*Your Link to the Department of Civil Engineering*

# CE CONNECTION

SPRING 2020 | ISSUE 31

*Jim Peterson Creates $1 Million endowment for environmental engineering* | *Pg. 06*


*Tino Maestas (Odin Construction), Dean Lorenzo Smith, Dr. Ben Fell, and Louay Owaidat (President, Odin) gather at the November event to celebrate the re-visioning of an outdoor research space.* | *Pg. 08*

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SACRAMENTO STATE
Department of Civil Engineering

# CHAIR'S MESSAGE

Dear alumni, colleagues and friends,

I hope this finds you healthy and doing well in this incredible, historic time.

We began planning the content for the spring 2020 newsletter before COVID-19 was identified in the United States, so I'm sure you'll notice the relatively "normal" articles presented. I had thoughts of reworking the cover page and content to highlight our efforts during the health crisis to move to a virtual university, but decided not to because, as I read the issue, it brought me happiness, pride and confidence in the future because of our fantastic students, faculty and staff. So, I wanted to share the unaltered newsletter with you in hopes it brings those same feelings into your day. There will be more to come in the summer newsletter on the remarkable feats of our faculty and staff to teach online, and the resiliency of our students.

In short, we had an incredible fall semester. You'll read about a new lab opening for concrete durability testing, made possible by a $50,000 gift from Louay Owaidat and Odin Construction. Also, a graduate of our MS program, Jim Peterson ('98) created a $1 million endowment to support the environmental engineering program, and a $40,000 per year gift agreement to immediately impact the program. Our faculty continued their excellent teaching and scholarship work, exemplified by Zoi Dokou's study of groundwater contamination in the Bahamas via an NSF grant. Finally, I encourage you to read the article on page 26 highlighting alumnus Sean de Guzman ('10 BS and '14 MS) as the newly appointed Chief of Snow Surveys and Water Supply Forecasting at DWR.

Take care of yourselves and I look forward to seeing you soon.

**Ben Fell**
***Chair, Department of Civil Engineering***

If you would like to make a donation to support students who have been impacted by the COVID-19 pandemic you can support our Sac State CARES fund by visiting https://bit.ly/SacStateCares. During this time of uncertainty and evolving needs, the Sac State CARES fund allows the flexibility to provide support to the programs with greatest need as identified and determined by the Vice President of Student Affairs.

SACRAMENTO STATE
Department of Civil Engineering

# Support the Department

Looking for a way to support the Civil Engineering Department? We have four different funds that enhance our ability to educate students:

- **The Ken Kerri Endowment Fund** — Provides support for faculty and student enrichment activities.
- **The CE Freshman Scholarship Fund** — Scholarships to outstanding freshmen.
- **The Graduate Environmental/Water Resources Scholarship Fund** — Scholarships to deserving graduate students in the environmental or water resources engineering areas.
- **The Department Trust Fund** — These resources support student attendance and participation at conferences and competitions, senior design project team expenses, and equipment for labs when other funds are not available.

To donate to any of these funds, go to **http://bit.ly/ceonlinedonate** and follow the directions for online donations.

- Or mail a check made out to the appropriate fund to:

  **Attn: Ashley Mihok**
  **California State University, Sacramento**
  **Department of Civil Engineering**
  **6000 J Street, MS 6029**
  **Sacramento, CA 95819**

- For additional questions on how to give, contact:

  **Nebrisa Fish '05**
  **Director of Development**
  **(916) 278-2453**
  **nebrisa.fish@csus.edu**

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## Upcoming Events

### October 16, 2020
(tentative)

9th Annual Civil Engineering Golf Tournament

For more information or to register please contact Ashley Mihok at ashley.mihok@csus.edu.

### November 17, 2020
(virtual or in-person TBD)

Evening with Industry

For more information or to register please contact Ashley Mihok at ashley.mihok@csus.edu.

## Sponsorship

See information below to become a 2020 Department of Civil Engineering sponsor --

https://bit.ly/cesponsorship2020

**www.csus.edu/ecs/ce**

Like us, and follow us to stay up to date on current CE News and Events!

# Sac State Alum *Gifts Sac State* with $1M Contribution

When A. James "Jim" Peterson was laid off from his job with a private engineering consulting firm, he made a decision that would forever alter his career. With nothing to lose, he signed up for Civil Engineering graduate classes at Sacramento State.

"I could get by with my [undergraduate] degree, but not ahead," Peterson recalls of the decision to return to school. "I could continue to work for private engineering consulting firms, but there was a limit. I told myself, 'I can go further.'"

Twenty-five years later, Peterson is giving back to the university that helped him to move forward with his career. Last year, he established, "The Arvid J. Peterson Fund in Environmental Engineering," and donated

$40,000 to support the environmental engineering curriculum. Another $1 million is to be donated to the department as an estate gift.

"Environmental engineering is a sub discipline of civil engineering," Peterson explains. "Most environmental engineers are just civil engineers, but they specialize in certain kinds of work." He identifies the growing need for individuals trained to effectively handle environmental crises. "There's no shortage of environmental problems; they're not going away. There is plenty of work out there, and plenty of job opportunities."

Prior to his return to school at Sac State in 1996, Peterson found several opportunities to work in the private sector as an environmental science engineer. Though he had originally been interested in pursuing hydraulics, Peterson soon found himself at the forefront of many different types of assignments across the country. These projects included air quality studies, investigating and cleaning up hazardous waste sites, and alternative energy projects.

Peterson enjoyed his career and his work, but he soon realized that those who were climbing the corporate ladder were individuals that possessed an engineering degree. As an undergraduate, Peterson had not pursued that branch of education.

