July 2011 Newsletter of the AGU Near-Surface Focus Group

Recent announcements of interest to the NS community (conferences, academic positions, graduate student opportunities etc.) can be found at the AGU NS-Focus Group Web Page: http://nsg.agu.org

AGU NS Membership as of July 2011:
Primary affiliation: 740 members; Secondary: 2591 members

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1. Call for abstracts: AGU Fall Meeting 2011

Visit the AGU Fall Meeting 2011 Web site for information on deadlines, schedules, guidelines, registration information and more!

The AGU Fall Meeting is the largest worldwide conference in the geophysical sciences, attracting nearly 20,000 Earth and space scientists, educators, students, and policy makers. This meeting showcases current scientific theory focused on discoveries that will benefit humanity and ensure a sustainable future for our planet.

Abstract submission: Closes 4 August 2011 23:59ET/3:59+1 GMT

1.2. Near Surface Geophysics sessions

NS01: Near Surface Geophysics General Contributions
This session provides the opportunity for contributions that fall within the broad spectrum of Near Surface Geophysics, but are not directly appropriate to any of the other sessions proposed for the focus group.

NS02: Cryosphere Geophysics
Conveners: John Bradford, Achim Heilig, and Seth Campbell
Description: The study of the earth's cold regions presents perhaps the most diverse set of geophysical problems of any earth system. We must understand the influence of water in all its phases, and a dynamic system whose geophysical properties can change dramatically on time scales from hours to over centuries. Geophysical methods provide fast, cost-effective, and non-invasive alternatives to conventional manual measurements for subsurface characterization. We invite papers that investigate developments in cold regions subsurface imaging. This may include geophysical hardware development or data acquisition in these harsh and irregular environments, advancements in data processing and analysis, or new developments in characterization of snow, ice, or permafrost properties

NS03: Exploiting GPR and Seismic Wavefield Properties for Characterization of the Shallow Subsurface
Conveners: Georgios Tsoflias, and John Bradford
Description: While significant methodological advances have been made in ground-penetrating radar (GPR) and high-resolution seismic subsurface imaging, further understanding is needed in relating wavefield responses to

subsurface properties. Consideration of wave polarization and angle of incidence/transmission can lead to improved characterization of fractures in aquifers and reservoirs. Frequency dependent propagation analysis can be a rich source of information, such as water saturation or clay content. We invite contributions that explore the propagation properties of electromagnetic and elastic waves for characterization of heterogeneous subsurface properties and for monitoring of active processes.

NS04: From Pore-Scale to Basin-Scale: Geophysical Methods for Groundwater Evaluation and Management
Conveners: Rosemary Knight, and John Lane
Description: The Development of Geophysical Methods for Groundwater Evaluation and Management In this session we focus on the development of geophysical methods using subsurface, surface, airborne, or satellite sensors to quantify subsurface properties and processes relevant for the effective, sustainable management of groundwater resources. Of specific interest is the development and demonstration of new ways of acquiring, analyzing, interpreting geophysical data. We welcome examples related to all aspects of groundwater management including, but not limited to, development of hydrostratigraphic models, assessment of aquifer properties, evaluation of groundwater quantity and quality, monitoring of natural/managed processes. All approaches are of interest including laboratory and field experiments, theoretical and numerical modeling.

NS05: Hydraulic Fracturing and Fluids in the Shallow Subsurface
Conveners: James Conder, Wayne Pennington, and Juan Lorenzo
Description: Recent and rapid growth in the availability of passive seismic data sets from hundreds of commercial hydraulic fracturing treatments as well as experiments provides an opportunity to improve the current understanding of initiation and growth of fluid-driven fractures. Source mechanics and moment tensor inversion, as well as simpler spectral content, amplitudes and event duration of hydraulic fracture mechanisms may share parallels with other natural processes such as magmatic dike growth and glacial sliding. We welcome presentations that highlight the similarities in observations, methods and models of these different processes from both all manner of research institutions and industry.

NS06: Low-enthalpy Geothermal Resources: Characterization and Technique Development
Description: Low-enthalpy geothermal resources (LEG) are global, renewable resources that are widely distributed and easily accessible. Optimal development of these resources can enhance energy security by using sustainable and socially acceptable energy extraction processes with lower environmental impact. We are seeking contributions from theoretical and practical advances that quantify and characterise LEG resources at local, regional and national levels, identify suitable technologies for development of various LEG types, evaluate socio-economic factors related to LEG and other contributions that encourage optimum, structured and sustainable development of LEG resources

NS07: Novel Techniques Applied to Near-Surface Geophysical Problems
Conveners: Graham Kent, John Bradford, and Mark Vardy
Description: The Near-Surface (NS) is a difficult and dynamic environment for geophysical surveying; demonstrating sharp discontinuities, small-scale heterogeneity, and complex morphology. The last 5-10 years have seen significant changes in the technology and methods being applied. Multi-disciplinary surveys are the norm, while processing/interpretation workflows are also developing apace, furthering the wealth of information that can be gleaned from these data. In this session we seek to showcase case studies where new/novel techniques have been applied to the NS. We encourage contributions from authors who have applied techniques/workflows from industry and/or taken a multi-disciplinary approach to solving complex NS problems.

