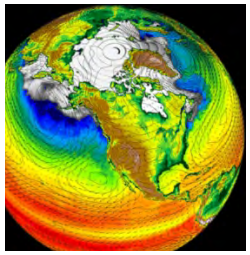
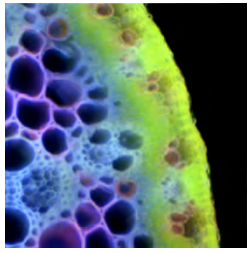
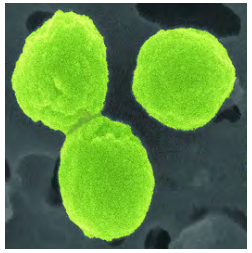


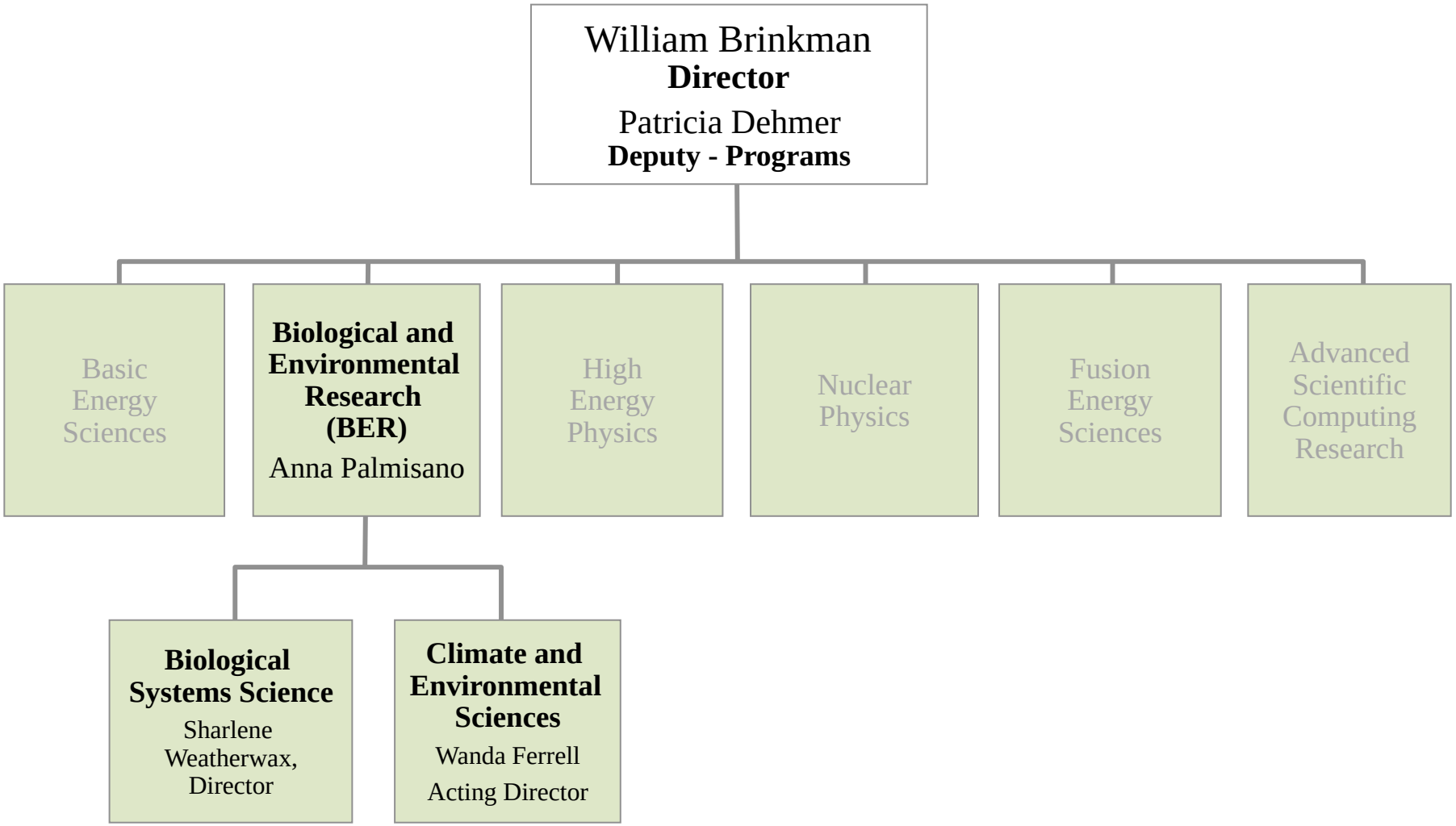




Subsurface Biogeochemical Research
Spring PI Meeting
March 29-31, 2010

U.S. Department of Energy
Biological and Environmental Research Program

Paul Bayer
Program Manager
March 29, 2010

Department of Energy Office of Science



Subsurface Biogeochemical Research (SBR)

