

## In This Issue...

We welcome three new courses to the SENCER Model Series this summer. Each course will be highlighted in sessions at SSI 2007, and will also be published online soon. To read brief descriptions of the models - *The Power of Water*, *Slow Food*, and *Science on the Connecticut Coast* - please turn to page 4.

Richard Duschl, professor of science education in the Graduate School of Education at Rutgers University, and Stephanie Knight, professor of educational psychology at Texas A&M University, will join a distinguished panel who will discuss "SENCER and K-12 Education" during a Post-Institute Symposium at the 2007 SENCER Summer Institute. Page 2.

SENCER highlights the progress and goals of an alumni team attending SSI 2007 from Butler University on pages 6 and 8. On page 5, the focus is on the plans of a team from Macon State College who are just beginning to apply SENCER to the curriculum of a new degree program at their institution.

Southern Connecticut State University has launched a Center for Excellence in Mathematics and Science, led by SSI alumna and Dean of the School of Arts and Sciences, DonnaJean Fredeen. Page 3.

The Bioliteracy Project is looking for teachers to contribute your thoughts and experiences on teaching evolutionary biology through an online survey. Turn to page 8 for more information on the information requested and how to submit your opinions.

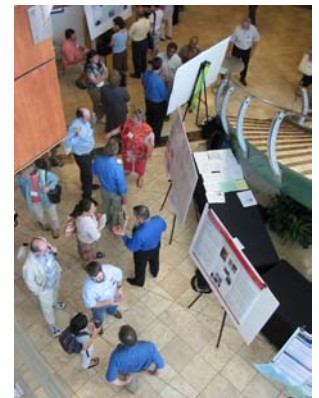
The SENCER Summer Institute begins soon! To alleviate any last minute concerns you may have, please take a look at "Frequently Asked Questions" about the Institute, published on pages 7-8.



Pictures from  
SSI 2006

(left) Participants  
during a concurrent  
session

(right) Participants  
at the poster  
session



## Leaders in Science Education to Participate in Post-Institute Symposium on SENCER and K-12 Education

The application of SENCER to pre-service teacher education is an area of growing interest for many in the SENCER community. This year, a post-Institute symposium on SENCER and K-12 Education will be held on Monday, August 6th in the afternoon, and we are pleased to say that Richard Duschl, an expert in the field of science education, will participate in the discussion. Dr. Duschl is a professor of science education in the Graduate School of Education at Rutgers University and an executive member of the Rutgers Center for Cognitive Studies.



*From the Rutgers University website*

Richard A. Duschl is known for his research on assessment, on argumentation discourse practices and on the application of history and philosophy of science to science education. He has been a teacher of both high school and middle school students, and was the Chair of Science Education at King's College London.

Professor Duschl's present research focuses on establishing science assessment learning environments that focus on the role of students' argumentation processes. This research is an extension of his NSF funded Project SEPIA (Science Education through Portfolio Instruction and Assessment) research. Project SEPIA investigated the dynamic learning and teaching structures associated with formative assessment strategies when implementing full-inquiry units.

Dr. Duschl was also the chairperson of the committee that authored 'Taking Science to School' a National Academies publication that explores learning processes of children, effective teaching methods, teacher preparation, and professional development, as key factors in student success.

He will also be part of a more informal discussion on Monday, August 6th at the Eastland Park Hotel. Professor Duschl will offer thoughts on how our increased understanding of cognitive science challenges our assumptions about the level of capability of children to learn science and how this knowledge enables us to develop successful strategies to "engage students [as early as possible] in scientific tasks that explore ideas and problems that are meaningful to them with carefully structured support from teachers."

Jean Moon, director of the Board on Science Education, National Academy of Sciences, the group that commissioned *Taking Science to School*, will moderate this session and situate this work within the larger context of efforts by the National Academies to improve science learning.



*From the Texas A&M website*

Stephanie Knight, Professor of Educational Psychology in the College of Education and Human Development at Texas A & M University, will also join us for the Symposium on SENCER and K-12 Education. She is the recipient of the Houston Endowment Inc. Endowed Chair in Urban Education, and has received the university former students' association award for teaching excellence and was selected as a University Faculty fellow as a result of her research and scholarship in teacher education.

