

By Kristin Luciani May 16, 2013

Socrates Fellow Brings Coral Research to Local High School

Coral reef health is the scientific specialty of Aaron Hartmann, a sixth year Ph.D. student at Scripps Institution of Oceanography. It's also the subject of study he introduced to classrooms at High Tech High North County to give students a taste of what it's like to be a scientist. Using 10-gallon aquarium tanks they built themselves, the students developed and implemented their own experiments to investigate how human activity impacts coral health. What they learned inspired the students to lead a local conservation campaign that made news in Curaçao, a small island nation in the southern Caribbean.



Postcards from the students' conservation campaign are hand-delivered in Curaçao by High Tech High teachers and graduate student Aaron Hartmann. From left, Parag Chowdhury, Chris Morissette, Aaron Hartmann, Matt Leader

Hartmann is one of nine graduate students participating in the [Socrates Fellows Program](#) run by ScienceBridge, a UC San Diego organization that brings together university researchers, local school districts, community groups and industry partners to improve STEM (Science, Technology, Engineering and Mathematics) education. In 2008, ScienceBridge received a National Science Foundation (NSF) GK-12 grant to create the Socrates Fellow Program, which connects UC San Diego Ph.D. students with local teachers to bring authentic science experiences into the classroom.

“The greatest thing about Socrates is that students feel like they are a part of science, and they really are,” said Matt Leader, a biology teacher at High Tech High North County working with Hartmann. “They are doing real experiments to create new knowledge.”

As an “in-house expert,” Hartmann talks with the students about his research—both in the lab and in the field in Curaçao—and helps students to develop their own experiments. What Hartmann brings to the class is designed to complement the curriculum, and he works closely with the teachers to ensure that student research projects and academic lessons are seamlessly integrated.

Using live corals that Hartmann brought back from Curaçao, as well as some provided by Birch Aquarium at Scripps, the High Tech High students set up and ran experiments to determine the effects of fertilizer and reduced light on the health of corals. While they collected data, Hartmann also discussed the bigger picture of this scientific problem; that is, how urban development affects the environment. He described his own research that found that coral reefs in underdeveloped parts of Curaçao were healthier than those in developed areas of the island.

“The students became genuinely concerned for the corals in Curaçao,” said Hartmann. They decided to use what they learned to create a postcard conservation campaign in their local community. Nearly a hundred North County residents signed postcards pledging their support for protecting the health of coral reefs in Curaçao.

When Hartmann, Leader and fellow High Tech High teachers Chris Morissette and Parag Chowdhury received a grant to travel to Curaçao for field research, they brought the postcards with them to deliver to the country’s parliament. The event made the front page of the island’s local newspaper.

Citizen Science: Pollinators in Peril

How is urbanization affecting bees in San Diego? Local high school students and the UC San Diego Holway Lab recently presented their initial findings from a collaborative research project to investigate this question. Led by graduate student James Hung and High Tech High teacher Jesse Wade Robinson, 11th grade biology students collected insects from across San Diego County over a period of eight weeks. They then curated collections of their specimens and analyzed data to find trends about how pollinators are affected by urbanization. The students’ research was designed to strategically complement Hung’s work, while educating students about the role of San Diego’s pollinators.

The pollinator project is one of the first projects at UC San Diego to exemplify how scientists can effectively collaborate to engage the public in authentic scientific research. The project serves as a model for conducting citizen science locally, and was facilitated by ScienceBridge at UC San Diego as part of the San Diego Citizen Science Network. The network serves to bring

The students' coral reef experiments also earned first place in the [2013 QuikScience Challenge](#), a competition organized by the University of Southern California, Wrigley Institute for Environmental Studies, Quiksilver Inc. and the Quiksilver Foundation to encourage students to learn more about scientific research.

together local citizen science stakeholders to leverage resources, establish best practices and increase capacity for conducting citizen science projects in San Diego. For more information, visit the [Citizen-Science Program](#) page or email Shelley Glenn Lee at sglenn@ucsd.edu.

“I was proud to see the creative projects that the students came up with on their own,” said Hartmann. “One of the things I’ve learned from Socrates is that students can learn in unique ways, and there are different ways of measuring success—other than just test taking.”

Next year, Leader plans to continue with the theme of coral studies for his biology class. He has already arranged to take a group of about 16 students to Curaçao to communicate what they’ve learned about coral health to high school students on the island. Hartmann will continue with his research and teaching; he plans to build a career that combines both.

The 2012-13 Socrates Fellows will showcase their work in the Natural Sciences Building atrium on Friday, May 31 from 3 to 5 p.m. This marks the final year of the original NSF grant supporting Socrates; however, ScienceBridge plans to continue the program with support from campus partners. For more information about the Socrates Fellows Program and ScienceBridge, visit <http://sciencebridge.ucsd.edu>.

The Socrates Fellows Program begins during the summer, when graduate students and teachers meet to plan how they will work together in the coming school year. The five-week preparatory session includes workshops that are facilitated like lab meetings—an opportunity for teachers to experience science as a profession—as well as workshops that train graduate students how to teach and communicate with high school students.

“Working with the teachers, you learn to take a step back from your research and think about why it matters,” said Hartmann. “You learn how to communicate what you’re doing and why, not just to high school students, but to the general public as well.”

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