Retitling the Program

- NABIR => NABIR + EMSP => ERSP => Subsurface Biogeochemical Research (SBR)

FY 2011 President's Budget Request

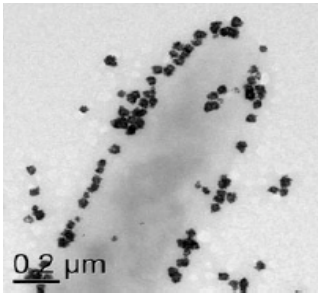
- "The Subsurface Biogeochemical Research activity addresses fundamental science questions at the intersection of biology, geochemistry, and physics to describe complex processes in key subsurface environments."
- "The activity builds on BER advances in genome science and promotes crossdisciplinary research to link interdependent relationships between microbial metabolism, geochemical reactions, and physical transport processes with computational modeling to advance a predictive understanding of environmental processes. "
- "The current focus of the activity is to predict the impact of biogeochemical processes on the fate and transport of contaminants in the subsurface."

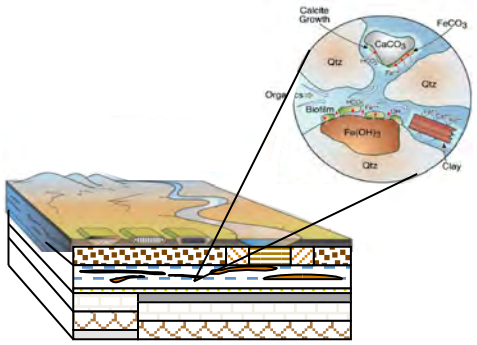
The SBR activity is a very diverse and multidisciplinary program and relies on integrative science to accomplish its goals

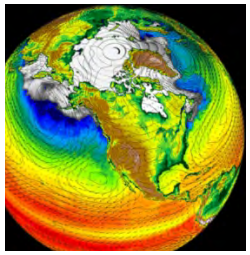
Subsurface Biogeochemical Research (SBR)

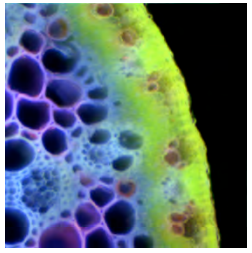
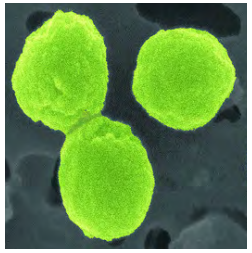
Purpose of the annual PI meeting

- Provide opportunities for sharing research results and promoting interactions among the SBR scientists and other invited guests.
- Evaluate the progress of each project or program and discuss future research directions.
- Showcase the scientific expertise and research progress over the past year to senior managers in the DOE Office of Science, the technology offices within DOE and other participants from other Federal Agencies.







SBR Programmatic Activities

2009 Programmatic Activities and Future Opportunities

Notice 09-07, Environmental Remediation Sciences Program

- 106 applications submitted
- Review Panels held October 26-29, 2009
- 18 full applications funded, $19M over three years
- 9 exploratory applications funded, $1.3M over two years
- Awardees notified; grant processing is ongoing
- Abstracts to be posted on the SBR website

Mid-Term SciDAC Projects Review held April 20, 2009

Notice 09-26, Early Career Research Program

- Funded by the 2009 American Reinvestment and Recovery Act (ARRA)
- Untenured Assistant Professor within 10 Years of Ph.D.
- Posted July 2, 2009
- Letters of Intent due August 3, 2009
- Full applications due September 1, 2009
- Review Panel held December 3, 2009 (D. Lesmes)
- 133 applications reviewed by CESD staff; 4 awards
- See http://www.science.doe.gov/SC-2/early_career.htm for award information
- Future Office of Science Early Career Program awards to be funded by program

2009 Programmatic Activities and Future Opportunities

Office of Science (SC) Graduate Fellowships Program

- Funded by the 2009 American Reinvestment and Recovery Act (ARRA)
- SC Office of Workforce Development for Teachers and Scientists
- Undergraduate and Graduate Students
- Posted September 30, 2009; on-line application system
- Full applications due November 30, 2009
- ~3200 applications received by SC
- 1155 assigned to BER; 722 reviewed online
- Review Panels held March 11-12, 2010 (T. Anderson)
- Imminent announcement of ~160 awards for all of SC
- For information about the program , go to:
  http://www.scied.science.doe.gov/SCGF.html
- Future Office of Science Graduate Fellowship Program announcements, awards and funding to be handled by the SC Office of Workforce Development for Teachers and Scientists

2009 Programmatic Activities: Environmental Molecular Sciences Laboratory (EMSL) Recovery Act Project

To probe fundamental physical, chemical and biological processes underpinning DOE's energy, science and environmental challenges.

