ORE since 1966
OCEAN AND RESOURCES ENGINEERING
IN THE SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF HAWAI'I AT MĀNOA

HANA O KE KAI

"Work of the Ocean"

NEWSLETTER OF THE OCEAN AND RESOURCES ENGINEERING DEPARTMENT, Fall 2018, Volume 22, Issue 1

Chair's Message

Eva-Marie Nosal, Chair

The near-miss of Hurricane Lane in late August was a wakeup call for many in Hawai'i. Our remote ocean location and delicate critical infrastructure make Hawai'i especially vulnerable to extreme events such as hurricanes and tsunami. ORE is keenly aware of our kuleana to the people of Hawai'i and the Pacific Basin as we work together to understand and prepare for the worst. For example, Prof. Cheung has been pioneering and promoting hazard awareness, planning and mitigation in Hawai'i and the around the Pacific Basin for nearly 15 years (featured in F16 edition); Prof. Howe chairs the UN Joint Task Force on SMART cable systems for climate monitoring and disaster mitigation (featured in S17 edition); Prof. Huang conducts research to improve sustainable coastal management (featured in F17 edition). This edition highlights vital work led by ORE Researcher Dr. Ning Li to assess vulnerability from hurricane-induced coastal flooding.

In a recent and related development, I'm extremely pleased to welcome Prof. Justin Stopa to ORE this semester. Justin studies ocean waves - extreme events in particular - which are critical for engineering design and are poorly understood. Part of Justin's research program will involve understanding and addressing extreme events in a changing climate, and to advance engineering adaptations needed to compensate for dangerous future environmental conditions. In the Spring 19 semester, Justin will be offering a new course dealing with ocean engineering design parameters in light of climate change. Read more about Justin's background and areas of expertise in this edition.

Inside this issue:

Moving forward, we recognize that the scope of activity in Hawai'i in ocean and resources engineering extends well beyond our department unit, and that together we are many times stronger than the sum of our parts. With this in mind, ORE's new strategic plan includes a vision to provide a vibrant, inclusive, central "hub" – an ORE Ohana – for education, research, engagement and service to the broad UH and Hawai'i engineering communities. Details and strategies (some of which have already been implemented) for achieving this vision are available in our 2018-2023 Strategic Plan, available on our website: http://www.soest.hawaii.edu/ore/documents/reports/ORE_StrategicPlan_2018-2023.pdfYour feedback and involvement are valuable to us as we work together to realize our vision. Check out our website (www.soest.hawaii.edu/ore) for ways to stay involved and for regular updates. Contact me anytime with feedback, questions, comments, ideas, news items: nosal [at] hawaii.edu, 808-956-7686, or via my (anonymity-optional) department feedback form: https://goo.gl/forms/WGD8iay0l9mUqpVq1. I look forward to hearing from you.

Editor's Corner

Nicholas Ulm, ORE TA

Thank you to everyone who contributed to this issue. This will be my last time as editor of the ORE newsletter as I have moved on to an RA position. Editing the newsletters this past year has been very rewarding and I would like to thank our department chair, Eva-Marie Nosal, for being so involved and working closely with me on each issue. I hope you enjoy this version of *Hana O Ke Kai*.

New in ORE

Justin Stopa, PhD

We are very pleased to welcome Dr. Justin Stopa as an Assistant Professor of ORE. His research focus is ocean waves, in particular, understanding their mechanics. Stopa has been actively involved in ocean wave research through modeling efforts and space-based satellite technologies such as altimetry and synthetic aperture radar (SAR). He has developed several algorithms to extract quantitative wave information from SAR such as: orbital wave velocity, wave spectra in sea ice, and significant wave heights.

Since obtaining his PhD from ORE in 2013 under Dr. Kwok Fai Cheung, Dr. Stopa has worked at the L'institut Francis de Recherche pour l'Exploitation de la Mer (IFREMER) in the Laboratory of Ocean Physics and Remote Sensing, one of the premier laboratories in ocean sciences. While in France, Stopa was an oceanographer funded by the Office of Naval Research project focused on understanding the physics and sea states in the Arctic Ocean as new ocean areas open up due to melting sea ice.

