

September 2010 Newsletter of the AGU Near-Surface Focus Group

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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 September 2010:

Primary affiliation: 680 members; Secondary: 2843 members

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1. Message from the new Chair of the Near-Surface Geophysics Focus Group Louise Pellerin

In looking over Lee's parting message to the NSFG many things came to mind; first a special thanks to Lee Slater, past chair, for all his work in shepherding the NSFG in a short period of time from a fledgling focus group to a stable and well-recognized part of the AGU. We also had the good fortune of forming the NSFG as AGU governance was being restructured, and we now are voting members of the AGU Council. As Lee mentioned, the work of many dedicated members made this possible, and I want to share with Lee my gratitude and appreciation for those who have given their service in the past, will do so in the future, and those new to the NSFG leadership. We still have informal liaisons with AGU hydrogeophysics, EEGS and SEG, but have added Asian, European and South American Representatives along with the role of past chair to the Executive Committee – so we are keeping Lee in the leadership for a couple more years! Feel free to contact any of us.

AGU Near Surface Focus Group 2010-11 Executive Committee

Chair Louise Pellerin, Green Engineering, [pellerin@ak.net](mailto:pellerin@ak.net)

Vice-Chair George Tsoflias, University of Kansas, [tsoflias@ku.edu](mailto:tsoflias@ku.edu)

Secretary Rhett Herman, Radford University, [rherman@radford.edu](mailto:rherman@radford.edu)

Past Chair Lee Slater, Rutgers University, [lslater@andromeda.rutgers.edu](mailto:lslater@andromeda.rutgers.edu)

Newsletter Editor Xavier Comas, Florida Atlantic University, [xcomas@fau.edu](mailto:xcomas@fau.edu)

Web Editor Juan Lorenzo, Louisiana State University, [gllore@lsu.edu](mailto:gllore@lsu.edu)

Student Representative Seth Campbell, University of Maine-Orono, [seth.campbell@umit.maine.edu](mailto:seth.campbell@umit.maine.edu)

Fall Meeting Program Representative Chester Weiss, Virginia Tech, [cjweiss@vt.edu](mailto:cjweiss@vt.edu)

EOS Representative Seth S. Haines, U.S. Geological Survey, [shaines@usgs.gov](mailto:shaines@usgs.gov)

Asian Representative Qi You Zhou, Nanjing University, [zhouqy@nju.edu.cn](mailto:zhouqy@nju.edu.cn)

European Representative Niklas Linde, Universite' de Lausanne, [Niklas.Linde@unil.ch](mailto:Niklas.Linde@unil.ch)

South American Representative Juan Lorenzo, Louisiana State University, [gllore@lsu.edu](mailto:gllore@lsu.edu)

Last year 22% of our membership contributed to the NSFG. Our corporate sponsors supported 30 students to attending the NS Luncheon at the fall meeting. The AGU is launching a fundraising campaign 'Science for Humanity', which resonates with NS. A strong response from our members and corporations will allow us to support students at NSG's Fall Meeting social/networking events, and through Fall Meeting registration, and travel grants. Supporting the 'Science for Humanity' campaign supports our future.

Some current statistics:

Total AGU Membership 55,472

Primary NS Membership 680 (1.23%), of which 231 are student members

Secondary NS Membership 2,843 (5.13%)

Louise Pellerin, NSFG Chair

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## 2. Message from the new Near-Surface Geophysics Focus Group Student Representative Seth Campbell

I'm excited to join the executive committee of the NSFG as the student representative beginning this September. I am a 1st year PhD student at the University of Maine and I primarily use geophysics for glaciological, permafrost, and Army research. I've been a college student for 13 years and there is running joke at UMaine of whether I'll gain tenure because I've been a student for so long! This said, I've also worked for a variety of science and geophysics organizations over the past decade. My experiences have provided a unique glimpse at the options available for geophysics students both in the educational and professional realm. As the new student representative, my primary goal is to help foster and grow connections between NSFG students and the professional world. I look forward to working with each of you over the next two years and will start posting my plans and ideas on the WIKI in the near future. Please feel free to contact me at any time. Best wishes,

Seth W. Campbell, NSFG Student Representative

[seth.campbell@umit.maine.edu](mailto:seth.campbell@umit.maine.edu); [http://climatechange.umaine.edu/people/directory/profile/seth\\_campbell](http://climatechange.umaine.edu/people/directory/profile/seth_campbell)

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## 3. NS activities at the Joint Assembly Meeting of the Americas (from Juan Lorenzo)

Almost 2200 abstracts were presented at the Joint Americas Meeting between Monday and Thursday, August 9-12, 2010. Everyone agreed that the waterfalls were the most spectacular of both American continents and provided a stimulating backdrop to many scientific discussions.