- $60M for 32 cutting-edge experimental capabilities.
  - Nuclear magnetic resonance spectrometers,
  - mass spectrometers,
  - molecular/microscopy imaging capabilities, and
  - nano- and molecular-level characterization instruments.
- Systems already received:
  - Atom probe tomography spectrometer,
  - Environmental scanning electron microscope,
  - Experimental computing system & archive, and
  - Combined scanning electron/focused ion beam microscope.

2010 Call for Proposals open until April 8, 2010

Plenary talk by Don Baer, Tuesday pm; "permanent" poster

2009 Programmatic Review of National Laboratory Science Focus Area (SFA) Programs

Current SBR National Laboratory SFA Programs

➢ Argonne National Laboratory	$1.5M
➢ Idaho National Laboratory	$1.2M
➢ Lawrence Berkeley National Laboratory	$4.5M
➢ Lawrence Livermore National Laboratory	$1.2M
➢ Oak Ridge National Laboratory	$3.0M
➢ Pacific Northwest National Laboratory	$6.5M
➢ SLAC National Accelerator Laboratory	$700K

- On-site peer review of ANL and ORNL SFA Programs in June 2009
- Review for an SFA Program in Transuranics held April 24, 2009
- LLNL (A. Kersting & M. Zavarin) selected; project initiated October 1, 2009
- Review process described in: http://www.sc.doe.gov/ober/sfareview.pdf

National Lab overview posters on outside boards for the whole meeting.

2010 Programmatic Activities and Opportunities

2010 SBR Notice (DE-FOA-0000311)

- Posted March 24, 2010
- Pre-apps due April 29, 2010
- Full applications due July 15, 2010
- Review Panel in late August or early September 2010
- Awards in early FY2011 (pending budget passage)
- Todd Anderson is POC

- Go to: http://www.er.doe.gov/production/grants/grants.html for an overview of the notice and instructions for how to apply.
- Go to: https://www.fedconnect.net/FedConnect/ for the full notice.
- Go to: http://www.grants.gov to submit forms.

2010 Programmatic Reviews

Mid-Term Peer Review of the Integrated Field Research Challenge (IFRC) Projects

- March 31 – April 1, 2010
- Field Research Executive Committee (FREC) and Additional Reviewers
  - Hanford 300 Area IFRC
  - Rifle IFRC
  - Oak Ridge IFRC

National Laboratory SFA Program Reviews

Argonne National Laboratory	reviewed in 2009
Oak Ridge National Laboratory	reviewed in 2009
Idaho National Laboratory	on-site review in June 2010
Lawrence Berkeley National Laboratory	on-site review in May 2010
Pacific Northwest National Laboratory	review in 2011
SLAC National Accelerator Laboratory	review in 2011
Argonne National Laboratory	review in 2012
Lawrence Livermore National Laboratory	review in 2012
Oak Ridge National Laboratory	review in 2012

2010 Committee of Visitors (COV)
Review of CESD Programs

COV Reviews are charged to assess:

- The efficacy and quality of the processes used to solicit, review, recommend, monitor, and document application, proposal and award actions.
- The quality of the resulting portfolio, including its breadth and depth and its national and international standing.

2010 COV Review:

- All CESD research and user facility programs, including SBR and EMSL
- All FY07-FY09 projects at universities and programs at the National Laboratories
- Scheduled for July 21-22, 2010 in Germantown, MD
- Chaired by Judy Wall
- Todd Anderson is the POC