Recently, he was lead author on a publication in the *Proceedings of the National Academy of Sciences* which presented the first comprehensive estimates of continent-wide wave data within the Antarctic marginal ice zone and explained how waves impact sea ice formation and development. He is chairing an international effort of wave climate scientists to ensure the quality of the European Space Agency-funded project called the Sea State Climate Change Initiative will produce sufficient data for climate applications.

During his graduate studies, Stopa developed the automated wave forecast system still in operation through the Pacific Islands Ocean Observing System (PacIOOS) and assessed the wave energy potential in Hawai'i, which is a critical component of assessing wave renewable energy. "As a wave scientist, I also feel it is critical to prepare the next generation for sea state changes in offshore and coastal regions," said Stopa. "By combining my unique background in wave science, remote sensing, and international collaboration, I hope to make an impact in the community of Hawai'i and worldwide by partnering with and educating future scientists and engineers, and through continued research at the University of Hawai'i at Mānoa."

Welcome aboard Justin!

ORE NEWS

- **Linyan Li** defended her Ph.D. Dissertation presentation "Numerical Dispersion in Non-Hydrostatic Modeling of Long-Wave Propagation " on July 31st, 2018
- **Conghao Xu** defended his Ph.D. Dissertation presentation "Study of wave interaction with vertical piles integrated with oscillating water columns" on August 31st, 2018
- **ORE** welcomes Dr. Justin Stopa as an Assistant Professor.
- **Congratulations** to Bradley Beeksma and Nicholas Ulm for winning 2nd Place at the PACE Breakthrough Innovation Challenge for Dive Buddy on November 15, 2018
- **We're Hiring!** ORE is advertising three tenure track faculty positions. Application review begins February 15, 2019, open until filled . More information with links to the detailed is available on our website (http://www.soest.hawaii.edu/ore/extras/employment/). We encourage you to apply, or to post and pass around this notice as appropriate.

Probabilistic Mapping of Storm-induced Coastal Inundation for Climate Change Adaptation

Ning Li

Tropical cyclones are usually weakened or deflected to the south when approaching the Hawaiian Islands due to the high pressure system to the northeast, strong wind shear, and relatively low sea surface temperature near Hawaii. The situation has subtly changed in recent years with an increasing number of hurricanes tracking closer to the islands (e.g., Hurricane Guillermo in 2015, Hurricane Celia, Darby, Lester in 2016, Lane and Olivia in 2018). Strong winds and heavy rainfall, even under tropical storm conditions, bring risks and damage to residents and their properties. In addition, storm-induced coastal flooding could be even more devastating. Many residents still recall Hurricane Iniki, which made landfall on Kauai during high tides leaving thousands of homes damaged or destroyed. If a hurricane of similar strength makes landfall on Oahu, flooding and overtopping from storm surge and waves will bring more damage and loss due to the high density of population and infrastructure in low-lying coastal plains.

Climate change is an important factor in the coastal inundation modeling for future storms. Reminiscent of the El Niño years of 2015 and 2016, global warming from the climate changes will likely increase the number of tropical cyclones and shift their tracks toward Hawaii. Sea level rise combined with high tides can add more than 1 m to the present sea level, which will reduce the freeboard at the shore and exacerbate storm inundation on land.

