

12:15–1:30..... Lunch on your own

1:30–4:30..... Boise Hydrogeophysics Research Site  
Afternoon tour of the facilities with demonstration of hydrologic and geophysical methods

4:30–7..... Free time/Dinner on your own

## EVENING SESSION

### Homework Session: Tomography Bake-Off

7–7:15..... Introduction to the homework

7:15–8:15..... Poster viewing and discussions, with refreshments

- **EM Wave Velocity and Porosity Using 2D GPR Borehole Tomography**, Adam Mangel (Clemson Univ)
  - **Ultimate Tomography Bake-Off Challenge Using BHRS Data**, James Irving (Univ of Lausanne), S. Marelli
  - **Estimation of Porosity at the Boise Hydrogeophysical Research Site Using 2D Travel-time Inversion of Seismic and GPR Borehole Datasets**, Emily Fay (Stanford Univ), A. Parsekian, R. Knight
  - **Cross-gradient Joint Inversion and Classification of Crosswell Seismic and GPR Traveltimes at the Boise Hydrogeophysical Research Site**, Joseph Doetsch (Lawrence Berkeley Nat'l Lab), N. Linde, M. B. Kowalsky
  - **Joint Inversion of Boise Hydrogeophysical Research Site Borehole Seismic and GPR Datasets**, Abderrezak Bouchedda (Ecole Polytechnique de Montreal), M. Chouteau
  - **Crosshole GPR full-waveform Inversion to Characterize the Aquifer of the Boise Hydrogeophysical Research Site**, Anja Klotzsche (Forschungszentrum Juelich), J. van der Kruk, J. Bradford, H. Vereecken
- 8:15–9..... Panel-led discussion: James Irving, Jan van der Kruk, Joseph Doetsch

## WEDNESDAY, 11 JULY 2012

### MORNING SESSION

#### Session: Advances in Time-Lapse Monitoring

9–9:30..... **Coupled Hydrogeophysical Inversion of Time-lapse Geophysical Data**, Johan Huisman (IBG-3 Agrosphere Forschungszentrum Juelich), M. B. Cho, J. Rings, J. Sorg, J. A. Vrugt, H. Vereecken

9:30–10:30..... **Introductions to Posters**

- **Evaluation of ERT Data Acquisition Geometries for Robust Monitoring and Time-lapse Studies**, Bernd Milkereit (Univ of Toronto), W. Pun, W. Qian, C. Bank
- **Optimized Geoelectric Monitoring for 3D Arrays**, Dale Rucker (Hydrogeophysics, Inc.), M. Loke
- **Inversion of Multi-temporal Geoelectrical Field Data Sets: Insights on Noise Characterization and Regularization**, Frederic Nguyen (Univ of Liege), A. Kemna, T. Robert, T. Hermans, D. Caterina, A. Flores Orozco
- **Improved Imaging of Electrically Conductive Solute Plumes Using a New Strategy for Physics-based Regularization of Resistivity Imaging Problems**, Erasmus Oware (Clemson Univ), S. Moysey, T. Khan
- **Analysis of Lab-scale Infiltration Experiments with ERT and High Resolution CCD Imaging**, Stephen Breen (Univ of California-Irvine), R. Detwiler, C. Carrigan

- **Time-lapse GPR WARR Surveying During a Lab-scale Infiltration Experiment**, Adam Mangel (Clemson Univ), S. M. J. Moysey, J. van der Kruk, J. C. Ryan, J. Tarbutton
- **Time-Lapse Resistivity Monitoring of the Hyporheic Zone: The Water Layer Problem**, Jonathan Nyquist (Temple Univ), L. Toran, D. O'Donnell
- **Time-lapse Imaging of River-water Intrusion into a Contaminated Aquifer Using Time-lapse Electrical Resistivity Tomography**, Erin Wallin (Pacific Northwest Nat'l Lab), T. C. Johnson, W. J. Greenwood, J. M. Zachara
- **Long-term Monitoring of Hydrological Changes in the Near Surface Via Surface NMR and Borehole NMR**, David Walsh (Vista Clara, Inc), E. D. Guneward, K. Keating, A. B. Sanderlin, S. J. Vogt, B. A. Bergin, S. L. Codd, T. P.A. Ferré, A. Hinnell, J. Butler, E. Reboulet, S. Knobbe, R. Knight
- **SP and Hydrologic Monitoring of Shallow Groundwater Flow in Covered Karst Terrain**, Sarah Kruse (Univ of South Florida), P. Bumpus
- **Advancing Field Methods for GPR Monitoring of Flow Channeling in Fractured Rock**, George Tsofilas (Univ of Kansas), M. Becker, M. Baker, C. Perl
- **Time-lapse Seismic Imaging for Carbon Capture, Utilization and Storage (CCUS) in Thin, Stacked Coals**, Ellen Gilliland (VCCER, Virginia Tech), N. Ripepi, M. Karmis
- **Full Coupled Hydrogeophysical Inversion of CO<sub>2</sub> Migration Data in a Deep Saline Aquifer**, Joseph Doetsch (Lawrence Berkeley Nat'l Lab), M. B. Kowalsky, C. Doughty, S. Finsterle, J. B. Ajo-Franklin, X. Yang, C. R. Carrigan, T. M. Daley

