



**2007 Environmental and Subsurface Science Symposium,  
featuring Subsurface Biotechnology and Bioremediation**

**Organized by**

**Inland Northwest Research Alliance**

**Montana State University  
Center for Biofilm Engineering**

**Utah State University  
Biological and Irrigation Engineering Department**



**Sponsored by**



*Safely delivering the Idaho Cleanup Project*

## **General Information –**

### **About Inland Northwest Research Alliance**

The Inland Northwest Research Alliance (INRA) is a non-profit scientific and educational organization consisting of eight Western research universities (Boise State University, Idaho State University, Montana State University, University of Alaska Fairbanks, University of Idaho, University of Montana, Utah State University and Washington State University). The total research and development budget for these universities in FY 2004 was approximately \$729 million, which could collectively rank these institutions as the fifth largest institution of higher education in the country in terms of research funding. INRA was created to promote new opportunities for research and education that will benefit the region and the nation in a variety of technical disciplines.

The INRA mission is to provide organizational structure to regional multi-institutional and multi-disciplinary research and education programs; collaborate on research and educational programs with federal laboratories, academic, and government partners; contribute to member institution's education and retention of scientists and engineers in the Inland Northwest; and promote regional economic development by building collaborative programs vital to the regional economy and ultimately aiding in the technical independence and security of the United States. INRA has worked with the Idaho National Laboratory (INL) to develop a substantial regional capability in Environmental and Subsurface Sciences, and continues to work with the INL to develop programs that are not only regionally relevant, but of national importance.

### **About Montana State University Center for Biofilm Engineering**

At the Montana State University Center for Biofilm Engineering (CBE), multidisciplinary research teams find solutions to, and applications for, industrially relevant problems and potentials of microbial biofilm formation. The CBE was established in 1990 as a National Science Foundation Engineering Research Center. As part of the MSU College of Engineering, the CBE provides students with opportunities to get a head start on their careers by conducting research on teams led by world-recognized leaders in the biofilm field.

### **About Utah State University Biological and Irrigation Engineering Department**

The mission of the Biological and Irrigation Engineering Department (BIE) is to teach students preparing to become biological engineers how to apply engineering principles and the knowledge of biological sciences to the design, control, and analysis of biological-engineered systems and to solutions of biotechnology problems. The department also prepares students for entry into other professions, including biomedical engineering, environmental engineering, medicine, and law.

### **Meeting Facilities – Utah State University - Eccles Conference Center**

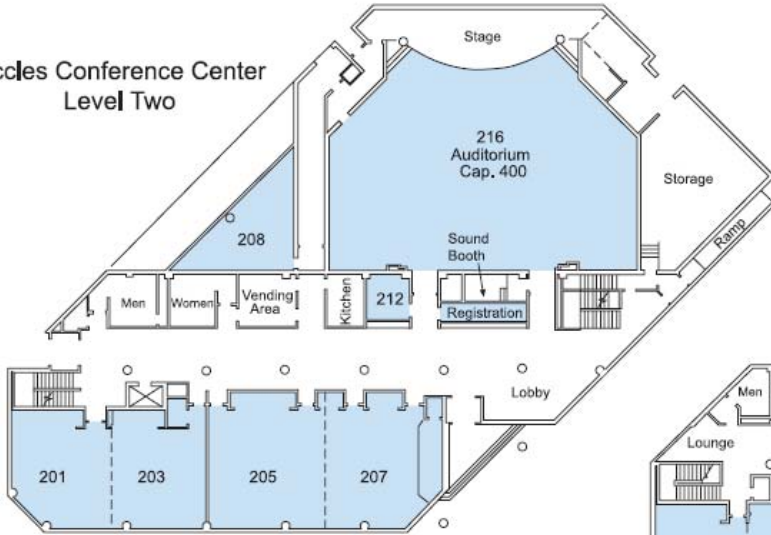
The Eccles Conference Center (ECC) provides professional, year-round conference facilities in the heart of the Utah State University campus.