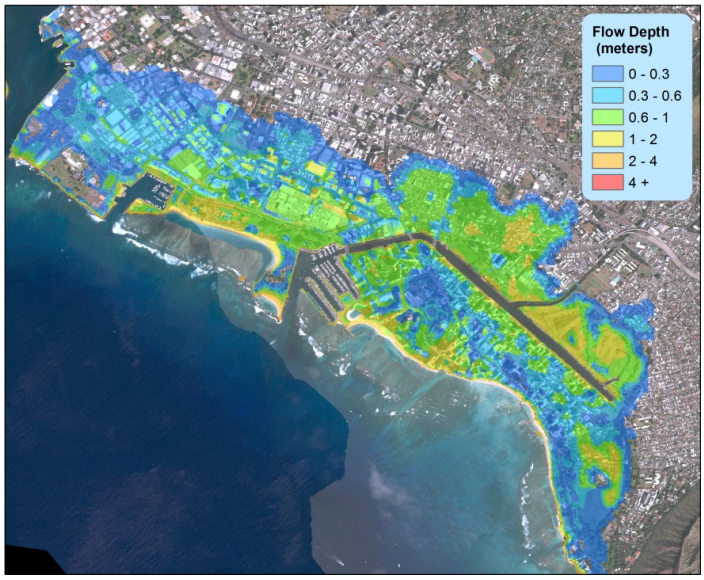

Figure 2. Flow depth for a Category 4 hurricane making landfall at Oahu

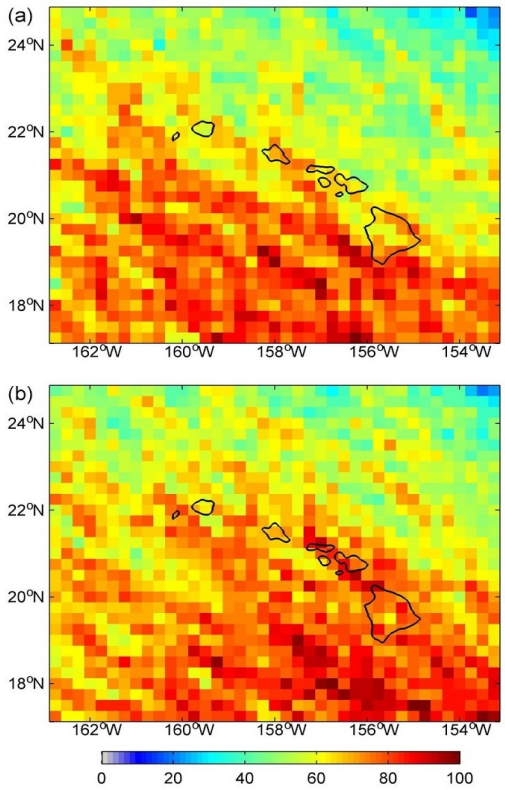

Figure 1. Occurrence of tropical storms and hurricanes in 0.25° × 0.25°

Mesoscale tropical cyclones are significantly influenced by large-scale weather systems and future scenarios can be inferred from global climate models. Kerry Emanuel, an MIT Atmospheric Science Professor, advances a deterministic-stochastic approach to simulate formation, strengthening, migration, and weakening of hurricanes from ambient weather and ocean conditions produced by the global climate models.

Coastal infrastructures and buildings planned or designed today will have service life toward the end of 21st century. We have developed a method to assess the future vulnerability of infrastructure and buildings from hurricane-induced coastal flooding (Li et al., 2018).

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Inside ORE

Probabilistic Mapping of Storm-induced Coastal Inundation for Climate Change Adaptation—Continued

Ning Li

The scenario set represents potential hurricanes over an equivalent 1000-year period toward the end of the 21st century for probabilistic analysis. In comparison with a control dataset of simulations for the historical 1980–1999 period, the simulated future hurricanes show a 2% increase in number and a northward shift of the tracks toward the Hawaiian Islands (See the track density in Figure 1), corroborating recent experiences. We used a suite of spectral wave, circulation, and Boussinesq models on a hierarchy of nested grids to describe generation and propagation of surge and waves across the ocean as well as wave setup and runup at the coast (Li et al., 2014). Analysis of the maximum sustained wind speed at the urban Honolulu coast allows selection of the top 24 storms to define a subset of scenarios for detailed inundation mapping. The modeling results from direct landfall of a Category-4 hurricane on the south shore of Oahu show inundation from downtown Honolulu to Waikiki (seen in Figure 2). Barring the tail end of the distribution, the suite of inundation scenarios allows us to define flood hazard maps with return periods of up to 500 years or annual exceedance probabilities of 0.2% or greater for climate change adaptation (Figure 3).

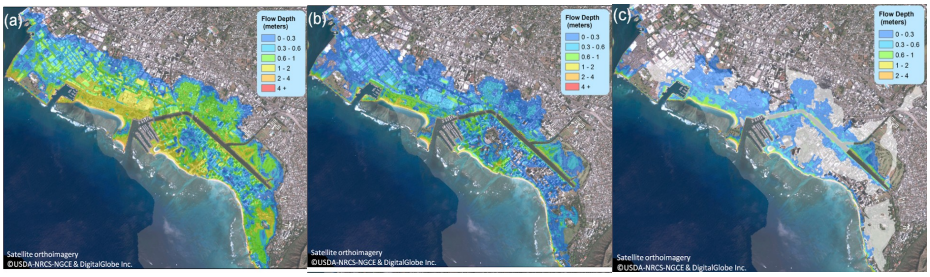

Figure 3. Inundation maps at the end of the 21st century from combined phase-averaged and phase-resolving modeling. (a) 500-year. (b) 200-year. (c) 100-year return period. The transparent white layer denotes the FIRM with 1% exceedance probability.