*"I recognized that, 'If I get an engineering degree, I can further my career the way I want to'—and that's what I did."*

Peterson graduated from Sac State with his Master of Science in 1998. His senior thesis advisor, Professor Chris Tomine, had previously introduced him to Bart Croes, then Chief of the Research Division at the California Air Resources Board (CARB), for his senior project. Upon completion of his degree, the Air Resources Board promptly offered him a job. He happily accepted. He remained with the Air Resources Board over the next seventeen years, until his retirement at age 57 due to health-related concerns.

Peterson admits that his decision to support Sac State's environmental engineering curriculum wasn't a lifelong ambition, nor was it something he had initially planned to do. However, after making sure close family members were financially secure, and after donating to several other charities, he began to consider the impact of donating to an institute of higher education. An endowment fund with Sac State became an obvious choice.

Dr. Benjamin Fell, Chair of the Civil Engineering Department notes the contribution from Peterson is unique. "Philanthropic gifts are incredibly important to us because it helps us work on innovative initiatives that need resources and buy new equipment."

A portion of the invested money will be returned annually to the department as it generates income from interest.

*"Most of the funds will be used to support a lecturer position to teach courses in environmental engineering."*

With the remaining funds, Dr. Fell explains, "the department chair will consult with the faculty in the environmental engineering area and decide where the priority is for the funds each year."

These funds could be used for new equipment, other lab improvements, and emerging needs related to environmental engineering—which is exactly in line with what Peterson intends for his gift. "What I would like is to ensure that some of the courses that I found worthwhile… continue to be offered, so that other students can take them and hopefully accomplish some of the things that I was unable to do with my career, because it got cut short." He laments that, with the departure of certain professors, classes that were beneficial to his career were discontinued. He hopes that his gift will help fund the hiring and funding of faculty that will continue to teach courses he considers essential.

In recent years the school has noticed a growing trend with those giving donations to the department, in the form of wills, trusts, and endowment funds. "Over the last five years, the department has raised over $1.6 million, which has been turned around and invested back into making the program better," says Dr. Fell.

To those considering making a gift to Sac State through their own will or trust plan, Peterson recognizes that the choice is, "highly personal." He is confident in his decision to give back and to influence the careers of students for years to come. "I would like to see that there are people out there that have some of the skills I had, and to do some good with them."

## 16TH ANNUAL

# Evening with Industry

At the back of the Alumni Center, as nearly two hundred seats were filled with excited undergraduates and equally enthusiastic faculty from the Department of Civil Engineering, Malak Alhaidari beamed with pride. When she graduated with her degree in 2016, Alhaidari became an engineer with the USACE. She never dreamed that, one day, she would be returning to Sac State as a panelist for an event that had inspired her during her own undergraduate years.

Event RECAP

"This is very honoring," Alhaidair commented, looking around the room as even more students crowded in. "It [appearing on the panel] wasn't even on the horizon as a freshman."

The Evening with Industry is an interactive event in which students present questions to a panel of professionals, and then get the opportunity to chat one-on-one with representatives from some of the most well-known engineering firms in the region. Among those companies in attendance included MacKay and Somps, Carollo, Michael Baker International, GEI, and Kiewit.

Opening remarks from Dr. Benjamin Fell, Department Chair, and Dr. Lorenzo Smith, Dean of the College of Engineering and Computer Science, acknowledged the group in attendance was the, "largest gathering we've had," and encouraged students to take advantage of the opportunities of the evening.

"We are trying to expose you to as many industry professionals as we can," emphasized Dr. Fell while addressing the crowded room. "The folks here today are your community and support network."

After a brief introduction by President Richard Dokken, of Dokken Engineering, the keynote speaker of the evening took center stage. Louis Stewart, the first Chief Innovation Officer for the City of Sacramento, detailed the advancements in commerce and business that have come to the area over the past several years. His long-term goals include the expansion of the Sacramento region into a hub that investors seek out for growth and enrichment. New technology, such as the autonomous bus that was tested on the campus last year, continues to make its way to the city for ground breaking trials and research. Civil Engineering students at Sac State are at the epicenter of this expansion. Stewart challenged students to take advantage of these opportunities. "What happens if 'What if?' questions turn into solving real-world problems?" he posed, challenging students to think outside the box both during their studies and as professionals upon graduation.

> *It's very humbling to talk to a room full of people that do what you want to do, and can give good advice.*
>
> **— ANNA COVAL**

The panel of industry professionals followed next. Malak Alhaidari joined fellow panelists Josh Marston, Kira Davis, Victor Guardado, Marco Palilla, and Gabe Apgar as they answered student questions about pursuing internships, getting involved in student clubs, and how to balance both personal and professional life. In line with Stewart's theme, the panelists encouraged undergraduates to reach out beyond their comfort zones to experience and learn as much as they could about the engineering world. "It's up to you to ask questions and seek guidance from senior engineers," Apgar spoke frankly.

Recent graduate Guardado agreed. "Be coachable, and be humble," he advised those in attendance. "These are two of the most important qualifications going out into the workforce."



After the panel, light refreshments were served as undergraduates made their way over to meet with the representatives from the engineering companies. Sac State civil engineering faculty joined them. They were just as enthusiastic at meeting the visiting agencies and the panelists as the students were, and eagerly encouraged the undergrads to get to know their peers.

"Some of the panelists were my students," Dr. Ghazan Khan commented as he gazed, enthralled, at the full room around him. "I'm going to go talk to them [the panelists], and then I'm going to go push my students to talk to them."

At that moment, Dr. Khan spotted one of his current students in the food line. "Hey! Stop talking with your friends and stop eating!" he jokingly instructed the student. "Go talk to people!"

In response, the student held up a small stack of business cards to Dr. Khan. "I've already grabbed three!"

