

## EXPOSURE



## DOWN-TO-EARTH DISCOVERIES

*A scientist's lab without walls*

Story by [Fresno State](#)

May 31<sup>st</sup>, 2019

From the deserts of the Middle East to the remote islands of the Indo-Pacific, Dr. Joshua Reece has made scientific discoveries everywhere.

But nowhere compares to California's Central Valley.

"There's a lot we don't know about the heavily populated Central Valley of California," he says. "We're really situated to make major scientific discoveries."

That's why the "Reece Lab" has become a major staple at Fresno State. Dr. Reece is an

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conservation biology.

Through his lab classes, students gain hands-on, scientific research experience in California's coast, Yosemite National Park, Sequoia National Park, Kings Canyon National Park and the surrounding deserts.

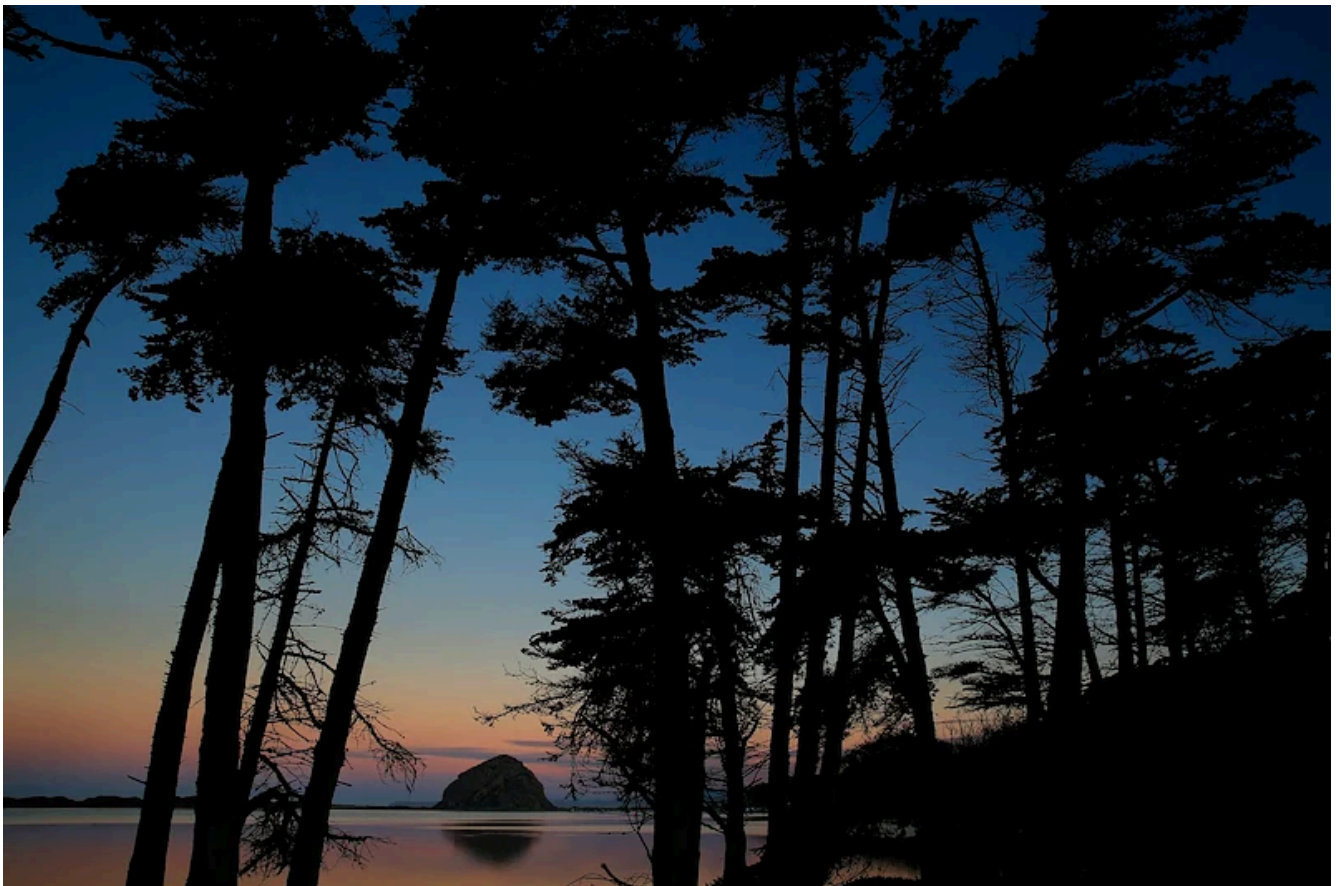
Dr. Reece believes science is best taught with in-the-classroom pedagogy and outdoor experiences. As opposed to "stale textbooks," his students read research articles at home and have discussions in the classroom. Then, they apply their learning in labs — located in the world around them.

