UC SANTA BARBARA
THE Current

June 18, 2018
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Lofty Ambitions

While NASA's mandate is space exploration, the nearly 60-year-old government agency also supplies an immense amount of scientific data about Earth from the organization's satellites and other aeronautic missions.

NASA requires a highly trained workforce to achieve its scientific goals. One means of finding those skilled scientists is by way of its Earth and Space Science Fellowship program, which provides training grants to principal investigators at universities and educational institutions that support graduate student research.

Three students from UC Santa Barbara have received NASA funding for earth science projects. Deanna Nash, David Miller and Michael Nowicki are among only 54 people out of 424 applicants who were so honored.

"It's a very competitive fellowship," said geography professor Leila Carvalho, who mentors Nash. "The fact that three UCSB students received this fellowship in one year — for terrestrial, atmospheric and oceanography studies — speaks to the breadth of the research done in our department."

Associate professor Joe McFadden noted that the Department of Geography is home to a wide range of the Earth system science research conducted on campus. "It's the place where the different threads come together," he said. "This not only provides a very interdisciplinary approach but also is very exciting for the students."

Fellowship recipient Miller's project examines the effects of the recent drought on California urban tree species and vegetation such as turf grass. "What's different

about my study is that it uses imagery from airplanes rather than from satellites," explained Miller, who works with McFadden and would like to become a research scientist or an academic after he completes his doctorate. "I'm using data sets gathered by sensors being tested on planes for eventual space flight that sample a wide portion of the spectrum. Rather than using just a few parts in the visible or near-infrared, this data provides hundreds of samples that allow me to determine how the vegetation responds to drought effects through time."

On the West Coast of the United States and the western coast of Europe, extensive research has been conducted on atmospheric rivers — long, narrow conduits of water vapor in the atmosphere. Working with Carvalho, Nash for her NASA project will add to that body of knowledge by studying atmospheric rivers over high Asia.

"I'm interested in seeing how atmospheric river events are impacting extreme precipitation in high Asia, which contributes to flooding events and the general hydroclimate in that region," said Nash, who hopes to become a scientist at the Jet Propulsion Laboratory in Pasadena, where she interned for two years while earning her master's degree.

Under the mentorship of assistant geography professor Tim DeVries, fellowship recipient Nowicki is combining satellite-based estimates of net primary production — carbon uptake minus plant respiration — with global-scale oceanographic data in the ocean. The goal is to make those estimates more accurate.

"Multiple data sources deliver a more complete picture of carbon export in the oceans," noted Nowicki, a graduate student in UCSB's Interdepartmental Graduate Program in Marine Science whose long-term goal is to become a research scientist or university faculty member. "I want to improve our understanding of the global carbon cycle and the ocean's carbon cycle."

"We're very proud of these students for being able to do this interdisciplinary work and also for being able to compete in the very top echelons within their disciplines," DeVries said. "They compete not only in their disciplines but also as star interdisciplinary players."

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.