Another group of students made their way around to each of the booths, enthusiastically chatting amongst themselves as they waited for some of the crowds to thin out in between tables. "I feel very supported," Harpreet Gill said of the event. "It's one of the only events where all these people are here specifically for the students." His friends Akram Qashou and Ralph Nzenkue agreed. All three students were graduating the following month, and appreciated the opportunity, "to see what is available before graduating,"

Junior Anna Coval shared similar sentiments. "My focus is water resources," she explained. "It's very humbling to talk to a room full of people that do what you want to do, and can give good advice."

The Department of Civil Engineering would like to thank all of the companies, firms, and organizations that came out to assist us in this special event. Thank you also to all of our sponsors for helping fund such an educational evening for Sac State's engineering undergraduates.



# Save the Date!

## 9th Annual Civil Engineering Golf Tournament

Friday, October 16, 2020 **(tentative)**

**NEW LOCATION**

We are excited to announce that for the first time, our Tournament will be held at

TopGolf
1700 Freedom Way
Roseville, CA 95678

Each firm will be asked to purchase a foursome, send between 1 to 4 players, and will be matched with students interested in the general area of the firm's business. Proceeds support the Sacramento State Department of Civil Engineering.

For more information or to register please contact Ashley Mihok at ashley.mihok@csus.edu.

**Want to sponsor the event or our department?**
Visit our webpage at www.csus.edu/ecs/ce for more info.


***Topgolf is in no way affiliated, nor does it endorse, Sacramento State, nor the Department of Civil Engineering.***
***Photo credit: TopGolf***

# New Indoor and Outdoor Lab

## for Engineering Research Opens on Campus

It was a picturesque autumn evening on November 12th as more than fifty faculty, staff, students and community sponsors gathered for the official unveiling of the Concrete Durability Research Laboratory. Located within the Sustainable Technologies Outdoor Research Consortium (STORC), the lab houses both an outdoor exposure site and an indoor laboratory, known as the Advanced Laboratory for Infrastructure Materials Research (ALIMAR). Though still technically in development, guests were allowed to explore the lab and view some of the new equipment that had recently been purchased.

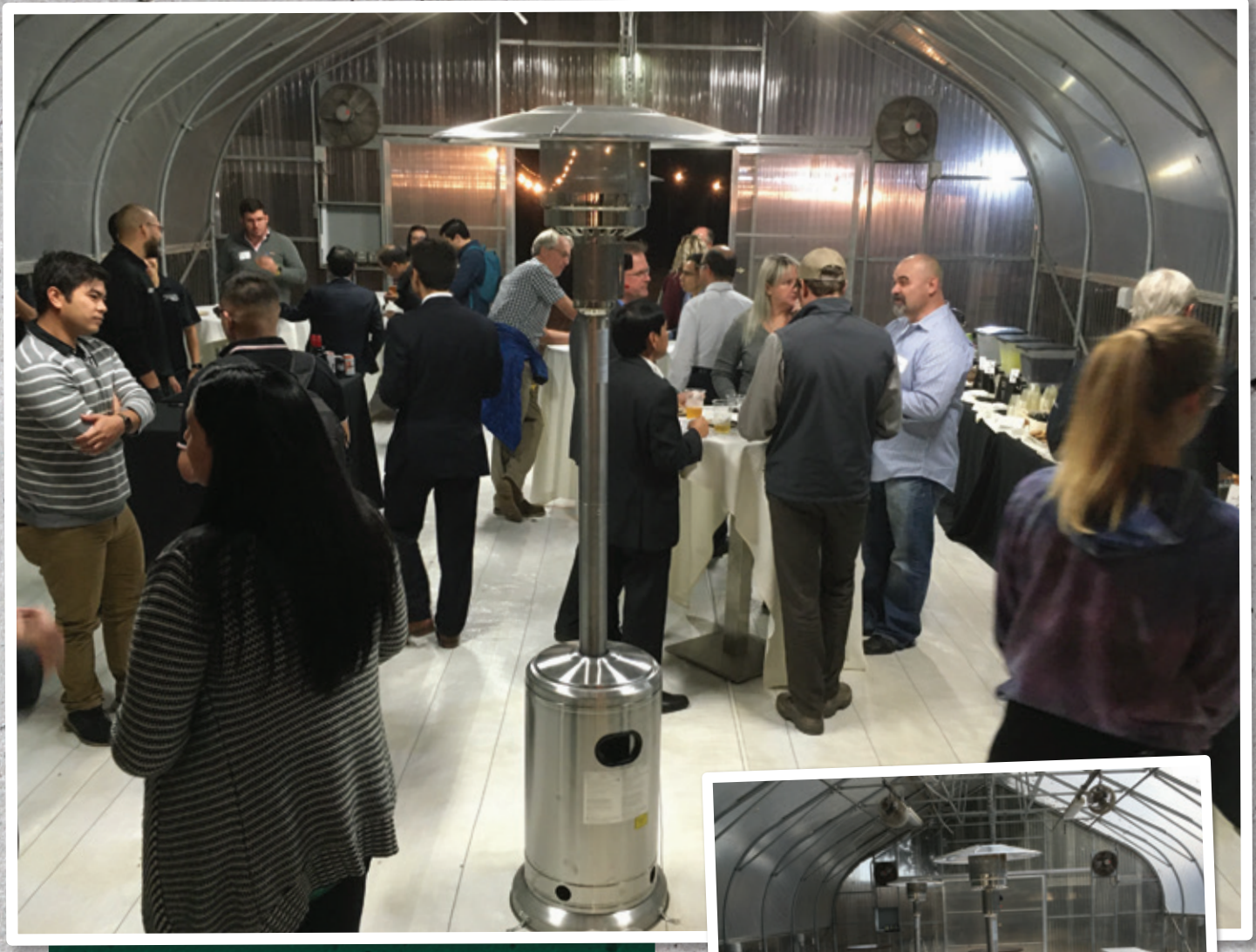
Dr. Jose Garcia played a big part in the development and execution of the lab, and was in attendance that evening. "I am very excited about the new opportunities that the lab offers for the students and the faculty," he said. "The students can gain more knowledge and receive training that will give them an advantage when they are applying for jobs in the cement and concrete sector."