10:30–11..... BREAK

11–12:30..... Poster viewing and discussions

12:30–2..... Lunch on your own

### AFTERNOON SESSION

2–3..... Panel-led discussion: Sander Huisman, Jonathan Nyquist, George Tsofilas, Jan van der Kruk

#### Workshop Wrap-Up: State of the Practice/State of the Science Whitepaper

3–3:15..... Introduction to Whitepaper (with an invitation to all attendees to participate)

3:15–3:45..... BREAK

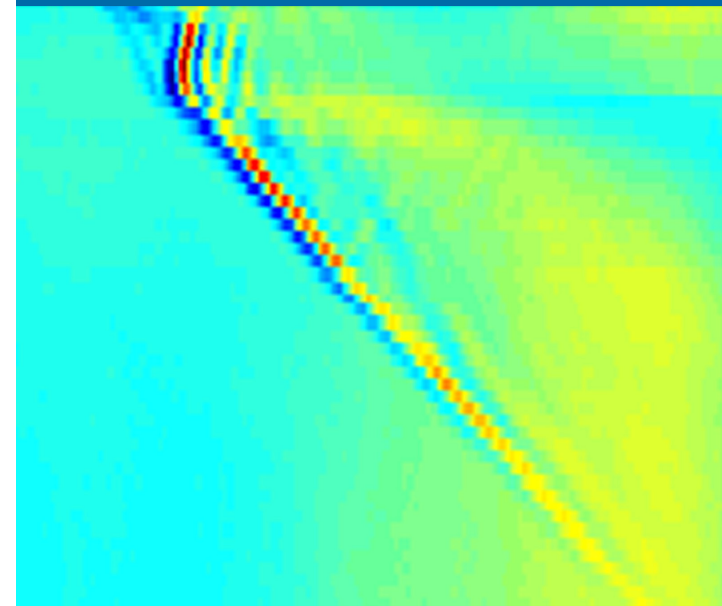
3:45–4:45..... Panel-led discussion to outline paper

4:45–5:30..... Writing assignments, proposed timeline for preparation

## ORGANIZING COMMITTEE

Rosemary Knight, General Chair; James Irving; Rob Jacob; Lee Liberty; Kamini Singha; Jan van der Kruk

# SEG-AGU Hydrogeophysics Workshop



## BOISE, IDAHO USA 8–11 JULY 2012



# 2012 SEG-AGU Hydrogeophysics Workshop

## SUNDAY, 8 JULY 2012

4pm ..... Registration, BSU, Lookout Room, Student Union Building

6pm ..... Icebreaker BSU, Lookout Room, Student Union Building

*All sessions will take place in the Lookout Room in the Student Union Building*

## MONDAY, 9 JULY 2012

### MORNING SESSION

9–9:15..... Welcome to the meeting, agenda, objectives

### Characterizing Near-Surface Structure and Properties

9:15–9:45..... **On the Use of Complex Resistivity Imaging to**

**Estimate in-situ Hydraulic Conductivity**, *Andreas Kemna (Univ of Bonn)*, *J. A. Huisman*, *E. Zimmermann*, *R. Martin*, *A. Flores Orozco*, *H. Vereecken*

