Ocean Observation*, April 2019.
- Stopa JE, F Ardhuin, E Stutzmann, T Lecocq (2019). Sea state trends and variability: Consistency between models, altimeters, buoys, and seismic data (1979–2016). *Journal of Geophysical Research: Oceans*, 124, 3923–3940.

## Alumni Profile

### Justin Goo, MS 2007

In March 2019, Justin Goo was selected to serve as the Chief, Civil Works Technical Branch, U.S. Army Corps of Engineers - Honolulu District responsible for overseeing a team of 11 Coastal and Hydrologic and Hydraulic (H&H) Engineers, Engineering Technicians, and Administrative Staff. The Civil Works Technical Branch is responsible for providing Coastal and H&H technical water resource solutions for the Honolulu District Civil Works programs. Typical projects include navigation improvements and maintenance, hurricane and storm risk management, ecosystem restoration, hydropower, and recreation. The Honolulu District's Civil Works area of responsibility includes everywhere in Hawaii and in U.S. Territories in the Pacific, including Guam, American Samoa, and the Commonwealth of the Northern Marianas Islands.

Upon graduating with his Ocean and Resources Engineering Master of Science Degree in December 2007, he started with the U.S. Army Corps of Engineers (USACE) Honolulu District as a Department of the Army intern in 2008 and upon completion of the two-year program he worked in the Civil Works Technical Branch as a Coastal Engineer until 2015. In early 2015, Justin transferred to the USACE's Japan District at Camp Zama, working first as a project manager in the Navy Section until 2016, and later as the Navy and DLA Military Construction Program Technical Lead from 2016 to 2018. Justin returned to Honolulu District in September 2018 and serving as the Technical Lead for the Ala Wai Flood Risk Management Project before taking on his new position as the Chief of the Civil Works Technical Branch.



During his time with USACE he's worked on a variety of coastal engineering projects and studies including planning, design and repair of breakwaters, revetments, piers and wharves, mooring buoys, seawalls, and dredging throughout the Pacific Region including the State of Hawaii, Guam, The Commonwealth of the Northern Marianas Islands, American Samoa, and Japan. He married his wife Kris in November of 2013 and in his spare time he enjoys playing and coaching soccer, basketball, golfing, and surfing.

While we celebrate the recent revamping and revival that ORE has enjoyed over the past several years, ORE anticipates facing severe budget limitations and shortfalls over the next several years as a fallout from COVID-19. We are also keenly aware and appreciate that external support and giving may be especially difficult at this time for many in the ORE 'Ohana, so we will be especially grateful for any support that you can provide to help sustain our momentum. 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  
Department of Ocean and Resource Engineering  
University of Hawaii at Manoa  
2540 Dole Street, Holmes Hall 402  
Honolulu, HI 96822 USA

If you are interested in making an in-kind donation, if you have any questions about your donation or about how ORE is using donor support, or if you would like to explore other avenues of support, please don't hesitate to contact Eva-Marie Nosal at 808-956-7686 or nosal[at]hawaii.edu.



### Hana O Ke Kai

Newsletter of the  
Department of Ocean & Resources Engineering  
School of Ocean & Earth Science & Technology  
University of Hawaii at Manoa

2540 Dole Street, Holmes Hall 402  
Honolulu, HI 96855-2303 USA

TEL: +1(808)956-7572  
FAX: +1(808)956-3498  
Email: [adminore@hawaii.edu](mailto:adminore@hawaii.edu)  
URL: <http://www.soest.hawaii.edu/ore>

To subscribe, obtain copies of previous issues of HANA O KE KAI and send your material for the newsletter publication, please visit the [our website](#) and click the 'News' link.

**ENGINEERING THE OCEANS  
SINCE 1966!**