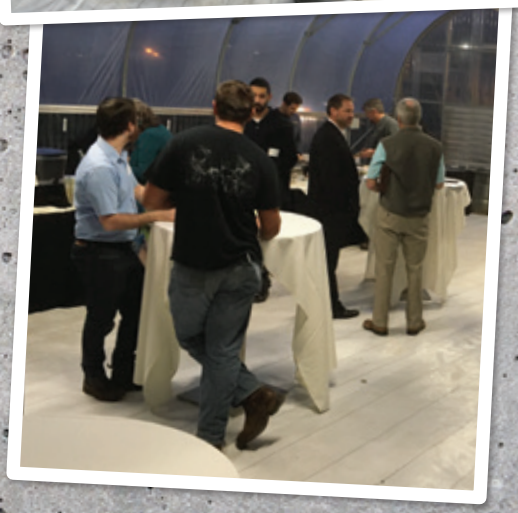
Dr. Benjamin Fell, Chair of the Department of Civil Engineering and Assistant Director of the STORC, shared a similar enthusiasm, describing the lab as a, "blank canvas," and a unique type of facility. "The closest exposure lab that we could find resides at Oregon State, so if we could develop this, it would certainly be the first of its kind in Northern CA."

Visions of a lab accessible to faculty and students–graduate and undergraduate alike–began several years ago with the hire of Dr. Garcia in 2018. When I was visiting Sac State," Dr. Garcia explains, "I met with Dean Smith and shared my idea of establishing a concrete durability research center that would include an outdoor exposure site and an indoor laboratory. Dean Smith informed me about the availability of the STORC space and we thought it aligned really well with my research interests and the university's mission to conduct applied research."

Dr. Lorenzo Smith, Dean of the College of Engineering and Computer Science, recalls being extremely impressed by the idea of the lab. "Dr. Jose Garcia joined our college, bringing with him a vision for an outdoor concrete durability lab. Dr. Ben Fell, his department chair, helped create a solid plan around that vision. Those two represent the 'passionate professors.' They invested a great deal of time and energy in developing a plan."

To make this lab possible, several companies provided donations to fund the restoration of the space, as well as the addition of new equipment. Mr. Louay Owaidat, of Odin Construction, became a partner and worked closely with Dr. Fell and Dr. Garcia to bring the vision of the lab to fruition. Odin Construction helped to fund the civil





*Long term, I would like this to be an extremely active and state of the art research space.*

**— DR. BENJAMIN FELL**


BACKGROUND
2017 Infrastructure Grades
D+



engineering portions of the lab. SMUD also generously stepped in to help fund portions of the lab devoted to Mechanical Engineering.

There are many research goals that the lab will facilitate in the coming years. These include biodiesel research (turning oils and fats into gas), development of fuel from organic material, research on wetlands and vegetation in the delta region (such as the research being conducted by Dr. Cristina Poindexter), and accessibility by both students and larger collaborators, such as Odin Construction.

There have been considerable donations made to the development of the lab since its opening. "In early November," Dr. Garcia states, "I submitted a proposal to the Sacramento Chapter of the American Public Works Association (APWA) for a $25,000 education fund to purchase equipment for the indoor laboratory. In late November…we were informed that my proposal had been selected. We are already purchasing the equipment that I identified in the proposal and I expect all of the equipment to be in place by the end of the summer."

Other surprises came in as well: SMUD generously donated a gasifier used for testing organic fuel sources, and during the opening ceremony itself, Odin Construction pledged an additional $50,000 in donations to use towards upgrades of the facility.

The facility is still a long way to go from being completely functioning. The department is still looking to fundraise approximately $150,000 that will go towards further developments of the area. "We are in need of drainage and hardscaping – currently the lab is situated on decomposed granite–which we can't operate forklifts on–and when it rains the DG clogs the current drainage at the site," Dr. Fell elaborates. "Long term, I would like this to be an extremely active and state of the art research space." Meeting their fundraising goal will go a long way towards achieving that dream.

For now, Dr. Garcia is appreciative of how far his dream has come, and is thankful to the organizations, companies, firms and people involved in making it a reality. "I am very thankful for their efforts which are often behind the scenes," he says gratefully. "The lab and the event have been a team effort [and] a lot of people contributed in different ways."

# Alumni Spotlight:

# Emad Ehsani

The Oakland Army Base was the sight of a large scale, fully operational army base bordering Interstate 80 and the Port of Oakland. Shortly before the turn of the new century, the base was decommissioned and the land divided up for redevelopment. Old structures required careful demolition and removal, and new structures, including commercial facilities and rails for public transportation, needed careful guidance and installation. Of further concern were possible environmental issues that the repurposing of the area could create.

Enter Emad Ehsani, PE, graduate of the Sacramento State civil engineering program. He joined the BKF engineering team responsible for development projects at the base, and was soon promoted to Design Project Manager. Ehsani recalls the project required many specific details, including roadway and utility designs.

*"Some of my tasks included infrastructure upgrades, including roadway re-alignment, adding an adequate drainage system, and implementing a new sewer facility which included four new pump stations,"*

Ehsani says. He helped coordinate efforts between various stakeholders, including Caltrans, Port of Oakland, EBMUD, PG&E and AT&T for main facility relocations. He also collaborated with the appropriate Oakland agencies, including BCDC, to set up a permit that would develop proper drainage outfall into San Francisco Bay. The

previous plan designed during the Army's occupation of the area was long outdated. Ehsani worked with a team of Engineers to create a proper system that was economical and environmentally sound.

