

The SENCER Centers for Innovation

Science Education for New Civic Engagements and Responsibilities (SENCER) is a faculty development and science, technology, engineering, and mathematics education reform initiative supported by the National Science Foundation. The SENCER Centers for Innovation (SCI) are formal regional organizations launched in the spring of 2008 that offer programming and support for current members of the SENCER community and people new to SENCER.

The SCIs – New England, Midatlantic, South, Midwest, and West – are hosted locally by a college or university, and provide at least two symposia per year to address the needs and interests of the regional community. Each SCI is directed by a Leadership Council, whose members represent two and four-year institutions in the region and who share their expertise in course and program design. In addition to coordinating symposia and workshops, SCIs are home to burgeoning institutional partnerships on issues of civic consequence, such as water and public health. This poster features some of the many initiatives and activities currently offered by the SCIs. Learn more by visiting the SENCER website, www.sencer.net.

SCI-West

Host Institution: Santa Clara University (CA)
Co-directors: Steven Bachofer (Saint Mary's College of California) and Amy Shachter (Santa Clara University)

The SCI-West pursues a regional research project: Precious Water and Watersheds. Healthy watersheds are crucial to ensuring high-quality drinking water. Many potential contaminants threaten our watersheds and require detailed monitoring of waterways. The SCI-West Research Project seeks to actively engage students and faculty from various educational institutions in biological, chemical, and environmental science courses to monitor watersheds for specific contaminants. The research results will become a resource for the community as well as water regulatory agencies.

For the initial research project, SCI-West began to monitor levels of pyrethroids in San Francisco Bay area creeks and rivers. Since organophosphates were phased out by 2004, pyrethroids have become the most common insecticides used residentially by both homeowners and professional pest control agents. In the initial phase of the SCI-West project, experimental protocols were established and standard methods were investigated.

Currently, the project involves Saint Mary's College, Holy Names University, Los Medanos College, University of the Pacific in California, Kapi'olani Community College in Hawaii, Brigham Young University in Utah, and the University of Montana.



Students collect and analyze samples as part of the Watersheds project (SCI-West)

SCI-South

Host Institution: University of North Carolina at Asheville
Co-directors: Edward Katz and Keith Krumpe (UNCA)

The SCI-South is working to disseminate the SENCER approach to more colleges, universities, and schools systems close to existing SENCER community members. The Leadership Council will expand in the coming months to accommodate faculty representatives from one four-year institution and one two-year institution for each state in the region.

The co-directors and members of the Leadership Council consult for local institutions on topics such as large scale curricular reform, an area of particular expertise. UNCA applied the SENCER philosophy to the creation of its Integrative Liberal Studies (ILS) Topical Clusters. Each UNCA student is required to complete three courses (natural science, social science, and an elective) from a list of courses focused on an important societal topic. The cluster "Food for Thought: Engaging the citizen in the science and politics of food information, food consumerism, nutrition, and health" was selected as a SENCER model in 2008.

SCI-South community members most recently gathered at the University of North Carolina at Asheville in January 2009. The next symposium (spring 2009) will be hosted by Oxford College at Emory University.



SCI-Midatlantic Leadership Council (above)

A SENCER Model Course from the Midatlantic Region

The Mathematics of Communication: Keeping Secrets (Stephen J. Greenfield, Rutgers University)

For thousands of years, people have tried to communicate secretly and securely. This course discusses some of the mathematical and social issues related to cryptography. Every person who has used an ATM, made a phone call using a cellular phone, or had their health records transmitted among caregivers or insurers should be concerned about secure communication. Social issues include the conflict between the right to privacy and the desire of some government agencies to have assured access to certain communications, and the difficulty and propriety of preserving intellectual property rights over a collection of bits.

This course covers a number of important topics in the mathematics and theoretical computer science discovered within the last quarter century.

SCI-New England

Host Institution: Southern Connecticut State University (CT)

Co-directors: DonnaJean Fredeen (Southern Connecticut State University) and Rob Sanford (University of Southern Maine)

The New England SENCER community contributes mature projects in assessment, environment studies, institutional partnerships, and honors courses to the SENCER community.

At Stonehill College, faculty are sections of general chemistry on themes such as Food and nutrition, environment, forensics, art, medicine.

As part of a federally-funded Mathematics Integrated with Science through Technology project, Lesley University is developing modules that engage students with local and national issues.

Rob Sanford, SCI-NE co-director, published a SENCER influenced text, *Environmental Science: Active Learning Laboratories*. Another SENCER initiative at USM, a three course honors sequence that focuses on the human body, is a consistent offering in general education.

SCI-Midatlantic

Host Institution: Rutgers University (NJ)

Co-directors: Monica Devanas and Terry McGuire (Rutgers University)

The SCI-Midatlantic is a vibrant association of universities and colleges working on several areas of focus, including partnerships with K-12 educators and a regional water project, the focus of their 2009 spring symposium. "Water, Water, Everywhere: Connections for Research, Education, and Outreach" at Rutgers University will bring together formal and informal educators who will share their expertise on incorporating local water issues into the curriculum and forming partnerships to extend the impact into the community.

The SCI's fall 2008 symposium, "Preparing the Undergraduates of Tomorrow: The Critical Role of K-8 STEM Education" provided an overview of K-8 science learning and its specific implications for the improvement of science education at the college level. The Center for Liberal Arts and Society at Franklin & Marshall College (PA) hosted the event, which included presentations by Alan Friedman, a nationally known consultant in museum development and science education, and Richard Duschl, the Waterbury Chair in Secondary Education at the Pennsylvania State University.

SCI-Midwest

Host Institution: Harold Washington College (IL)

Co-directors: Marion Fass (Beloit College) and Dennis Lehman (Harold Washington College)

The SCI-Midwest is working with disciplinary societies, two- and four-year colleges and universities, and non-governmental organizations on initiatives in public health, the environment, and other topics of interest to educators and students in the region. Currently, the SCI is collaborating with the Shedd Aquarium, the Brookfield Zoo, the Alliance for the Great Lakes, the National Park Service, and the Friends of the Chicago River on joint projects. The upcoming BioQUEST meeting (June 2009) hosted by Beloit College will feature the topic Green Architecture, Green Curriculum with presentations on:

- * Investigative Cases: Green Explorations
- * Quantitative Approaches to Sustainability Data
- * Sustainability and Global Health
- * Sustainability: Towards an Alternative Future

The SCI has also sustained a strong schedule of workshops and symposia to reach out to faculty in the region. Butler University hosted a symposium in December 2008 for Indiana schools. Marion Fass and SENCER Leadership Fellow Cathy Middlecamp (University of Wisconsin Madison) presented at the Wisconsin Campus Compact Annual Meeting in February 2009. A meeting on mathematics, coordinated by SENCER visiting mathematician Cindy Kaus, is planned for the fall of 2009 at Metropolitan State University (MN).