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"That's where I find that students become most engaged," he says.

"They get sitting around a campfire talking after a day in the field and they really get to know each other and start talking about what they're learning."

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→ **Did you know? The Fresno region is one of the only places in the U.S. within a 90-minute drive of three national parks.**



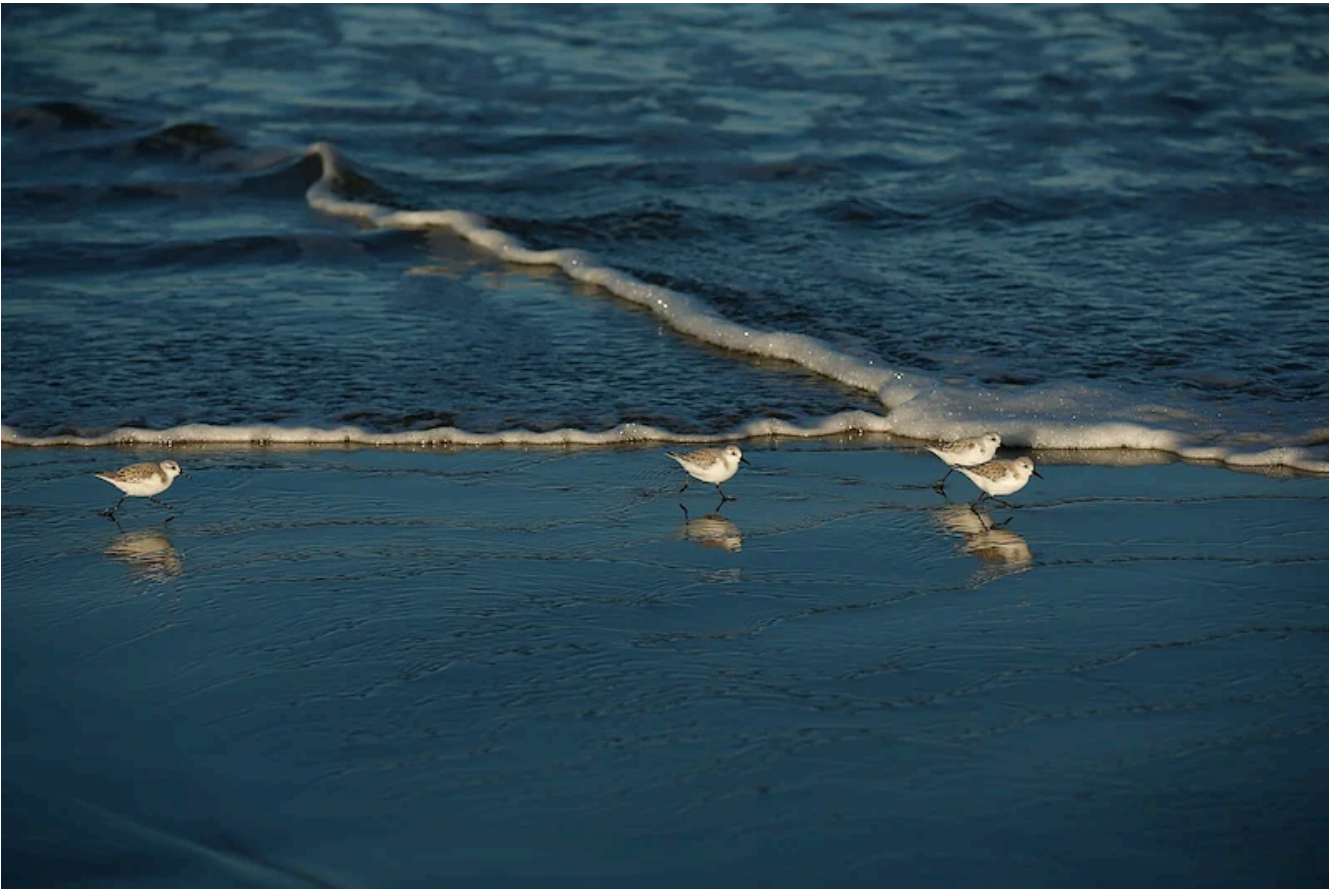
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## COASTAL CALCULATIONS

