American Geophysical Union

Near-Surface Geophysics Focus Group (NSFG)
Newsletter: July 2016

In Brief:

Recent announcements of interest to the near-surface community (conferences, academic positions, graduate student opportunities, etc.) can be found on the AGU Near-Surface Geophysics Focus Group website.

Early career scientists: Check out the NSFG early career website.

Follow NSFG on Facebook and Twitter @NS_AGU!

1. AGU Updates

1.1 Submit Your Abstracts for 2016 Fall Meeting

The abstract submission site is now open. Submit your abstract by 27 July for your chance to be a Fall Meeting VIP. The final deadline for abstracts is 3 August.

Primary and cross-listed Near-Surface Geophysics sessions include the following:

- NS001: Advances in Exploration Geophysics
- NS002: Advances of Airborne Survey in Near Surface Geophysics: From Geologic Framework Studies to Hazard Investigation
- NS003: Frontiers of Uncertainty Estimation in Geophysical Inversion
- NS004: Geophysical and Geotechnical Constraint on Geomechanical Models of Hydraulic Fractures
- NS005: Geophysical Characterization of Cold Regions Hydrology and Permafrost Dynamics
- NS006: Geophysical Methods for Groundwater Evaluation and Management
- NS007: Geophysics in Laboratory Meter-Scale Experiments
- NS008: Innovative Applications of Geophysics to Agriculture for Environmental and Economic Sustainability
- NS009: Integrating Surface Geophysical Methods into Multi-scale Investigations of Surface and Groundwater Connectivity
- NS010: Near-Surface Applications to Soil Processes and Dynamics
- NS011: Near Surface Geophysics General Contributions
- NS012: Time-Lapse Geophysical Studies in Coastal Areas
- ED003: Approaches That Facilitate Learning in Applied Geophysics
- GP004: Electromagnetic Imaging of Natural and Engineered Fracture Systems
- H006: Advances in Petrophysics for Hydrogeophysics and Near Surface Geophysics
- H012: Advancing Ecohydrology with Geophysics

1.2 Share Your Science at Exploration Station During Fall Meeting

Exploration Station is an annual event that takes place at AGU's Fall Meeting. It provides a venue for the local community and AGU members to come together to share the excitement of science. The event is an open house for San Francisco families, teachers, and children (as well as Fall Meeting attendees and their families) to learn about the exciting work currently occurring in Earth and space sciences. During the event, participants have a chance to meet scientists, do hands-on science, and take home fun resources collected during their visit. If you're interested in presenting at Exploration Station, please read our FAQ and email exploration-station@agu.org by **22 August 2016.** All costs (exhibitor space, electricity, wireless internet) for the event other than shipping and handling of materials are covered by AGU. Watch the video or read this *Eos* article to learn more about getting engaged with the public at Fall Meeting.

1.3 Opportunity to Share Your Work with K–12 Educators at the GIFT Workshop During Fall Meeting

We are now accepting proposals from teams of at least one scientist and one education specialist to present during the Geophysical Information for Teachers (GIFT) Workshop at AGU Fall Meeting. This workshop enables scientists to work closely with an education specialist to develop and share material with K–12 teachers and informal educators. Check out material from our 2015 workshop to get some ideas. Each team of presenters will receive one free full-week registration to the AGU Fall Meeting. Note

this is in addition to the free registration to AGU for all K–12 educators. Applications are now open and due **31 August 2016**.

Questions about the GIFT workshop? E-mail us at GIFT@agu.org.

1.4 Help NSFG Benefit from the AGU Section and Focus Group Incentive Program!

Please consider giving to AGU so that NSFG can take advantage of the 2016 Donor Incentive Program. This tax-deductible gift will not only assist AGU but will support our focus group's initiatives. If only 5% of our members (i.e., about 20 people) give $50 or more in 2016, AGU will provide NSFG with $1000. If 10% of our members give $50 or more, AGU will provide $3000! Given that we are a small focus group, these extra funds would make a real impact on our efforts in support of students and early career scientists. Any donations to AGU qualify, regardless of which program you are supporting! To learn more, please visit the incentive program website or contact AGU's Development Department via email or 202-777-7434.

1.5 Student Spotlights and Research Highlights

Interested in being highlighted, or know a student who should be? Please email Sarah Morton for more information about the Student Spotlight. Take a look at this month's Student Spotlight on Megan Miller at the end of the newsletter.