During the first two days of the meeting, seven (7) Near Surface Geophysics sessions were held for a total of 73 oral presentations and poster displays. We must give recognition and thanks to all the presenters, students, invited speakers and conveners for their effort in making the meeting a success. In particular, the last session ("Radioactivity in the Near-Earth Surface Environment") was held jointly with five other sections and highlights the strong interdisciplinary nature of near-surface geophysics. Among the hallway conversations there was a sense of growth of the near-surface geophysics community and opportunity to continue growing and better defining our role by reaching out to near-surface workers in sister societies. Two sessions (poster-4 and oral) on "Mapping and monitoring of the near-surface" were convened by L. Sebastien and E.C. Slob. Invited speakers M. Van Genuchten and F. André led 6 presentations of the oral session. "Near Surface geophysics general contributions" (with 27 posters) was convened by Juan M. Lorenzo Jandyr Travassos. Two sessions (poster-11 and oral) on "Technological developments in near-surface environment", (with 11 posters) were convened by S.L. Fontes. Three out of the 7 speakers were invited: L. A. Gallardo, C.M. Sainato, S. Urquhart and A. Ustra. Two sessions (poster-11 and oral) on "Radioactivity in the near-surface environment", were convened by J Oliveira and F. Brenha Ribeiro Three of the 7 oral presentations were invited: H. Bokuniewicz, M. Schubert, D.M. Bonotto.

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## 4. 2010 Fall AGU Meeting abstract deadline: 2 September 2010

### 4.1. Near-Surface Geophysics sessions (from Chester Weiss)

Proposed Near-Surface Geophysics sessions for the 2010 AGU Fall Meeting (<http://www.agu.org/meetings/fm10/>)  
Abstract deadline: 2 September 2010

NS01: Near-Surface Geophysics General Contributions

Conveners: Chester Weiss, Virginia Tech, [cjweiss@vt.edu](mailto:cjweiss@vt.edu); Leif Cox, Montana Tech, [lcx@mtech.edu](mailto:lcx@mtech.edu)

NS02: Inversion II: Uncertainty and Managing the Unknown

Cosponsors: Geomagnetism and Paleomagnetism, Hydrology, Mineral and Rock Physics, Nonlinear Geophysics, Seismology

Conveners: Behnam Jafarpour, Texas A&M University, [behnam@pe.tamu.edu](mailto:behnam@pe.tamu.edu)

Description: Subsurface characterization and modeling play a central role in effective exploitation of underground hydrological, mineral, and energy resources. Inverse modeling is commonly applied to infer the spatial distribution of rock physical properties from indirect and incomplete measurements. This session encourages new contributions in inverse modeling methods to: 1) improve solution stability, non-uniqueness, and computational complexity, 2) reconcile data and model resolutions, 3) incorporate prior uncertainties, 4) combine data with different coverage, resolution, and accuracy, and 5) quantify forecast uncertainties.

NS03: Biogeophysics: Towards Modeling of Geophysical Signatures of Microbial Processes in the Earth

Cosponsors: Biogeosciences, Cryosphere, Global Environmental Change, Geomagnetism and Paleomagnetism, Hydrology, Mineral and Rock Physics, Seismology

Conveners: Lee Slater, Rutgers-Newark, [lslater@andromeda.rutgers.edu](mailto:lslater@andromeda.rutgers.edu); Estella Atekwana, Oklahoma State University, [estella.atekwana@okstate.edu](mailto:estella.atekwana@okstate.edu)

Description: Biogeophysics deals with the geophysical signatures of microbial processes in the Earth. We invite contributions that offer new insights into the linkages between geophysical signatures and microbial processes that may support the development of model frameworks. We welcome observation-based contributions across a wide range of length scales - from individual cells, biofilms and up to field-scale signatures. We particularly encourage theoretical, numerical and/or conceptual model developments, along with novel applications such as those found in remote or extreme environments, carbon sequestration and methane hydrates exploration.