Prior to her current appointment, she served as the Director of the Learning to Teach In Inner-City Schools (LTICS) Program in Houston urban schools, Director of the Center for Collaborative Learning Communities at TAMU and Associate Director for Research into Practice in the NSF funded Center for Teaching and Learning, Information Technology in Science Center at Texas A&M. She also participated as a senior researcher in the national Center for Research on Excellence and Diversity in Education with the responsibility for developing the synthesis on research on professional development for teachers of diverse populations. Her research focuses on effective classroom practices and preservice and inservice professional development for teachers. She served as Co-Editor of the *American Educational Research Journal* from 2004-2007 and has published many articles in journals such as *Journal of Teacher Education*, *Journal of Education of Students Placed at Risk*, *Journal of Educational Research*, and *the International Journal of Learning Environments*.

We welcome all of the guests who will participate in the session on Monday morning, "Taking Science to School: A Conversation with Richard Duschl," and the post-Institute Symposium on SENCER and K-12 Education on Monday afternoon.

## Southern Connecticut State University Initiates Center for Excellence in Mathematics and Science

Justin Burner, SENCER Intern



DonnaJean Fredeen,  
Dean of the School of Arts  
and Sciences

On March 16, 2007, the Connecticut State University System's Board of Trustees approved a proposal, prepared by DonnaJean Fredeen, for the establishment of a new Center for Excellence in Mathematics and Science at Southern Connecticut State University.

The new Center at SCSU identifies a need to improve interdisciplinary communication, teacher preparation, and interaction between the university and the K-12 institutions in New Haven. "The mission of the Center for Excellence in Mathematics and Science is to foster outstanding teaching and research in the various fields of math and science through the enhancement of existing campus initiatives and through effective collaborations between math and science faculty in K-16, with the goal of increasing the number and quality of students pursuing careers in math and science."

Dr. Fredeen, the Dean of the College of Arts & Sciences, has served as chairperson and professor of chemistry, and will now act as coordinator for the Center. The goals of the Center relate to various aspects of the university's own mission statement and are fivefold: Improve the administration, facilities, and research infrastructure of the science disciplines; foster discussion for collaboration between teaching and research in math and science; improve New Haven's mathematics and science programs at the elementary and secondary levels; assist faculty in creating and reorganizing courses in line with the General Education Program; and create new programs to increase participation and interest, starting at an early age, among underrepresented groups (specifically women) in STEM education.

Writing grant proposals is a large factor in the initial plans to achieve these goals. In particular, a revised proposal for two state grants provided by the National Science Foundation (NSF) and the Mathematics and Science Partnership (MSP) will be submitted. The Center also plans to assist various departments with professional development workshops and outreach programs in New Haven's K-12 institutions. Space in the university's newly planned academic building will be utilized for internal, interdisciplinary development and research, a practice already seen in other institutions such as UCONN. In continuation with SCSU's involvement with NCSCE, the Center will assist in sending campus teams to the SENCER Summer Institute as well as organizing visits to the university by members of SENCER. Long term goals include further communication between STEM faculty and the State Department of Education regarding K-12 State Frameworks, and the preparation of a specialized M.S. in Science Education degree with a concentration in Elementary Science Education.

Already, the Center has helped find judges for the New Haven Science Fair and has done regional planning in New Haven for the American Chemical Society National Chemistry Olympiad. They also plan to work with the math department to coordinate SCSU's annual Mathematics Contest for the students of New Haven. The Physics Department at SCSU has been offering inquiry-based outreach initiatives in the elementary schools in New Haven, and the new Center plans to continue this trend by providing similar programs that allow K-12 students and faculty to experience university-level laboratory science environments.

Southern Connecticut State University has been associated with SENCER for some time. For the second year in a row, one of the new SENCER Model courses – *Science on the Connecticut Coast: Investigations of an Urbanized Shoreline* by Vincent Breslin and James Tait – comes from SCSU. Last year, *Computer Ethics* was contributed by Terrell Ward Bynum. The new Center will continue the University's association with SENCER, and David Burns, SENCER's PI, will serve on the Center's Advisory Board. We congratulate Dr. Fredeen and SCSU on the new Center and look forward to continued work with SCSU and their Center for Excellence in Mathematics and Science.