Utah State University – Eccles Conference Center  
5005 Old Main Hill  
Logan, Utah 84322-5005  
Phone: (435) 797-0423  
Fax: (435) 797-0036

### **Campus Parking**

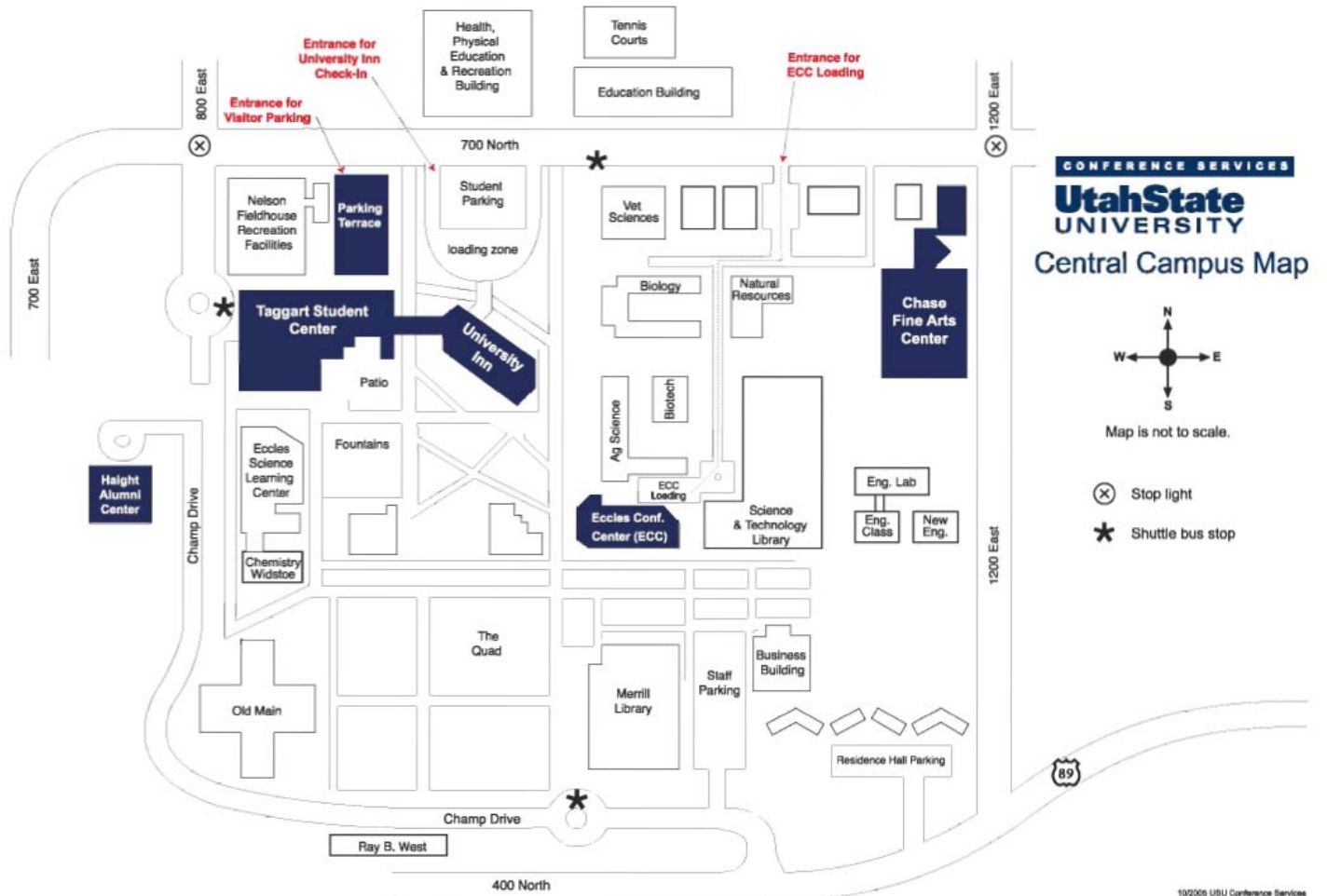
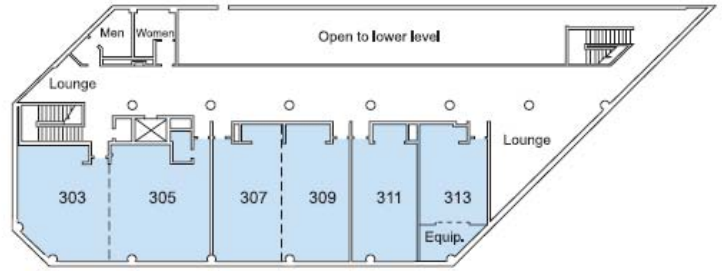
Parking is available in the Parking Terrace next to the University Inn. Overflow parking is available at the football stadium parking lot just 3 blocks north of the Parking Terrace. A free shuttle bus runs directly to the Taggart Student Center or the University Inn every five minutes.