NS04: Joint Interpretation of Different Geophysical Data for Natural Resources Characterization

Cosponsor: Seismology

Conveners: Tim Seher, Massachusetts Institute of Technology, [seher@mit.edu](mailto:seher@mit.edu); Michael Commer, Lawrence Berkeley National Laboratory, [mcommer@lbl.gov](mailto:mcommer@lbl.gov)

Description: Joint inversion of complementary field data is important for (at least) two reasons: First, the combined sensitivities help create more detailed and reliable subsurface models. Second, the joint analysis of different geophysical data can be used to estimate rock physical parameters. Indeed, parameters like fluid saturation, permeability, fracture density or porosity are often more interesting than the geophysical attributes themselves. Quantitative data integration is an area of active research. This session aims to bring together geophysicists from academia and industry to present the state-of-the art in data integration and to define the main challenges for future research.

NS05: Airborne Geophysics for Geohazards and Environmental Problems

Cosponsors: Geodesy, Geomagnetism and Paleomagnetism, Hydrology, Natural Hazards, Seismology, Volcanology, Geochemistry, and Petrology

Conveners: Shigeo Okuma, Geological Survey Japan, AIST, [s.okuma@aist.go.jp](mailto:s.okuma@aist.go.jp); Maria Deszcz-Pan, USGS, [maryla@usgs.gov](mailto:maryla@usgs.gov)

Description: Airborne geophysics maps large, remote and/or rugged terrain, making it an efficient and effective tool for volcano, earthquake and landslide hazard studies as well as environmental problems such as hydrogeological characterization. Gravity, magnetic, EM, radiometric, spectral and thermal instruments are typically mounted on helicopters and fixed wing aircraft, but instrumentation on unoccupied aerial vehicles is increasing. Airborne monitoring and repeated measurements are suitable for detecting temporal and spatial variations related to geohazards and environmental problems. We invite case histories and studies that are advancing the developments of instrumentation, processing, and modeling of airborne geophysical data.

NS06: Inversion I: Back to Basics

Cosponsors: Geomagnetism and Paleomagnetism, Mineral and Rock Physics, Nonlinear Geophysics, Seismology

Conveners: Thomas Lecocq, Royal Observatory of Belgium, [Thomas.Lecocq@seismology.be](mailto:Thomas.Lecocq@seismology.be); Rhett Herman, Radford University, [rherman@radford.edu](mailto:rherman@radford.edu)

Description: Inversion software is used in almost every branch of geophysics. Many researchers use inversion software written by others which work as 'black boxes' for users. Users adjust parameters to get the final output without fully knowing what the software is doing. We encourage contributions which go back to the basics of inversion so users will have an intuitive knowledge of the software. We encourage submissions such as 'how-to'

tutorial sessions for beginners to invert simple data matrices, and how uncertainty evaluations and even more complex inversions are performed. General inversion models that may handle different types of data are encouraged. Datasets will be available on the AGU-NS focus group website for presenters to use in their examples. We strongly encourage students to submit.

#### NS07: Beyond the Case History: Novel Seismic Methods and Applications

Cosponsors: Seismology

Conveners: Seth Haines, USGS, [shaines@usgs.gov](mailto:shaines@usgs.gov); Juan Lorenzo, Louisiana State University, [gllore@lsu.edu](mailto:gllore@lsu.edu); Thomas Blum, Boise State University, [thomasblum@u.boisestate.edu](mailto:thomasblum@u.boisestate.edu); Andy Lamb, Boise State University, [andylamb@cgiss.boisestate.edu](mailto:andylamb@cgiss.boisestate.edu)

Description: Seismic methods can offer a wealth of information in near-surface studies and new developments provide improved characterization of a range of targets. We seek presentations that demonstrate the potential of seismic methods (P- and/or S-wave reflection, refraction, surface-wave, VSP, or combinations thereof) to provide useful information with bearing on problems in the near surface and beyond. Suggestions include unique methodologies, novel applications, and/or integration with diverse data types. We particularly encourage presentations that include estimation of relevant physical properties and/or that yield results with uncertainty estimates.