9:45–10:45..... **Introductions to posters, Group 1**

- **Anisotropic 2D Modeling of Induced Polarization Data**, *Johannes Kenkel (Bonn Univ)*, *R. Martin*, *A. Kemna*
- **Geoelectric Sounding for Predicting Shallow Aquifer Properties Using Modified Archie Equations**, *Benard Ifeanyi (Nnamdi Azikiwe Univ Awka)*, *A. U. Utom*, *B. C. E. Egboka*, *N. E. Egboka*, *H. C. Okeke*
- **Azimuthal Resistivity Survey — a Confirmatory Information on the Kinematics of Near-surface Fractures at the Enugu Area, Anambra Basin, Nigeria**, *Benard Ifeanyi (Nnamdi Azikiwe Univ Awka)*, *D. K. Amogu*, *A. U. Utom*, *A. G. Onwuemesi*, *A. C. Ekwe*, *B. C. E. Egboka*, *N. E. Egboka*, *K. M. Onuoha*
- **Three-dimensional Parallel Inversion of Two Massive Surface Resistivity Datasets to Characterize Vadose Zone Contamination beneath Waste Infiltration Galleries at the Hanford Site**, *Tim Johnson (Pacific Northwest Nat'l Lab)*, *D. Rucker*, *W. Greenwood*, *D. Wellman*, *M. Doornbos*, *J. Morse*
- **Using Electrical Resistivity to Characterize the Unsaturated Zone and Monitor Infiltration for Improving Managed Aquifer Recharge**, *Chloe Mawer (Stanford Univ)*, *P. Kitanidis*, *A. Pidlisecky*, *R. Knight*
- **Hydrogeological Mapping: PC Soundings Versus TEM**, *Niels Schrader (Roskilde Univ)*
- **Electrical Evidence for Solute Mass Transfer at the Lab-scale**, *Kamini Singha (Pennsylvania State Univ)*, *R. Swanson*, *F. D. Day-Lewis*, *A. M. Binley*, *K. Keating*, *R. Haggerty*
- **Multiple-scale Integration of Hydrological and Geophysical Data through Bayesian Sequential Simulation**, *Paolo Ruggeri (Univ of Lausanne)*, *E. Gloaguen*, *J. Irving*, *K. Holliger*
- **Cooperative Cross-hole ERT and 2D Full-waveform GPR Inversion**, *Abderrezak Bouchedda (Ecole Polytechnique de Montreal)*, *M. Chouteau*
- **Estimation of Shallow Soil Water Content during Evaporation by Using Full-waveform Inversion of Off-ground Zero-offset Ground Penetrating Radar**, *Davood Moghadas (Research Center of Juelich)*, *K. Z. Jadoon*, *S. Lambot*, *H. Vereecken*, *J. Vanderborght*
- **Recent Developments in Full-waveform Inversion of GPR Data**, *Jan van der Kruk (Research Center of Juelich)*, *A. Klotzsche*, *S. Busch*, *X. Yang*, *J. Bikowski*, *H. Vereecken*

- **New Approaches to the Application of High Sensitivity Temperature Logs for Detection of Groundwater Flow in Fracture Rock**, *Pete Pehme (Univ of Guelph)*, *B. L. Parker*, *J. A. Cherry*
- **Micro-gravity Measurements for Permeability in Shale Hills GZO**, *Robert Jacob (Bucknell Univ)*, *K. Singha*

10:45–11:15.... **BREAK**

11:15–12:30.... Poster viewing and discussions

12:30–1:45..... **Lunch on your own**

### AFTERNOON SESSION

### Characterizing Near-Surface Structure and Properties

1:45–2:45..... **Introduction to posters, Group 2**

- **Information about Local Hydrogeologic Conditions Derived from Time-series Microgravity Monitoring in the Western USA**, *Don Pool (USGS Arizona Water Science Center)*, *J. Kennedy*, *R. L. Carruth*
- **Improvement in MRS Parameter Estimation — A Closer Step Toward Hydrogeological Interpretations**, *Ahmad Behroozmad (Aarhus Univ)*, *E. Auken*, *A. V. Christiansen*
- **Laboratory Measurements to Explore the Link between Surface Area, Surface Relaxivity, and NMR Relaxation Time in Partially-saturated Porous Media**, *Samuel Falzone (Rutgers Univ)*, *K. Keating*
- **Improving Reliability of Surface NMR Relaxation Time Measurements: Composite Pulses to Quantify Background Magnetic Field Inhomogeneity**, *Denys Grombacher (Stanford Univ)*, *J. Walbrecker*, *R. Knight*
- **The Integration of Logging and Surface NMR for Mapping Spatial Variation in Hydraulic Conductivity**, *Rosemary Knight (Stanford Univ)*, *K. Dlubac*, *J. Butler*, *E. Grunewald*, *D. Walsh*
- **MRSmatlab — a Toolbox for Modeling, Processing, and Inverting Surface-NMR Data**, *Jan Walbrecker (Stanford Univ)*, *M. Mueller-Petke*, *M. Hertrich*
- **Laboratory Monitoring of P-waves in Partially Saturated Sand**, *Daniel Brito (Univ of Pau)*, *J. Barrière*, *C. Bordes*, *P. Sénéchal*
- **Compression and Shear Wave Examples of Near-surface Seismic Methods for Hydrogeophysical Applications**, *Steve Sloan (US Army ERDC)*, *J. B. Harris*
- **Characterization of the Shallow Karstic Coastal Aquifer by 3D Seismic Reflection Survey: A Case Study**, *Muhammad Toqeer (UPPA)*, *H. Perroud*, *D. Rousset*
- **Wavelet Transform and Neural Network on Integrated Geophysical Data for Decipher the Saline and Fresh Water Aquifer**, *Upendra Singh (Indian School of Mines)*, *S. B. Singh*
- **Controlling the Seawater Intrusions: Coupling Groundwater Model and Geophysical Data**, *Klara Steklova (Univ of British Columbia)*, *E. Haber*, *S. Aravkin*
- **An Integrated Approach to Characterizing Spatial and Temporal Variability in Canal Leakage**, *Chris Hobza (US Geological Survey Nebraska Water Science Center)*, *B. L. Burton*, *J. Vrabel*, *J. C. Cannia*
- **Where Is All the Groundwater Flow Coming from into the Barton Springs Pool? A Geophysical Case Study**, *Mustafa Saribudak (Environmental Geophysics Associates)*, *N. Hauwert*

