

Student-Teacher Opportunities In Hands-On Research In Oceanography and Paleontology

Through Participation in
the Geopaths Marine
Geoscience Program at
CSUB



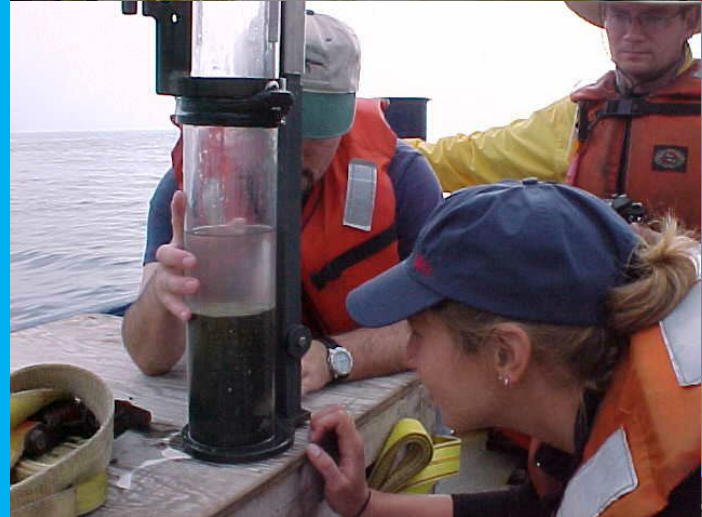
CSUB Department of Geological Sciences, in collaboration with the University of San Diego and Scripps Institution of Oceanography, is recruiting teachers, students and student-teachers to participate in a hands-on marine science program.





Students will get the opportunity to be an active member of an oceanographic research voyage, collecting real research samples and data aboard a Scripps research vessel off the coast of San Diego.

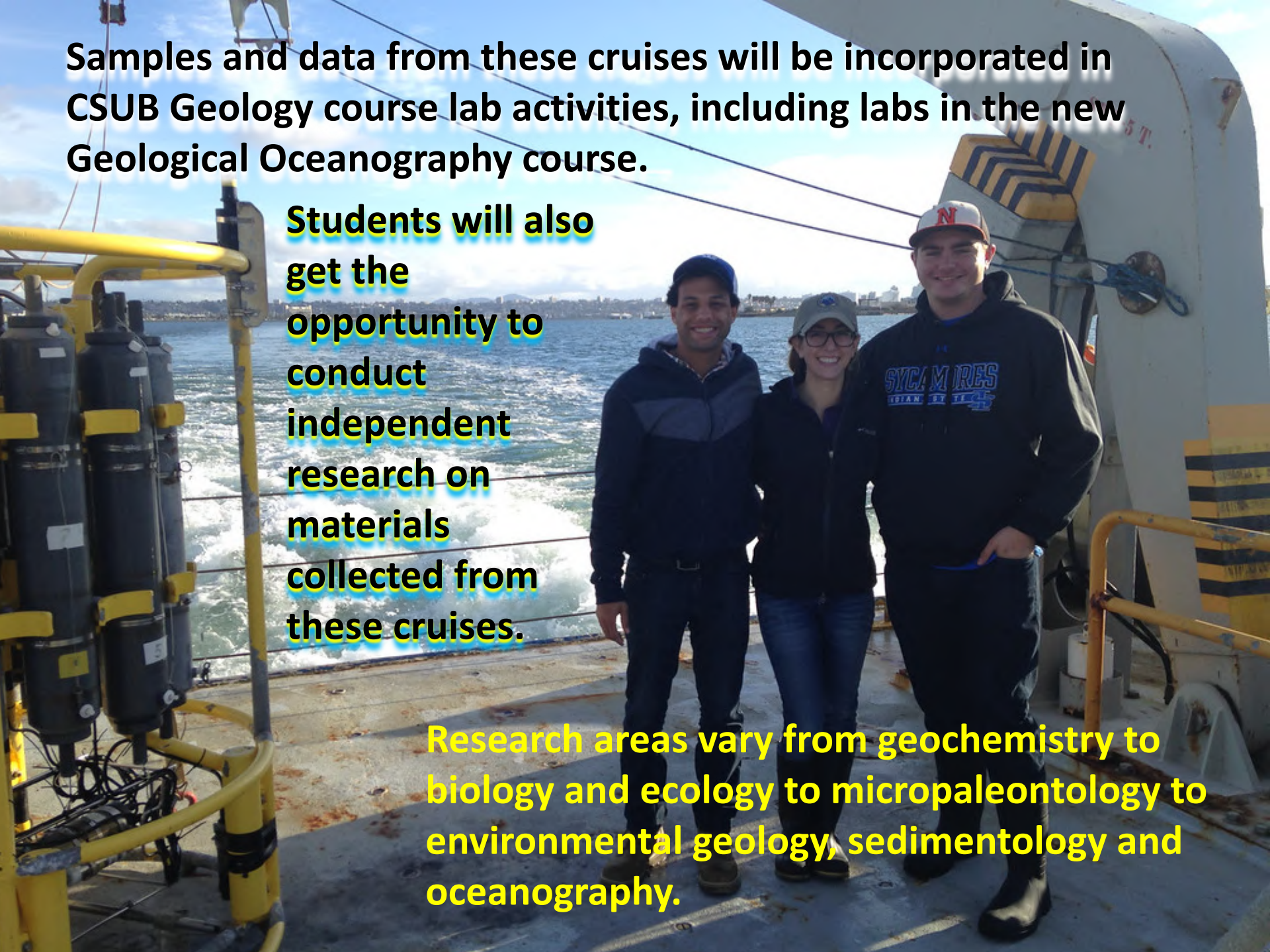
Through National Science Foundation funding, students will be able to sail on these exciting voyages for free.