The Georgia native first became interested in the biological sciences during a class field trip in college where he worked with sea turtles. Snorkeling at the beach and studying marine life took Dr. Reece down a track he hasn't gotten off since.

Now, Dr. Reece is recreating the same experience for Fresno State students. One of the major projects he works on with students is in Morro Bay.

Morro Bay underwent a major dredging project two years ago. In order to clear the bed of the harbor, Dr. Reece says enough sand to fill "43 football fields" was deposited onto the beach.

Every month, Dr. Reece and his students visit Morro Bay to study the impact of dredging. They are joined by professors and students in the Chemistry Department and the Department of Earth and Environmental Sciences.

Dr. Reece's students are looking to see how dredging impacts the species that live on the beach, while students from other courses study the sand grains.

Over 300 students have researched in Morro Bay.

"This type of research has a direct application to management," Dr. Reece says. "There's a

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dredging. They need the dredging to keep the harbor open, but they want to mitigate the impacts to the environment. Our results feed directly into their management strategies.”

So far, Dr. Reece and his students have not seen strong negative impacts of dredging in Morro Bay, but they are able to recommend ways management can balance what humans need from the ecosystem to what biodiversity needs to persist there.



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→ **Did you know? Donor support of Fresno State's Course-based Undergraduate Research Experiences ensures all science students, from freshmen to graduate students, receive hands-on research experience.**



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# INDOOR INQUIRY, OUTDOOR EXPLORATION

Thanks to their lab experiences, over a dozen students have progressed to do their own independent research projects in Morro Bay. The data they collect on preserving native biodiversity has been presented at conferences throughout the state and nation. Manuscripts are also being prepared for publication.

“Students really brighten up when they start sharing the research that they’re doing that inspires the average person in the public,” Dr. Reece says. “When they come up with their own questions and come up with an actual discovery, finding answers to questions no one’s asked before, they get self confidence and realize, ‘I can be a scientist. This isn’t that hard.’ That sort of breakthrough is what I find most rewarding.”

For senior biology student Chrisionna Graves, Dr. Reece’s lab is an opportunity to explore a never-before-seen environment. Chrisionna is learning that science doesn’t just happen in the classroom.

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“Before last summer, I’d never been camping in my life,” she says.

“Being in this lab has opened me up to a lot more opportunities to be outdoors in nature. I like getting hands-on experience.”

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And according to Dr. Reece, Chrisionna is in the best place to gain hands-on experience.

“Fresno State has been really well situated for this type of research. That ability to go 7,000 feet in the mountains, but also zero feet above sea level is really powerful. It shows the students the diversity that California has,” Dr. Reece says. “They can see how science is done. They participate in it and become really engaged in the scientific process.”





→ Did you know? “Learning by doing” in research contributes to higher retention and creates a skilled workforce that is able to tackle challenges related to food, water, energy, health and the environment.

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**YOU CAN HAVE A HAND IN STUDENT SUCCESS.**

Footnote: *Photos by Cary Edmondson, Story by Esra Hashem — University Brand Strategy and Marketing*

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