

SPECIAL
POINTS OF
INTEREST:

- WE²ST officially begins its first semester
- 8 phenomenal Undergraduate Scholars are selected
- ConocoPhillips Media Days comes to CSM
- WE²ST Fellows and Scholars participate in a myriad of education and outreach activities

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ConocoPhillips Center for a Sustainable

WE²ST

Water-Energy Education, Science and Technology

FALL 2014

WE²ST Center Kicks-Off to a Great Start

The WE²ST Center was announced on April 24, 2014 at CSM after special presentations by Samer Adham and Terri Hogue. Fran Vallejo from ConocoPhillips presented a check for three-million dollars to CSM President Bill Scoggins, CSM Foundation member Kim Senger, and WE²ST director Terri Hogue. The kickoff ceremony was part of the annual Mines Alumni weekend.



ConocoPhillips presents WE²ST with a giant check

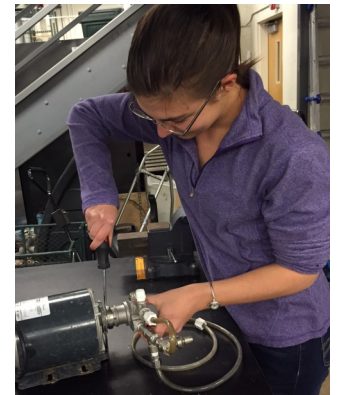
Water-Energy Research Begins

Four initial research thrusts for WE²ST are currently underway. Dr. Terri Hogue is leading the initiative to evaluate water sourcing for unconventional energy and regional water budgets. Dr. John McCray is focusing on integrated water resource management including contamination of groundwater via leaks/spills. Dr. Tzahi Cath's research centers on treatment and reuse of flow back and produced waters. Dr. Jessica Rolston is conducting social science and policy research. She is investigating the Memorandums of Understanding (MOUs) that are on the rise in Colorado as a strategy to meet the needs of both industry and communities. MOUs are signed directly between companies and local governments and typically guarantee

increased certainty in permitting in exchange for stricter environmental and reporting standards. Rolston's team is using multidisciplinary methods to investigate how the public views MOUs, if the presence of MOUs increases public trust of industry, and if wells permitted through MOUs demonstrate significantly different environmental and safety performance.



Cynthia Kanno and Austin Roberts modeling degradation of contaminants in the subsurface



Kathryn Casias putting a pump head on a motor



Undergraduate Scholars Selected



Aspen Anderson explains erosion to 5th graders

This fall, eight Undergraduate Scholars were selected after a rigorous application and interview process: Aspen Anderson, a sophomore in Geophysical Engineering; Kathryn Casias, a junior in Environmental Engineering; Kylie Ford, a sophomore in Chemical Engineering; Carley Lauer, a sophomore in Chemical and Biological Engineering; Austin Roberts, a junior in Chemical and Biological Engineering; Luis Servin, a junior in Petroleum Engineering; Austin Shaffer, a

junior in Petroleum Engineering; and Seth Suydam, a junior in Petroleum Engineering. All Scholars are teamed up for research with Graduate Fellows and/or Faculty. In addition, Scholars attend monthly training sessions focusing on research skills, oral communication training, and interpersonal skill building. These Un-

dergraduate Scholars have set the bar very high this first semester—they are definitely some of the finest students at CSM!



Carley Lauer participates in Media Days

Spotlight on Graduate Fellows

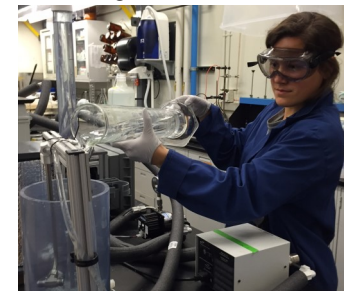
Four fantastic graduate students joined WE²ST this fall: Liz Bell from Pennsylvania State University with a B.S. in Environmental Systems Engineering, Cynthia Kanno from Princeton University with a B.A. in Geosciences, Ella Walker from Oklahoma State University with a B.S. in Chemical Engineering, and Skylar Zilliox with a B.S. in Engineering Physics from Colorado School of Mines and a B.A. in Liberal Arts from St. John's College. In addition, Chris Ruybal joined

WE²ST as an affiliated Fellow. He is funded by The Trefny Institute as a Graduate Teaching Fellow. As part of his Fellowship, Chris spends part of his

time each week helping to teach pre-engineering at two Denver high schools.