**Eccles Conference Center  
Level Two**

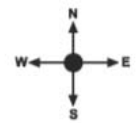


**Meeting & Banquet  
Floor Plans**

**Eccles Conference Center  
Level Three**



**CONFERENCE SERVICES**  
**Utah State  
UNIVERSITY**  
**Central Campus Map**



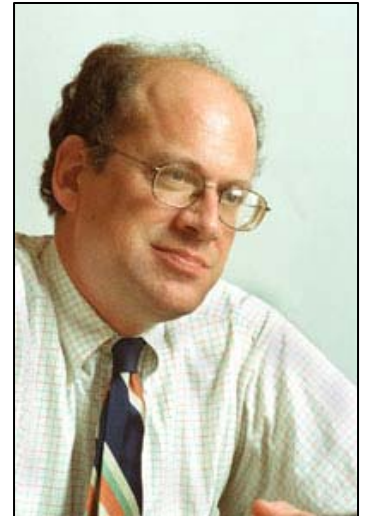
Map is not to scale.

⊗ Stop light

★ Shuttle bus stop

## **FEATURED SPEAKER**

**Dr. William H. Schlesinger, Ph.D.**, On 1 June 2007, William H. Schlesinger was named President of the Institute of Ecosystem Studies, a private ecological research institute on the grounds of the Cary Arboretum in Millbrook, NY. He assumed this position after 27 years on the faculty of Duke University. Completing his A.B. at Dartmouth (1972), and Ph.D. at Cornell (1976), he moved to Duke in 1980, where he retired in spring 2007 as Dean of the Nicholas School of the Environment and Earth Sciences and as James B. Duke Professor of Biogeochemistry.



He is the author or coauthor of over 180 scientific papers on subjects of environmental chemistry and global change and the widely-adopted textbook *Biogeochemistry: An analysis of global change* (Academic Press, 2nd ed. 1997). He was among the first to quantify the amount of carbon held in soil organic matter globally, providing subsequent estimates of the role of soils and human impacts on forests and soils in global climate change..

He was elected a member of The National Academy of Sciences in 2003, and was President of the Ecological Society of America for 2003-2004. He is also a fellow in the American Geophysical Union and the Soil Science Society of America.

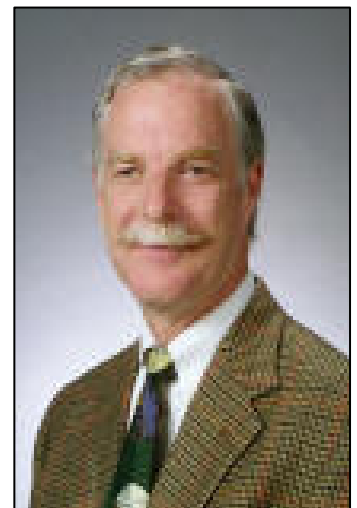
His past work has taken him to diverse habitats, ranging from Okefenokee Swamp in southern Georgia to the Mojave Desert of California, and three times as a Duke alumni tour guide to Antarctica. His research has been featured on NOVA, CNN, NPR, and on the pages of Discover, National Geographic, The New York Times, and Scientific American. Schlesinger has testified before U.S. House and Senate Committees on a variety of environmental issues, including preservation of desert habitats, global climate change and carbon sequestration.

Schlesinger currently serves on the Board of Trustees for the Doris Duke Charitable Foundation (New York) and the Southern Environmental Law Center (Charlottesville) and on the Board of Scientific Advisors for Terrapass LLC (San Francisco). He is also a member of the selection advisory committee for the St. Andrews Prize for Environment, sponsored by Conoco-Phillips.

He and his wife, Lisa, live in Millbrook, where they enjoy birdwatching, gourmet cooking, and collecting southwestern art.

