SMITH FELLOWS

By Jane Braxton Little

Erika Zavaleta
still life with athlete

In her quest to learn how life works, Erika Zavaleta would rather not do it sitting still. Her mission has sent her to the Bering Sea, to learn how ecological changes are affecting subsistence hunting of the Yup'ik people. It drew her to California grasslands, where her research with carbon dioxide found that global warming could actually increase the water available to oaks and summer wildflowers. And it attracted her to New Zealand, where she studied introduced rats and opossums to see how eradicating them affects native birds.

Her tireless passion for a broad range of inquiry has made Zavaleta a poster child of the Smith fellowship program, says former director Chris Haney: "She seems to sail through everything with high energy and an innovative spirit."

Zavaleta, 31, lives with her husband and two sons in Santa Cruz, California. Surfboards of many sizes and colors form a rainbow across a wall in their spacious living room, which is filled, on an early autumn morning, with a mix of world music and baby babble. Zavaleta floats from kitchen to office to glider chair, at once hostess, scientist and mother.

She moves as gracefully between the disciplines of conservation science. Zavaleta works with anthropologists to understand how people use their environment. She seeks out economists to understand how financial decisions affect the environment.

"I have the attention span of a barnacle, but I like bringing people of different disciplines together," she says.

Growing up in Manhattan, Zavaleta was interested in "everything about everything," says Jeff Weitz, her former physics teacher and high school adviser at Horace Mann School in the Bronx. Matching her active mind with tenacious athleticism, she regularly bicycled the 10 miles from Manhattan to Horace Mann instead of taking the train. She prepared for Weitz's physics exams by bicycling 60 miles to clear her head. The workouts turned her into a road cyclist who spent two years on the national cycling team, earned a trip to the junior World Championships and won a shelf full of trophies. She is also an accomplished rower and a mean body boarder. "I like to move," she says.

That made Zavaleta's Ph.D. research challenging. Studying the effects of climate change on grassland plants forced her onto her hands and knees, her face a foot from the ground for days in a row, months on end. Finally, she says, after four years sitting there counting stems, "I learned to be meditative."

Zavaleta also learned "a zillion different techniques" to measure ecosystem change. She applied some of them to her Smith fellowship research, studying California oaks to better understand their failure to regenerate. Before undertaking any fieldwork, she crunched previously collected data through a Geographic Information Systems analysis to show regional trends under different growing conditions. Zavaleta found valley oaks regenerating on preserved land, for yet unknown reasons, at twice the rate of those on unprotected land.

That result alone is significant for demonstrating the benefits of land conservation, says Mark Reynolds, The Nature Conservancy's senior ecologist in California. Zavaleta's analysis of previous studies also pioneered a research process that exhibits "how deftly she can adapt and raise everyone's thinking around her," he says.

Armed with three Stanford degrees, Zavaleta recently landed a position as an assistant professor in the environmental-studies department at the University of California at Santa Cruz. She commutes five miles uphill to her office on an electric bicycle, which she pedals at least part of the way. Barely moved into her office surrounded by coastal redwoods, Zavaleta has already made her mark beyond academe with research on the economic effects of removing tamarisk. The woody shrub has invaded stream-side areas throughout the Southwest, sucking water away from native plants. In turn, the loss of natives has resulted in bare soil washing into the water, smothering streambed life and scouring

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banks; streambeds and banks, in turn, have become narrower and more vulnerable to floods. Zavaleta estimated that Southern California alone loses 230,000 acre-feet of Colorado River water annually to tamarisk. Eradicating the invader could save around $50 million a year, she said in a scientific paper published in 2000.

Zavaleta's presentation at a California water managers meeting in 1998 drew tremendous interest from Metropolitan Water District officials, intrigued by the benefits of removing tamarisk to help both the environment and their bottom line. Her research helped make the case for federal legislation, expected to be enacted this year, allocating $25 million to $50 million annually for tamarisk control throughout the West.

Zavaleta's approach to the tamarisk problem was emblematic of the athlete. "She just dove into the data," says Hal Mooney, a Stanford professor of environmental biology who supervised Zavaleta's thesis research. "She's totally fearless."

With a quick string of publishing credits in *Science*, *Nature* and other prestigious journals, Zavaleta makes it all seem easy. As easy as riding a bike.