

Earth System Science at CSU Long Beach

An interview with Elizabeth Ambros, California State University Long Beach, Long Beach, CA

The ESSE experience really helped to develop the Earth System Science "culture" at California State University, Long Beach. ESS concepts have also found their way into the teacher preparation curriculum.



What has experience in Earth system science education meant to you?

It really helped me to develop new partnerships and networking relationships with like-minded scientists and educators. It also led (in some measure) to follow on funding for programs at my institution.

What has experience in Earth system science education meant to your institution?

The ESSE experience really helped to develop the Earth System Science "culture" at California State University, Long Beach. Many of the principles of ESS helped to guide CSULB's involvement in the ALERT program (collaborative California State University program with NASA-JPL and NASA-AMES) and, more recently, in the NSF-funded Geoscience Diversity Enhancement Program (GDEP). There are now many research and teaching examples that derive their ethos from the ESS, "writ large". Faculty members from Geological Sciences, Geography, and Archaeology routinely collaborate on research and teaching projects. The ESS concepts have also found their way into the teacher preparation curriculum (both elementary and secondary) through essential collaborations with faculty in the Department of Science Education. Last but not least, while not directly caused by ESSE, the creation of a B.A. and B.S. program in Environmental Science and Policy at CSULB fully demonstrates the integrative power of an ESS-oriented degree program.

What aspect of Earth system science education has been most useful to students at your institution?

My personal opinion is that the interdependencies of cause and effect (and non-linearity thereof) connected with the ESS conceptual framework has been most valuable to students. When students can actually see (either through a role-playing exercise, lecture, or modeling exercise) that changes in sea surface temperature, for example, have both weather and climate implications (depending on the time scale), they are able to integrate their learning much better. Also, students in urban settings really see the environmental justice aspects of ESS very clearly, and are able to see the relevance of the ESS approach to their daily lives.



How can the ESSE community help the future development of Earth system science education at your institution?

The easy answer is "money" -- money for students and faculty to work on additional curriculum change, money for applied research in the immediate area that might be brought into the classroom. Another very useful development would be relatively low cost visualization software and image sequences that would be public and easy to incorporate into PowerPoint and other lesson framework programs. The GeoWall software/hardware is also very powerful in terms of 3-D visualizations, which are often "Aha" moments for students.

How can your institution contribute to the future development of the ESSE community?

We can probably do much more for creation of modules and case studies for urban geoscience projects. California State University, Long Beach, is located in a highly urban coastal area, with many people and too few resources. The opportunities for applied research into environmental justice issues is tremendous, and the results from these case studies might lead to helpful case studies for other ESSE practitioners, through documentation in website resources.



Our campus has done quite a bit with Virtual Field trips, but these have always had a firm geological framework, rather than ESS.

Has your institution tracked students involved in Earth system science education following graduation?

I am afraid that we don't have any definite data, as our major point of contact is through the 300I course, which is offered for General Education students, rather than undergraduate majors. As the ES+P (Environmental Science and Policy) program grows, it may be appropriate to track students from this program, and identify them as essentially ESS practitioners.

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<http://seis.natsci.csulb.edu/deptweb/Deptwebpage.html>

Project ALERT

<http://www.projectalert.nasa.gov/>

Geoscience Diversity Enhancement Program

<http://www.csulb.edu/depts/geography/gdep/>

Environmental Science and Policy Program

<http://www.csulb.edu/programs/es-p/index.html>