To access *Computer Ethics* by Terrell Ward Bynum, visit <http://www.sencер.net/Resources/models.cfm>.

To read about the new model by Vincent Breslin and James Tait, *Science on the Connecticut Coast*, please turn to page 5. You may also view a PowerPoint presentation they did on the course at the January 2007 SENCER New England Regional Meeting by visiting [http://www.sencер.net/Meetings/pdfs/OtherMeetings/Southern\\_CT.pdf](http://www.sencер.net/Meetings/pdfs/OtherMeetings/Southern_CT.pdf).

## Three New SENCER Model Courses Address Sustainability, Resources, and the Local Environment

Three courses have been selected to join our SENCER Model Series this summer, bringing the total of our collection of examples of successful, effective methods to address issues of concern to society to 30. The models published this year are diverse in their foci, but all, in some way, consider a critical issue: the sustainability of resources and the ecosystem. The individual authors address the idea through the topics of nutrition and health and water systems, both global and local, but all encourage students to realize the effects of human activity on the health of their communities. Two of the models selected, *Slow Food* by Marion Fass, and *Science on the Connecticut Coast: Investigations of an Urbanized Shoreline*, by James Tait and Vincent Breslin, are called “emerging” models because they are new courses that were developed as a result of their authors’ participation in the SENCER project. Because they are new courses, “emerging” models are presented as “works-in-progress” and examples of the diverse approaches and strategies that SENCER alumni have used to improve science education in their home institutions.



*Alix Fink*

The new models will be featured during sessions at the 2007 SENCER Summer Institute in Portland, Maine. The full text of each will also be added to our website ([www.sencernet.net/Resources/models.cfm](http://www.sencernet.net/Resources/models.cfm)) soon, where they will be available for download, along with all other SENCER model courses. Below are brief summaries of the courses.

### Featured Model: The Power of Water Alix Dowling Fink and Michelle L. Parry, Longwood University

The Power of Water (POW) is an interdisciplinary science course that engages students in considering significant social issues related to global water resources and in learning the basic chemistry, physics, biology, and earth science concepts that underlie those issues. POW, a product of Longwood University’s SENCER involvement, supports our General Education science goal and is a recommended goal course for our pre-service K-8 teachers. During a session at SSI 2007, one of the model developers, Alix Fink, will discuss the evolution of this SENCER course from inception to its current form, the resources and strategies used in the continued development of the course, and the challenges faced along the way.



*Michelle Parry*

### Emerging Model: Slow Food Marion Fass, Beloit College

We are what we eat, and what we eat shapes the environment around us. This model course on Slow Food that explores the connections of food, culture and corporations, looks at issues of food, biodiversity and sustainability, to explore local food and paradox of increasing rates of obesity and increasing rates of food insecurity. The model focuses on activities that engage students with the local community, its “foodshed,” its farmer’s markets, and the problems of hunger.



*Marion Fass*

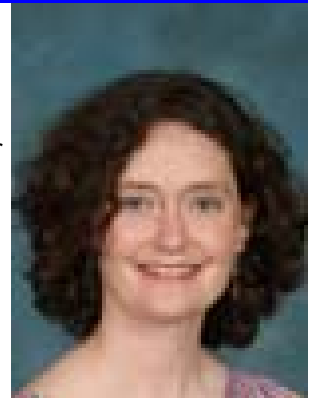
The Slow Food movement promotes good taste, eating local and preserving biodiversity. As the basis for a course, Slow Food offers students an optimistic perspective for analyzing a challenging set of issues. The Slow Food course curriculum brings together the sciences of nutrition, agricultural and ecology with an understanding of the economic and cultural factors that shape how we eat in the United States and possible strategies to build more sustainable practices. Readers of this model will get ideas of how to design service learning projects for their communities that enable students to respectfully use their skills, to contribute to community needs, and to enhance their understanding of local issues.

