



American Geophysical Union
Near-Surface Geophysics Focus Group (NSFG)
Newsletter: September 2015

In brief:

1. AGU Updates

- 1.1 New Addition to the NSFG Newsletter: Research Highlights
- 1.2 New Fall Meeting Undergraduate Mentoring Program
- 1.3 Virtual Poster Showcase
- 1.4 Request for Photos

2. Journal Information and Special Issue Call for Papers

- 2.1 *Earth's Future*: Now Indexed in Web of Science

3. Tech-Transfer Courses and Training

- 3.1 Multichannel Analysis of Surface Waves (MASW) Workshop

4. Upcoming Conferences and Workshops

- 4.1 Meetings Overview

5. Position Announcements

- 5.1 Postdoctoral position: Electrical geophysics/hydrogeophysics at Rutgers University–Newark
- 5.2 Two Ph.D. positions in the field of hydrogeophysics at the Forschungszentrum Jülich, Germany
- 5.3 Environmental geophysicist position at Lawrence Berkeley National Laboratory

6. Research Highlight: Cryosphere Geophysics, by Andy Parsekian

Recent announcements of interest to the NS community (conferences, academic positions, graduate student opportunities, etc.) can be found at 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 New Addition to the NSFG Newsletter: Research Highlights

We've added a new section at the end of the newsletter that will highlight research from the near-surface geophysics community. Our first highlight is by Andy Parsekian, the NSFG early career representative, who describes his recent geophysical work to measure unfrozen sediments beneath lakes on Alaska's North Slope.

Contact [Burke Minsley](#) if you are interested in contributing a research highlight for a future newsletter. We are especially looking for examples that illustrate the breadth of near-surface geophysics that is being applied to other AGU Sections and Focus Groups.

1.2 New Fall Meeting Undergraduate Mentoring Program

AGU is piloting a program at the 2015 Fall Meeting that will pair a subset of undergraduate Fall Meeting attendees with more-experienced attendees for an in-person mentoring experience, and we are currently recruiting [mentors](#). Mentors do not necessarily need to be senior scientists or AGU awardees or honorees; the most important requirements are that the mentor has attended at least one Fall Meeting before, shares the students' research and scientific interests, and has knowledge and experience that will be useful to the student. Learn more at <http://education.agu.org/undergraduate-students/agu-fall-meeting-undergraduate-mentoring-program/>.

1.3 Virtual Poster Showcase

A new and exciting opportunity for your undergraduate and graduate students to showcase their work is now available. Although many college students conduct research with faculty in organized summer programs or as part of their course work or degree work, they often face barriers to traveling to present that research, especially at national conferences. The [Virtual Poster Showcase](#) will allow participation by those students who can't travel. AGU is piloting [three opportunities](#) for an undergraduate and graduate Virtual Poster Showcase this fall. Contact [Pranoti Asher](#) (AGU Education and Public Outreach Manager) for more information.

1.4 Request for Photos

Have you been to the field this summer? Send your photos to student representative [Sarah Morton](#) (smorton@kgs.ku.edu) to be displayed on the [NSFG Facebook page](#) and new [focus group webpage](#) with a short caption about your work!

2. Journal Information and Special Issue Call for Papers

2.1 *Earth's Future*: Now Indexed in Web of Science

The AGU open access journal *Earth's Future* has been accepted for future indexing in Thomson-Reuter's Web of Science. Although the official impact factor won't be available for a few years, articles from the journal have already received high citations and altmetrics scores. Since the journal's inception in 2013,

Earth's Future articles have reached a broad global audience, with 112,000+ visits and 86,000+ full article downloads. *Earth's Future* is a transdisciplinary journal exploring global change and sustainability.

- [Learn more and submit a manuscript.](#)
- [Read an *Eos* article about *Earth's Future*.](#)
- [Sign up for email alerts when new articles are published.](#)

View Top-Cited *Earth's Future* Articles

- [An apparent hiatus in global warming?](#)
 - [A geological perspective on sea-level rise and its impacts along the U.S. mid-Atlantic coast](#)
 - [Socio-hydrology: Use-inspired water sustainability science for the Anthropocene](#)
-
-

3. Tech-Transfer Courses and Training

3.1 Multichannel Analysis of Surface Waves (MASW) Workshop

Dates: 5–6 November 2015

Registration cost: free

Location: [Kansas Geological Survey](#), Lawrence, Kansas

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 for obtaining 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 high-resolution linear Radon transform, 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.