#### NS08: The Fractional Calculus of a Complex Earth

Cosponsors: Hydrology, Nonlinear Geophysics

Conveners: Chester Weiss, Virginia Tech, [cjweiss@vt.edu](mailto:cjweiss@vt.edu); Mark Everett, Texas A&M, [everett@geo.tamu.edu](mailto:everett@geo.tamu.edu)

Description: A growing number of seemingly disparate studies in the geosciences have found common ground in their application of fractional calculus as a means to accommodate the intrinsic complexity of geologic materials and processes - especially those problems rooted in transport phenomena and the effect of spatially correlated geologic fabric and textures. This session invites contributions which investigate the link between spatiotemporal geocomplexity, and the language and methods of fractional calculus, particularly as it applies to the inference of rock properties and processes therein from the analysis of geophysical observables. Contributions from laboratory, field-based and theoretical studies are welcome.

#### NS09: Geophysical Studies of Concentrated Animal Feeding Operations (CAFO)

Conveners: Andrew Pilant, US EPA R&D, [pilant.drew@epa.gov](mailto:pilant.drew@epa.gov); Wayne Robarge, North Carolina State Univ., [wayne\\_robarge@ncsu.edu](mailto:wayne_robarge@ncsu.edu)

Description: CAFOs are concentrated sources of multiple human and ecosystem stressors: reactive nitrogen (ammonia, nitrates, methane), phosphorous, fecal matter, bacteria, pharmaceuticals, pesticides, salts and metals. CAFO gases may cause N imbalances and respiratory issues. CAFO effluent leaked from ponds and sprayed on agricultural fields may pollute surface and groundwater, and contribute to fish kills, hypoxia and algal blooms. This session will bring together researchers using geophysical techniques to measure and monitor CAFOs and the pathogens, gas, liquid and solids they produce and emit to the surrounding environment. The goal is to better understand the human and environmental impacts of animal factory farms.

#### 4.2. Hydrogeophysics sessions (from Niklas Linde)

Proposed Hydrogeophysics sessions for the 2010 AGU Fall Meeting (<http://www.agu.org/meetings/fm10/>)

Abstract deadline: 2 September 2010

H26: Hydrogeophysics: Advances in measurement, monitoring and modeling of hydrological processes

[http://www.agu.org/meetings/fm10/program/scientific\\_session\\_search.php?show=detail&sessid=354](http://www.agu.org/meetings/fm10/program/scientific_session_search.php?show=detail&sessid=354)

Conveners: Adam Pidlisecky and Baptiste Dafflon

H15: Hydrogeophysical data fusion: methods, scales and information content

[http://www.agu.org/meetings/fm10/program/scientific\\_session\\_search.php?show=detail&sessid=343](http://www.agu.org/meetings/fm10/program/scientific_session_search.php?show=detail&sessid=343)

Conveners: Andrew Binley, Ty P.A. Ferre, Johan Huisman

H60: Novel High-Resolution Field and Modeling Approaches to Aquifer Connectivity Characterization

[http://www.agu.org/meetings/fm10/program/scientific\\_session\\_search.php?show=detail&sessid=388](http://www.agu.org/meetings/fm10/program/scientific_session_search.php?show=detail&sessid=388)

Conveners: Chris Graham, Luisa Hopp, Kristopher Kuhlman, Bwalya Malama, Michael Cardiff

H70: Hydrogeophysics for Digital Soil Mapping: Novel Techniques and Applications  
[http://www.agu.org/meetings/fml0/program/scientific\\_session\\_search.php?show=detail&sessid=398](http://www.agu.org/meetings/fml0/program/scientific_session_search.php?show=detail&sessid=398)  
Conveners: Sebastián Lambot, Roelof Versteeg, Jan Van Der Kruk, Johan Huisman, Harry Vereecken

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#### 5. Exploration Station at the Fall AGU, December 12<sup>th</sup>, 2010 San Francisco

We are getting ready for another great Exploration Station in San Francisco this December 12th in conjunction with the American Geophysical Union's annual meeting. This is a request to consider being a part of this illustrious event and to save the date.

##### What is Exploration Station?

Exploration station is a four-hour event that is free, and open to the public where participants make their way through an average of 15 exhibits offering a variety of easy, family friendly, hands-on activities and an opportunity to interact one-one-one with scientists, engineers, and education specialist. Exploration Station was established to take advantage of the large number of scientists and education specialists that gather in San Francisco to attend the AGU meetings. Past events have been very successful at engaging young people and their families.