Ehsani graduated from Sac State in 2008. "I started as an electrical engineer," he says, "and after the first year, I switched majors to civil engineering. It wasn't until my junior year that I realized I had an interest in transportation engineering, and I started taking elective classes geared towards that field." During his undergraduate studies, he participated in two internships. The first was with Stacy and Witback, Inc. "They are a general contractor mainly focusing on light and heavy rail infrastructure," explains Ehsani. "I worked on the 7th Street Lightrail Extension Project for the Regional Transit (RT) Downtown Sacramento for two and a half years. I worked full-time during summer and winter breaks, and part-time during school years." His second that he had until graduation was in the Design Division of the Sacramento Area Sewer District.

After graduation, Ehsani was picked up by Dokken Engineering, and remained with them for five years. During that time, he took two graduate classes at Sac State, intending on completing a Master's program. However, his plans changed when his wife found employment in the Bay Area. He followed her to San Francisco two months later, where he was hired by BKF Engineers. With Dokken Engineering, he had assisted with widening Road 80 in Tulare County. BKF Engineers proved to be a gateway to similar projects, including the Herndon Avenue Grade Separation in Fresno and the Laurel Access to Mills, Maxwell Park & Seminary (LAMMPS) project, also located in Oakland. By January 2020, Ehsani and his wife had returned to Sacramento, and he had made his way to Dewberry-Drake Haglan.

A proud Alumnus of Sac State, Ehsani joined the Civil Engineering Program Industry Advisory Committee (CEPIAC). "It was important for me to help and give back to the students, and to be part of a group that makes decisions and assists the department program by maintaining connections to our professional industry," Ehsani recollects of his decision to join the CEPIAC. "I wanted to make sure the students and faculty understand the full picture, and share some of the challenges students face after graduation based on my own experience."

*I worked on the 7th Street Lightrail Extension Project for the Regional Transit (RT) Downtown Sacramento for two and a half years. I worked full-time during summer and winter breaks, and part-time during school years.*

One way that Ehsani enjoys connecting with students is through Sac State's annual Golf Tournament. "The golf tournament is a great event to spend time with students, discuss their goals, and answer any questions they may have about my experiences or the civil engineering industry in general. The conversations are very casual and non-stressful. Also, it's a great time for students to have the opportunity to discuss their goals and receive some feedback. Sometimes the conversations become a non-formal interview for a possible internship, and/or a full-time position opportunity for students."

The memories that stick out the most for Ehsani regarding his time at Sac State are the moments he spent getting to know his peers. "We were a close group of classmates that became good friends," recalls Ehsani. "We typically studied together and attended various functions. To this day, I still keep in touch with a lot of my former classmates, and try to connect with them to catch up whenever I can." By being part of the CEPIAC annual Golf Tournament, Ehsani hopes to instill in current undergraduates the values of networking and remaining connected. "A lot of them [former classmates] stayed in the area and work in the same industry I do, so I see them at different professional functions and/or conferences."

# The Engineering *Entrepreneur*

**Cesar Montes de Oca originally transferred to Sac State from the University of Florida, intending to pursue an electrical engineering degree. However, Montes de Oca quickly realized that the degree choice may land him in an office only job—a career path he wanted to avoid. Thus, he changed majors to civil engineering. His ultimate goal, of owning his own business, never once wavered.**

"I come from an entrepreneurial family and understood the importance of making connections and networking," says Montes de Oca. "I made it a point to be involved in organizations that would build those connections." To that end, Montes de Oca strived to excel in all of his classes (including his favorite, "Soils Mechanics," with Dr. Aryani) to give himself the best possible opportunities after university.

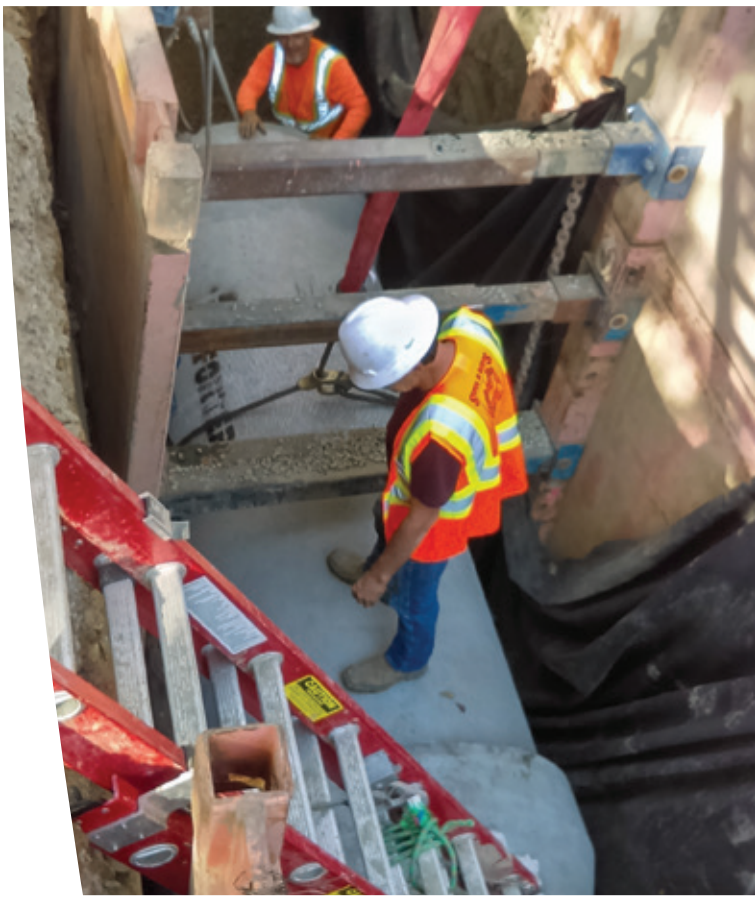
Montes de Oca was also very particular on where he wanted to complete his undergraduate internship. He was able to find an opening with Dokken Engineering, where he had the opportunity to work on designs for bridges, retaining walls and sound walls. He remained with them until his graduation from Sac State in 2006 and held various positions for the next several years until he launched his own company in 2014.

