CIVIL AND ENVIRONMENTAL ENGINEERING | COLLEGE OF ENGINEERING | FALL 2022

BENCHMARK & BEAKER

CE/ENVE Students Jump into National Competitions

Cal Poly teams land top awards with projects that propose solutions to real-world environmental challenges

— see Page 6

ALSO INSIDE:

CAL POLY
College of Engineering

From The DEPARTMENT CHAIR

Thanks to the quality of our students, dedicated faculty and staff, and supportive alumni and industry partners, we have emerged from the pandemic stronger than before.

The student clubs are back to doing great things: mentoring their fellow students, doing outreach to local schools, and competing and winning!

The concrete canoe team showed their ingenuity during the 35th American Society of Civil Engineers Concrete Canoe Competition, paddling to a historic sixth win. The team now holds the record for the most all-time wins. WERC and ECi, two of our environmental engineering competition teams, also took first places in their respective competitions.

Our faculty continue to create a better tomorrow through their work both inside and outside the classroom. Some are working on intriguing projects that include researching carbon sequestration on a green-sand beach in Hawaii, laying the groundwork for offshore wind energy plants, and digging tidal records from two centuries ago to study how human intervention impacts coastal flooding.

At the same time, efforts to revamp our curriculum for the transition to a semester system in fall 2026 are moving forward.

Several of our faculty members were recognized for their excellence in scholarship, efforts to promote diversity, enhance student learning and elevate student success through mentoring. They exemplify our department's culture of excellence.

We are grateful to our alumni and the civil and environmental engineering industry for their support and appreciation of the qualities of our graduates. Many of the finest employers in the industry continue to back the department through their participation in the Industrial Partnership Program. Their aid is instrumental as we continue improving the quality of our programs.

Because of donor support, we can offer the Learn by Doing education we are known for. Join us as we celebrate our milestones while looking forward to a bright future.

Misgana Muleta, Ph.D., P.E.
Department Chair

INSIDE

COVER

Cal Poly civil and environmental engineering students competing in the 32nd annual WERC Environmental Design Contest at New Mexico State University jump from a sand dune during a field trip to White Sands National Monument.

Global Waste Research Institute workshop draws experts to brainstorm a better and more sustainable way to dispose of disaster debris and waste materials

by Emily Slater

▲ The Global Waste Research Institute hosted a workshop at Cal Poly to identify sustainable solutions to post-disaster debris.

DEALING WITH POST-DISASTER DEBRIS

When a natural disaster leaves a staggering amount of debris in its wake, cleanup efforts kick into high gear as workers fast-track materials to local landfills — a practice the engineering and science communities are aiming to correct.

The Global Waste Research Institute hosted a recent workshop at Cal Poly to identify and discuss sustainable solutions to post-disaster debris, drawing 45 participants from a wide range of academic, industry and regulatory groups across the country, including several Cal Poly graduates. The workshop was funded by the National Science Foundation.

"We are trying to reuse and recycle materials and create value instead of sending everything to landfills," said Nazli Yesiller, who serves as the director of the Global Waste Research Institute at Cal Poly and co-director of the NSF SUstainable Material Management Extreme Events Reconnaissance organization.

"Moving out post-disaster debris as quickly as possible creates a significant roadblock to sustainability," she added.

SUMMEER was established in 2020 with a $300,000 NSF grant for the purpose of contributing to natural hazards research through training and reconnaissance, with a focus on sustainable materials management.

The September workshop at Cal Poly followed similar events in Florida and Virginia, all funded by NSF and co-organized by Yesiller, to identify challenges in data needs, field work, potential tools and techniques for reconnaissance activities, and preliminary guidelines and standards.

"We discussed challenges and solutions to most effectively conducting reconnaissance," Yesiller said.

"Post-disaster debris management is an underdeveloped field."

— Nazli Yesiller

During the Cal Poly workshop, experts in the field shared lessons from recent natural disasters in California that included the 2017 Mud Creek landslide on Big Sur's coast, 2018 debris flow and flash flood in Montecito and 2018 Camp Fire in Butte County.

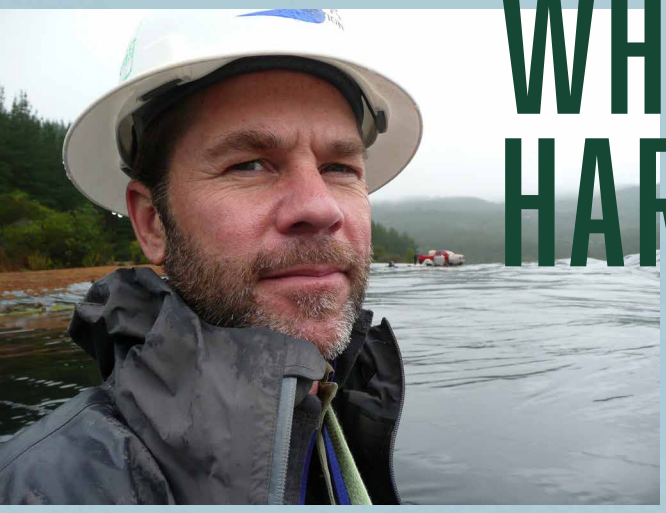
Information from presentations and breakout session discussions will be summarized and synthesized for the research community to guide future exploration and further studies.