*Continued on page 5*

## Summer Institute Team Takes on New Degree Program

Stephanie Winterrowd, Macon State College

Macon State College is a smaller member of the University of Georgia system located in Macon, Georgia. We are an open access college, which means that we do not have any admission requirements: we are open to any and all students who would like to attend college. We have only recently added four-year baccalaureate degrees to our campus curriculum. The SENCER approach to teaching could be a great match to both our campus and our students for several reasons. First, since we are just starting new programs, we have the opportunity to integrate new classes and teaching approaches into brand new classes. This can sometimes be easier than trying to “convert” existing courses to a new style. In addition, our students are often returning to school after taking time off or even after pursuing an entirely different career. This makes them a unique group that is sometimes difficult to reach or engage in a more “traditional” manner of teaching.



Stephanie Winterrowd

Our team is newly formed, just like some of our programs, so we are not entirely sure where SENCER might lead us. We know we would first like to work to include SENCER techniques in our own classes. We also hope to introduce others to the SENCER approach, perhaps by starting a “Best Practices” lunch group where people from across campus can meet, have lunch and discuss ideas that work in their classes. In addition, we have been discussing some issues/questions that we would like to specifically address on campus. In general, many of our students tend to be in health related fields because we have a very successful nursing department. Because of this background, we feel that current health issues like diabetes, obesity, general nutrition, cancer, etc. would be great issues to address not just for the community but also for the students in our classes. Using the SENCER approach to develop new classes or alter existing classes to include more health issues as well as include a civic engagement exercise in the health field is a definite possibility. The other idea that several of us have discussed is developing units or a new class specifically for education majors. One of the new degrees that we will begin offering next year is a 4-year science education degree. We would like to develop a SENCER type unit or class addressing how to teach science and evolution in a socially conservative environment.

We are all very excited about the opportunity to participate in this conference and the chance to learn new techniques to use in our classrooms.

*Stephanie Winterrowd, Michael Winterrowd, Whitney Elmore, and Don Brown will constitute the team from Macon State College at SSI 2007.*

## Three New SENCER Model Courses Address Sustainability, Resources, and the Local Environment

Continued from page 4

### Emerging Model: Science on the Connecticut Coast: Investigations of an Urbanized Shoreline

James Tait and Vincent Breslin, Southern Connecticut State University

Science and the Connecticut Coast is course that fulfills the laboratory science requirement for non-science majors in the Honors College at Southern Connecticut State University. The course is divided into four modules covering geology, coastal processes, coastal pollution, and climate change and addresses key environmental questions, including: How have past harbor sediment contamination affected the quality of New Haven Harbor ecosystems? How can we assess hurricane preparedness and potential impact? What are the potential consequences of climate change on Connecticut residents and how can the emission of greenhouse gasses be minimized? Lectures and labs are accompanied by weekly field exercises where students collect data and record observations which are posted on-line. Results of the HON 270 analyses have contributed to a GIS data base of sediment metal analyses in New Haven harbor and have been presented at regional Long Island Sound Research Conferences.



James Tait



Vincent Breslin

## Butler University Incorporates Civic Engagement into Core Curriculum

Joseph Kirsch, Robert Holm, Donald Braid, Margaret Brabant,  
Travis Ryan, William Beranek, and Olujide Akinbo

Civic engagement is becoming an important part of most forward thinking college curricula. Butler University has supported civic engagement for some time through a Center for Community and Citizenship and a University Service Committee. In addition, the faculty of the University has approved a new general education curriculum, called the Core Curriculum, which contains a number of civic engagement elements. The new Core contains a first year seminar with a central theme of self, community, and world along with a second year experience called Global and Historical Studies. In addition, the new Core has a junior or senior capstone course requirement that focuses on societal issues, and requirements for both university and Indianapolis community service.

In the summer of 2006, Butler University sent a team of science faculty to the Summer Institute at Santa Clara University to report on civic engagement activities at Butler and to learn from the programs and experiences of other Institute participants. The Butler team submitted a proposal for a SENCER-NSF post-Institute implementation award through the SENCER program to support civic engagement activities in science pilot courses for the capstone part of the new core curriculum. Two courses were proposed, an urban ecology course through the biology department, and an environmental issues course through the chemistry department. The urban ecology class is scheduled for the fall of 2007, and the environmental class will be taught in the spring of 2008. The urban ecology class will be taught by Dr. Travis Ryan, assistant professor of biology. The environmental chemistry class will be taught by Dr. Olujide Akinbo, associate professor of chemistry. These two SENCER courses also meet the requirements for the University Honors Program.