Chris Ruybal (second from left) with high school pre-engineering students



Liz Bell adding feed solution to the forward osmosis bench scale system

“Chris spends part of his time each week helping to teach pre-engineering at two Denver high schools”

New Graduate Curriculum Added

This fall, all of the WE²ST Fellows took a brand new graduate seminar course called Water Sustainability and Energy Production: A Survey and Introduction taught by Terri Hogue and Andrea Blaine. Students read and discussed current research, heard from key speakers in the field, and engaged in a variety of practical exercises to develop important

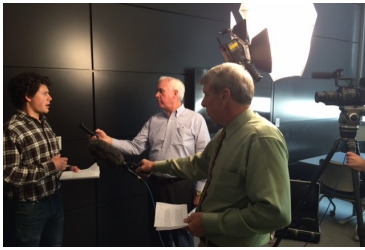
communication, research, and interpersonal skills needed for future professionals. Course curriculum included specific topics such as speaking/writing for a variety of audiences, media relations, important research and literature review strategies, critical thinking and analysis, mentoring, teamwork, conflict management, and education outreach.



Graduate students demonstrate a 6th grade outreach lab they created on potential energy



Graduate Fellows at a lunch with speaker Karl Fennessey



Austin Roberts practices his interview skills

sulfide leak from a well and given a few minutes to prepare a statement. Next, each person was interviewed by professional reporters and filmed by a video crew. After everyone

WE²ST students and faculty got to stand in the spotlight, literally, for two full days in October, thanks to ConocoPhillips Media Training. More than 20 participants first studied both good and bad video clips of industry representatives being interviewed on the news. They were then presented with a hypothetical scenario of a hydrogen

had a turn in the spotlight, the group analyzed each other's clips to discuss what worked and what didn't. Jim Lowry, Perry Pearce, and Louis Salazar from ConocoPhillips were in attendance as well as a professional reporter and video crew. The training was out of most people's comfort zone but extremely rewarding overall!



Media Days participants are instructed by Jim Lowry, ConocoPhillips Director, Lower 48 Communications

WE²ST at the GSA Conference

John McCray and Terri Hogue, along with several colleagues, developed and facilitated a special session on the **Joint Sustainability of Water Resources and Petroleum Energy Production** at the Geological Society of America (GSA) national meeting in Vancouver, British Columbia in October, 2014.

The session featured 12 oral presentations, including talks by Karl Fennessey from ConocoPhillips, Robert Horner from Argonne National Laboratories, Robert

Jackson from Stanford University and Bridget Scanlon from the University of Texas. WE²ST was also well-represented with presentations by Jessica Rolston, Tzahi Cath, John McCray and Terri Hogue.

GSA 2014

19-22 October | Vancouver, BC, Canada



Students Engage in Outreach at Local School

WE²ST is partnering with Shelton Elementary School to bring some fantastic hands-on science labs to kids in Golden. In December, Scholars and Fellows volunteered in the Shelton Science Lab to help run a 6th grade Mass-Volume-Density lab, a 5th grade Revegetation lab, a 3rd grade Earthworm-Soils lab, and a 2nd grade Animal Adaptations lab. Teachers and students alike at Shel-

ton are extremely excited to have the WE²ST students in the classroom. Not only are the labs great for the younger kids, but they also help train the Scholars and Fellows to communicate their science well. This opportunity is helping to build a great relationship between WE²ST and the community; more fun labs are scheduled for next semester!



Luis Servin (left) and Seth Suydam (right) help 6th graders at Shelton Science Lab



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Advisory Board:

Fran Vallejo, ConocoPhillips
Samer Adham, ConocoPhillips
Sabrina Watkins, ConocoPhillips
Kim Senger, CSM Foundation
Kevin Moore, CSM, CECS Dean

The ConocoPhillips Center for a Sustainable WE²ST at Colorado School of Mines was formulated to promote the joint sustainability of unconventional energy production and water resources through education of water-energy literate graduate and undergraduate students and by conducting world-class research on critical topics in the field.

Leadership Team:

Terri Hogue, Director
John McCray, Deputy Director
Andrea Blaine, Assistant Director
Jessica Rolston, Community-Corporate Relations
Cynthia Howell, Public Outreach
Jackie Randell, Administrative Assistant

WE²ST Space Update

A new space for WE²ST is under construction in Chauvenet Hall. The finished center will house offices for the Assistant Director, the Administrative Assistant and the Graduate Fellows. In addition, there will be conference room that will hold 6-8 people. We hope to move in to our new center in the middle of the spring semester!

Upcoming Events

- January 29, 3:30pm — Advisory Board meeting, CSM
- February 4, 4pm, Seminar—Steve Crowell, PlusPetrol
- February 11, 3pm, Seminar—Bridget Scanlon, UT Austin
- February 25, 4pm, Seminar—Tisha Schuler, COGA
- March 4, 3pm, Seminar—David Ellerbroek, AECOM
- March 22-26, ACS National Meeting in Denver—Oil&Gas-Water Nexus
- March 25, 4pm, Seminar—Patty Limerick, Center of the American West



WE²ST

*The nation's "go-to" institution
for research, education and outreach
in the water-energy nexus*