NS08: Seismic Characterization of Unconsolidated Sediments
Conveners: Nedra Bonal, Juan Lorenzo, and James Crane
Description: An understanding of the mechanical properties of unconsolidated materials obtained from seismic methods can improve predictions of soil dynamics and groundwater flow behavior. Unconsolidated material properties are sensitive to properties such as water content, matric suction, temperature, texture, biofilm presence, and multiphase pore fluid, among others. Many of these properties may change over a relatively short period of time. Any heterogeneity or anisotropy in such factors can be highly influential on observed seismic responses. We invite presentations which incorporate analytical approaches, including unsaturated soil constitutive models, and/or experimental results that exploit seismic methods

NS09: The Role of Mineral Water Interface in Understanding Geophysical Signals

Conveners: Yuxin Wu, and Andre Revil
Description: Mineral/water interfaces play a critical role in controlling the fate and transport of important chemical species. Properties of this interface, such as its complexation and charge structure, are important drivers of geophysical signals (e.g. IP, SP). Understanding the linkage between interfacial properties and geophysical signals is critical to the development of geophysical methods as monitor tools. Here, we invite studies on mineral water interfacial properties and their linkage to geophysical signals across laboratory and field scales. Particular interests include, but are not limited to, studies of the effects of mineralogy, biofilm, fluid chemistry on interfacial properties and corresponding geophysical signals

1.3. Hydrogeophysics sessions

Hydrogeophysics sessions for the 2011 AGU Fall Meeting (http://sites.agu.org/fallmeeting/)
Abstract deadline: 4 August 2011

H87: Geophysics for the Critical Zone
http://sites.agu.org/fallmeeting/scientific-program/session-search/503
Convenors: Barry Allred, Ulrike Werban, Steffen Zacharias, Peter Dietrich

H88: Hydrogeophysical Data Fusion for Estimation and Prediction in Hydrologic Systems
http://sites.agu.org/fallmeeting/scientific-program/session-search/504
Convenors: Stefan Finsterle, James Irving, Michael Cardiff

H89: Hydrogeophysics: Monitoring and Modeling of Hydrological Processes from Lab to Field Scale
http://sites.agu.org/fallmeeting/scientific-program/session-search/505
Convenors: Andrew Hinnell, Vanessa Mitchell, Joerg Rings

H90: Imaging of Ecological, Hydrological, and Biological Processes Over Multiple Scales
http://sites.agu.org/fallmeeting/scientific-program/session-search/506
Convenors: Terenton Franz, Dush Jayawickreme, Ty P.A. Ferré

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2. Call for session abstracts: Hydrogeophysics Summer Research Workshop; July 8 to 11, 2012; Boise, ID (from Rosemary Knight)

The second Society of Exploration Geophysicists Hydrogeophysics Summer Research Workshop will be held at Boise State University, Boise ID, July 8 to 11, 2012. At this stage the organizing committee is discussing session topics. We intend to make this a **work**shop, so will be designing a number of the sessions around "homework" that is done in advance using data sets acquired or contributed for this purpose. We welcome your involvement! If there is a session that you would like to organize, please contact one of us by 1 September 2011.

We look forward to seeing you in Boise next summer!

Rosemary Knight <rknight@stanford.edu>, Rob Jacob <rwj003@bucknell.edu>, James Irving <james.irving@unil.ch>, Jan van der Kruk <j.van.der.kruk@fz-juelich.de>, Lee Liberty<lliberty@boisestate.edu>

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3. Call for papers: Geophysics: Advances in near-surface electromagnetic induction geophysics (from Mark Everett)

SEG invites papers on the topic of "Advances in near-surface electromagnetic induction geophysics" for July-August 2012 publication in a special section or supplement of GEOPHYSICS.

There has been a great deal of activity in near-surface electromagnetic induction geophysics in the past several years. New and experienced practitioners are achieving great success in applying the method. Moreover, theorists are becoming better able to exploit the rich information content that is available in electromagnetic induction data

sets. The electromagnetic induction method, with its broad opportunities to design new transmitters, receivers, and interpretation tools, continues to offer wide avenues to capture the spatial complexity of the subsurface. The goal of this special GEOPHYSICS issue is to highlight recent achievements, stimulate interest across a broad spectrum of geophysicists, and set the tone for continuing developments in this field.

