

CUAHSI Education and Outreach Programs

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As a university consortium operating on a national scale, CUAHSI has a unique role to provide our university community members with support and opportunities to integrate their research with highly effective teaching and communication of water science to a broader audience. Thus, while CUAHSI is not directly delivering STEM education programs, our Education and Outreach programs aim to provide resources to those who do. Our offerings include courses, topical modules, laboratory exercises, and videos, which incorporate new research and encourage broad interest in environmental science.

Many of these resources are based around the premise that students will be motivated and learn best when earth science and systems concepts are connected to tangible relevant places, experiences, and issues for those participating students. CUAHSI hosts and organizes learning materials that can be used to convey these concepts through an examination of the role of water in the earth system. Two key programs that we use in order to develop and disseminate these resources are the NSF-funded Water Data Center and our ongoing partnership with university community to produce “Let’s Talk About Water” events.

CUAHSI operates the “Water Data Center” (WDC), a facility that provides public-access data services to the hydrologic science community and other critical-zone science communities that requires access to various sources of water data to perform research on fundamental challenges in hydrology and earth system science. We enable the water research community by supporting data access, data publication, software development, and curation, in addition to the development of technology standards that ease data discovery, access, and sharing. In addition to supporting basic and applied research, these data are valuable resources for creating place- and problem-based learning.

The CUAHSI Water Data Center (WDC) supports educators in creating and sharing innovative approaches to using real data in the classroom using CUAHSI data services. Working with our university members who both deliver undergraduate education and work with K-12 educators, we have found that educators who want to employ real data and tailored content face significant barriers, including: finding the correct data products; linking the data to software that can view, process, and interpret results; and being able to effectively use “big data” products in a classroom environment. Our tools for data discovery, access, and analysis allow students and educators to search for data in their “own backyard,” discover data related to local issues, and, in some cases, even contribute data back to the system. CUAHSI has partnered with several of our university members to explore and disseminate best practices for bringing real data into the classroom and maintains and solicits new materials for STEM education modules at: <http://wdc.cuahsi.org/WDC/Education.html>.

CUAHSI also produces ongoing outreach programs that are meant to stimulate student interest in environmental science and careers in water science that we execute in conjunction with our university community. Our “Let’s Talk About Water” (LTAW) program is the primary program targeted toward an

undergraduate audience and again uses the concept of tapping in to local issues and personal experiences to make science interesting and relevant to the audience. LTAW focuses on water issues through a format that consists of viewing the documentary with a carefully selected (and prepared) panel and holding a question-and-answer (Q&A) session following the film. Several “Let’s Talk About Water” events have been successfully presented on multiple college campuses thanks to this easy-to-follow formula, which serves to maximize the effectiveness of Q&A sessions after films. CUAHSI developed this approach after attending many events where the Q&A formats after movies generally did not work well. Panelists often gave extended speeches that did not directly address topics raised by the film and failed to connect the dots between events depicted in the film and issues relevant to the audiences’ lives.

The “Let’s Talk About Water” format addresses these problems with thoughtful preparation and careful execution of the event and specifically targets lower division undergraduates to teach them about the importance of water science and attract them to water science careers. For example, a multi-campus event in Boston involving the University of Massachusetts Boston, Northeastern University, and Tufts University rotates annually among the campuses to expose undergraduates to these different campuses and their graduate programs. For the past 6 years, CUAHSI staff has worked with instructors in entry-level earth science, engineering, and public health courses to offer extra credit to students who attend the “Let’s Talk About Water” events. This has helped to attract audiences of about 200 students to each film viewing and subsequent discussion. CUAHSI works with university hosts to craft a program with an appropriate film that connects to local issues and a panel that includes local experts and a mix of academics and practitioners. As the science discussion winds down, moderators have segued into discussion of their own career experiences and future career options for students in a range of water-related careers, including consulting, research, resources management, policy, and law. Using this approach, CUAHSI has sustained lively discussions for more than 90 minutes at all events. Students rated the events highly and some even found internships with the panelists at the event. We’ve documented this formula and the resources we offer to hold events in an EOS article and on our website.

These two programs represent the role CUAHSI can play in supporting our university members and stimulating student interest in STEM careers. When we hear from our community of a need (“We need help with data-based problem sets,” “It’s too difficult to develop real-data based lessons,” “We want to do more effective campus outreach events,”), CUAHSI staff works with university partners to develop and pilot programs. These ideas and resources can then be disseminated to the broader university community and, if successful, sustained as education support services. CUAHSI is continually looking for new partners and ideas, with the idea that the Consortium’s role is to support development of innovative, successful approaches to education and outreach that can be supported, shared, and replicated for community benefit.