4. Upcoming Conferences and Workshops

4.1 Meetings Overview

Meeting (click to go to website)	Location	Meeting Dates	Submission	Registration
<u>Society of Exploration Geophysicists 85th Annual Meeting</u>	New Orleans, Louisiana	18–23 October 2015	<i>Closed</i>	<i>Open</i>
<u>Geological Society of America</u>	Baltimore, Maryland	1–4 November 2015	<i>Closed</i>	Early registration ends: 28 September 2015
<u>3rd International Conference on Engineering Geophysics</u>	Al Ain, United Arab Emirates	15–18 November 2015	<i>Closed</i>	<i>Open</i>
<u>3rd International Workshop on Geoelectrical Monitoring (GELMON 2015)</u>	Vienna, Austria	24–26 November 2015	30 September 2015	Early registration ends: 15 October 2015
<u>AGU Fall Meeting</u>	San Francisco, California	14–18 December 2015	<i>Closed</i>	Early registration ends: 12 November 2015
<u>2nd SEG/DGS Workshop: Near-Surface Modeling and Imaging</u>	Manama, Bahrain	6–7 March 2016	<i>Closed</i>	September 2015
<u>SAGEEP 2016</u>	Denver, Colorado	20–24 March 2016	<i>TBA</i>	<i>TBA</i>

5. Position Announcements

5.1 Postdoctoral position: Electrical geophysics/hydrogeophysics at Rutgers University–Newark

The Near-Surface Geophysics group at Rutgers University–Newark is looking to appoint a postdoctoral scientist in electrical hydrogeophysics with an anticipated start date of 1 October 2015. The project primarily involves laboratory and field-based research on the electrical geophysical signatures resulting from byproducts associated with the degradation of chlorinated solvents induced by active remediation strategies. The appointee will also be expected to contribute to other ongoing near-surface geophysics projects in the group as needed. A strong background in electrical resistivity, induced polarization and spectral induced polarization is preferred. Expertise in laboratory petrophysics or field-scale measurements and inverse methods is required. The position is initially for one year with a possibility for an extension.

The Near-Surface Geophysics group at Rutgers University–Newark currently consists of four full-time faculty in near-surface geophysics and a diverse group of graduate students. Rutgers University–Newark is located in northern New Jersey, just 20 minutes from New York City by public transport. Contact [Lee Slater](#) for further information about the position.

5.2 Two Ph.D. positions in the field of hydrogeophysics at the Forschungszentrum Jülich, Germany

- Large-scale EMI and GPR hydrogeophysical soil characterization (reference number D115/2015)
- Weathering front characterization with EMI and GPR in Chile (reference number D116/2015)

In the IBG-3, advanced modeling and inversion algorithms are developed and applied for a wide range of hydrogeophysical studies using electromagnetic induction (EMI) and ground penetrating radar (GPR) systems.

The Ph.D. position on “Weathering front characterization with EMI and GPR in Chile” is part of the interdisciplinary DFG Priority Program “Earthshape: Earth Surface Shaping by Biota.” The primary objective of this project is to apply and extend existing EMI and GPR data processing algorithms for the characterization of the weathering front on different hillslope sites along coastal Chile.

The Ph.D. position on “Large-scale EMI and GPR hydrogeophysical soil characterization” is part of the BMBF-funded project “Soil3” on sustainable subsoil management. The primary objective of this project is to extend and apply existing large-scale EMI and GPR data processing algorithms for the time-lapse characterization of the top- and subsoil of long-term agricultural field experimental sites.

A significant part of the projects consists of fieldwork with state-of-the-art multichannel EMI and GPR systems. Both projects offer a unique opportunity to connect novel processing and inversion techniques to interdisciplinary data in a state-of-the-art computational environment.

Requirements:

- University degree in geophysics, physics, electrical engineering, computational geoscience, or related natural sciences with a good final grade.
- Geophysical fieldwork experience, preferably with EMI and/or GPR.
- Advanced knowledge of numerical methods.
- Experience in (Matlab) programming.
- Strong English writing and communication skills.