The conversations and planning for the two SENCER science courses motivated a change in a long-standing political science course that focuses on public policy and the environment. Dr. William Beranek, president of the Indiana Environmental Institute and adjunct professor at Butler University, allowed students in his American Environmental Policy and Politics class to opt for a civic engagement activity rather than a term paper. Three students out of twelve selected the civic engagement activity that involved conducting and recording results of interviews between different stakeholders involved with an environmental issue. Expectations were that stakeholders would come from different sides of the issue. Students were required to submit written interview questions, prepare a briefing paper on the topics to be discussed with stakeholders, and present an oral briefing to the instructor before the interviews. The students learned the need for developing an understanding of the topic and establishing a knowledge base before the interviews. The students were pleasantly surprised at the friendliness and high knowledge level of the stakeholders, even though they held different positions on the issue. Students could select public policy topics from the following: (1) community concerns about emissions of potentially toxic chemicals, (2) state laws on electricity from renewable energy sources, (3) state policy on the relationship between farming needs and wildlife needs, (4) state policy on recycling, (5) a need for more stringent mercury emission controls on coal burning generators, and (6) animal feeding operations in a rural community vs. potential jobs.

Dr. Travis Ryan will teach a SENCER Urban Ecology course in the fall of 2007. The goals of the course are to understand the ways that urbanization has changed natural landscapes and the consequences of those changes on the native flora. Students will read *Win-Win Ecology* by Michael Rosenzweig along with other relevant articles from the scientific literature. While the course is science based, it will be approached in a manner that is amenable to students across the university. The civic engagement activities will involve examination of urban forests in the Indianapolis area using iTree software and tools to determine the ecological value of the urban forest. The class may complement the field work with a survey to gauge public attitudes and perceptions on the value of urban forests. The course will also involve interaction with local neighborhood associations and community leaders.



*Olujide Akinbo*



*Margaret Brabant*



*Donald Braid*

*Continued on page 8*

## SENCER Summer Institute 2007 Frequently Asked Questions

### Does SENCER provide airport transportation?

No. You will need to make your own arrangements for ground transportation from the airport to your hotel and back to the airport at the end of the Institute.

### How do I get to my hotel from the airport?

The La Quinta Inn and Suites and the Sheraton South Portland Hotel both offer shuttles to the Portland airport during certain hours. Please contact the hotels directly to make arrangements. The Eastland Park Hotel does not offer a shuttle, but it is a short taxi ride from the airport.

### What if I forget which hotel I'm staying in?

The SENCER staff will post a complete list of hotel assignments on the SSI 2007 page at [www.sencernet.net](http://www.sencernet.net) before the office closes on July 27, just in case you can't find the information emailed to you.

### Where do I catch the shuttle buses for Institute programs and activities?

At your hotel, the shuttle buses will leave from the main entrance. You will be dropped off at the University of Southern Maine campus in front of the Abromson Community Education Center. At the University of Southern Maine, the shuttle buses will leave from the front of the Abromson Community Education Center.

Pick-up and drop-off times will be available in your program book, which you'll receive at on-site registration. Unfortunately, we will be unable to provide shuttle service between the hotel and campus outside of these time periods.

### When does on-site registration begin?

Registration for SSI 2007 will begin at 8:00 am on Friday morning, August 3rd in the lobby of the Abromson Community Education Center on the University of Southern Maine campus. There will be a breakfast meet-and-greet during registration. If you arrive late (after 9:30 am) you may register at the SENCER office on the USM campus during Institute hours. **On Friday morning, shuttle buses will run from the hotels to campus from 7:45 am—9:30 am.**

### Where is the SENCER office on the University of Southern Maine campus?

The SENCER office is in the Abromson Community Education Center, room 109. This office will be staffed during Institute hours and our SENCER Senior Associates will hold office hours to provide consultations to participants.