"There is very little tracking of materials and very little research," Yesiller said. "Post-disaster debris management is an underdeveloped field."

Geotechnical Engineering Professor Jim Hanson, who joined the workshop, said it is imperative that the public understand the jaw-dropping quantity of debris left after a disaster and its environmental impact.

He also highlighted the need for new standards that would govern how materials, such as concrete, could be safely and effectively reused.

Next up, according to Yesiller, is securing funding to finance full-scale reconnaissance in the collection of post-disaster debris data and assessment of waste storage sites and management activities over time. ■



WHERE TO HARVEST THE WIND?

Engineering Professor Robb Moss to map the seafloor before giant wind turbines arrive on the Central Coast

by Emily Slater

▲ Cal Poly Engineering Professor Robb Moss.

Offshore wind energy is on its way to the West Coast and a Cal Poly engineering professor will play a crucial role in deciding where to tether giant floating turbines to avoid earthquake hot spots and safeguard whale migration routes.

For the first time ever, 373,268 acres of the outer continental shelf off Morro Bay and Eureka will be auctioned off on Dec. 6 for commercial-scale floating offshore wind energy development.

Both wind energy areas have the potential to produce 4.5 gigawatts of offshore wind – enough to power more than 1.5 million homes as California aims to meet its 100-percent clean energy goal by 2045.

Government officials say the 376-square-mile Morro Bay Wind Lease Area is ideal for wind energy development because of its sustainable wind speeds, suitable water depths and access to existing transmission lines.

"This area is ripe for generating offshore energy," said Geotechnical Engineering Professor Robb Moss, whose research niche is developing forecasting tools to identify geological hazards that could threaten infrastructure.

The West Coast poses marine hazards that have yet to be encountered in wind energy development, but Moss said he can barely contain his excitement about research he is spearheading to clear the way for the wind turbines that will float thousands of feet above the seafloor.

Moss recently secured $250,000 in grant funding from Cal Poly supporter John Gregg of Gregg Marine for a one-year pilot project that involves shooting lasers through optical fibers to gather data about geohazards, sediment temperature and whale migration routes before floating platforms are anchored.

"If we can do better geophysics and track/monitor whale health, that's a big win," he said. "There's a lot of hope in this project."

MAPPING THE SEAFLOOR

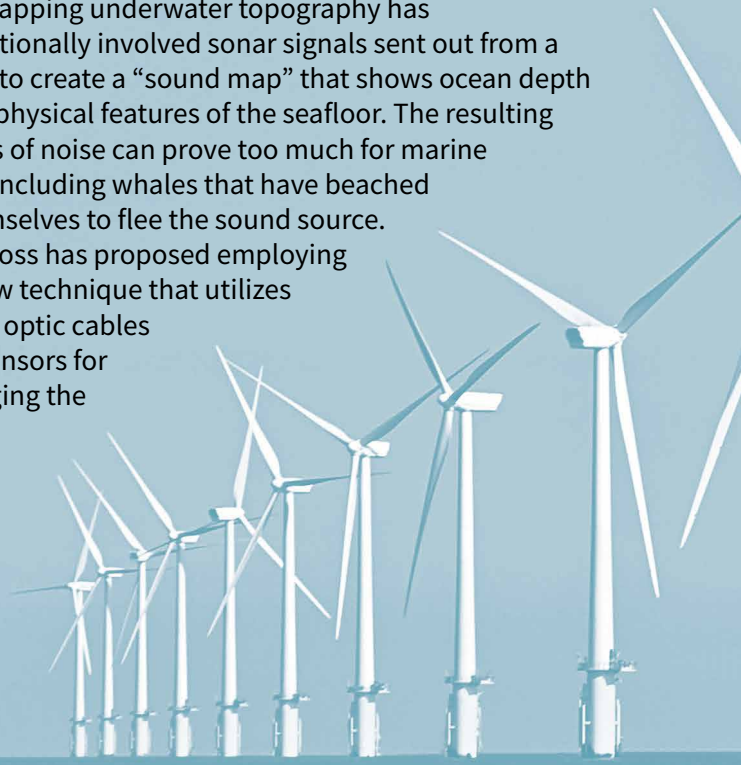
When wind energy made its debut on the East Coast six years ago, the shallow depth of the coastline allowed the turbine foundations to be anchored to the seafloor.

On the West Coast, however, the depth of the water where the wind blows will require the turbines, with their 100-meter blades and 300-meter masts, to float on platforms tethered to a seafloor marked by active earthquake fault systems and deposits formed by massive slope failures.

The goal is to minimize the number of tethers that could anchor as many as 100 floating platforms in the Morro Bay Wind Area by placing them strategically to avoid geohazards and whale routes while maximizing power transmission.