Li, N., Yamazaki, Y., Roeber, V., Cheung, K.F., and Chock, G. (2018). Probabilistic mapping of storm-induced coastal inundation for climate change adaption. *Coastal Engineering, 133, 126-141.*

Li, N., Roeber, V., Yamazaki, Y., Heitmann, T.W., Bai, Y., and Cheung, K.F. (2014). Integration of coastal inundation modeling from storm tides to individual waves. *Ocean Modelling, 83, 26-42.*

Farewell to ORE

Yefei Bai

I am really grateful to spend the most important period of my life at the department of Ocean and Resources Engineering in pursuing the doctoral degree, building up my specialities, and maturing my character. Millions of memory fragments on my plentiful experience in the department, either cheerful or painful, have deposited under my heart over the time, and at this moment it only leaves everyone's smiling faces rise and shine. Walking through all the faces, I would stop by Dr. Cheung's and say "Thank you for being my respectful advisor", stop by Yoshiki's and say "Thank you for being my cooperative colleague", and stop by Natalie's and say "Thank you for being the helpful department secretary". Stepping on my moving train, I would like to say, "Thank you, everyone! I am honored to be one of the ORE Ohana".

My next stop is Ocean College, Zhejiang University, P.R.China, and I will serve as a faculty member there. How coincidental that ORE has established substantive research and academic collaboration with the Ocean College through a 3+2 program since 2016. Feel free to reach me out whenever you want to visit Zhoushan, China.

Development of New Field Instrument for In Situ Monitoring of 3He

Gary M. McMurtry

Helium isotopes provide important precursory and co-seismic signals of seismic unrest, volcanic eruptions and earthquakes. The timescales of these predictive $^{3}He/^{4}He$ ratio anomalies can range from years to within periods of a few days or less. To date, the only means to sample for He isotopes is using conventional collection techniques with sample return to the laboratory. However, real-time, in situ analysis is necessary to detect any rapid changes in time for effective hazards response and planning. We have made considerable progress in development of an in situ He isotope analysis system, and are now ready to begin field testing. If successful, the new He isotope instrument will help to save lives and mitigate societal costs of volcanic eruptions and major earthquakes, especially from those located within critical and/or densely occupied regions. The instrument will augment present monitoring capabilities - seismometers and related equipment, and will save on labor and other costs associated with the conventional measurement of this critical isotopic ratio.

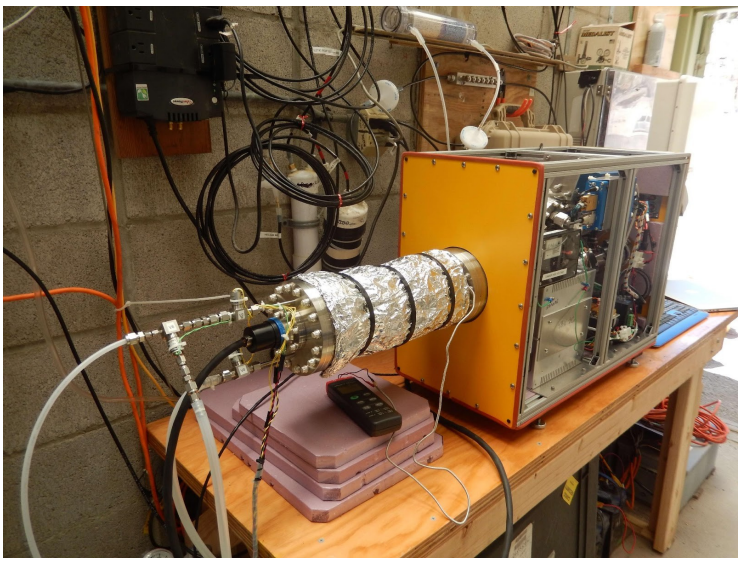

Figure 1. Front view of "Lyle" prototype He isotope monitor deployed in storage room at Horseshoe Lake, Mammoth Mountain, California. This site provides AC power and a safe enclosure.