## **KEYNOTE SPEAKER**

**Kirby Donnelly, Ph.D., Professor and Head of the Environmental & Occupational Health Department at the Texas A & M University System Health Science Center School of Rural Public Health**, is the Associate Director of the NIEHS Superfund Basic Research Program at Texas A&M. Research interests include complex mixture risk assessment and exposure assessment. Active research projects includes a study of childhood exposure to pesticides in the lower Rio Grande Valley of Texas, and study of biomarkers of exposure in urban and rural populations in Sumgayit, Azerbaijan, and a study of gene-environment factors affecting birth defect incidence in China. Dr. Donnelly serves as lead instructor in four classes including PHEO 605. Chemical Hazard Assessment, VAPH 670, Basic Environmental Toxicology, and Agro 614, Biodegradation and Bioremediation. He is a co-investigator on a program funded by the Health Resource and Services Administration (HRSA) and Environmental Protection Agency to assess the utility of health promotion for improving clinical outcomes (urinary elimination of pesticides) in children.



### **Nametags Please**

All Environmental and Subsurface Science Symposium attendees are urged to wear their nametags throughout the entire event. If you misplace your nametags, please visit the Registration Desk.

### **Technical Paper (Oral Presentation) Sessions**

All speakers will be encouraged to utilize time set aside during each morning's continental breakfast and breaks and the afternoon's lunch/breaks to test their presentations. We also recommend that speakers bring a back up file of their presentation on a flash drive or CD. Speakers will have received a letter from INRA providing further details regarding presentation logistics.

### **Poster Session and Catered Poster Reception – Hamilton's Steakhouse**

**Technical posters must be submitted to Michelle Rutledge in ECC room 201/203 by NOON on Wednesday, July 25, 2007.** INRA will arrange the hanging of the posters at Hamilton's Steakhouse. The reception and viewing of the posters will begin at 6:30 p.m. on Wednesday, July 25, 2007.  
**Viewing of the posters from 3:00 – 6:30 p.m. is for poster judges only.**

Registered attendees receive complimentary hors d'oeuvres and a beverage coupon (attendees using the beverage coupon for alcoholic beverages must be 21 years or older). A cash bar will also be available. A beverage coupon is included in the registration packet. Lost coupons will not be replaced.

**Poster Finalist Interviews:** The poster finalist interviews will be held Thursday, July 26, 2007 from 5:00 – 7:00 p.m. in ECC room 205/207. **Poster Presenter and Judges only.**

Posters, with the exception of the finalists, can be picked up in ECC room 201/203 on the afternoon of July 26<sup>th</sup>. Poster Finalists should pick up their posters after the luncheon on the afternoon of July 27<sup>th</sup>.

### **Technical Paper and Poster Abstracts**

Copies of all technical paper and poster abstracts are included in your registration packet and will be available on the symposium website at <http://institute.inra.org/esss07/> after the symposium.

### **Continental Breakfasts, Morning Breaks and Afternoon Breaks**

Continental breakfasts, morning and afternoon breaks will be offered free of charge to all registered attendees. The breakfasts and breaks will be provided in ECC room 205/207.

### **Lunches**

Lunch time will be on your own, with the exception of the catered lunch reception on Friday, July 27, 2007. The lunch reception will be held in ECC room 205/207, immediately following the Friday morning technical sessions ending at noon.

## AGENDA –

<b>Wednesday, July 25, 2007</b>		
7:00 am – 8:40 pm	Registration and Continental Breakfast  <b>Continental Breakfast in Eccles Conference Center Room 205/207. Seating in ECC Auditorium Morning speakers check computers and/or audio-visual equipment before presentations.</b>	Eccles Conference Center
8:40 – 9:00 am	<b>Welcome and Overview</b>  <ul style="list-style-type: none"> <li>• <b>Introduction</b>, Steven R. Billingsley, INRA Executive Director</li> <li>• <b>Welcome</b>, Brent Miller, Ph.D., Vice President of Research, Utah State University</li> </ul>	ECC Auditorium
9:00 - 10:00 am	<b>Featured Speaker Address:</b> <b>Dr. William Schlesinger, Ph.D., President of the Institute of Ecosystem Studies,</b> <b>“Better Living Through Biogeochemistry”</b>	ECC Auditorium
10:00 – 10:30 am	<i>Break, refreshments provided</i>	ECC 205/207
10:30 – 11:30 am	<b>Keynote Address:</b> <b>Dr. Kirby Donnelly, Ph.D., Professor and Head of the Environmental and Occupational Health Department at the Texas A&amp;M University System Health Center School of Rural Public Health</b> <b>“Remediation of Genotoxic PAHs in Soil and Groundwater”</b>	ECC Auditorium
11:30 - 1:30 pm	<b>Lunch Break. Afternoon speakers check computers and/or audio-visual equipment before presentations.</b>	<b>On your own</b>
1:30 – 5:00 pm	<b>Afternoon Technical Sessions</b> (See below for presentation titles and presenters.)	ECC Auditorium
6:30 - 9:00 pm	<b>Catered Poster Reception</b> All technical posters will be on display; student posters will be judged. Complimentary hors d'oeuvres and cash bar will be provided for all attendees. Directions to Hamilton's are located at the end of this agenda.	Hamilton's