UNICO Engineering is a dynamic and integrative firm located in Folsom, CA. "Our services include construction management, land surveying, program management and systems integration," describes Montes de Oca. "The first couple of years were challenging to find the right people to hire, meaning those who were a good fit with our company culture and shared a similar vision for the growth of UNICO. The last couple of years we have hit our stride; in fact, we just surpassed the 50-employee mark." When looking to hire, Montes de Oca looks for candidates that are excellent communicators, who establish networks with other professionals and have a desire to develop their engineering talents. "These skills are critical for business development and are extremely important in managing projects," notes Montes de Oca.

Despite the company's relatively young age, Montes de Oca's firm has already been involved in several major projects. "We are currently performing construction management and inspection for the 3rd Street Sewer Upgrade Project for the City of Sacramento Department of Utilities. The project installs a new 42-inch sewer pipeline using an open-cut trench. Additional work includes installation of new sewer manholes, modifications to existing drain inlets, and new combined sewer service connections. Construction is currently underway on 3rd Street between U and Q Streets, and at the intersection of 3rd St. & T St. Work will travel north on 3rd St. until H St., near the Sacramento Valley Station." As Montes de Oca points out, the project is complicated by the constant traffic in and around nearby businesses, including the Crocker Art Museum. "Traffic control and public outreach are critical components to project delivery," Montes de Oca stresses, reiterating the importance of strong communication skills.

Montes de Oca has remained very close with Sac State over the years by keeping in touch with professors such as Dr. Matsumoto, and particularly by being involved with undergraduates. "I have mentored the CE 190 (Senior Project) class [for] several years. At UNICO, we pride in hiring student interns from Sac State. We have two new students that just started in February of this year. We also have a track record of hiring our interns on as full-time employees when they graduate."

Moving forward, Montes de Oca is still planning the next steps for himself as well as UNICO. "Each year we [the company] go through a strategic planning exercise to develop a plan for where we want to be as a company both for the following year and longer term. Our goal is to continue to grow and diversify in geographic markets. This year, we are focused on expanding our construction management expertise to include bridges and structures, and to expand into the Bay Area." With the success of his current projects, and the knowledge of how hard work can pay off, Montes de Oca is confident that his expectations of where UNICO will go in the future will not only be accomplished, but surpassed.



# NSF Grant Allows for
# RESEARCH AFTER DISASTER


On September 1, 2019, Hurricane Dorian made landfall on a string of islands in the Bahamas. A Category 5 monstrosity, Hurricane Dorian holds the record as the most intense hurricane to hit the area. One of the most devastated islands was the Grand Bahama Island. By the time the cyclone had moved on towards the United States, more than half of the island was submerged underwater. The power grid was completely offline. Dozens were dead, and thousands more were injured, displaced, and homeless.

Though cleanup and restoration projects have been ongoing since the disaster, Grand Bahama is still plagued by concerns. One of the most distressing is saltwater contamination of the island's groundwater supply. During the storm, surges between 20 to 25 feet battered the coast, causing massive flooding. The sea water seeped into the freshwater reservoirs, and residents, already struggling with the loss of their homes and their livelihood, found they had no access to clean water.

Nivea Mazzoni, an alumna of Florida Institute of Technology and a resident of the island, requested assistance for the ravaged region. The response came from Sacramento State's Dr. Zoi Dokou, who, along with Professor Efthymios Nikolopoulos of Florida Tech, applied for and received a grant from the National Science Foundation (NSF) in the form of the Rapid Response Research (RAPID) award. This gift is requested and supplied to fund research in the aftermath of events that need immediate action and have a limited amount of time available to conduct studies and find solutions to problems.

"The ultimate goal of this research is to create a tool that will assist local officials as they assess what steps should be taken in responding to challenges caused by storm-induced saltwater intrusion, and help the affected communities improve resilience to weather and climate extremes," says Dokou, the Principal Investigator of this project, about the team's overall objective.

After an orientation and briefing with Grand Bahama Island stakeholders and local authorities, the team got to work. During their week stay, the group collaborated with local civil engineers and water management authorities, as well as professors from the University of the Bahamas, to set up monitoring equipment of the area and to collect soil and groundwater samples. The project became a united effort which will eventually lead to the involvement of both university and high school students. The week concluded with one final briefing and update with authorities and stakeholders. Dokou recalls that the parties, "were very eager to facilitate our research project by coordinating the

monitoring process with the local consultant, and sharing complimentary information on the Grand Bahama aquifer with the research team."

Preliminary findings from the available data were not exactly positive. "The team discovered that even though over six months have passed since Hurricane Dorian, the salinity levels on the GB aquifer remain elevated in many locations on the island and the water is not drinkable, exceeding by far the EPA's standards for drinking water," Dokou summarizes. "This is mainly attributed to the fact that there has been very limited rainfall in the meantime. What we are eager to see is how these levels will change when the rainy season starts and the recharging of the aquifer occurs."

The research that Dokou and her colleagues began is far from being complete. Further sampling and monitoring of the area will take place over the course of the next nine months to observe the situation. "Groundwater samples are being collected from sixteen wells within the inundated area at the island's wellfields," Dokou continues. "In addition, at least one well located outside the inundated area is sampled to serve as a control point. In-situ measurements of electrical conductivity, total dissolved solids, salinity, temperature and water levels are currently being collected using portable meters. Sampling will be performed once per week for eight months (early February to the end of September 2020)."

In addition to reviewing further test results and samples in real-time, Dokou hopes that, during her return in the summer, she can visit with local high schools and stress the importance of water safety and conservation with students. She would also like to explore future collaborations with the University of the Bahamas. Her team plans to draft an updated proposal to the NSF for a continuation grant allowing researchers to receive further support for research into groundwater models for the area.

