Treading carefully around the marsh’s edge at China Camp, Vasey lays out the elements of the extensive research framework in use at China Camp and at Rush Ranch on San Francisco Bay. He compares similar approaches at other NERR sites across the nation, as well. He and colleagues refer to the collective projects as the ‘sentinel site’ program. China Camp is one sentinel site, Rush Ranch another.

NERR researchers and surveyors set up and precisely level a series of benchmarks on solid ground. Each benchmark consists of a brass monument fixed in a concrete footing. The monuments create a vertical control that the team links to tide water gauges and land-based GPS networks. The monuments allow the team to measure the depths and rates of sediment deposition to marsh surfaces and the rise in water levels. If high enough amounts of sediments reach marsh surfaces, Vasey says, then marsh plants could potentially “keep up with sea level rise.”

As we concluded our trek around China Camp, the conversation drifted to the critical importance of conserving wild lands and their endemic species. “In my opinion,” said Vasey, humans have created an ecological stumbling block. “We’ve whittled down the space for life on this planet to a constriction, a bottleneck. Species are not going to make it through this bottleneck,” he continued, unless we “life-boat them—do something to help them through this tumultuous period.” If we can help species through, then they can build back their populations. We don’t have to start from scratch.”

“Current predictions show that sea level rise could change up to 85 percent of the Bay’s high marsh into mudflats or low marsh by the end of the 21st century,” Vasey says. These findings originated after scientists visiting China Camp and Rush Ranch conducted three independent studies to measure the depths and rates of sediment deposition to marsh surfaces and the rise in water levels. If high enough amounts of sediments reach marsh surfaces, says Vasey, then marsh plants could potentially “keep up with sea level rise.”

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As sunset began to burnish the landscape, Vasey looked out across the flat expanses of pickleweed and the tufts of gumplant sheltering unseen harvest mice and other marsh cohabitants. His voice filled with passion as he concluded, “We don’t have to lose lineages.”

A heat wave in May set the San Francisco State University campus abuzz with students enjoying music, sunshine, and conversation as they basked on the expansive lawns of the central commons. Walking by the Science Building, this reporter heard a cacophony of laughter from a cluster of students eating lunch outside—a rare occurrence in our fog-blasted corner of the City.

Laughing amongst the group was a man with curly graying hair and wearing dress pants, shiny shoes, sunglasses, a button-up shirt, and a black fedora. The man looked like he could be in a jazz band. And, I discover, he is: He plays clarinet, flute, and saxophone in his rare free time with a band composed mostly of computer programmers. He also bicycle commutes 20 kilometers from Pacifica to SF State three days a week. And he has worked as a whitewater rafting guide for many years on the Chattooga River in Georgia. It also turns out that this multifaceted man, Dr. Jerry Davis, has published more than a dozen scholarly papers on geography and advised over 90 graduate students during his three decades at SF State. When asked to boil down the professor’s essence, a colleague responds, “Oh gosh! It’s kind of eclectic jazz. It can be harmonic. Discordant. It is kind of all over!” And this fusion, it turns out, befits a geographer like a legend does a map. Davis himself probably says it best. “Connections are everything.”

Chairing Geography:
“Connections are Everything” by Ellen Alycia Young

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Jerry Davis claims the university’s Department of Geography & Environment and has done so for the past four years of his 30-year-long career. Last spring, for a class project, I spent a morning with Davis, learning how he has spent that long tenure studying scientific connections and establishing personal ones.

To prepare for our conversation, Davis spent his hour-and-a-half long bike commute crafting a term that encompasses his field of interest. The 12-syllable phrase he created unites his research on caves, swamps, gullies, meadows, streams and the biotic… You can’t really understand how a stream is working unless you understand the plants and animals that are all part of that ecosystem. This term has virtually no areas without life forms. If you go to the dry valleys of Antarctica you still have life forms there.

This interplay between the living and non-living elements of an environment are evident in Davis’s research on San Pedro Creek in nearby Pacifica, about 12 km (almost 7.5 miles) south of SF State. Davis’s research focuses on the shape and topography of the creek and sources of sediment in the watershed. Why is it important to understand the morphometry and sediment sources in a creek? As Davis puts it, the “geomorphology determines the habitat.” San Pedro Creek is a habitat for steelhead trout, a federally listed threatened species. Trout swim upstream to lay their eggs in deep pools of clear water. By examining the sources of sedimentation and shape of the stream, Davis’s work can inform efforts to help improve steelhead habitat.

Davis and graduate student Michelle Slocombe have conducted similar investigations of the geomorphology of meter-wide creeks that meander through recently restored meadows in the Sierra Nevada. They spent long days in the high Sierra sunshine measuring every curve, pool, and riffle of these creeks in an effort to understand how their limited flow compares to the rush of larger more established rivers. These comparisons are useful for informing future meadow restoration work.

Beyond streams, Davis is one of a tiny population of geomorphologists to study karst—land filled with solutional caves (ones in soluble rock such as limestone). Davis’s explanation of how these caves formed draws upon all elements of the carbon cycle. Davis explains that plants and bacteria release carbon dioxide into the soil. This CO₂ in turn, dissolves in water to form carbonic acid. Carbonic acid is responsible for carving the caves he studies. This explanation makes it laughable to think of caves (as most of us do) as just holes in rock.

In his research, Davis draws upon his earliest passions. Davis got his first taste of cave exploration as a kindergartner tromping in storm drains in Georgia. He set foot in his first “natural” cave as a student at the Georgia State University in Atlanta. At the time, he was part of an outdoor exploration group. According to Blesius, Davis makes each of his graduate students “feel like he or she is the most important person at that moment.” Graduate student Slocombe agrees. “He genuinely cares about his students and stops at nothing to make sure they succeed,” even especially—if that means reviewing papers and answering questions on nights and weekends.” Beyond dedicating time to fieldwork, Davis has virtually no areas without life forms. If you go to the dry valleys of Antarctica you still have life forms there.

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University professors tend to wear many hats, and Davis is no exception with his jazz fedora, his bicycle helmet, and his wide-brimmed field hat that gives him the look of a scholarly Indiana Jones. By his colleagues' description, Davis is "a hippoc," "enthusiastic," "stable and analytical," "encyclopedic," "an open-minded creative thinker," and "a scientist and geographer through and through." When expressed amazement at this multifaceted combination, Barbara Holman laughed, "That's a geographer! Geographers recognize the importance of both the physical and human environment in everything they do."

Davis has posted the first test flight of the spider-like UAV on his YouTube channel; www.youtube.com/user/TheSpiderUdude/ feed. It shows Christian piloting the giant-insect-of-a-robot tethered to a rope as it hovers over a lawn in a seemingly erratic up-and-down pattern. The rise and fall of the drone may seem like "dissonant jazz" to the untrained eye. In an eclectic research geography, however, it is all harmony—a promising new tool with highly-efficacious responsivity.

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