Proposed field methods and activities

At Kilauea, we plan to occupy the site originally used by Friedman and Reimer (1987) at Sulphur Bank. The ^{4}He flux at the summit of Kilauea Volcano, Hawaii was surveyed by Reimer (1987) who found that the Sulphur Bank solfatara field had the highest net volcanic He flux. This site was one of the first ones studied for in situ instrumental ^{4}He monitoring (Friedman and Reimer, 1987). In collaboration with NPS and USGS-HVO, we plan to re-occupy the original USGS monitoring site at Sulphur Bank. Occasional gas sampling there suggests the Rc/Ra ratio of this hotpot volcano varies from 13 to 15 (e.g., Hilton et al., 1997).

In another USGS collaboration, we are field-testing near Horseshoe Lake on the flank of Mammoth Mountain volcano in eastern California. This site was chosen because: (1) helium isotope variations were observed after seismic swarms associated with injection of basaltic magma beneath the volcano; (2) there is a safe building enclosure with available AC power; (3) high frequency (sub-hourly) volcanic CO_2 fluxes and concentrations are also measured at the site (Lewicki et al., 2008); and (4) scientists from USGS-Menlo Park can drive to the site during the testing period.

Deployment of any instrument in the field first has to contend with interfering species, chief of which will be water vapor and CO_2 – the two most abundant volatiles in magmatic gas. Our solution to this issue is to remove as much water vapor as possible by prior recirculation of sample gas through a cooling-chemical trap dryer system. Because water vapor is so abundant in fumaroles, we have also added two pre-traps: a cooling condensation trap using a small refrigerator immediately followed by a liquid condensation trap. Water is an especially interfering gas because it will also diffuse through the glass inlet at elevated temperature, to ultimately reside in the ion and getter pumps in the instrument's high vacuum. From our preliminary lab work, CO_2 is much less likely to significantly diffuse through the glass inlet.

Experiences in the Scientific Diving Qualification Course

Nicholas Ulm

The Scientific Diver Qualification Course offered at UH is a hands-on, dive intensive class that trains scientists on how to properly and safely conduct experiments while SCUBA diving. This past summer, I had the pleasure of taking the accelerated version of the course. The summer session spans three and a half weeks, Monday through Friday, from 8:00 am to 6:00 pm most days. The classroom is out at the beautiful Hawaii Institute for Marine Biology (HIMB), located on Coconut Island in Kaneohe.

To start most mornings, we met at the docks bright and early to take the shuttle boat out to Coconut Island. From there, we would immediately go into either a classroom setting, or to one of the nearby reefs. The classroom portions are fairly hands-on, practicing basic dive skills and first aid for rescue diving scenarios. Do not let the "Scientific" name fool you, this course focuses just as much on safety as it does scientific methodology.

After establishing a baseline for dive safety, the course "dives" into how to perform surveys and experiments underwater. The preferred format for the class is as follows: start by practicing the method in the classroom, visualize what you need to do on the dive, and then practice execution in what feels like some of the most stressful scenarios they could put you in. Although incredibly frustrating to practice in, these stressful situations make you a better diver by giving you experience in how to handle situations when the weather suddenly turns on you. Of course, the entire time you are under the watchful eye of the incredible dive instructors out on HIMB.

The beauty of this course is that it trains divers from the basic Open Water certification up to Master Diver regardless of starting experience. Although the course prefers students with more dive experience, the class is comprised of divers with a wide range of experience. Having only ever dove twice before taking the course, I was the extreme case. Most people who take the course are marine biologists or oceanographers, who absolutely need to dive in order to work in their field and have normally been diving for most of their lives. Being the only engineer and having very little dive experience, I obviously began the class as the best scientific diver there. Sarcasm aside, the course helped me to become a better scientist and diver by the end by preparing me to be the lead diver during an experiment.

Figure 1. Summer 2018 Dive Class Exploring the Sunken Shipwreck, The Sea Tiger. Whitetip Reef Sharks, Sea Turtles, and Other Marine life are all permanent residents of the ship sitting 100 feet below the surface.

Although the course is very hands-on and time intensive, there is time to enjoy where we are diving. Some of my dives included going out to Reef 42 / 43, where we saw over 12 to 13 sea turtles resting in a massive trench between the two coral reefs. By the end of the course, I was able to dive to 100 feet to explore a sunken ship the Sea Tiger.