We offer:

- An interdisciplinary environment, as well as excellent facilities for hydrogeophysical research and numerical simulation and inversion studies.
- Opportunities to be part of the national and international scientific community.
- Opportunities for educational enrichment. Ph.D. students are encouraged to attend international conferences and a three-month research stay abroad with a cooperating partner is planned.

For further information, please contact Prof. Jan van der Kruk, email: j.van.der.kruk@fz-juelich.de or visit our webpage www.fz-juelich.de/ibg/ibg-3.

Please send your application—including the reference number—with the relevant documentation to: Mr. K. Beumers, Institut für Bio- und Geowissenschaften, Forschungszentrum Jülich GmbH, 52425 Jülich, Germany

Email: k.beumers@fz-juelich.de

5.3 Environmental geophysicist position at Lawrence Berkeley National Laboratory

The [Earth and Environmental Science Area](#) of Berkeley Lab is seeking applications for a career track geological scientist specializing in environmental geophysics. Scientists in this area conduct basic and applied research focused on hydrogeological, geochemical, and biological processes that are important for climate change, carbon cycling, environmental stewardship, and subsurface energy resources.

This career track environmental geophysics position is focused on developing new approaches to integrate diverse data sets (including geophysical data collected from surface and UAV-based platforms) and use of information to interpret complex terrestrial environment behavior. Essential for this position is demonstrated experience in the acquisition, inversion, and integration of hydrogeophysical and remote sensing data sets and knowledge of terrestrial system processes that govern water flow and biogeochemical cycles.

To apply, visit <http://jobs.lbl.gov> and reference the Job Number (81279).

6. Research Highlight: Cryosphere Geophysics, by Andy Parsekian

As the featureless expanse unfolds ahead of my snowmobile, the snow-covered tundra looks like a downy softy blanket—but it is not. Instead, the frozen surface feels more like stiff Styrofoam, jarring the ride. I absorb the bumps by holding my legs in a partial crouch. The loaded train of sleds that I'm towing leaves only a trail of shallow scratches in the hard snow.

This part of the world is arguably changing faster than most areas under a warmer climate, and it is essential to gather data on the subsurface to understand how permafrost is now releasing carbon that has been trapped for eons. Geophysicists have investigated the cryosphere for decades. However, borehole data from Alaska's Arctic is lamentably sparse and making direct measurements of the subsurface is strikingly challenging. Today, modern instrumentation, computing power, and analysis software means that we are now, more than ever, gathering the data permafrost scientists need to predict the future of these systems.

This past spring I traveled along with a Ph.D. student to Alaska's North Slope, where we met colleagues from the University of Alaska Fairbanks and the USGS. The main objective here was to make ground penetrating radar (GPR) and surface nuclear magnetic resonance (NMR) measurements of thawed sediments below lakes. The main event was a 300 km-long traverse by snowmobile, starting at the Toolik Field station and ending at the coast of the Arctic Ocean, during which we crossed dozens of lakes. The GPR revealed dipping sedimentary bedding structures in lake sediments, a clue that may help to understand the origin of the sharply variable bathymetry.

There are only a few ways to measure deeper into the thawed lake bottoms: In rare cases direct probing can detect the maximum extent of thaw, and recently airborne electromagnetic geophysics have proved effective for this purpose. In this case, we chose to use surface NMR since the unambiguous measurement of liquid water content gives us high confidence in interpreting the deepest extent of thaw. These measurements on drained lake basins, floating-ice lakes, and grounded ice lakes revealed differences in thaw depths, and in some cases, isolated thawed sediments deep below the terrestrial surface.

Using geophysics to measure properties of thawed permafrost teaches us about an important below-ground dimension of the cryosphere that is often out of view. With measurements like these, we hope to contribute to a new understanding of Arctic system change. Check out <http://www.articlakeice.org> to meet the rest of the team and find more information on Arctic lakes research.



Ph.D. Student Andrea Creighton (left) and the author (right) running the surface NMR inside a tent on the North Slope, Alaska



Setting up the GPR on a snowmobile to profile lake-bottom sediments

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 NS community. Please keep messages brief and provide contact information and (if available) a Web address for additional information.

Get your message out to NS 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!