2:45–3:15..... **BREAK**

3:15–4:30..... Poster viewing and discussions

4:30–5:30..... Panel-led discussion: *Andreas Kemna*, *Tim Johnson*, *James Irving*, *Rosemary Knight*

7 pm ..... **Conference dinner for all attendees**  
Cottonwood Grille, 913 W River St

## TUESDAY, 10 JULY 2012

### MORNING SESSION

### Thinking About Scaling Up: Geophysical Methods at the Watershed Scale

9–9:30..... **Groundwater Resource Assessment in Outback Australia-Going from the Local to the Regional Scale Using Airborne Hydrogeophysical Methods**, *Tim Munday (CSIRO Earth Science and Resource Engineering)*

9:30–10:15..... **Introductions to Posters**

- **A Geostatistical Parameterization for Model-space Reduction and Bayesian MCMC Sampling**, *Burke Minsley (US Geological Survey)*, *J. Irving*
- **Quantitative Two-layer Inversion for Multi-configuration Electromagnetic Induction Tools**, *Jan van der Kruk (Research Center of Juelich)*, *A. Mester*, *S. Rudolph*, *C. von Hebel*, *L. Weihermüller*, *H. Vereecken*
- **Airborne Electromagnetics as an Effective, Data Based Tool for Large Scale Groundwater Mapping**, *Antonio Menghini (Aarhus Geophysics)*, *A. Viezzoli*
- **Geophysical Investigations for Coal Bed Natural Gas Co-produced Water Management, Powder River Basin, Wyoming**, *Bruce Smith (US Geological Survey)*, *J. Sams*, *G. A. Veloski*, *B. Minsley*, *R. Bern*, *J. W. Zapancic*, *A. Quist*, *R. W. Healy*, *R. G. Hammack*, *M. A. Engle*, *B. L. Burton*
- **Using Geophysical Data to Improve an Optimization Groundwater Model Evaluating the Effectiveness of Intentional Recharge in the North Platte River Valley, Western Nebraska, USA**, *James Cannia (US Geological Survey)*, *J. Abraham*, *S. M. Peterson*
- **NMR Logging: A Tool for Quantifying Effective Porosity and Hydraulic Conductivity within the Murray Darling Basin of Australia**, *Jared Abraham (US Geological Survey)*, *K. P. Tan*, *K. Lawrie*, *R. Brodie*, *J. Clarke*, *G. Schoning*
- **Combining Ground-based Measurements to Enable Efficient and Exhaustive Hydrogeological Regional Characterization**, *Martin Blouin (INRS-ETE)*, *E. Gloaguen*, *A. Pugin*
- **Hydrogeophysical Modeling for Improved Understanding of Permafrost Distributions in the Yukon Flats, Alaska**, *Burke Minsley (US Geological Survey)*, *T. Wellman*, *L. Cox*, *M. Walvoord*, *J. Abraham*
- **Observation of Hydrologic Influences on Transient EM-38 Response at Local and Watershed Scales**, *Stephen Moysey (Clemson Univ)*, *S. Gangrade*
- **Coupling Shoreline Changes with Ground Water Monitoring Data to Interpret Changes of Hydrogeological Properties in Confined Aquifers on Littoral Zones in Taiwan**, *Yun-Bin Lin (Chianan Univ of Pharmacy and Science)*

10:15–10:30.... **BREAK**

10:30–11:30.... Poster viewing and discussions

11:30–12:15..... Panel-led discussion: *Burke Minsley*, *Tim Munday*, *Kamini Singha*