We are also seeking research highlights that showcase use of near-surface geophysics in other AGU sections and focus groups. If you are interested in writing a short, one-page highlight, please contact Burke Minsley.

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2. Survey on a Potential National Near-Surface and Critical Zone Geophysics Facility

We would like your input in a short survey on the demand, rationale, and need for a potential national facility for near-surface and "critical zone" geophysics. The survey should only take ~10–15 minutes to complete. You can do so anonymously, or identify yourself if you'd like to be included in future discussions. **NOTE: this survey is not just for geophysicists!** We are especially interested in hearing from those students and researchers who are not expert geophysicists but would like to have access to near-surface geophysical instrumentation, software, and expertise. Some context on the survey is included below, but if you prefer to just go straight to the survey, you can find it here.

The University of Wyoming/Wyoming Center for Environmental Hydrology and Geophysics (WyCEHG) will be part of the Incorporated Research Institutions for Seismology (IRIS) team that is writing a proposal in response to the National Science Foundation's (NSF) solicitation for Management and Operation of the National Geophysical Observatory for Geoscience (NGEO). The solicitation specifically mentions "near-surface and critical zone geophysics" as a "frontier capability" of interest. **We believe that this solicitation, and the partnership with IRIS, represents a major opportunity to expand access to and use of near-surface geophysics in a broad range of Earth science disciplines.** A partnership between the University of Wyoming and IRIS can leverage an existing facility of near-surface geophysical instrumentation recently established by a Research Infrastructure Improvement grant from the NSF Experimental Program to Stimulate Competitive Research (EPSCoR). A list of the current instrumentation in the WyCEHG facility can be found here.

If a national facility comes to fruition, our goals are to make it widely available and responsive to the needs of the user community, including both near-surface geophysicists and also, importantly, users in allied disciplines, from soil science to hydrology. Although many details remain to be worked out, we expect that the facility will be governed by a steering committee drawn from representatives of these fields.

With this survey we hope to assess demand for the instrumentation and services that might be provided by a national facility for near-surface geophysics. Your answers will help guide planning efforts for such a facility. Thanks for taking a few minutes to share your ideas—and if you have any questions or comments, please feel free to contact Steve Holbrook.

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3. Journal Information and Special Issue Call for Papers

3.1 Special Monograph on Levees and Dams: Advances in Geophysical Monitoring and Characterization

This peer-reviewed volume will inform policy makers, engineers, and Earth scientists about the current and emerging role of geophysics in addressing environmental processes, assessments, and policy directions related to new and existing dams and levees.

Until recently, much of the focus of geophysicists has been confined to characterization and remediation, without consideration of the complex relationship between natural processes (e.g., floods) and human activities associated with the design and ongoing dependence on these structures. It is important to enhance communications between geoscientists, engineers, and policy makers to improve the way in which these structures are managed.

Over time, unexpected changes in the physical properties of these man-made structures may or may not compromise their integrity, and such questions require creative (and preferably noninvasive) assessment approaches. Monitoring and remediation of existing structures can be challenging because, often, failures are at a smaller scale and recertification procedures are at a larger scale than envisaged during construction or planning. New, efficient risk management approaches may benefit greatly from geophysical methods that can address these scaling issues.

We encourage innovative and substantiated geophysics-related ideas. Potential topics include, but are not limited to, placement of geophysical tools within the management policies of levees and dams; small and midsized laboratory experimental approaches; field characterization studies using electromagnetic, seismic, potential field, and integrated methods; inverse modeling; regional overviews as conditioned by climatic zones; statistical analyses and tools for improved management processes such as age strengthening or weakening of structures; and monitoring of important processes such as piping and fluid flow.

We expect the monograph to include 10–20 book chapters, each about 8–20 printed pages in length, containing color and/or black-and-white figures and tables.

Timetable: Submission deadline: 1 October 2016; Reviews and final manuscript: 1 April 2017; Expected publication: October 2017.

For suggestions on manuscript preparation, please see the Springer submission guidelines. Upon submission of manuscript (email), please include the contact information for four potential reviewers.