Mapping underwater topography has traditionally involved sonar signals sent out from a ship to create a "sound map" that shows ocean depth and physical features of the seafloor. The resulting walls of noise can prove too much for marine life, including whales that have beached themselves to flee the sound source.

Moss has proposed employing a new technique that utilizes fiber optic cables as sensors for imaging the



seafloor. Distributed acoustic sensing uses pulses of laser light to continuously detect vibrations along optical fibers. Changes in intensity can reveal seafloor faults or landslide-related hazards that must be found before development begins.

"With wind energy coming, we are trying to create a paradigm shift in seafloor geophysics," said Moss, who will work alongside Geophysics Professor Zhongwen Zhan from the California Institute of Technology.

The emerging technology they will employ also records whale calls and can be used in identifying, tracking and monitoring whale migration, according to Zhan.

"The beauty is we aren't using noise that harms marine mammals and are, in fact, using the technology to minimize the hazard of the tethers in their migration routes," said Moss who added that real-time data can be turned over to whale biologists.

Moss aims to launch his pilot project in November with outreach to telecommunications companies about utilizing their subsea cables for the mapping effort. In areas where cables do not exist, Moss plans to send out seafloor robots (remotely operated vehicles) by summer to place his own fibers.

"This project calls for seafloor robots, sensors and cameras – lots of cool stuff," Moss said. "We are going to learn a lot." ■

"With wind energy coming, we are trying to create a paradigm shift in seafloor geophysics."

— Robb Moss

A Treasure Trove of Data

The recent industry practice of bundling both power and fiber cables from offshore wind turbines to onshore electric grid ties can provide long-term monitoring of both marine mammals and infrastructure.

Whales and their migration routes can be tracked through the life of the offshore wind installation, providing important data to researchers, according to Moss.

He said the bundled cabling also can allow for continuous monitoring of the wind turbines as a diagnostic tool for scheduling maintenance, downtime and replacement.

"My excitement for this project is through the roof because I think the potential impacts are pretty broad," Moss said. ■

▲ Cal Poly team Mustang Matrix claimed first place at the WERC Environmental Design Contest for inventing an online system that monitors virus removal during wastewater treatment.

STUDENT TEAMS LAND TOP AWARDS AT PRESTIGIOUS DESIGN CONTEST

Projects propose solutions to real-world environmental challenges

by Emily Slater

Eight environmental engineering students from Cal Poly won first place in a national design contest for inventing a real-time system that monitors virus removal during wastewater treatment, advancing the science of water reuse.

The members of Mustang Matrix competed in the 32nd annual WERC Environmental Design Contest that brings industry, government and academia together in search of innovative solutions to real-world challenges.

College students from across the country converge at New Mexico State University each year to compete for prizes that include more than $30,000, trophies and worldwide recognition.

A second Cal Poly team — CPIRALBLUE — claimed third place for a project that converted carbon captured at a power plant into spirulina algae to offset the cost of operation and make a profit.

Environmental Engineering Professor Tracy Thatcher said ever since Cal Poly joined the contest 13 years ago, the projects and solutions just keep improving.

"These students realize the world is in peril and they want to make it better," said Thatcher, who serves as the faculty adviser for Cal Poly's teams.

GETTING TO AN ANSWER NO ONE KNOWS

Teams start in the fall by selecting from a list of real-world tasks proposed, designed and sponsored by industry and government agencies to meet an immediate environmental need.

Most of the tasks call for cleaning up, preventing or measuring several types of contaminants. They range from improving solar efficiency to removing methanol and ethanol from the drinking water supply on the International Space Station.

"The teams aren't trying to get to an answer someone knows but to an answer no one knows," Thatcher said. "That gives the students a real purpose."

When Gracie Wong learned her team would be

addressing a wastewater challenge, she was excited.

"Wastewater treatment is a topic in a lot of our classes and emerging technologies around water are so important," said Wong, who plans to work in a related field after graduating this spring.

When second-year student Gavin Plume discovered his team would be researching uses for captured carbon, he was equally excited.

As a high school sophomore in 2019, Plume recalled reading a troubling report on the state of the climate. The next day he became a vegetarian to reduce his carbon footprint and changed his path of study from history and philosophy to environmental engineering.

"This project was something I really cared about, so I put a lot of time into it," Plume said.

TAKING A PROJECT FROM BEGINNING TO END

Members of Mustang Matrix spent their first couple of months researching methods to design a continuous wastewater monitoring system, then began building and testing results.

Meanwhile team CPIRALBLUE studied many technologies for using carbon dioxide before deciding on spirulina, which could be used as a food source and dietary supplement. A nontoxic blue dye also can be extracted from the algae.

Both Wong and Plume said collaboration was a key to creating a full design with bench-scale testing and a business plan.