Samples and data from these cruises will be incorporated in CSUB Geology course lab activities, including labs in the new Geological Oceanography course.

Students will also get the opportunity to conduct independent research on materials collected from these cruises.

Research areas vary from geochemistry to biology and ecology to micropaleontology to environmental geology, sedimentology and oceanography.





Experienced Teachers Will Work With Future Teachers to Create Educational Modules/Activities that use Real Samples and Data.

Experienced high school teachers will work closely with students studying to be teachers during and after the cruise.

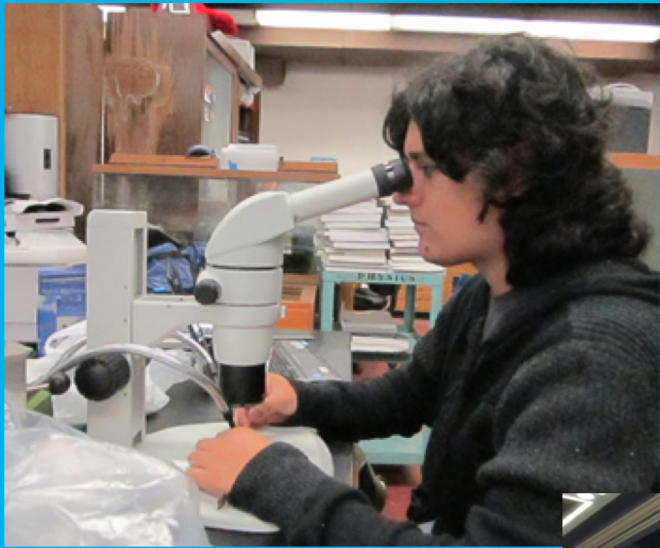
One goal for these teams of teacher/students is to develop lab modules that can be used in the classroom.

These modules/activities will be based on real samples, data and experiences obtained during the cruise.

A free workshop for teachers and students will be held after the July cruise to facilitate module development.

