

## EXPOSURE



## EVOLUTIONARY WONDER

*Submerged in water, grad student uncovers the world*

Story by [Fresno State](#)

October 22<sup>nd</sup>, 2018

Evolutionary genetics. It's the study of how species' genes adapt over time.

For many students, it's a chapter in a biology textbook, one they read with glazed eyes.

But for Shelby Moshier, the topic is a source of unbridled joy — and an opportunity for hands-on learning in California's natural landscape.

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“I think it's important to try and understand how the natural world works,” Shelby said. “Because then we can make inferences, like decide where we should build something. It all ties in with a lot of different aspects of human life.”

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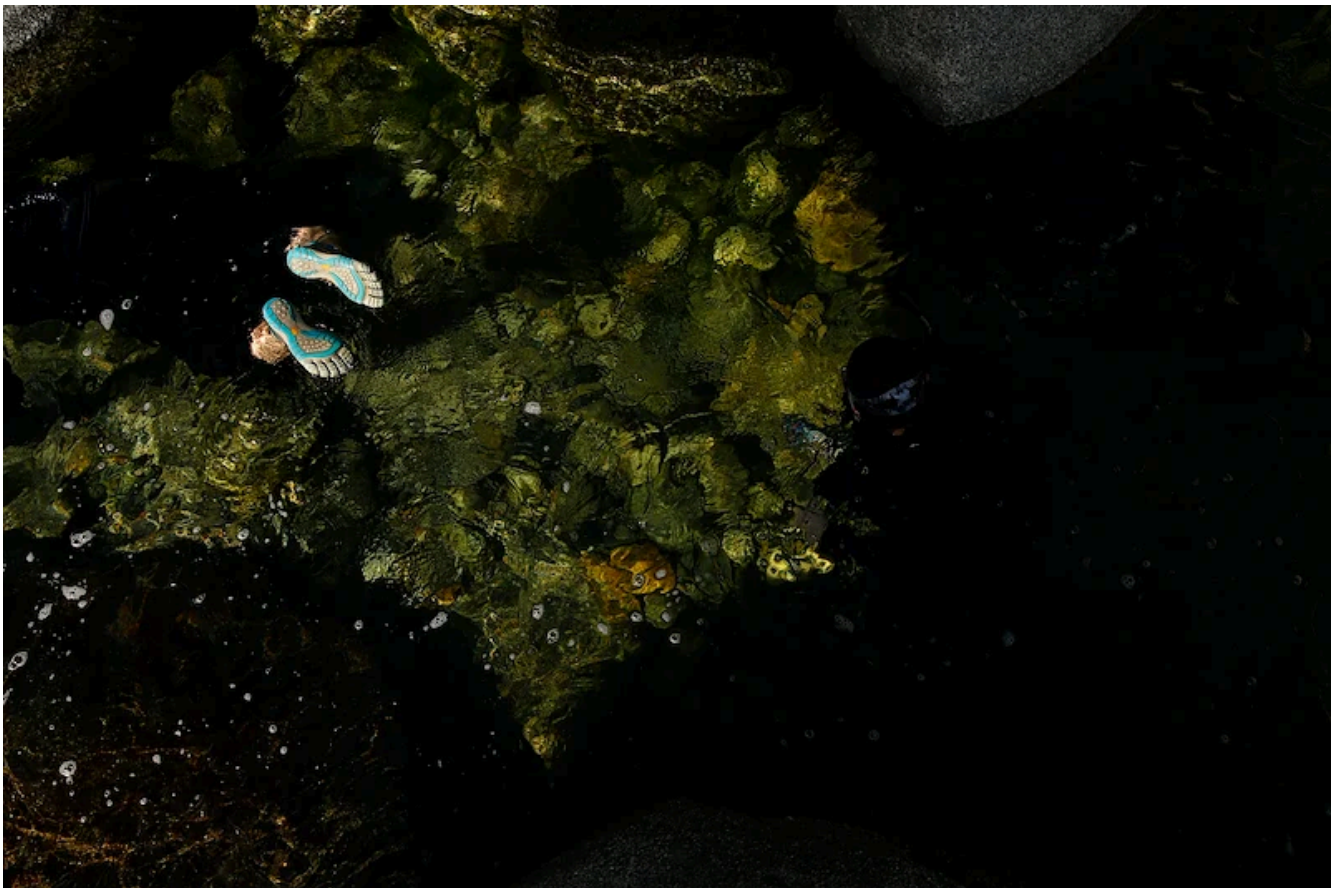
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Shelby is a graduate student studying biology at Fresno State, whose goals are to earn a Ph.D and become a professor. Her research interests are ecology and evolutionary genetics.

Her interest in the world around her began when she was growing up in Tollhouse, a rural community northeast of Fresno, near Shaver Lake. Living on 40 acres of land, she remembers a childhood spent outdoors, hiking and fishing.

In sixth grade, her science teacher would conduct lessons outdoors and take students on field trips. Those experiences cemented her love of biology.

“Having grown up in a rural area, you’re outside in nature all the time and you see things. You’re making observations from a young age,” she said.

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As an undergraduate student at Fresno State, she began working with biology professor Dr. Joshua Reece. Dr. Reece's focuses are conservation biology and evolutionary genetics. He teaches labs where he frequently travels with students to conduct research in various California environments.

Shelby and her fellow classmates travel to California's Central Coast and Morro Bay to conduct such research. Recently, she was part of a group of graduate and undergraduate students who joined Dr. Reece on a trip to Sequoia National Park.

"We helped the park do river surveys, snorkeling to visually see what species we can find," she said. "Then the other aspect is called environmental DNA sampling. So you basically take a water sample...Then they can sequence it and it will tell you what species have been in that water."

The research helps park biologists understand which invasive species are in the region and whether populations are staying stable.

⇒ **Did you know? Hands-on, collaborative research projects sharpen students' understanding of the world. Fresno State is dedicated to providing every student with this high-impact experience.**



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As night fell in the park, Shelby and her fellow classmates began setting up microphones to capture bat calls. Their goal was to help park biologists take measurements and swab bats for diseases.

The trip was a source of joy for Shelby. She said she enjoyed the opportunity to work with others from different backgrounds and apply what they are learning in the classroom in a real-life setting.

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“Getting people from all different walks of life and working on that problem together... You can approach it from a bunch of different angles, which I think is really cool,” she said.

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Shelby is gearing up for upcoming trips to Morro Bay, where she will conduct research for her master's project. She will be looking at how dredging is affecting coastal biodiversity. Already, one of her manuscripts has been submitted for publication. It's about bird species and climate change vulnerability.

Ultimately, Shelby credits her success to her teachers — in particular, her Fresno State professor, Dr. Reece.

"Dr. Reece got me focused on what I want to do," she said. "Just the number of projects that I've been able to be involved in as a part of his lab has been instrumental in shaping my goals. It's been amazing."

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

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