"So much of what we do at school is on an individual basis but working as a team is more of what we'll see in the real world," said Wong, who met twice weekly with her teammates who included Cole Wilkinson, Joshua Schipper, Sara Henkemeyer, Briel Eckel, Analisa Duarte, Aimee Kim and Maxwell Webb.

Plume valued the hands-on experience he gained as a first-year student as he worked alongside teammates Isaac Perez, Carley Niski, Michelle Cullen, Audrey Esteban and Aileen Morales.

"The students learn leadership, teamwork and taking a project from beginning to end," said Thatcher, who said self-confidence is a result.

The competition concludes in the spring at the New Mexico Farm and Ranch Heritage Museum, where teams give presentations and show a bench-scale version of their solution.

A highlight for Wong was presenting Mustang Matrix's project to the judging panel that included two researchers from the U.S. Environmental Protection Agency which sponsored the wastewater task.

"We had some great conversations with the judges about our project, and they thought we did a good job," said Wong, whose team won both the task and bench-scale demonstration awards and had their research paper published.

Plume said his scientific literacy improved, along with his reading and writing skills, as the team compiled their 30-page paper.

"I really enjoyed the process and learned a lot," said Plume, who now is using that knowledge to lead a new WERC competition team as they develop a detection system for microplastics in reservoirs. ■

▲ Cal Poly team CPIRALBLUE claimed third place at the WERC Environmental Design Contest for a project that converted carbon captured at a power plant into spirulina algae.

"These students realize the world is in peril and they want to make it better."

— Tracy Thatcher

TAKING STRUCTURAL HEALTH MONITORING TO THE NEXT LEVEL

Professor aims to design, manufacture sensing system with nanomaterials

by Emily Slater

Long Wang
CE-ENVE

For humans, pain sends a signal that the body needs protection and healing, but for infrastructure, there is not an equivalent sensing system, so a bridge or building may collapse without warning.

Structural Engineering Professor Long Wang aims to address that deficiency through three research projects focused on structural health monitoring — the process of collecting, interpreting and analyzing data from structures to determine their safety and life span — with grants from the National Science Foundation and Department of Defense.

"We are trying to implement sensing systems using nanomaterials that could detect damage in advance," said Wang, who joined Cal Poly's faculty in 2020. "We could use this material in airplanes, bridges and buildings."

Sensor signals can be correlated to structural conditions, so an alert could be issued upon detection of structural damage in much the same way a message of pain is transmitted to the brain.

"Our goal is to design better sensors using nanomaterials so we can prevent catastrophic structural failures and facilitate the decision-making process," Wang said.

DESIGNING, MANUFACTURING MATERIALS

Wang's goal is to enhance the design efficiency and performance of electronic components using nanomaterials for a broad

▲ Structural Engineering Professor Long Wang is spearheading research on sensing systems that could detect damage to structures such as bridges and buildings before they collapse. Photo: Dennis Steers / College of Engineering

range of applications that include monitoring structural integrity and human performance.

A $194,734 grant from the National Science Foundation is funding Wang's work to strategically engineer the performance and properties of such mechanically flexible materials while engaging underrepresented and first-generation college students at Cal Poly.

Since nanomaterials deal with sizes of 100 nanometers or smaller in at least one dimension, they provide a huge surface-to-volume ratio and possess superior mechanical and electrical properties compared to conventional bulky materials. Because of their unique material properties, Wang believes nanomaterials are promising candidates for next-generation sensing devices.

The nanomaterials eventually could be used in electronics as a complement to conventional electronic materials, with the properties customized to monitor structural conditions, as well as human motion and physiological health.

Nanomaterials could also be integrated with concrete, for example, or sprayed on a structural surface, according to Wang who said that in some cases the materials can combine with the structure to provide mechanical reinforcements.

Besides establishing an innovative design strategy, Wang is collaborating with the University of South Florida to develop new techniques to manufacture nano-/micro-structures using electrostatic forces.

The project, funded with a $156,298 grant from the National Science Foundation, could result in ultra-fast material manipulation, nano-/micro-structure construction and high-end electronics manufacturing.

PREDICTING CORROSION DAMAGE

As Wang continues studying the design and manufacture of new materials, he is set to embark on another project that will create digital models to prevent structural failures.