The reason I took the course, besides wanting to go diving, was to utilize the certification in ORE601 as the scientific diver. Although SDQC itself has very little overlap with the work we do in ORE601, it prepared me to be able to handle any activity we choose to do on those dives and to allow me to plan those experiments.

Congratulations to Troy Heitman, Recipient of the Link Foundation Fellowship

Troy Heitman

The Link Foundation Fellowship is a 1-year Fellowship awarded to students working towards their Ph.D. [linkenergy.org]. Generally speaking, the committee awards research that focuses on topics relating to ocean engineering and instrumentation, so their interests are in-line with what we do here in ORE. In fact, there have been a few ORE students to receive the award in previous years. It is worth emphasizing to current and future students that the application process is not demanding. Furthermore, the range of topics awarded is rather broad, from the geometric optimization of wave energy converters, to algorithm developments in PIV studies, and of course, anything novel directed towards ocean instrumentation (application, design, build, etc.). Point being, your dissertation topic alone likely fits their interest and I encourage everyone to apply.
My application was on the fabrication of a low cost instrument, specifically designed to observe free surface gravity waves and currents in coastal environments. The principles are largely adopted from the knowledge I learned in ORE609: Hydrodynamic Fluid Body Interactions. Basically, for a given geometry suspended within the water column, I can calculate a response curve as a function of hydrodynamic forcing parameters. Once I know the response curve, all I have to do is place a motion sensor in the body to infer the hydrodynamic parameters of interest. If you are familiar with how a surface buoy collects data, the principles are more or less the same.

What makes it different than off-the-shelf commercial instruments starts at its costs. Like most students, I don't have a budget to support the purchase of field instruments, let alone research grade ones. The instrument I designed and fabricated costs orders of magnitude less than commercially available instruments. The significant cost savings is largely attributed to the application design. For example, I'm considering depth applications in ~10m or less with event based deployment strategies. This allows me to relax much of the design criteria and turn to readily available materials. Also, my goal is to use the data in support of numerical simulations at regional scales, so integral properties are of primary interest. Lastly, when you consider that even the highest frequency gravity waves of interest are on the order of 1Hz, the slowest/cheapest sensors become plausible.

Over the last few years things have changed a lot in terms of circuits and electronics. With the big influx of cheap microcontrollers and microprocessors, it is easier than ever to put together an idea. It certainly helps to have a good programming background and some familiarity with Linux based operating systems. That being said, this whole project actually started as a weekend hobby. I then discovered that UH Professor, Brian Glazer, would be offering a course on embedded systems. Excited as I was to hear that, I went and spoke with him about the course and he said it would be largely hands on and you'll be choosing a project idea to pursue. I couldn't ask for a better fit and I walked into the course and hit the ground running. Here I am, a year later with an instrument that is meeting expectation and has shared interest. Although the project is not finished yet, I will certainly keep everyone updated on future endeavors.

Inside ORE

Dive Buddy Drone


Bradley Beeksma & Nicholas Ulm

While diving for UH's scientific diver course, Nic was frustrated by having to carry technical equipment and an awkward tow-line for a dive flag, all while keeping track of his dive partner. He thought the whole situation would be a lot safer if a dive flag drone was able to automatically track and follow him from the surface, eliminating the need for a tow-line. We found that nothing like this exists, so as graduate students in the Ocean & Resources Engineering department, why not go ahead and build it ourselves. We're calling it "Dive Buddy," a drone that eliminates the need for tow-lines on dive flags, giving divers the freedom to focus on safety and research unhindered.