### WEDNESDAY AFTERNOON TECHNICAL SESSIONS

<b>Remediation of Toxic Metals</b>		
Session Chair: Dr. Timothy S. Magnuson, Ph.D., Associate Professor of Microbiology, Department of Biological Sciences, Idaho State University, Pocatello, ID		
1:30 – 2:00 pm	Timothy Magnuson, Ph.D., Purification of Redox-Active Biomolecules from Pure Cultures and Complex Samples	ECC Auditorium
2:00 – 2:30 pm	Chiachi Hwang, Bacterial Communities Stimulated for Uranium Bio-reduction Display Temporal Concordance Along Controlled Flow Paths	ECC Auditorium
2:30 – 3:00 pm	David Reed, Ph.D., Quantification of Ammonia Oxidizing Bacteria and Archaea from Groundwater and Basalt Following Urea Treatment to Promote Calcite Precipitation for Strontium Immobilization	ECC Auditorium
3:00 – 3:30 pm	<i>Break, refreshments provided</i>	<b>ECC 205/207</b>
3:30 – 4:00 pm	James P. Kennedy, Arsenic Binding Proteins for Removal of Arsenic From Solution	ECC Auditorium
4:00 – 4:30 pm	Marek H. Zaluski, Ph.D. A Modular SRB Bioreactor for Acid Rock Drainage Treatment	ECC Auditorium
4:30 – 5:00 pm	Eric Boyd, Mineralogy Influences Structure and Diversity of Bacterial Communities Associated with Geological Substrata in a Pristine Aquifer	ECC Auditorium

## Thursday, July 26, 2007

7:00 – 8:30 am	<b>Continental Breakfast in ECC Room 205/207. Seating in the ECC Auditorium Morning speakers check computers and/or audio-visual equipment before presentations.</b>	Eccles Conference Center
8:30 – Noon	<b>Morning Technical Sessions</b> (See below for presentation titles and presenters.)	ECC Auditorium
Noon – 1:30 pm	<b>Lunch Break. Afternoon speakers check computers before presentations in the Technical Session room.</b>	<b>On your own</b>
1:30 – 5:00 pm	<b>Afternoon Technical Sessions</b> (See below for presentation titles and presenters.)	ECC Auditorium
5:00 – 7:00 pm	<b>Poster Finalist Interviews – Poster Presenter and Judges only</b>	ECC 205/207

### THURSDAY MORNING TECHNICAL SESSIONS

#### Subsurface Microbial Communities Session Chair: Dr. Ron Crawford Director, Environmental Research Institute; Distinguished Professor of Microbiology, University of Idaho, Moscow, ID

8:30 – 9:00 am	Nick Benardini, Ecoproteomics: A Novel Approach for the Analysis of Environmental Biofilms	ECC Auditorium
9:00 – 9:30 am	Anhong Zhou, Ph. D., Comparison Analysis on Cell Surfaces of Gram-negative Bacteria and Gram-positive Bacteria by Atomic Force Microscope and Raman Microspectroscopy	ECC Auditorium
9:30 – 10:00 am	Jack Adams, Ph.D., In Situ Denitrification in Mine Waste Rock	
10:00 – 10:30 am	<i>Break, refreshments provided</i>	ECC 205-207

#### Subsurface Biotechnology and Bioremediation I Session Chair: Dr. Ron Crawford Director, Environmental Research Institute; Distinguished Professor of Microbiology, University of Idaho, Moscow, ID

10:30 – 11:15 am	Phil Jardine, Ph.D., Exploring Subsurface Bioreduction and Immobilization of U and Co-contaminants at the Oak Ridge Field Research Center: Past, Current, and Future Research Endeavors	ECC Auditorium
11:15 – Noon	Deborah Newby, Ph.D., Coupled Biogeochemical Process Evaluation for Conceptualizing Trichloroethylene Co-Metabolism	ECC Auditorium