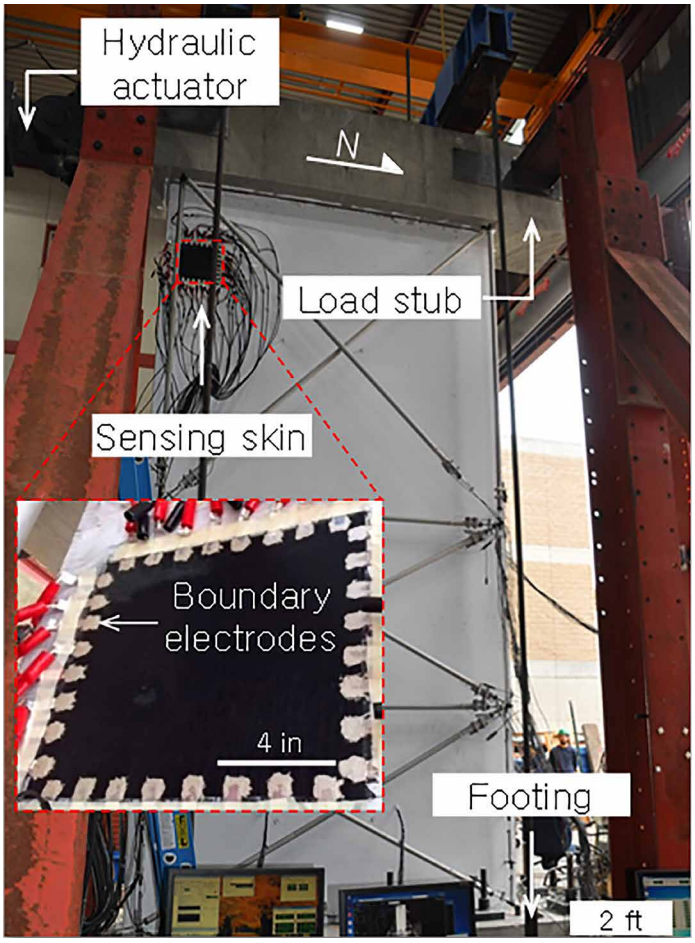
A $60,129 grant from the U.S. Army Corps of Engineers is funding Wang's study of corrosion damage on steel structures and how corrosion develops under different loading conditions.

Through the collaboration with the University of California, San Diego the experimental study will support the development of a computational model for predicting corrosion damage evolution.

While Wang's other research projects are rooted in nanomaterials and sensors, the project would implement a machine-learning technique to automatically detect corrosion damage based on images of structures.

"We want to ultimately provide a digital model of a structure so people can assess that structure and better maintain it," Wang said.

The technique could target aging infrastructure that needs immediate attention, which would enable decision-makers to more efficiently allocate resources to prevent structural failures. ■



▲A sensing skin made of nanomaterials and polymer was implemented on a full-scale reinforced concrete wall to monitor concrete damage under seismic loading in one of Professor Long Wang's experiments.

"We are trying to implement sensing systems using nanomaterials that could detect damage in advance. We could use this material in airplanes, bridges and buildings."

— Long Wang

RESEARCHING CARBON CAPTURE IN HAWAII

Cal Poly group joins team to sample and study a green volcanic mineral that increases carbon dioxide absorption by the ocean

by Emily Slater

▲ Environmental Engineering Professor Yarrow Nelson, center, and Cal Poly students Casper Pratt and Bip Padrnos collect samples of olivine in Hawaii.

An international team of experts from the environmental, geochemical and biological sciences — including a Cal Poly professor and two students — spent a month this summer at mobile research stations on Hawaii beaches to study a green volcanic mineral that captures the carbon dioxide driving climate change.

The team's research will paint a clearer picture of the risks and impacts of radically accelerating the weathering of the mineral olivine by spreading large amounts onto coastlines where it can dissolve in seawater, increasing the rate of carbon dioxide absorption by the ocean.

Environmental Engineering Professor Yarrow Nelson, who is leading the research at Cal Poly, said the rise in global temperatures now requires more than the reduction of fossil fuels. Turning back the tide will necessitate carbon sequestration.

Nelson received a $38,000 grant from Vesta — a public benefit corporation exploring how to harness the carbon-capturing power of the olivine crystals that form natural green beaches — to determine how much olivine is safe to add to a beach given the mineral contains nickel, chromium and cobalt which could harm marine life.

"Our research will be the guardrail on the project," said Nelson, whose expertise is on toxic trace metals in aquatic environments.

Nelson enlisted help from third-year student Casper Pratt and blended master's student Bip Padrnos who conducted sampling and research in conjunction with the larger Vesta team while on the Big Island in July.

The trio set up mobile research stations at one of three sites — green-sand Papakolea, white-sand Kua Bay or black-sand Richardson Beach Park – where they collected and analyzed seawater and sediment samples.

The Cal Poly crew's piece of the larger research puzzle will be critical in showing the movement and changes in the trace metals released at olivine-enriched beaches.

"These findings could be a limiting factor in how much olivine is safe to put on a beach," Nelson explained.

The research that began in Hawaii is progressing this quarter, as Nelson works with both Padrnos and Pratt to develop their experimental designs and design specific experiments at Cal Poly.

Padrnos returned from the Big Island with 4 liters of sediment that he's now spiking with trace metals so the trio can ascertain how the metals will move into the ocean and impact marine ecosystems.