2010 Meetings

Goldschmidt 2010

- June 13-18, 2010; http://www.goldschmidt2010.org
- Hosted by University of Tennessee and ORNL in Knoxville, TN
- Many sessions being convened by SBR PIs:
  - Geophysical Monitoring of Near-Surface Hydrogeochemistry – Baker, Hubbard ,Slater
  - Chemical and Biological Processes at Mineral Surfaces – Bargar *et al.*
  - Hydrobiogeochemical Evolution of Groundwater Systems in Natural and Impacted Environments – Brooks, Watson, Bayer *et al.*
  - Extracellular Electron Transfer and Microbial Mineral Transformation – Gorby, Roden
  - Biogeochemical Controls on Mercury Transformation and Global Cycling – Gu, Nagy, Liang *et al.*
  - Formation Mechanisms, Stability, and Distribution of Oxyanions in the Environment – Gu *et al.*
  - Molecular Structure and Dynamics in Biogeochemistry – Johs, Liang, Smith *et al.*
  - Iron Geomicrobiology – Kostka *et al.*
  - Molecular-Scale Interactions of Organic C with Mineral Salts – Mayes *et al.*
  - Focus on Phyllosilicates – Roden and Burgos
  - Microbial Redox Transformation and Metal(loids) and their Implication for Bioremediation - M Ginder-Vogel *et al.*

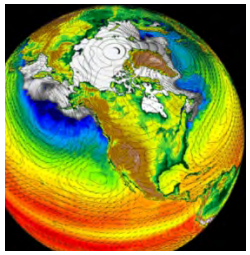
2010 Meetings

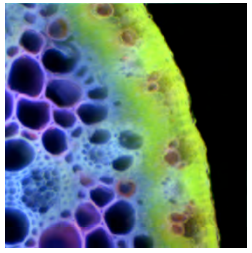
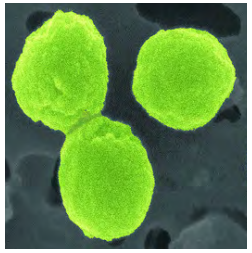
International Society for Microbial Ecology (ISME-13)

- Theme – *Stewards of a Changing Planet*
- August 22-27, 2010; http://www.isme-microbes.org/isme13
- Partially sponsored by BER
- To be held in Seattle, WA
- Invited oral sessions being led by SBR PIs:

  - Ecology of Engineered Environments – D. Lovley *et al.*
  - Ecology of Recalcitrant Compound Degradation – F. Loeffler *et al.*
  - Evolutionary Ecology of Microbial Communities – D. Stahl *et al.*

- Jim Fredrickson and Alan Konopka (PNNL) are Chair and Co-Chair of the local organizing committee



SBR Programmatic Highlights

SBR News & Awards
(since last PI meeting)

2010 Darcy Lecturer
Tim Scheibe, PNNL

PRESIDENTIAL EARLY CAREER AWARDS FOR SCIENTISTS AND ENGINEERS

2009 Presidential Early Career Award (PECASE)
Alexandre Tartakovsky, PNNL

Environmental and Engineering Geophysical Society

EEGS/NSG Frank Frischknecht Leadership Award – **Susan Hubbard**, LBNL

Environmental and Engineering Geophysical Society

EEGS/Geonics Early Career Award – **Kamini Singha**, PSU

Geological Society of America
Hydrogeology Division

2010 Birdsall-Dreiss Lecturer
Susan Hubbard, LBNL

R&D 100

Geochip wins R&D 100 Award
Jizhong Zhou, U. Oklahoma

AAAS ADVANCING SCIENCE, SERVING SOCIETY

2010 AAAS Fellow
Don Baer, PNNL
Jizhong Zhou, U Oklahoma

Houtermans Medal
Nathan Yee, Rutgers

U.S. DEPARTMENT OF ENERGY INCITE LEADERSHIP COMPUTING

PFLOTRAN on "Jaguar"
Peter Lichtner, LANL

SBR Publications in 2009 and 2010

PIs continue to publish in a wide variety of peer reviewed journals addressing key issues in:

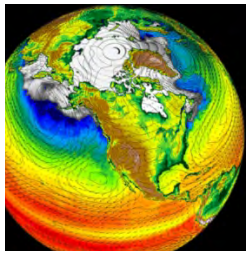
- Environmental Science
- Geochemistry
- Microbiology and Microbial Ecology
- Hydrology and Water Science

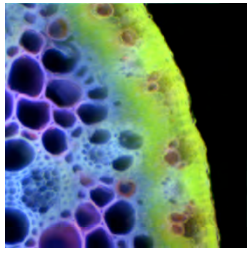
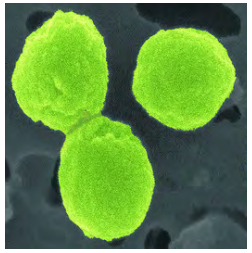
…and many other related areas.