Recent Publications

- **Nihous, G.C.,** 2018. "A preliminary investigation of the effect of Ocean Thermal Energy Conversion (OTEC) effluent discharge options on global OTEC resources," *Journal of Marine Science and Engineering*, **6**, 10
- Jia, Y., **G.C. Nihous** and K. Rajagopalan, 2018. "An evaluation of the large-scale implementation of Ocean Thermal Energy Conversion (OTEC) using an ocean general circulation model with low-complexity atmospheric feedback effects," *Journal of Marine Science and Engineering*,**6**, 28
- Bai, Y. and **Cheung, K.F.** (2018). Linear shoaling of free-surface waves in multi-layer non-hydrostatic models. *Ocean Modelling*, 121, 90-104.
- Bai, Y. Yamazaki, Y., and **Cheung, K.F.** (2018). Amplification of tsunami drawdown and runup in the Hawaiian Islands by near-trench slip of mega Aleutian earthquakes. *Ocean Modelling*, 124, 61-74.
- Bai, Y., Yamazaki, Y., and **Cheung, K.F.** (2018). Convergence of multi-layer nonhydrostatic models in relation to Boussinesq-type equations. *Journal of Waterway, Port, Coastal, and Ocean Engineering*, 14(2), 06018001-1.
- Bai, Y., Ye, L., Yamazaki, Y., Lay, T., and **Cheung, K.F.** (2018). The 4 May 2018 Mw 6.9 Hawaii Island earthquake and implications for tsunami hazards. *Geophysical Research Letters*, 45(20), 11,040-11,049.
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- Li, N., Yamazaki, Y., Roeber, V., **Cheung, K.F**., and Chock, G. (2018). Probabilistic mapping of storm-induced coastal inundation for climate change adaption. *Coastal Engineering*, 133, 126 -141.
- Yamazaki, Y., **Cheung, K.F.,** and Lay, T. (2018). A self-consistent fault-slip model for the 2011 Tohoku earthquake and tsunami. *Journal of Geophysical Research*: *Solid Earth*, 123(2), 1425-1458.
- Xu, C.H., **Huang, Z.H**., and Yao, Y. (2019) A wave-flume study of scour at a pile breakwater: Solitary waves. Applied Ocean Research 82: 89-108.
- Yao, Y., **Huang, Z.H.,** He, W.R. and Monismith, S.G. (2018). Wave-induced setup and wave-driven current over Quasi-2DH reef-lagoon-channelsystems Coastal Engineering 138: 113-125
- Lee, C.H., Xu, C.H. & **Huang, Z.H.** (2018). A three-phase flow simulation of local scour caused by a submerged wall jet with a water-air interface. Advances in Water Resources. Online first.
- Xu, C.H. & **Huang, Z.H.** (2018) A dual-functional wave-power plant for wave-energy extraction and shore protection: A wave-flume study. Applied Energy 229:963-976.
- Yao,Y., **Huang, Z.H**., He, W.R. & Monismith, S. G.(2018). Wave-induced setup and wave-driven current over Quasi-2DH reef-lagoon-channel systems. Coastal Engineering 138:113–125.
- Yao, Y. , **Huang, Z.H.** & Lo, E.Y.M. (2018). Experimental study on floating debris generated by solitary waves running up a composite beach. Journal of Coastal Research SI(85):851-860
- Cao, D. P. ,Jian, W., **Huang, Z. H**.,& Lo, E. Y. M. (2018) Prediction of wave runup on columns of two semi-submersibles models. Journal of Coastal Research SI(85):1031-1035
- Yu, M. L., Lee, C.H. & **Huang, Z.H.** (2018). Impulsive waves generatedby the collapse of a submerged granular column: a three-phase flow simulation with an emphasis on the effects of initial packing condition. Journal of Earthquake and Tsunami 12 (2): 1840001
- Lee, C.H. & **Huang, Z.H.** (2018). A two-phase flow model for submarine granular flows: With an application to collapse of deeply-submerged granular columns. Advances in Water Resources 115:286-300.

New in ORE

Lin Sun, MS Student

Hi all! I am Lin from China. My background is Ocean Surveying and Mapping from Shandong University of Science and Technology in China. During my undergraduate study, we mainly worked on marine survey positioning, bathymetry and relief maps of the ocean bottom. Now I am an RA under Professor Cheung and focus on setting up DEM database of the Tsunami Mapping Program. In my free time, I love playing volleyball and swimming.

Andi Erickson, MS Student

Hello, my name is Andi Erickson. I am from Long Beach, California. I got my undergraduate degree in Engineering Physics (BS) and a minor in Economics and Business from Westmont College in Santa Barbara, CA. My senior year at Westmont I worked with Engineering Without Border to help build and maintain a series of wells in Tanzania, Africa. During my time at ORE, I hope to focus on marine renewable energy to benefit coastal cities throughout the world. Outside of the classroom, I enjoy traveling, anything outside, especially surfing and hiking, and cheering on the LA Rams.