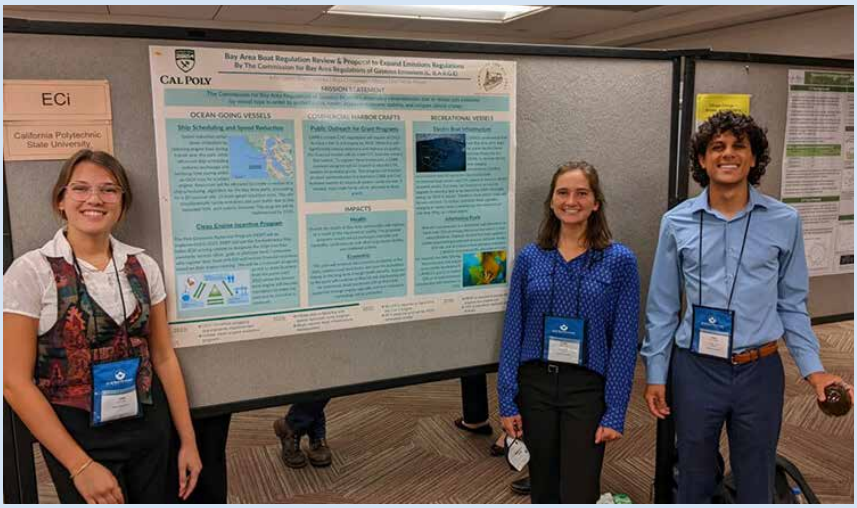
The samples are being tested on the College of Agriculture, Food and Environmental Science's ICP-OES instrument that can measure 80 elements from the periodic table using argon plasma.

"The hope is that the trace metals won't be bioavailable to marine life," Padrnos said. ■

▲ Cal Poly engineering student Casper Pratt dives to collect a sample while on a research expedition in Hawaii to study climate change. Master's student Bip Padrnos, left, analyzes samples for his research.

CAL POLY TEAM WINS ENVIRONMENTAL CHALLENGE INTERNATIONAL

by Charlotte Tallman



▲ Environmental engineering students Julia Loew, Molly Foster and Ramy Wahba at the Air and Waste Management Association Conference in San Francisco.

A team of environmental engineering Cal Poly students proposed a regulatory plan to reduce emissions from vessels in the San Francisco Bay and won the Environmental Challenge International (ECi) at the Air and Waste Management Association Conference in San Francisco.

The team consisted of Julia Loew, Ramy Wahba and Molly Foster (traveling group), Anja Cronjaeger and Marcus Lira (who worked on the project but could not attend the conference).

"We had to start completely at square one with a topic that none of us had any background in and a competition that none of us had participated in before," said Molly Foster. She noted a lot of trial and error in learning to research and work as a team on the project. "We had to branch out from purely technical work and consider regulations and human/environmental impacts, which broadened our understanding of the issues at play in California."

The Air & Waste Management Association is a leading environmental policy and technology association. The annual conference brings environmental scientists, engineers and regulators to share the latest initiatives addressing communities' environmental issues.

Assuming the role of the new governor of California, the assignment was to choose a sustainable approach to regulate emissions from watercraft and reduce air quality impacts on port communities. Each student team described and justified their chosen program over other options.

This year's challenge was the Bay Area, where San Francisco and Oakland have large ports with significant populations residing in portside communities. Each team's research included existing and proposed studies, policies, laws and regulations related to emissions from port-related activities and their health impacts on portside communities at the federal and state level, including a critical review of California's current regulations.

"It was surreal to be in San Francisco, just miles away from the ports we were proposing regulations for," said Ramy Wahba, who is also studying ethics, public policy, science and technology. "My favorite part of the competition was easily the roleplaying portion, in which the judges took on different roles, including government officials, air pollution regulators and port-owners sustainability scientists, and asked us questions about our proposal from their respective perspectives. It was a very tangible example of how interdisciplinary field environmental engineering is."

> *"It was surreal to be in San Francisco, just miles away from the ports we were proposing regulations for."*
>
> — Ramy Wahba

Judges included environmental air monitoring experts and those from specialty practices such as technology, sustainability and regulations.

"This was my first time deep-diving into a research topic like this, and I learned so much," said Julia Emma Loew. "I worked alongside a team of such talented and fun people. I especially enjoyed networking with industry professionals and getting to know the students from the other ECi teams." ■

PADDLING INTO HISTORY

Cal Poly civil and environmental engineering students, from left, Nick Toma, Heather Migdal, Sarah Scherzinger and Carson Bak paddle during the coed race at the 2022 American Society of Civil Engineers Concrete Canoe Competition.

Cal Poly's Concrete Canoe Team sets a milestone by winning sixth national title

Back in the water after a two-year delay because of the COVID-19 pandemic, the Cal Poly concrete canoe team returned to its winning ways at the 2022 American Society of Civil Engineers (ASCE) Concrete Canoe Competition on June 3-5, at Louisiana Tech University. The victory marks Cal Poly's sixth championship in the 35-year history of the competition.

Competing with their space-themed canoe "Europa" against 19 other universities in Ruston, Louisiana, located about 240 miles north of New Orleans, seven Cal Poly civil engineering students and an environmental engineering major not only swept the races but also finished first in the technical presentation and technical proposal categories of the competition and second in the final product prototype. Université Laval of Canada finished second and Western Kentucky was third.