For Dr. Dokou, the research on Grand Bahama carries personal significance. "Being an environmental engineer, I have always had an appreciation for the environment and nature, and I look for ways to make an impact on people's livelihoods," she reflects. "This research provides me with the opportunity to make an impact on communities that have been stricken by disasters such as Hurricane Dorian. Knowing that I can make a difference through my research is my driving force."

# Student Spotlight: Amanda Jones

*On the Go with Amanda Jones*

**Current Junior Amanda Jones likes to stay busy. As someone who is no stranger to hard work, Jones keeps her schedule filled and stays motivated to succeed by planning each day and setting personal daily goals. Recently, Jones took a break from her studies and talked with us about being on the go as a civil engineering undergraduate.**

**When did you intend to graduate from Sac State's program? What is your main area of focus?**

I intend to graduate in spring 2021 with a Civil Engineering BS. Most of my electives will be structural focused.

**Are there any extracurricular activities you participate in, or are you part of any internships?**

I took 18 units last semester. With classes, homework, work, and my dog and horses to take care of, I don't have time for any extracurriculars. This semester, I'm hoping to join SEAOC [Structural Engineers Association of California] and ASCE [American Society of Civil Engineers].

**Do you intend to pursue a Master's Degree or any other further education?**

I do want to get my Master's in Structural Engineering once I graduate so that I can pursue getting my SE licensure.

**What are some goals you keep in mind as you make your way through college?**

A big goal for me is simply graduating. I'll be the first in my family to get a degree and that is huge for me. I also really appreciate what civil engineers do and how they can impact the world for the better. I hope to design and build something that will be good for people and the environment.

**What are your career goals? Do you have something lined up for when you graduate?**

I ultimately want to get my master's and SE. I always pictured myself working for CalTrans or somewhere else where I could help improve our aging infrastructure.

**Would you elaborate a bit more? What do you see as some major problems facing California's system over the next decade or so, and how would you like to be part of making it better?**

A lot of California's infrastructure is aging, literally in the sense that most of it was built in the 1970s or before. The I St Bridge was built in 1911. On top of that, a lot of maintenance and repairs are put off or never done. Tons of this infrastructure [uses] outdated designs as well. One problem caused by outdated designs is the traffic they create. Population in California is likely to keep rising, which will add to the already terrible traffic situation. All one needs to do is look at the report card ASCE puts out to see that something needs to be done. 2019 got a C+ on infrastructure overall, which is marginally better than the D from last year. I hope to work somewhere that will front run change and update the outdated structures.

**How do you find the strength to stay motivated on such a tightly run schedule?**

I am highly motivated to do well; I think it's the competitive spirit in me, and I am motivated to finish my degree because it's something I've been looking forward to for so long. I feel like a lot of the strength to keep on track and keep going comes more from habits and planning than from motivation at some point. The big ones are keeping a detailed planner and going to bed at the same time every night. I've also found it helps to take breaks. Every day I make a list of things I need to get done. Once I finish an item, I take a break to play a game or walk my dog. My family, my boyfriend, and his family have all been the best. I wouldn't be back in school and doing well if it weren't for them. Everyone is so supportive and always there if I need anything, [and] they're also so interested in what and how I'm doing.

**What has been your favorite class to date?**

I don't think I have a 'favorite' class; I enjoy learning and get really into whatever classes I'm taking. If I had to pick, Mechanics of Materials was challenging and fun. I'm in Intro to Structural Analysis right now and it is my favorite class this semester.

**Are there any specific classes, professors, or moments that really stick out for you as being transformative?**

Professor Pattengale at Sierra College is a pretty inspirational guy. I had to take a break from college when my boyfriend got really sick. When I finally came back and started at Sierra College, I was unsure if engineering was what I still wanted to do. Pattengale loves engineering and his students. He helped me find the passion for learning and how cool engineering is again.

# HORNETS INVADE UCLA for ITE Student Leadership Summit

**Four members of Sac State's ITE student chapter attended the Student Leadership Summit (SLS) held this year at UCLA, from January 31st through February 2nd. Led by Dr. Masoud Ghodrat Abadi, the students were able to meet with representatives from different companies, attend workshops, and network with their peers.**

**PHOTO**
(Left to Right) Mueller, Fischer, Dawkins, Cerna. Photo by Muller.

> *SLS 2020 was one of the most eye-opening and humbling experiences of my professional career.*
>
> **— MICHAEL MUELLER**

"SLS 2020 was one of the most eye-opening and humbling experience of my professional career," says junior Michael Mueller. As the Webmaster of Sac State's local chapter, Mueller is responsible for maintain the social medial and website of the group. The conference was an excellent place to gather material to share with others. "By attending I felt like I was able to share this amazing experience with everyone who was not able to attend and encourage more people to join our chapter."

Emily Fincher, a junior planning to graduate spring 2021, is the current President of Sac State's ITE chapter. She believes that the conference better prepared her for a leadership role in both her local setting as well as for her future career. "SLS was a great combination of team building, industry demonstrations, and career development," she states. "We participated in team building activities that gave us the opportunity to not only build as a team of officers but also meet students from other schools that participated in SLS. They offered industry tours to allow us to see what was happening locally in the transportation industry. We also had resume workshops and speed interviews to develop those skills."

One of the greatest advantages of the conference is that it brings together engineering students from around the nation to see firsthand the advancements that are being made in the transportation industry. This was one major reason that officer Katlyn Dawkins attended the conference. She recalls that students, "…did get to see some demonstrations on what the future of transportation has in store…" Though only a freshman in Sac State's program, she already see the advantages of attending conferences and workshops, noting, "…we are the future, and it is important to know what is going on in the industry, the challenges that are faced and what the industry is trying to gear towards the future."

