

In the News

Energy Security Summit 2005, Grand Forks, North Dakota, March 21–22: John Harju (EERC) moderated a panel session entitled “Reducing U.S. Dependence on Foreign Oil.” **Chris Zygarlicke** (EERC) served as a panelist on a session entitled “Using Agri-Based Fuels to Reduce Fossil Fuel Consumption.” **Everett Sondreal** (EERC) moderated a panel session entitled “Challenges and Opportunities Facing the U.S. Coal Sector.” **Tom Erickson** (EERC) served as a panelist on a session entitled “Policy Options to Speed Up the Move to a Hydrogen Economy.” **Zygarlicke** moderated a session entitled “Expanding the Use of Wind Power in the United States.”

American Chemical Society 229th Annual Meeting and Exposition, San Diego, California, March 13–17: Ed Olson (EERC) gave a presentation coauthored by **Blaise Mibeck** (EERC) entitled “Kinetics of Mercury Oxidation in Flue Gas.”

Boston International Seafood Show, Boston, Massachusetts, March 13: Nicholas Ralston (EERC) served on a panel discussion entitled “Combating the Methylmercury Seafood Scare.”

POWERGEN: Renewable Energy, Las Vegas, Nevada, March 1–4: Chris Zygarlicke (EERC) presented a paper coauthored by **Ted Aulich** and **Ed Olson** (EERC) entitled “Biorefinery Research Innovations: Key to Healthy Domestic Economies and National Security.”

PITTCON 2005, Orlando, Florida, February 27–March 4: Loreal Heebink (EERC) presented a paper coauthored by **David Hassett** and **Erick Zacher** (EERC) entitled “Development of a Test Method to Determine Swell and Expansion Potential in CCBs.” **Heebink** presented a second paper coauthored by **Hassett** and **Zacher** entitled “Real-Time Thermal Devolatilization of Mercury and Mercury Compounds from CCBs Detected with Atomic Absorption Spectrometry.” **Hassett** presented a paper coauthored by **Zacher** entitled “Long-Term Storage of Air-Sampled Mercury on Gold-Coated Quartz Tubes.” **Hassett** presented a second paper coauthored by **Heebink** and **Zacher** entitled “A Method for Determining Microbiologically Mediated Release of Elemental and Organomercury Compounds from CCBs Using SPME, Gas Chromatography, and Atomic Fluorescence.”

Conference on Renewable Energy in the Upper Midwest, Grand Forks, North Dakota, February 23–24: Chris Zygarlicke (EERC) chaired a combined session entitled “Current Status of Renewable Energy in the Region.” **Zygarlicke** also coordinated a panel session entitled “Biodiesel Promotion and New Project Innovations.” **Ted Aulich** (EERC) coordinated and chaired a panel session entitled “Ethanol Production from Starch and Biomass.” **Brad Stevens** (EERC) coordinated a combined session entitled “The Challenge and Opportunity of a Hydrogen Economy,” and **Tom Erickson** (EERC) served as a panelist. **Zygarlicke** coordinated and **Darren Schmidt** (EERC) moderated a panel session entitled “Biopower Opportunities and Demonstrations.” **Stevens** coordinated a panel session entitled “Creating Change – Examples from Other States.” **Aulich** coordinated and served as a speaker for the panel session entitled “Biorefinery Chemicals and Products” and **Zygarlicke** served as the session’s chair. **Stevens** moderated the “Wind Session – Town Hall Q&A.” **Erickson** moderated the “Biomass Session – Town Hall Q&A,” for which **Aulich**, **Schmidt**, and **Zygarlicke** served as panelists. **Ed Olson** (EERC) gave a presentation entitled “Fuel and Chemical Biorefineries.”

Coal Ash and the Environment, Minneapolis, Minnesota, February 17: Debra Pflughoeft-Hassett (EERC) gave a presentation entitled “Coal Ash Environmental Issues 1985–2005,” “Early Field Assessments – Mine Placement of CCBs: Field and Lab Study,”

and “Early Field Assessments – CLSM and Concrete in the Environment.” **David Hassett** (EERC) gave presentations entitled “Early Field Assessments – Codisposal of Coal Ash and Gasification By-Products,” “Early Field Assessments – Sediment Attenuation,” “Laboratory Methods for Environmental Assessments I and II,” and “Rerelease of Mercury and Other Air Toxic Elements from CCBs: Methods and Results to Date.” **Loreal Heebink** (EERC) gave a presentation entitled “Lab/Field Studies of Coal Ash Use as a Soil Amendment.”

Coal Ash Resources Research Consortium® Annual Meeting, Minneapolis, Minnesota, February 18: Debra Pflughoeft-Hassett (EERC) gave presentations entitled “CARRC®: 20 Years of Service to the Coal Ash Industry” and “Special Projects Overview – American Society for Testing and Materials Standards Development.” **Loreal Heebink** and **Tera Buckley** (EERC) gave a presentation entitled “Coal Ash Properties Database and Other Electronic Tools.” **Heebink** also gave a presentation entitled “Mercury Issues Related to CCB Utilization.” **Buckley** gave a presentation entitled “Summary of Texas State Review.” **Bruce Dockter** (EERC) gave presentations entitled “Evaluation of Variability of Coal Fly Ash from Midwestern Utilities” and “Summary of State Regulations and Specifications.” **David Hassett** (EERC) gave presentations entitled “Characterization of Ammoniated Ash” and “Comparison of Available Swell and Expansion Tests and Development of an Expansion Test for CCBs.”