Cal Poly also received the R. John Craig Memorial Award, which honors the late New Jersey Institute of Technology professor who spent years promoting his grand vision of the National Concrete Canoe Competition to the ASCE before the first event was held in 1988.

The Cal Poly win snapped what had been a four-way tie for most titles at five with UC Berkeley, the University of Alabama in Huntsville and the University of Wisconsin.

Cal Poly also won concrete canoe championships in 2010-12, 2017 and 2018. ■

Pande Honored for Scholarship

Engineering Professor Anurag Pande was recognized as a Cal Poly award recipient for 2021-22. Each year, faculty and staff are nominated and recognized as exceptional members of the campus community.

Pande was named a Distinguished Scholarship Award recipient, selected for exemplifying the teacher-scholar model by involving students in his research and applying Cal Poly expertise in direct contributions to the region, state and nation.

Pande joined the College of Engineering in 2008 and has received numerous honors throughout his tenure. He is the first civil engineering faculty member to receive the Distinguished Scholarship Award at Cal Poly. His research benefits students through hands-on opportunities and strong mentor relationships.

Pande has secured more than 30 externally funded research grants totaling more than $2.5 million. His support for student research has resulted in 18 publications co-authored with his students.

He has a bachelor's degree in civil engineering from the Indian Institute of Technology Bombay and a master's degree and doctorate in civil engineering from the University of Central Florida. ■

— Taylor Villanueva

▲ Engineering Professor Anurag Pande was recognized for distinguished scholarship at the spring commencement ceremonies.

Recent Grads Return to Campus as Mentors

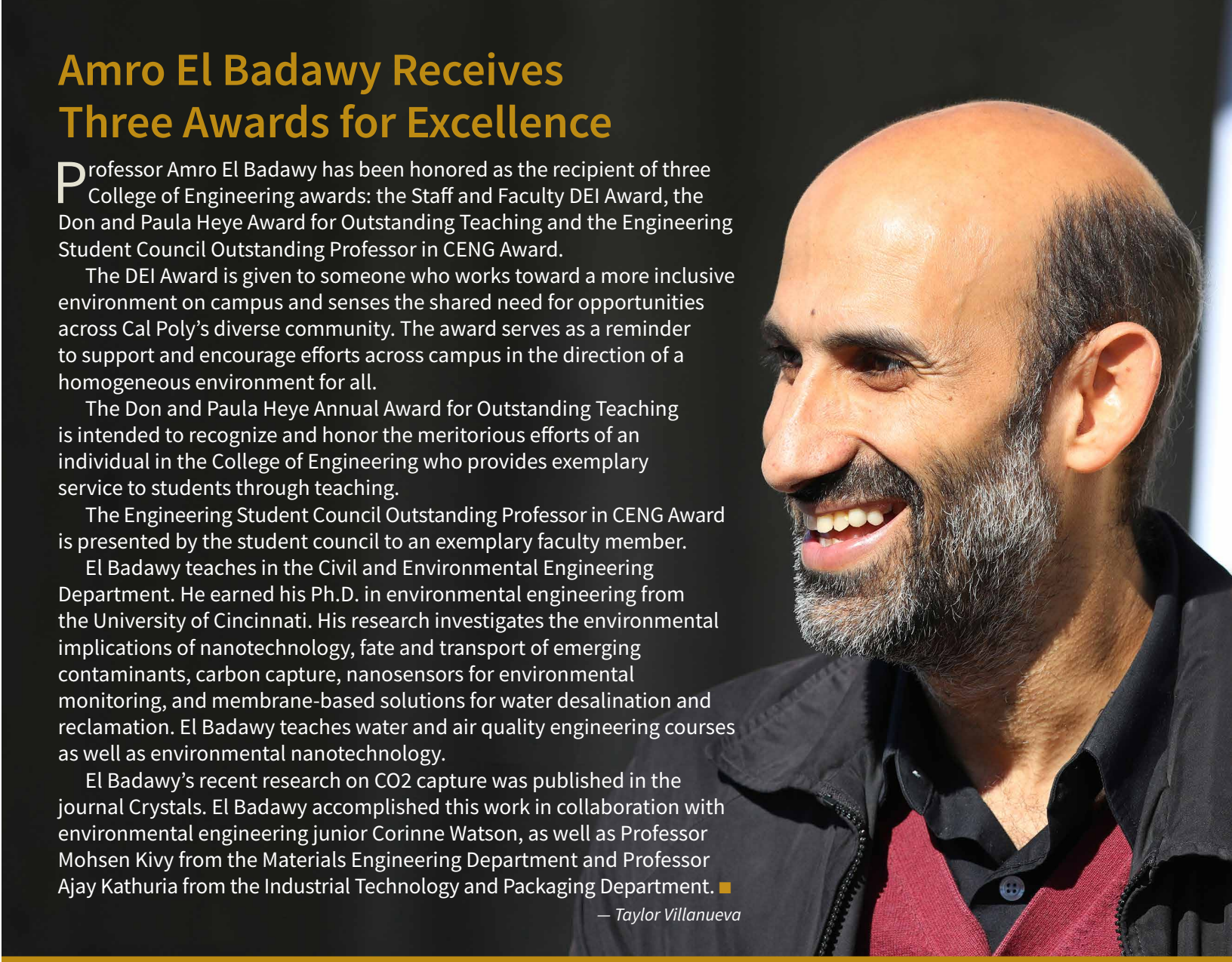
Members of the Recent Graduate Advisory Committee for the Civil and Environmental Engineering Department spoke at Cal Poly on Oct. 7, 2022. The RGAC members include from left, Timmy Puerling (CE, '15), Nick Blanchette (CE, '16), Charlotte Mountain (ENVE, '15), Mike Chang (ENVE, '15), Kristen McFarland (CE, '18), Sydney Grube (CE, '18), Marcial Lamera (CE, '20) and Joshua Core (CE, '15).