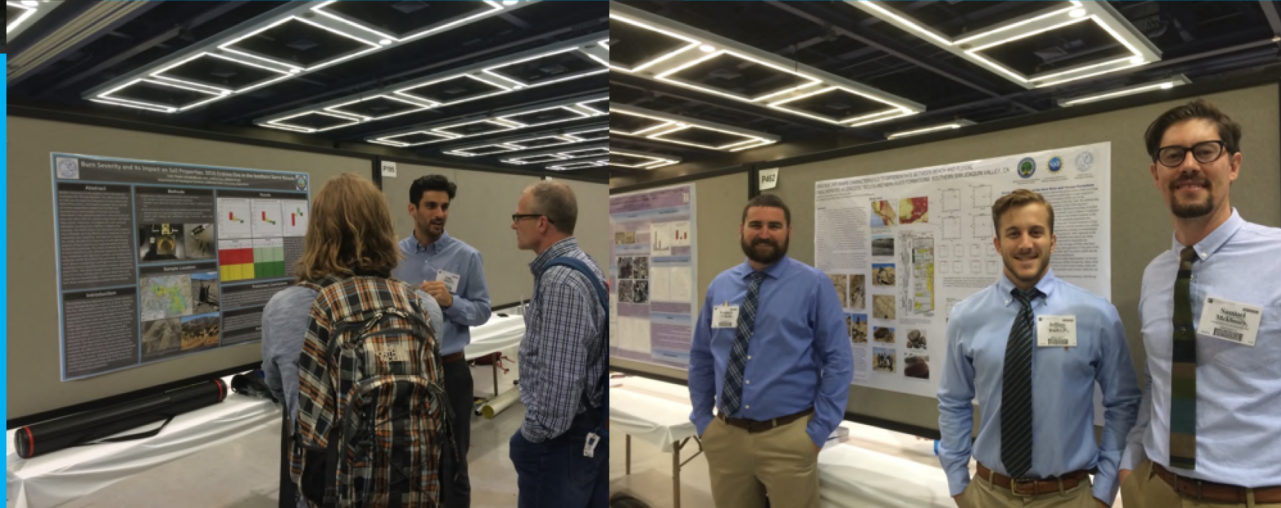


These modules will later be tested in the high school classroom and, once ready, then made available to any teacher in the country, just for the asking.



Research results from these voyages, including findings from educational research, will be presented by undergraduate students and teachers at national conferences and published with student and teacher co-authors.

Research results will have relevance to climate change, paleoceanography, marine biodiversity, carbon cycling, educational practices, and more.



Students and teachers will get a chance to work with scientists and experienced educators to explore marine science and create new tools to convey the excitement of science to the next generation.

For example, one focus of the research is on benthic foraminifera



Foraminifera are used in a wide variety of disciplines, including petroleum geology, environmental geology, climate change research, stratigraphy, paleoenvironmental assessments, marine biodiversity and paleoceanography

Outline of Activities

- Six Ocean Research Voyages Over 3 years
 - Hands-on participation on research cruises off the coast of San Diego
 - Student research based on samples and data collected during the cruises
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- Career Day Events
 - Recruitment of Minorities into Geosciences
 - Incorporation of Research Materials and Voyage Video in Classrooms



OBJECTIVES

- **Recruit Minority Students Into Geosciences**
- **Increase Oceanographic Research and Education at CSUB**
- **Engage Students and Teachers in Hands-On Research**
- **Develop and Test Educational Lab Modules**
- **Assess Program Effectiveness**



There will be two types of voyages on two different Scripps research vessels



One will be a 3-day summer cruise the first week in June aboard the *R/V Sally Ride*, the newest research vessel in the United States research fleet



All voyages will sail out of Scripps Institution of Oceanography's Marine Facility

The other voyages will be 24-hour cruises, one in late July and one in late September aboard the *R/V Robert Gordon Sproul*





On all cruises students and teachers will be active participants in the research effort, from securing research gear and setting up lab equipment on the ship to helping to deploy and recover sample collecting devices.

Students and teachers will be trained in safety procedures and data collection techniques.

Students and teachers will also be trained in shipboard operations and techniques, such as sample preservation and knot-tying.



Students and teachers
are active on deck



And in the lab

The ships use state-of-the-art research technologies



While operating 24 hours a day, some deployments and recoveries



are done during the day

While some deployments and recoveries are done at night



ON SHORE

STUDENTS AND TEACHERS WILL GET THE OPPORTUNITY TO TOUR SCRIPPS INSTITUTION OF OCEANOGRAPHY, INCLUDING:



MARINE FOSSIL OUTCROPS ON TORREY PINES BEACH

SCRIPPS BIRCH AQUARIUM



SCRIPPS GEOLOGICAL COLLECTIONS

JOIN OUR TEAM OF OCEAN-GOING RESEARCHERS!

For more information, contact:

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Voyage 1: May 31-June 6, 2018
Voyage 2: July 26th-28th, 2018
Workshop: July 29-Aug. 3rd, 2018
San Diego, CA



ACT QUICKLY—we need students and teachers for our next research cruise in early JUNE as well as the cruise in JULY!! Sign Up for this chance of a lifetime!