- 116+ publications in 2009
- 18 and counting in 2010

Environ Sci. & Technol. = 37
Appl. Environ. Microbiol. = 11
Geochim. Cosmochim. = 9
Water Res. Research = 5
ISME J. = 4
Env. Micro. = 4
Proceedings NAS = 3
Vadose Zone J. = 3
J. Bacteriology = 3
Analytical Chem. = 3
Water Research = 3
Microbiol. Ecol. = 2
Applied Geochem. = 2
FEMS Microbiol. Ecol. = 2
J. Contam. Hydrol. = 2
Geomicrobiology J. = 2
Trans. in Porous Media = 2

and many others



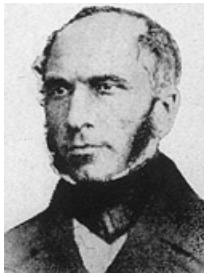




SBR PI Meeting Agenda

SBR PI Meeting – Darcy and Birdsall-Dreiss Lectures

Henry Darcy Distinguished Lecture in Ground Water Science

- **Tim Scheibe**, PNNL
- Established in 1986 in honor of Henry Darcy
- National Ground Water Research and Educational Foundation
- More than 60 lectures across the globe



Birdsall-Dreiss Distinguished Lecturer

- **Susan Hubbard**, LBNL
- Established in 1978 in honor of John Birdsall and Shirley Dreiss
- Geological Society of America – Hydrogeology Division

SBR PI Meeting – Community Exchanges

Breakout Sessions on Monday Afternoon

- Session A - Systems Environmental Microbiology: Innovative Approaches to Understand Cellular and Microbial Community Activity and Function
  - Application of genome science research to understand subsurface processes
  - Terry Hazen and Paul Bayer
- Session B – Biogeochemical Scale Transitions
  - Scaling processes across different types/levels of complexity
  - John Bargar and Roland Hirsch
- Session C – Modeling and Simulation of Subsurface Systems
  - Using High Performance Computing for subsurface research
  - Carl Steefel and David Lesmes

Plenary Presentations

- **Juan Meza** – Advanced Simulation Capability for Environmental Management (ASCEM)
  - Technical lead for the EM-funded ASCEM project
- **Don Baer** – New Capabilities at EMSL
  - Applicability of ARRA-funded instrumentation for SBR research and how to access
- **Margaret Torn** – Carbon Cycling in Terrestrial Ecosystems: Research Challenges and Opportunities
  - Research challenges applicable to climate change

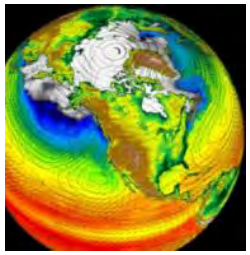
2010 SBR PI Meeting Logistics

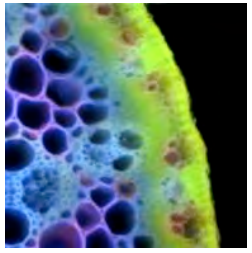
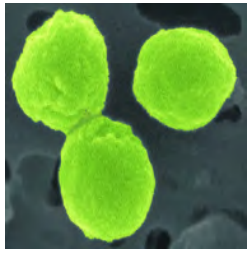
Permanent Posters

- SFA Overviews, IFRC Overviews, EMSL, CAMS

Reminders for Speakers

- $2 + 30 + 5 \neq 30$
- Presentations to Terry Hazen
- Carol Valladao for on-site logistics



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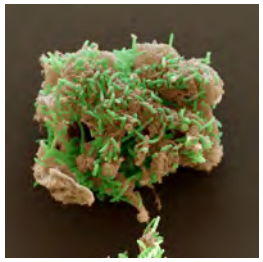
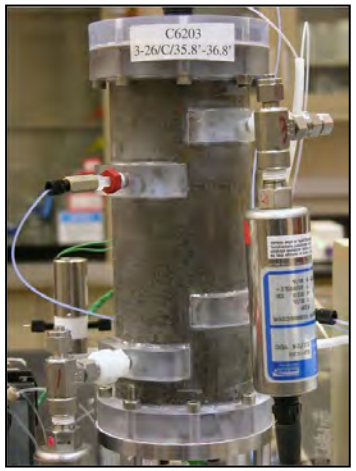


Todd Anderson – Program Manger
Field Biology/ Microbiology
Paul Bayer – Program Manager
Environmental Science/EMSL Management
David Lesmes – Program Manager
Geophysics/Hydrogeology



Roland Hirsch – Program Manager*
Chemistry, Synchrotron science
Arthur Katz – Program Manager*
Transuranics

Karen Carlson-Brown – Program Support Specialist
Eileen Knox – Program Secretary