

Saint Mary's professor shares enthusiasm of science with students of all ages



Dr. Bachofer with Students in the Field

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Pleasant Hill resident Steve Bachofer was establishing his position as the East Bay's pied piper of science even before President Barack Obama's State of the Union mention of science, technology, engineering and math (STEM) education.

Bachofer is a Ph.D professor in the Department of Chemistry at Saint Mary's College in Moraga. He is also the co-director of the Western regional center of Science Education for New Civic Engagements and Responsibilities (SENCER), an organization that takes the principles of STEM education and makes them come alive.

"Saint Mary's was looking for ways to improve our science education for non-STEM majors," Bachofer said, explaining how he became involved with SENCER.

"We were concerned with what students were retaining. They were learning for the finals and two weeks later, it was gone," he said, snapping his fingers.

The danger was both immediate -- the college was granting diplomas to people who knew very little about science and technology -- and long term.

"If your policymakers took one science class that they really didn't understand, but don't want to show that they don't know what they are talking about, then they are less likely to make good policy decisions," he warned.

Bachofer's approach is structured to link contextual civic issues to science. In some ways, it's a step into the past, with applied, real-life learning resembling an apprenticeship more than the textbook and standardized test format commonly used today.

"STEM recognizes that students are not a blank slate. It's an initiative that lets them be discoverers with us, not just learn from us," he said.

Recently, Bachofer led a class of Saint Mary's students right out into the field at the Alameda Naval Air Station, a location designated by the Environmental Protection Agency as a Superfund hazardous waste site. The class connected the social issue of urban redevelopment with the environmental science of soil.

"The EPA funded manufacturers to test field-portable instruments. I was able to obtain one of these [soil testing] instruments through a Dreyfus Foundation grant," he said.

The X-ray fluorescence analyzer -- impressively small for its \$34,000 price tag -- measures contaminants in soil. Resembling a hand-held drill with a digital readout, the tool saves time and money by reducing the need for lab test sampling.

Identifying areas contaminated by lead-based paints was the focus in Alameda. At the Concord Naval Weapons Station, Bachofer said determining the level and location of arsenic in the soil is more likely to be important.

There's a poetic symmetry in the fact that the professor has spent much of his career studying not dirt, but soap. "I can't really explain it," he confessed, "soap just interests me."

He's currently researching spherical soap aggregates, which absorb different organics than water. The subject made Bachofer's science guy emerge, but it's not a yawn.

"You can squirt these things out of a bottle and they'll hit the wall and stick! You're not feverishly trying to catch it before it goes down the drain," he said, making clean hands and counters sound like the best thing since man first stepped on the moon.

Bachofer has followed California's water issues closely and said the media is trying to get the public's attention about the Delta, but worries they are not listening.

"I don't think the general public knows what we are going to lose if we keep removing large quantities of fresh water," he said.

"If we're going to truly balance the environment and the natural habitat, we're going to have to cut back on the exports. We're using it for agriculture, we're sending it to the L.A. basin area "... We need to allow more of it to flow naturally if we want the natural habitats to thrive."

If we fail, Bachofer warned, the then-salty habitat will result in lost wetlands, changing migratory waterfowl and threatened fisheries.

"Plus, it will be a loss of the opportunity to be in this quiet area and allow it to give you peace."

This year, Bachofer took approximately 90 Pleasant Hill Elementary students to Broad Slough in the Delta to experience the area firsthand.

"They were able to touch all sorts of juvenile fish, they got to investigate what was growing in the mud, they got to come away with knowledge that the Delta is an ecosystem that is functional," he said, his voice filled with fifth-grade enthusiasm.

To make the greatest difference in science education, he believes the subject must be emphasized in the elementary curriculum.

"I don't even think the state of California takes a marker on science learning until fifth grade!" he protested. "That teaches (students) science isn't important, and if we really want to have a technology-driven society, we have to invest in these children all the way through."