Juan M. Lorenzo and William E. Doll, Editors. For all correspondence, please email gllore@lsu.edu, Subject: DAL

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4. Tech-Transfer Courses and Training

4.1 Multichannel Analysis of Surface Waves (MASW) Workshop

Dates: 14–15 July 2016
Registration cost: free
Location: Kansas Geological Survey, Lawrence, Kans.
Website

This free 2-day MASW workshop will provide an opportunity for geoprofessionals, geoscientists, and graduate students to gain knowledge about data acquisition, analysis, and interpretation of the seismic Rayleigh surface waves. The learning process will be facilitated by the use of SurfSeis software. The workshop is designed to address the current approaches for analyzing seismic data from both active and passive sources to obtain shear wave velocity (V_s) estimates for the near surface.

On day 1, a theoretical overview of the MASW method (active and passive) will be presented, participants will be familiarized with the SurfSeis software package, and field data acquisition from both active and passive sources is scheduled to take place (weather permitting).

Day 2 will continue with the theoretical MASW overview covering surface wave inversion, multimode interpretation and inversion, inversion sensitivity, use of a priori information, the quality of inversion results, and the latest advancements for dispersion curve imaging, such as the HRLRT, challenging dispersion curve patterns, and more. Seismic data acquired on day 1 will be analyzed. Participants are encouraged to bring samples of their own data for discussion, as time permits.

Attendees are expected to bring their own laptops.

5. Upcoming Conferences and Workshops

5.1 Meetings Overview

Meeting (click to go to website)	Location	Meeting Dates	Submission	Registration
Asia Oceania Geosciences Society 13th Annual Meeting	Beijing, China	31 July to 5 August 2016	*Closed*	*Open*
ASEG 25th International Geophysical Conference and Exhibition	Adelaide, Australia	21–24 August 2016	*Closed*	Standard Registration ends: 31 July 2016
35th International Geological Congress (IGC)	Cape Town, South Africa	27 August to 4 September 2016	*Closed*	*Open*
EAGE Near Surface Geoscience 2016	Barcelona, Spain	4–8 September 2016	*Closed*	Early registration ends: 15 July 2016
Geological Society of America Annual Meeting	Denver, Colorado	25–28 September 2016	12 July 2016	Early registration ends: 22 August 2016
Society of Exploration Geophysicists Annual Meeting	Dallas, Texas	16–21 October 2016	*Closed*	Early registration ends: 18 August 2016
AGU Fall Meeting	San Francisco, California	12–16 December 2016	3 August 2016	*TBA*

6. Position Announcements

6.1 Postdoc in Geophysics and Numerical Methods to Develop 3-D Modeling of Airborne TEM Data

The hydrogeophysics group at the Department of Geoscience at Aarhus University seeks a Ph.D. in applied mathematics, computer science, physics or geophysics for the development of a computer code to model airborne transient electromagnetics (TEM) data in three dimensions. He or she will be part of a group of scientists, engineers, and software developers that develop geophysical instrumentation and numerical modeling software with special focus on airborne electromagnetic methods. In addition to airborne TEM the group does research on the highest level within induced polarization, nuclear magnetic resonance, and hydrological modeling.

All applications must be made online and received by 1 August 2016.

6.2 Groundwater Relief Seeking Geophysicists' Support

The aid sector is spending vast sums of money on groundwater development in order to improve the health and financial development of people living in extreme poverty. However, the aid sector is often lacking in specific technical skills in order to ensure that this work is carried out properly.

Groundwater Relief's purpose is to provide technical support to aid organizations as they develop groundwater resources in order to improve the outcomes of projects. Groundwater Relief provides this support through a membership of groundwater experts.

We are seeking geophysicists to join this membership.

We are currently seeking two geophysicists to support us with an emergency project in Tanzania: An international charity is carrying out a geophysical exploration campaign for a refugee camp on the Tanzania-Burundi border. Groundwater Relief is working with a university to develop remote sensing maps to support the geophysical team based in Tanzania. We need two geophysicists to provide remote help and guidance for the team on the ground.

If this project is of interest, please get in touch with Groundwater Relief by email.

If you are interested in becoming a member of Groundwater Relief, please go to this website and follow the instructions.

6.3 First Quantum Mining Seeks Geophysicist for Latin America

First Quantum Minerals Ltd. is seeking a geophysicist to be based in Santiago (Chile) or Lima (Peru). The candidate would be filling or rapidly growing into a senior role with responsibility for geophysical support to Latin America. Exploration programs run at various stages, sometimes at remote sites and high altitude, using leading-edge technologies and demanding commitment to the highest safety, community, and environmental standards. Jurisdictional responsibilities currently include Chile, Peru, and Argentina, with potential mine-related work in Panama. Regular travel to projects and regional offices will be necessary in order to manage contractors and run field programs and maximize interaction with our South American teams. The role requires the ability to work in Spanish and English in a multicultural environment. The candidate should have a sound geological grounding and understand the business of exploration. First Quantum Minerals provides an environment most suited to a self-starter who questions and challenges ideas and welcomes being challenged back.