Young Engineers of the Year Awards

◀ At left, Civil and Environmental Engineering Department Chair Misgna Muleta presents the Young Engineer of the Year Award to Diego Rivera. At right, Laura Cremer, left, receives her award from Professor Tracy Thatcher.

The Cal Poly Civil and Environmental Engineering Department handed out its first Young Engineer of the Year awards in May after the Industrial Advisory Board selected two alumni whose achievements have been recognized by their colleagues in both the environmental and civil engineering fields. Laura Cremer, who graduated with an environmental engineering degree in 2010, is an environmental engineering manager at Amazon Web Services in San Francisco. She has been recognized in her career as a leader and outstanding young professional. Diego Rivera, who graduated with a civil engineering degree in 2019, is a structural design engineer with LERA Consulting Structural Engineers in New York City. He has been recognized for his contributions in the design of pattern surface structures, and he continues to mentor current Cal Poly students. ■

Amro El Badawy Receives Three Awards for Excellence



Professor Amro El Badawy has been honored as the recipient of three College of Engineering awards: the Staff and Faculty DEI Award, the Don and Paula Heye Award for Outstanding Teaching and the Engineering Student Council Outstanding Professor in CENG Award.

The DEI Award is given to someone who works toward a more inclusive environment on campus and senses the shared need for opportunities across Cal Poly's diverse community. The award serves as a reminder to support and encourage efforts across campus in the direction of a homogeneous environment for all.

The Don and Paula Heye Annual Award for Outstanding Teaching is intended to recognize and honor the meritorious efforts of an individual in the College of Engineering who provides exemplary service to students through teaching.

The Engineering Student Council Outstanding Professor in CENG Award is presented by the student council to an exemplary faculty member.

El Badawy teaches in the Civil and Environmental Engineering Department. He earned his Ph.D. in environmental engineering from the University of Cincinnati. His research investigates the environmental implications of nanotechnology, fate and transport of emerging contaminants, carbon capture, nanosensors for environmental monitoring, and membrane-based solutions for water desalination and reclamation. El Badawy teaches water and air quality engineering courses as well as environmental nanotechnology.

El Badawy's recent research on CO_2 capture was published in the journal Crystals. El Badawy accomplished this work in collaboration with environmental engineering junior Corinne Watson, as well as Professor Mohsen Kivy from the Materials Engineering Department and Professor Ajay Kathuria from the Industrial Technology and Packaging Department. ■

— Taylor Villanueva

Dan Jansen Recognized for Outstanding Club Advising

Engineering Professor Dan Jansen was honored with the Don and Paula Heye Award for Outstanding Club Advising and the Engineering Student Council Outstanding Club Advisor Award.

The Don and Paula Heye Award for Outstanding Club Advising is intended to recognize and honor the meritorious efforts of an individual in the College of Engineering who provides exemplary service to students through club advising.

The Engineering Student Council Outstanding Club Advisor Award is chosen by the student council to honor an exemplary club adviser.

Jansen earned his doctorate in civil engineering from Northwestern University. He is currently overseeing graduate research that ties into his own research around earthen structures. ■

◀ When he's not advising clubs, Engineering Professor Dan Jansen is working on projects involving compacted earth bricks.

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CONGRESSMAN VISITS CAL POLY'S WATER RESOURCE CENTER

▲ Civil and Environmental Engineering graduate students gave Carbajal and College of Engineering Dean Amy S. Fleischer, right, a tour of the algae ponds at the SURE! facility.
Photos: Dennis Steers / College of Engineering

U.S. Congressman Salud Carbajal visited the Cal Poly Sustainable Utilities Research and Education (SURE!) facility at the San Luis Obispo Water Reclamation Center in early November. The goal of SURE! is to provide sustainable solutions to renewable energy, wastewater recycling and resource recovery. Led by Civil and Environmental Engineering Professor Tryg Lundquist, below right, more than 50 Cal Poly students per quarter work at the SURE! site on algae-based wastewater treatment, algae biofuels, potable reuse and dairy wastewater treatment projects.

Click HERE for more on SURE!

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