

Program Goals

The SCWIBLES GK-12 program at the University of California, Santa Cruz (UCSC) aims to increase diversity in the environmental sciences by increasing the academic success and career opportunities for students in the Environmental Science and Natural Resources (ESNR) Academy at Watsonville High School.

Watsonville High School is located in an agricultural community in California's central coast that primarily serves low-income Latino students, a third of whom are learning English as a second language.



The Academy Structure

Watsonville High School has an innovative educational structure, where each student spends three years in one of seven small-learning communities, or Academies. These schools-within-the-school provide career-focused pathways centered around project-based learning.

The ESNR Academy guides students to postsecondary education and jobs in the relevant fields of agriculture, environmental management, and green technology.



Fellows' Research Into the Classroom—And Beyond

Summer Research Fellowship Program

Training in Inquiry-Based Pedagogy

During the summer, Graduate Fellows and Teacher Partners share areas of expertise, build collaboration through hands-on science, and develop exciting and effective inquiry-based curriculum.



A summer workshop kicks off this research experience with an intensive introduction to field-based inquiry projects. The projects, led by UC Santa Cruz faculty, are based on the

Organization for Tropical Studies field problems model, and are conducted in the UCSC Natural Reserve, labs, and greenhouses.

Teachers as Practicing Scientists

Teachers then apprentice to GK-12 Graduate Fellows who are working on their dissertation research for hands-on research experience.

This year, Teacher Dan Johnston joined Fellow Jorge Torres in his native Costa Rica to study how management practices affect the regeneration of secondary growth forests on private lands.



They used transects to identify species composition, and field experiments to evaluate the impact of management practices on seedling regeneration.

Nina Arnerg PhD Candidate in Ecology & Evolutionary Biology

I study the behavioral ecology of Golden-Crowned Sparrows on the California Central Coast.

I use field observations and microsatellite DNA fragments to understand why some individuals cooperate to form wide-ranging winter flocks, while others choose to be sedentary loners.



Evolutionary theory suggests that individuals that form flocks may be kin.

In partnership with the WATCH (Watsonville Area Teens Conserving Habitats) program of the Monterey Bay Aquarium, I am working with 10th-12th graders from the Marine Biology class, guiding students in a year-long study of bird behavior at the Elkhorn Slough National Estuarine Research Reserve.



Students go through a complete scientific investigation of their own design, from initial observations, to experimental design, and then presentation of their findings. Each semester, students spend six 3-h days collecting data in the field.

Elizabeth Bastiaans PhD Candidate in Ecology & Evolutionary Biology

I study variation in sexually selected traits (like throat color) of a lizard that lives in Mexico.

I use field observations, laboratory behavioral trials, and genetic techniques to understand how variation is maintained within and among populations.



Ultimately I want to know whether the mechanisms that maintain variation in sexually selected traits contribute to divergence between populations that can lead to the formation of new species.

In a 10th grade Agriculture class, I work with students to understand the basis of plant breeding, by investigating how genetics and environment contribute to variation in plant traits.



Using Wisconsin Fast Plants™, which have been artificially selected for classroom use, students choose a trait to analyze (like height), and grow two generations of plants during a single semester. Students learn to make a pedigree for their plants, calculate heritability for the trait they chose, and manipulate an environmental variable to observe its effects on the same trait.

Tara Cornelisse PhD Student in Environmental Studies

The Ohlone tiger beetle is an endangered species and endemic to Santa Cruz County. My research aims to determine what factors—habitat quality or habitat size and isolation—affect the beetle population in its remaining habitats.

I measure many habitat characteristics and relate them to the beetle's population viability at each site.



I also investigate the effects of human activity on the beetle's status as well as potential management techniques to augment the beetle's populations. I aim to bridge science and conservation management.

In a 10th and 11th grade Natural Resources class, I led a water quality module that examined how human activities can negatively affect water quality and, in turn, human & environmental health.

I guided students through an inquiry-based activity where they created a water filter to reduce the turbidity of the water samples.



The students learned how human construction activities increase runoff causing erosion, pollution, eutrophication, and habitat and water contamination. Students gained skills creating and applying a solution to a real world problem.

Jennie Liss Ohayon PhD Student in Environmental Studies

I research ecological and social aspects of the strategies used to restore native plant communities in Superfund sites following environmental remediation.

I use experimental and comparative studies to understand how to create initial native vegetation that is self-sustaining and resistant to invasion by weeds.

I also investigate how local communities participate in scientific decision-making about the restoration process.



SCWIBLES has been a great opportunity for me to expand and diversify public involvement in science.

I work with 10th-12th graders in Natural Resources and Green Careers on local solutions to energy sustainability.

Students conduct an energy audit of their high school and create biodiesel from vegetable oil. Students learn the chemical reactions for making biodiesel and test which vegetable oils produce high quality fuel.



Using a processor for making large quantities of biodiesel from waste oil, students gain experience in managing a complex, long-term project. They also learn how to raise community awareness about environmental issues through interactions with the popular press.