### THURSDAY AFTERNOON TECHNICAL SESSIONS

#### Subsurface Biotechnology and Bioremediation II

Session Chair: Alfred B. (Al) Cunningham, Ph.D., Professor, Civil Engineering, Education-Industry Development Coordinator, The Center for Biofilm Engineering, Montana State University, Bozeman, MT

1:30 – 2:00 pm	Robin Gerlach, Ph.D., Two Different Pathways of TNT Transformation – Nitrogroup and Aromatic Ring Reduction – Are Influenced by Biotic and Abiotic Processes	ECC Auditorium
2:00 – 2:30 pm	Matthew Fields, Ph.D. Responses of <i>Desulfovibrio vulgaris</i> to Physiological Constraints	ECC Auditorium
2:30 – 3:00 pm	Brent Peyton, Ph. D., Biological Uranium Reduction and Subsequent Stability	ECC Auditorium
3:00 – 3:30 pm	<i>Break, refreshments provided</i>	<b>ECC 205/207</b>

#### Subsurface Biotechnology and Bioremediation II (continued)

Session Chair: Alfred B. (Al) Cunningham, Ph.D., Professor, Civil Engineering, Education-Industry Development Coordinator, The Center for Biofilm Engineering, Montana State University, Bozeman, MT

3:30 – 4:00 pm	Anne Anderson, Ph.D., Mycobacterium: Proteomics and Genomics for Bioremediation	ECC Auditorium
4:00 – 4:30 pm	Karl Nieman, Ph.D., NMR Applications in Subsurface Bioremediation and Biotechnology	ECC Auditorium
4:30 – 5:00 pm	Mark Greenwood, MS, Sorption and Biodegradation of MTBE and TBA in Hyporheic Zone Soils	ECC Auditorium

## Friday, July 27, 2007

7:00 – 8:30 am	<b>Continental Breakfast in ECC 205/207</b> <b>Seating in the ECC Auditorium</b> <b>Morning speakers check computers and/or audio-visual equipment before presentations.</b>	Eccles Conference Center
8:30 – 10:00 am	<b>Morning Technical Sessions</b> (See below for presentation titles and presenters.)	ECC Auditorium
10:00 – 10:30 am	<i>Break, refreshments provided</i>	<b>ECC 205/207</b>
10:30 – Noon	<b>Morning Technical Sessions</b> (See below for presentation titles and presenters.)	ECC Auditorium
Noon – 12:30 pm	<b>Lunch Reception - Poster Awards,</b> <b>Steven Billingsley, Executive Director, Inland Northwest Research Alliance</b>	<b>ECC 205/207</b>
1:30	<b>Closing Remarks</b>	<b>ECC 205/207</b>

## FRIDAY MORNING TECHNICAL SESSIONS

### *Hill Air Force Base Activities*

Session Chair: Dr. Melinda Hamilton, Ph.D., Director, Life and Earth Sciences Division, Idaho National Laboratory, Idaho Falls, ID

8:30 – 9:30 am	Barbara Hall, Ph.D., Hill Air Force Base Environmental Restoration Program – A Description and Discussion of Site Management Approach, July 2007	ECC Auditorium
9:30 – 10:00 am	Aaron Swank, MS, Monitored Natural Attenuation of MTBE at OU11 (Hill AFB)	ECC Auditorium
10:00 – 10:30 am	<i>Break, refreshments provided</i>	<b>ECC 205/207</b>

### *Hill Air Force Base Activities (continued)*

Session Chair: Dr. Melinda Hamilton, Ph.D., Director, Life and Earth Sciences Division, Idaho National Laboratory, Idaho Falls, ID

10:30 – 11:00 am	Bill Doucette, Ph.D., Removal of Trichloroethylene from Shallow Subsurface Environments: Volatilization from Trees and Soil Surface versus Groundwater Interception Trench	ECC Auditorium
11:00 – 11:30 am	Darwin L. Sorensen, Ph.D., Bacteria in Iron Reducer Enrichments from TCE Contaminated Aquifer Material at Hill Air Force Base	ECC Auditorium
11:30 – Noon	Ryan Dupont, Ph.D., Implementation and Monitoring of Post-SEAR Bioaugmentation at a TCE Source Area, OU2, Hill AFB	ECC Auditorium
Noon – 1:30 pm	<i>Lunch Reception</i>	<b>ECC 205/207</b>