The recent explosive growth of near-surface electromagnetic induction geophysics foreshadows many innovative techniques and applications that are certain to be forthcoming. The organizers of the special issue encourage contributors to bring forward and discuss new advances in theory, instrumentation, data processing and interpretation, and innovative applications of near-surface applied electromagnetic induction geophysics. Topics might include but are certainly not limited to modeling, inversion, mapping spatial heterogeneity, anisotropy, buried target recognition, logging and airborne EM, in addition to new or emerging techniques such as landmine detection, biogeophysics, interferometry, shallow-water electromagnetics, radiomagnetotellurics, archaeology, and airborne UXO discrimination.

Interested authors should submit their manuscripts for review no later than 30 September 2011. In addition, the special section/supplement editors would like to receive a provisional title and list of authors as soon as possible. Authors should submit via the normal online submission system for GEOPHYSICS (https://mc.manuscriptcentral.com/geophysics) and indicate that it is a contribution for this special section or issue. The submitted papers will be subject to the regular peer-review process, and the contributing authors also are expected to participate in the review process as reviewers.

We will work according to the following timeline:
-- Submission deadline: 30 September 2011
-- Peer review complete: 22 March 2012
-- All files submitted for production: 1 April 2012
-- Publication of issue: July-August 2012

Given the tight timeline for publication of this issue, GEOPHYSICS is going to strictly enforce author submission guidelines, covered in "Instructions to Authors" published in the January-February 2011 issue and on the SEG Web site (http://seg.org/geoinstructionstoauthors). Please note that normal GEOPHYSICS page and color charges apply.

For specific questions, please contact the special section/supplement editors Mark Everett (everett@geo.tamuedu) and Colin Farquharson (cgfarquh@mun.ca) + guest editors if needed.

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4. Reminder: Advances in Characterization of Groundwater Flow Processes session at GSA annual meeting (from Remke Van Dam)

Dear Colleagues,

At the GSA Annual Meeting in Minneapolis from October 9-11, 2011, we invite you to present your research in the session: Advances in Characterization of Groundwater Flow Processes (T94).

In many parts of the world, groundwater resources have come under increased stress as a result of greater societal demands, a changing climate, and pollution. As the concerns over the sustainability of high-quality groundwater resources mount, it is critical to understand, predict, and mitigate these stresses, which requires improved characterization and monitoring of aquifer processes at an increasing range of spatial and temporal scales. This session will serve as a forum to discuss recent advances in the study of flow and transport in groundwater using approaches from aquifer hydraulics, geophysics, tracers, and novel drilling techniques. We invite contributions on theoretical, modeling, laboratory, and field studies.

We are pleased to have Giorgio Cassiani (University of Padova), Peter Dietrich (Helmholtz Centre for Environmental Research-UFZ), and James Famiglietti (University of California, Irvine) as invited speakers.

Abstracts are due by July 26 and can be submitted here (direct link to session T94): http://moourl.com/T94GSA2011

Sincerely,

Remke Van Dam (Michigan State University)
Vitaly Zlotnik (University of Nebraska-Lincoln)

Conference details: http://moourl.com/GSA2011

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5. Reminder: SEG 2011 Annual Meeting in San Antonio, TX, September 18-23 (from James Irving)

The SEG Annual Meeting is approaching rapidly and the technical program is in the process of being finalized and published. Approximately 50 near-surface abstracts were submitted this year, which has allowed us to build a great NS program consisting of three oral sessions ("Hydrogeophysics", “Surface Waves”, and “Environmental and Geotechnical Applications”), and one poster session for general NS contributions. In addition, the NS program will be complemented by a post-convention workshop entitled “Geophysics Applied to Geohazards and Public Safety”. Further information about the sessions and the post-convention workshop will be provided on the NSGS website (http://nsgs.seg.org/).

The NSGS will also be holding its annual reception during SEG at the Wynkoop Brewing Company on Tuesday, October 19, starting at 6:30pm. The Wynkoop Brewing Company is located at 1634 18th Street. There is no charge for SEG-NS Section members. Non-members can join on the spot and students are particularly welcome. Student membership is free! In addition, all members are welcome to share their ideas at the NSGS business meeting to be held right before the reception at the convention center (location and time to be announced).

For questions or suggestions please do not hesitate to email James Irving (james.irving@unil.ch), Klaus Holliger (klaus.holliger@unil.ch), or Jan van der Kruk (j.van.der.kruk@fz-juelich.de).

We are looking forward seeing you in San Antonio!