Minnesota Air, Water, and Waste Conference 2005/Breakout Session: Regional Approaches to Storm Water Management, Bloomington, Minnesota, February 15–17: Dan Stepan (EERC) presented a paper coauthored by **Lisa Botnen** and **Kirk Williams** (EERC) entitled “Red River Regional Storm Water Coordination Program.”

Canadian Council of the Ministries of Environment, Calgary, Alberta, February 15–16: John Pavlish and **Mike Holmes** (EERC) gave a presentation entitled “Technical Review of Mercury Control Technologies and Measurement Techniques for Coal-Fired Power Plants.”

American Association for Aerosol Research: Particulate Materials Conference, Atlanta, Georgia, February 10: Nicholas Ralston (EERC) presented a paper coauthored by **John Gallagher**, **Kevin Galbreath** (EERC), and **Edward Zillioux** (Florida Power & Light) entitled “Assessment of Toxicity of Residual Oil Fly Ash and Nickel Subulfide Using DNA Damage Assay.”

Auburn University, Auburn, Alabama, February 7: Nicholas Ralston (EERC) gave a presentation entitled “Selenium’s Role in Mercury Toxicity: The ‘Tonic-to-Target’ Paradigm Shift.”

26th Annual Energy Generation Conference, Bismarck, North Dakota, January 25–27: Dennis Laudal (EERC) presented a paper coauthored by **Mike Holmes** (EERC) and **Dennis James** (North American Coal Corporation) entitled “Mercury Regulations, Control, and Related Issues.”

Association of Oregon Loggers Convention, Eugene, Oregon, January 21: Ed Olson (EERC) gave a presentation entitled “Fuel and Chemical Biorefineries.”

Upcoming Events

September 19–21, 2005

Air Quality V: Mercury, Trace Elements, SO₂, and Particulate Matter Conference, Arlington, Virginia



Volume 16 – Issue 2

“Ya Gotta Wanna”

Janie Solarski, Editor

Hydrogen Research Fuels Growth at EERC

The EERC could break ground on a \$2.5 million, 10,000-square-foot National Center for Hydrogen Technology (NCHT) facility by fall 2005 or early 2006, dependent upon availability of funds, said EERC Director Gerald Groenewold. Federally designated in November 2004, NCHT is dedicated to the development and commercialization of hydrogen and fuel cell technologies.

“Hydrogen has been a part of this Center’s program since 1951,” Groenewold said. “This is our tenth Center of Excellence, and it will open a lot of doors of opportunity for us.” Current hydrogen-related research projects total nearly \$8 million, Groenewold said, and the EERC anticipates a minimum of \$50 million in research contracts over the next 5 years. Hydrogen is envisioned to be the primary energy carrier for the future, helping to establish the energy security of the United States.

“I believe in hydrogen, and I believe in a hydrogen future,” Groenewold said. “Hydrogen fuel cell applications in highway transportation will not happen immediately, but it will happen, maybe 15 years out. In the near term, we are already seeing considerable interest in off-road applications such as forklifts. The EERC is also working with the military on battlefield applications.”

The NCHT facility is part of an 8-10-year master building plan for the EERC that also includes a Technology Commercialization Center to be built on a vacant lot across from the EERC on the east side of North 23rd Street. It would allow the EERC to further its collaboration efforts and assist private sector partners in their commercialization goals. In addition, two office buildings and one laboratory on the north side of the EERC complex are planned as well as a new storage facility on the south side. The architectural plans were created by Schoen Associates, Grand Forks, and unveiled to EERC employees in March.

The EERC, which currently employs more than 270 people, is positioned extremely well for growth, Groenewold said. The hydrogen facility will create at least 50 high-paying jobs. The EERC is seeking funding from the city of Grand Forks through its Growth Fund and from the state of North Dakota through its Centers of Excellence program, which offers competitive funding requiring a two-to-one nonstate match for economic development and job creation activities.

The EERC’s master plan places all of its future buildings adjacent to existing facilities. “We are an integrated group of people, a team,” he said, “so it is essential that all of our facilities are interconnected.”

- Janie Solarski



Hobbyists Take Mercury Research Aloft

Chasing balloons was not Blaise Mibeck's first recipe for a hot career in science.

"I got a master's degree in physics" and a job as a Research Instrument Technician at the Energy & Environmental Research Center (EERC), says Mibeck, who is now a Research Scientist specializing in mercury capture.

But atmospheric forays for mercury research using government surplus and other weather balloons has become a passion for Mibeck and the all-volunteer crew he works with. Their mission: find inexpensive and effective ways to measure mercury, particulates, and other substances in the atmosphere.

Mibeck says the balloon work relates well to the EERC's investigation of mercury in the environment.