As an exhibitor you would be expected to be at the event for the full four hours plus set-up and tear-down time. You would also be expected to create a fun, dynamic and interactive learning experience for between 100-500 members of the public of all ages.

Please let us know if you are interested in participating by emailing us at [education@agu.org](mailto:education@agu.org) , and you will be the first to receive the updates for the event. More information to follow.

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#### 6. SEG 2010 Denver, Colorado, 17-22 October (from Jan van der Kruk)

A broad spectrum of near surface geophysics will be presented in three oral sessions about “Methodological developments and case studies 1, 2” and “surface waves”, two poster sessions: “Methodological developments and case studies 1 and 2” and three special sessions about “Geohazards and public safety”, “Humanitarian and Environmental Applications of Geophysics at the Community scale” and “Hydrogeophysics”.

The annual section's Business Meeting will be held at Monday, October 18 from 4-6 pm (room 206, Colorado Convention Center). The 2010 annual Near Surface Geophysics Section (NSGS) reception will be held at the Wynkoop Brewing Company, Mercantile Room, 1634 18th St. on Tuesday Oct 19. The reception will begin with a meeting at 6:30, followed by a dinner/social at 7:30. (No Charge to NSGS Members, Non-members can join on the spot and students are welcome: Student membership free). The Harold Mooney Award will be presented by the NSGS during the reception. The award is presented to an individual in recognition of long-term, tireless, and enthusiastic support of the near-surface geophysics community through education, outreach efforts, professional service, or development of opportunities with other professional disciplines that employ geophysics.

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#### 7. Environmental Geophysics Postdoctoral Fellow at Lawrence Berkeley National Laboratory

The Earth Sciences Division of Lawrence Berkeley National Laboratory is seeking applications for a Post Doctoral Fellow in environmental geophysics to work with our team in the development of methods to gain insights about and to remotely monitor complex subsurface processes. Using primarily complex resistivity, seismic and radar methods, we explore processes that are manifested at the pore to the field scales associated with environmental remediation, water resources, CO2 sequestration, and microbially enhanced hydrocarbon recovery applications.

We seek a motivated postdoctoral candidate to participate in and lead exciting experimental, theoretical, and numerical environmental geophysical research. This position requires an outstanding record of original and high-

quality research as well as demonstrated experience with and enthusiasm for subsurface characterization and monitoring using geophysical datasets. Essential for the position is a Ph.D. in geophysics, earth sciences, or engineering and a familiarity with hydrogeophysical and biogeophysical approaches.

To apply online at <http://jobs.lbl.gov>, please select "Search Jobs", enter 24695 in the keyword search field, and follow the online instructions to complete the application process.

For more information about the LBNL Environmental Geophysics Group, please visit [http://esd.lbl.gov/departments/geophysics/core\\_capabilities/environmental\\_geophysics.html](http://esd.lbl.gov/departments/geophysics/core_capabilities/environmental_geophysics.html)

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8. NRC Committee on Opportunities in the Earth Sciences seeks input (from Rick Hooper)

Dear colleagues,

I encourage you to submit your ideas to a new NRC Committee which is updating the "Basic Research Opportunities in the Earth Sciences" report that was completed in 2001. That report gave rise to the term "critical zone" and led to major new NSF investments, such as Critical Zone Observatories.

In the July 27 EOS, the committee requests input to this process. I can't emphasize strongly enough how important it is for the hydrologic science community to participate. This NRC report will provide important guidance to NSF on how to make investments over the coming decade.

The Committee is requesting answers to the following three questions:

1. What is one compelling and emergent question that Earth science can address in the next 10 years?
2. Within your area of expertise, what is one compelling and emergent question that your subdiscipline can address in the next 10 years?
3. What facilities and infrastructure are needed to conduct the research to answer these questions?

I would appreciate receiving a copy of your submission to better inform ourselves at CUAHSI. You would have to paste your response into an e-mail, as this input is being gathered in a survey.

Response must be received by September 8. Complete the questionnaire at <http://thenationalacad.nroes.sgizmo.com>.

Thanks,

Rick Hooper (CUASHI, Medford, MA)

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To contribute material to the NS-letter send an e-mail to:

Xavier Comas [xcomas@fau.edu](mailto: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

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