David Levya, MS Student

Hi, I'm originally from the Washington D.C. area, but went to the University of San Diego where I received a BS/BA in mechanical engineering. Upon graduating I began working for a dot matrix printer manufacturing company. After a few years, I decided to volunteer with the Peace Corps, and spent two years in a remote village in Cameroon teaching high school math and physics. Upon completing my volunteer service, I moved to Nicaragua and taught secondary mathematics at the American Nicaraguan School in Managua. I was lucky enough to have great access to surfing in each of these places, and once I learned about ORE, I decided this would be the perfect fit of my background and my passions.

Cameron Morrow, MS Student

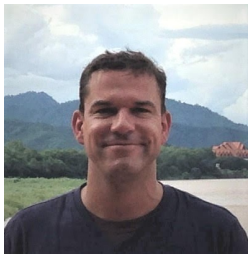
Howdy! I was born and raised in Texas near the DFW area. I completed my undergraduate degree at Texas A&M University where I studied ocean engineering. While studying in the ORE department, I plan to focus on marine renewable energy and offshore engineering. Currently, I am a Research Assistant under Dr. Huang, where I am also collaborating with the Hawaii Natural Energy Institute. In my free time I like to lift weights, rock climb, or go to the beach.

New in ORE

Shijie Haung, MS Student

Aloha! My name is Shijie Huang from China. When I was pursuing my bachelor degree at Zhejiang University and taking CFD course, I found it amazing to simulate real-life physics with computation by adapting governing equations. Thus, I decided to learn more about it. And now, here I am! I will focus on computer simulations regarding wave energy, WECs, and sediment transportation with Dr. Huang, my supervisor. In my spare time, cooking and basketball are typically my favorite activities, but since I'm in Hawaii, it would be a pity if I didn't try to do some water sports, like surfing.

Stefan Mrozewski, MS Student



Aloha, I'm completing pre-program courses before starting ORE grad studies. A long long time ago I earned a BSc (geophyics) from the University of Waterloo and worked as an oil-sands geologist then as a field engineer drilling wells in the Gulf of Mexico and overseas. I took a break from the industry and designed downhole tools for the Integrated Ocean Drilling Program as staff engineer with the Lamont-Doherty Earth Observatory at Columbia University where I also earned an MSc (technology management). I returned to the oilfield working in operations and account management in Brunei and Malaysia before oil prices took a nasty turn. So I'm back at school! Interested in tool and instrument development, hydrate characterization, carbon sequestration, and deepwater applications. Looking for a bridge partner.

Upcoming Conferences

- **The 6th International Conference on Coastal and Ocean Engineering (ICCOE 2019)** in Bangkok, Thailand from April 25-28th, 2019. http://www.iccoe.org/
- **MARI-TECH Conference** in Ottawa, Ontario from April 23-25, 2019 http://mari-techconference.ca/
- **OCEANS'19 MTS/IEEE Conference** in Marseille-France from June 17-20,2019. www.oceans19mtsieeemarseille.org/
- **117th Meeting of the Acoustical Society of America** in Louisville, Kentucky from May 13-17, 2019 https://acousticalsociety.org/asa-meetings/
- **Underwater Technology 2019** will be held in Kaohsiung, Taiwan from April 16-19, 2019. http://ut19.tori.org.tw/webpage/index.aspx
- **Underwater Acoustics Conference** in Crete, Greece from June 30th to July 5th, 2019 http://uaconferences.org/index.php/conference
- **21st International Conference on Offshore Engineering and Technology** in Rome, Italy from May 2-3, 2019. https://waset.org/conference/2019/05/rome/ICOET

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ORE is proud of Nic and Bradley and committed to doing all we can to support the further development of their invention. Would you consider making a donation to the ORE UH Foundation fund, to help us support students like Nic and Bradley? These unique opportunities and awards can be pivotal to students' academic and future success, and we and they depend on the support of our alumni and friends. Please consider donating to ORE today:

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If you have any questions about your donation, or about how ORE is using donor support, please contact Eva-Marie Nosal at 808-956-7686 or nosal@hawaii.edu.

Mahalo for your support!

Figure 1—Nicholas Ulm and Bradley Beeksma, ORE graduates (Center Two) winning 2nd Place in the PACE Breakthrough challenge for Dive Buddy Drone. Photo coutesy of Shidler College of Business

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IN THE SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY AT THE UNIVERSITY OF HAWAI'I AT MANOA

Hana O Ke Kai
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