### Can I access the internet on the USM campus?

The Abromson Community Education Center is wireless, and SSI 2007 participants will be able to log on to the network with a password and user ID that will be provided with your registration information. Unfortunately, the SENCER staff is unable to offer computers for participant use, but you are welcome to bring your computer to the SENCER office and take advantage of the wireless connection. Internet access at the hotels vary. The Eastland Park Hotel offers wireless internet, and both the La Quinta and Sheraton South Portland hotels have high-speed internet connections in guest rooms.

### Where is the SENCER office at the Eastland Park Hotel?

The SENCER office will be in the E.B. White room on the mezzanine level. This office will be staffed only when Institute sessions are held at the Eastland Park Hotel.

### Who can answer my questions and help me?

Our staff is ready to help you with your questions. Please look for a person wearing a "SENCER Staff" name badge and they will be happy to assist you.

### Is there a lost and found?

Yes, there will be a lost and found box at the SENCER office at the University of Southern Maine. There will also be some basic first aid supplies available in the office for minor injuries.



Courtesy of the Portland Convention and Visitors Bureau

## SENCER Summer Institute 2007 Frequently Asked Questions

Continued from page 7

### What should I pack?

Attire at the Institute is casual. Besides clothes, you should plan to bring a laptop with a CD drive for team time and for viewing CD-rom versions of the models.

### What's the weather like?

The average high in Portland in August is 77 degrees during the day, and a cool 57 degrees in the evening. We will be close to the water, so you might want to bring a sweater to wear at night.

## Butler University Incorporates Civic Engagement into Core Curriculum

Continued from page 6

In the spring of 2008, Dr. Olujide Akinbo will teach a SENCER course on Exploration of Current Environmental Issues. The goals of the course will be to make students aware of current environmental issues, to underscore that solutions to environmental problems require multidisciplinary approaches, to engage stakeholders who are active in local environmental issues, and to show that often there are no easy answers and compromise is necessary. Students in the class will be organized into teams that will read assigned articles and texts, gather and analyze existing data from public domains, and present their findings and analyses.



Joseph Kirsch

Clearly, the incorporation of civic engagement activities in college courses and curricula is a need and has a value. The task requires planning and making appropriate connections in the community external to the university. Faculty and students must also be willing to replace, at least in part, the comfort of the traditional lectures, exams, and papers with meeting and engaging external constituents and stakeholders if they are to learn about the issues confronting the communities in which they reside.

Robert Holm, Joe Kirsch, Margaret Brabant and Donald Braid will represent Butler University as a team at SSI 2007.

## Survey on Teaching Evolutionary Biology Launched

Mike Klymkowsky of the Bioliteracy Project at the University of Colorado, Boulder has set up a website and survey in the hopes of collecting and analyzing teachers' opinions as to what makes teaching evolutionary biology difficult. You can contribute your thoughts by going to <http://bioliteracy.net> and completing the online form.

**Welcome.** Our goal is to generate, test and distribute tools needed to determine whether students are learning what teachers think they are teaching.

We assume that accurate and timely assessment of student knowledge will encourage more effective teaching and better student understanding of science in general, and biology in particular.



*Ignorance more frequently begets confidence than does knowledge: it is those who know little, and not those who know much, who so positively assert that this or that problem will never be solved by science - Ch. Darwin.*



**Why?** Because a wide range of personal, social, ethical, economic and political decisions depend upon an accurate understanding of basic biology and the means by which science generates, tests and extends our knowledge of the world around and within us.

*It's not what you don't know that will hurt you. It's what you think you know that just ain't so - Mark Twain or maybe Satchel Page*

To take part in this project, go to the website then click on "answer survey questions" (left margin). When prompted to select a school, select "Teachers," then click on submit and respond to the questions. There is an open-ended question at the end of the short form that specifically asks for an opinion on the most difficult part about teaching evolution. If you are a chemistry or physics instructor, the counterpart question is "The most difficult challenge I face when teaching the theory of the big bang is..." If you have questions or comments about the survey or website, you can contact Mike Klymkowsky at [michael.klymkowsky@colorado.edu](mailto:michael.klymkowsky@colorado.edu).

From <http://bioliteracy.net>