The start date is negotiable, depending on identification of the successful candidate, but will commence not later than December 2016. Please contact both Matt Hope and Chris Wijns with expressions of interest.

First Quantum Minerals is a diversified producer and explorer. Outside of Latin America, the company currently operates or explores in Australia, Zambia, Mauritania, Turkey, Spain, Serbia, and Finland.

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7. Student Spotlight: Megan Miller, Arizona State University

Hailing from Arizona State University (ASU), Megan M. Miller is a Ph.D. student and research assistant in the Remote Sensing and Tectonic Geodesy Laboratory (RaTLab) led by Professor Manoochehr Shirzaei. Megan is keenly interested in understanding the mechanics behind deformational processes and where they originate. She combines interferometric synthetic aperture radar (InSAR), GPS, and borehole and piezometer data with inverse and poroelastic theory to investigate anthropogenic and natural phenomena. She was recently awarded the NASA Earth and Space Science Fellowship to support her project, "Remote Sensing of Land Subsidence and Hydrological Properties Across Arizona." Only 17% of this year's applicants were accepted to receive this award within the competitive Earth Science Research program. Megan is currently leading a similar project with principal scientist Simon Cox at GNS Science in New Zealand as part of the NSF East Asia and Pacific Summer Institute (EAPSI) graduate fellowship program. The EAPSI program provides travel funds and a summer stipend for graduate students to conduct a research project at an international research institution of their choice. Her proposed project uses InSAR datasets from the 2010 Canterbury earthquakes to understand the interaction between aquifer systems and seismic faults in relation to changes in elastic storage and water management problems.

One trait Megan shares with other geoscientists is a passion for exploring the outdoors. This hobby drives her curiosity about the geomorphic processes that shape the landscape; however, her hiking trails did not initially lead her to a geoscience university program. Megan actually completed her first bachelor's degree in economics from ASU in 2004 and pursued a career as a stock broker. After several years, Megan's inquiring mind and interests in Earth science surpassed her business ambitions, and she quickly enrolled in the geological sciences undergraduate program. She recalls her geophysics course as being especially enjoyable, and it turned into one of the motivating factors for her to continue in this growing field. After finishing her degree in 2013, she eagerly enrolled in the ASU graduate program and started down her new path in near-surface geophysics.

Her strong ambitions and intellect helped her produce enough material to present a poster at the 2013 AGU Fall Meeting after only one semester as a graduate student. She has since given an oral presentation in 2014, the results of which were published in 2015 in *the Journal of Geophysical Research: Solid Earth*. Then at AGU in 2015, she received one of five Outstanding Student Paper Awards for the Near-Surface Geophysics Focus Group for her poster presentation titled "Spatiotemporal Distribution of Strain Field and Hydraulic Conductivity at the Phoenix Valley Basins, Constrained Using InSAR Time Series and Time-Dependent Models" (NS43A-1950). For this work, Megan observed anthropogenic land subsidence in the Phoenix valley after she analyzed different hydrologic parameters to generate an elastic aquifer model using a time-dependent modeling scheme. She subsequently created a compaction model, which allowed her to produce a three-dimensional distribution of hydraulic conductivities to support ongoing urban planning and management projects in the area.

If you are interested in Megan's work in the Arizona basin or would like to hear more about her New Zealand endeavors, please contact Megan (megan.m.miller@asu.edu).

To contribute material to the NSFG newsletter, send an email to Burke Minsley.

Deadline: Material must be received five full business days before the first of the month.

Guidelines for submissions: All members are welcome to submit content of interest to the near-surface community. Please keep messages brief and provide contact information and (if available) a Web address for additional information.

Get your message out to NSFG members faster.

You no longer need to wait until the end of the month to share an important or time-sensitive contribution to the newsletter. Appropriate contributions to the newsletter will also be shared ASAP via Twitter. Please note that only NSFG members who follow @NS_AGU will receive Twitter announcements, so make sure that you sign up!