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6. Near Surface Geophysics in the news: LSU and Dr Juan Lorenzo featured on WAFB about testing Louisiana's Levees

http://twitter.com/#!/LSUGeology/status/83269797546180608

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7. Open positions:

7.1. Electromagnetic Geophysicist at Sandia National Laboratories, Albuquerque, NM

The Geophysics and Atmospheric Sciences Department of Sandia National Laboratories is seeking applicants for an Electromagnetic Geophysicist. Technical activities cover the spectrum from theory to application, including algorithm development, computer modeling, data inversion, instrumentation development, and field demonstration. Position will require some fieldwork and limited travel.

The position requires a Ph.D. in geophysics, geological engineering, electrical engineering, or physics (electromagnetics emphasis) from a leading post-graduate institution. The candidate must be expert in the application of electromagnetic techniques for subsurface exploration with proficiency in numerical simulation and inversion of electromagnetic fields for three-dimensional targets and geology. Must have experience in scientific programming in C, C++ and/or Fortran. Experience in both theory and application of complementary geophysical techniques, especially seismic, is desired. The candidate must have demonstrated the ability to produce quality research through a record of peer-reviewed journal articles and public presentations in the area of electromagnetics,

as well as to provide technical leadership in the program areas described above. Effective organizational, multi-tasking and communication skills are essential as well as the ability to obtain and maintain a DOE security clearance.

To apply for this position go to Sandia's Careers site on www.sandia.gov and search for the Keyword geophysics. The job ID is 638324. Sandia National Laboratories is an Equal Opportunity Employer M/F/D/V.

7.2. Two Environmental Geophysicist Postdoctoral Fellow Positions at Lawrence Berkeley National Laboratory

Permafrost Dynamics and Associated Hydrological and Biogeochemical Impacts

The Earth Sciences Division of Lawrence Berkeley National Laboratory is seeking applications for two Postdoctoral Fellows to develop and implement methodologies for monitoring complex near subsurface processes using geophysical methods. The Postdoctoral Fellows will work with a multi-disciplinary group of scientists to quantify the geophysical signatures of coupled hydrological-geomechanical-biogeochemical processes associated with carbon cycling in permafrost environments that are manifested at the pore to landscape scales. The project is part of a multi-institutional collaboration focused on understanding terrestrial ecosystem processes and feedbacks to climate (see below).

We seek two motivated postdoctoral candidates to participate in experimental, numerical and theoretical environmental research. Both positions require an outstanding record of original and high-quality research as well as demonstrated experience with and enthusiasm for shallow subsurface characterization and monitoring using geophysical datasets. Essential for the position is a Ph.D. in geophysics, earth sciences, geology, or engineering and experience with laboratory or field data acquisition and interpretation. Desired is a familiarity with hydrogeophysical and biogeophysical approaches and an interest in working with a multi-disciplinary team to understand complex near subsurface processes. Additional essential and desired characteristics associated with the two positions are provided below.

Postdoctoral Position #1 - This position will focus on laboratory core to meso-scale experiments to explore geophysical (seismic/electrical/radar), geomechanical, hydrological, geochemical and microbiological changes during simulated permafrost degradation processes. The successful candidate will play an important role in instrument and experimental design, performing laboratory experiments, and interpreting the diverse datasets. Essential for this position is expertise in geophysics and/or geomechanics and a track record of performing successful laboratory experiments. A background in hydrology, geochemistry or microbiology is preferred but not required.

Postdoctoral Position #2 - This position focuses on the use of field datasets for quantifying the spatiotemporal distribution and nature of shallow hydrological and biogeochemical processes associated with permafrost degradation in Arctic environments. Essential for this position is expertise in acquisition, inversion, and interpretation of near surface geophysical field datasets, with a particular emphasis on the use of surface ground penetrating radar and complex resistivity attributes. Interpretation is expected to be based on field geophysical data constrained by (or integrated with) point thermophysical, hydrological, and biogeochemical field measurements as well as laboratory experimental results.

For more information about the LBNL Environmental Geophysics Group, please visit http://esd.lbl.gov/departments/geophysics/core_capabilities/environmental_geophysics.html.

For more information about the project and multi-institutional collaboration, please visit http://ngee.ornl.gov/.

To apply, please visit http://jobs.lbl.gov and reference Geological Postdoc Fellow posting #73191

To contribute material to the NS-letter send an e-mail to:
Xavier Comas xcomas@fau.edu
DEADLINE: Material must be received 2 full business days prior to the first of each month.

GUIDELINES FOR SUBMISSIONS: All members are welcome to submit content of interest to the NS community. Please keep messages brief and provide contact information and (if available) a web address for additional information. AGU requests formatting of e-mail messages to be as simple as possible (no bold characters (use ALL CAPS instead), no color font, or other special formatting of text and paragraphs). E-mail attachments cannot be distributed