Junior Alexander Cerna, Vice President of the ITE chapter, shares similar sentiments. "The event itself held a wide array of activities," describes Cerna, "as well as a mini career fair where we met companies hiring interns and graduating students. The panels were presented by many members currently working in the industry or some professors from either USC or UCLA. They were very interactive and allowed for students and other members to connect with those currently working in the field."

Seeing other students as active members of their own ITE organizations inspired the Sac State local officers to step up their participation within their own groups. Mueller credits the SLS conference with giving him more, "pride," in his ITE membership, while Cerna believes that the event, "…gave me many great ideas of how to further involve our members and connect with more people. I talked with other chapters and how they handled their meetings and it gave me a lot of insight of how we can further improve our own chapter." Dawkins, who has been with ITE for a little over four months, found herself inspired as well. "I would like to be more involved and [try] to get more peers involved so we can do more activities."

Increased involvement sometimes leads to unexpected discoveries. "I planned on becoming a structural engineer because I grew up on a construction site with my dad," Dawkins admits. "But now, I am checking out other areas like transportation because it seems interesting, and is something new that interests me."

All four attendees agreed that anyone curious about joining ITE, or attending a conference, should not pass up the opportunity. "It is one of best ways to secure an internship," says Cerna. "The opportunities that are presented to you are amazing and [are] also a great experience in general."

Fincher agrees. "I would encourage anyone to grab hold of an opportunity like this because it really allows you not only learn more about your industry but also allows you to learn more about yourself, and how you see yourself fitting into the industry after graduation."

# Sac State Alumni
## Helps to Measure the Future of California

It's a cold Thursday morning when Sean de Guzman and his team head out from Sacramento to their destination in the mountains. At 0700, the sun still hasn't risen, and the cold temperature isn't expected to fully dissipate. Their destination of Phillips Station, CA is only forecasted to climb to 57F, and the area will be covered in snow. But as the newly appointed Chief of Snow Surveys and Water Supply Forecasting at the Department of Water Resources, de Guzman has come prepared. Armed with snowshoes and warm clothing, he and his colleagues ascend the mountain.

There are two goals for the day. The first goal: obtain a measurement of the snow melt for the DWR. The team will visit another site two miles west of Phillips Station, Tamarack Flat, in order to obtain data for a comparison. The second goal: spend part of the morning with media that have arrived to observe the first snow measure of 2020. California's recent water crises have piqued the interest of both local and nationwide observers. Though the process of answering questions and posing for photos may sound daunting, de Guzman knows how to keep things running smoothly.

"It's only a 20 minute snowshoe hike to the snow course located in the headwaters of the American River basin," he explains. "This enables us to verify conditions at another location [Tamarack Flat] before having to measure in front of media at Phillips."

At 11am, everything is ready to go. With reporters standing by, de Guzman and his team begin their work of measuring the snowpack. The data gathered today will be used to formulate hydraulic models to predict stream flow and runoff values. It will also be used to project runoff for the coming season, assist Caltrans with road condition evaluations, and evaluate the overall health of ecosystems across California.

Over the course of the day, the data comes pouring in. de Guzman is able to take his time a few days later to

summarize their findings. Measurements indicated, "…a snow depth of 40.5 inches and the snow water content [of] 14.5 inches. It resulted in 79 percent of an average February and 58 percent of the April 1 average for that location." In other words, California's snowpack is looking pretty decent. de Guzman further explains, "We refer to the percent of average for April 1 because in terms of snow water content, the snowpack typically peaks near April 1 of each year. The snowpack changes daily, so we're actively monitoring it with our automated snow sensor network made up of about 130 stations statewide."

de Guzman's position with DWR means that the days can be long and the work tiring, but far from being deterrents, they are the elements of the job that make it thrilling. "I've always enjoyed being outdoors," he says, mentioning his enthusiasm for camping, hiking and snowboarding. "Being a part of the snow surveys team enabled me to enjoy those same interests while applying water resources engineering concepts. The work our team produces is technical, meaningful, and innovative. It has been a perfect fit for me."

The journey to that eventual "perfect fit," began when de Guzman enrolled as an undergraduate in Sac State's Civil Engineering program. He became involved in many different extracurricular activities, including the Mid-Pacific Student Conference Planning Committee as their Geo-Challenge Chair. He was elected President of Tau Beta Pi—the official Civil Engineering Honor Society—as well as Vice President of the Institute of Transportation Engineers, and Secretary for Engineers Without Borders. "I was also involved with the American Society of Civil Engineers, Concrete Canoe, Steel Bridge, and Society of Women Engineers," he recalls. He graduated with his BS in 2010, and his MS in 2014.

Employment with the DWR came right after graduation with his bachelor's, and de Guzman stayed in various capacities throughout his engineering career, save for a small gap in 2011. "I was only separated from DWR for 7 months," he says, "but while I was working with San Diego Gas & Electric, I was given the opportunity to design the conduit supports over the Crown Valley Parkway Bridge in Laguna Niguel, CA. It was exciting to be able to apply the knowledge I gained in courses like Structural Analysis and Steel Design in industry."

As a water resources engineer, there are many other skills de Guzman learned at Sac State that are put to use on a daily basis. "One of the reasons I chose engineering as a major straight out of high school was because I liked math and science, and I didn't want to read and write all the time. One of the greatest skills Sacramento State taught me was the written communication techniques that I use every day. In an operational setting like what I'm in, you need to be able to get your facts and figures quick and be able to disseminate that information rapidly."

The skills and abilities de Guzman mastered at Sac State will come into play throughout his career, and as data from Phillips Station and other points is gathered and analyzed in the coming months, they will in turn help to shape the very future of the Golden State itself.

> *"…I chose engineering as a major straight out of high school…because I liked math and science…*
>
> **— SEAN DE GUZMAN**

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# CE CONNECTION