"Understanding where mercury is in the atmosphere is not well known," he says. "It was one of the questions we were trying to answer by sending up our instrumented balloons, which can go as high as 110,000 feet."

The work was supported, in part, under the U.S. Environmental Protection Agency Science to Achieve Results (STAR) program, which funds high-risk, low-cost experiments such as this balloon-facilitated airborne mercury sampling project.

"We built and deployed the experiment for a tiny cost," Mibeck says. "Of course, there's no labor cost because we're all volunteers. There's a serious purpose behind it, but we had fun doing it."

Using a gold-filter trap constructed and installed in their makeshift launch vehicle by EERC Senior Research Advisor David Hassett, this balloon-based research project has recovered a number of mercury-containing samples from stack plumes and other aerial venues in the region.

"The trap is made from coarse sand treated with gold, which has a high affinity for mercury in most of its forms," Hassett said. "The coarse sand structure allows a relatively high flow rate, which is what you want when you're sampling the atmosphere for mercury because you're basically looking for one red golf ball in a football field-sized area filled with white golf balls."



Blaise Mibeck



David Hassett

Volunteers prepare to launch a balloon for an airborne sampling project.

Mibeck has been in on about 30 balloon missions, to date. "I started out at (UND's) Space Studies Program and joined this (balloon) group with a mission to design and build space payloads," he said. Originally aiming for high-altitude rocketry, the group quickly figured balloons were a safer and much cheaper alternative lifting medium for their experimental cargoes.

"We started very simply with a device that sent a signal tone that we could track," Mibeck says. "The first balloon we sent up sent the signal okay, but the batteries went dead, and we lost track of the balloon; we never recovered that one. It was the only loss in 30 missions."

To learn more about the UND balloon project and view mission images, including several videos shot aloft, check out the project Web site at <http://balloons.aero.und.edu/habp>.

— Juan Pedraza

This was Part One of a two-part series. Next month: Don McCollar dismantles an antique Dictaphone in pursuit of elusive mercury emissions.

New Employees



Robert (Rob) Monette joined the EERC as a Contracts Officer. Monette prepares, reviews, negotiates, and administers a variety of sponsored agreements, subcontract agreements, and confidentiality agreements in accordance with federal and nonfederal contractual requirements, government and university regulations and policies, and EERC policies. The Belcourt, North Dakota, native earned his B.A. in Business Administration from UND in 1988 and began his career at United Airlines in Colorado Springs, Colorado. Monette returned to Belcourt in 1994 and joined Uniband, Inc., a small data management company owned by the Turtle Mountain Indian Tribe. Monette served in several positions and established numerous departments there as the company expanded rapidly. He also served as project manager of a \$100 million contract with the Immigration and Naturalization Service, managing 750 employees and subcontractors. Monette then served as CEO of Uniband Technologies, a data processing firm serving commercial clients, which the tribe appointed him to establish in 2001. A year later, he joined the UND Upper Midwest Aerospace Consortium and Earth System Science Institute as a Project Analyst. Monette, who will earn his MBA in May from UND, says he enjoys his new position at the EERC. "I had heard it was a good place to work," he said. "I'm impressed with the business and with the relationships people working here

have with one another." Monette commutes from his home in Belcourt. He and his wife, Sandy have three children. When he's not working, Monette enjoys spending time with family, reading, snowmobiling, and gardening.



Katie Hill Brandt joined the EERC as a Research Engineer. Brandt works in the Mercury Research Laboratory, conducting bench-scale testing and analysis of carbon sorbents and their effectiveness on mercury capture in combustion gases. She operates continuous emission monitors and is also involved in studies on SO₃ emissions. Brandt earned her B.S. degree in Chemical Engineering from

Northwestern University, Evanston, Illinois, in 2003. Afterward, she spent 1 year in the Lutheran Volunteer Corps, working with elementary students in an inner city after-school and meals program based at a church in north Minneapolis. The 1999 Grand Forks Central High School graduate and her husband, Kevin, a Civil Engineer at Grand Forks Air Force Base, were married last September. Brandt previously worked for three summers at the EERC and on a temporary basis since October, when she assisted with field testing at an Ohio Power Plant. "I'm glad to be back here," Brandt said. "This is a good place to be. Everyone is so friendly and helpful and always willing to answer questions." When she's not working, Brandt enjoys spending time with friends, working out, cooking, and singing. She sang in an a cappella group while in college.

Events



The Energy Security Summit, hosted by North Dakota Senator Kent Conrad, right, and the EERC, brought together leaders in the energy industry, government, and research to discuss America's energy dependency problem and how North Dakota could play a greater role in furthering the nation's energy security. The event, held March 21–22, attracted 150 CEOs and policy makers from 13 states, the District of Columbia, and Canada.



North Dakota Senator Byron Dorgan, host of the Conference on Renewable Energy in the Upper Midwest, coordinated and cosponsored by the EERC, presents his keynote address during the February 23–24 event at the Alerus Center in Grand Forks. The conference, which evolved from five successful wind energy conferences, covered a broad range of topics including wind, ethanol, biomass, hydrogen production, and other renewable fuels. More than 520 people from 25 states, the District of Columbia, and five Canadian provinces attended.