

April 2008 Newsletter of the AGU Near-Surface Focus Group

1. 2008 Joint Assembly, May 27-30, Fort Lauderdale, FL 2. 2008 Joint Assembly, Near-Surface Geophysics Focus Group lunch, Wednesday May 28 3. 2007 Fall AGU Meeting NS Outstanding Student Paper Award 4. Call for Abstracts SEG 2008: Submission Deadline April 9 5. Call for papers SEG The Leading Edge, Special Issue on Near Surface 6. EEGS FastTIMES March issue now available 7. Graduate Student Opportunities at Oklahoma State University 8. PhD Student Position in Hydrogeophysical Data Integration, the University of Lausanne 9. Near Surface Seismic Reflection Processing--an AAPG short course in San Antonio, Texas, April 19-20, 2008 10. Request for Published Geophysical Case Studies of Relevance to the Construction of Large Pipelines

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://www.agu.org/focus\\_group/nsg/index.html](http://www.agu.org/focus_group/nsg/index.html)

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1. 2008 Joint Assembly, May 27-30, Fort Lauderdale, FL:

Topical sessions of the Near Surface Geophysics Focus Group reflect the Floridian setting of this year's Joint Assembly. Sessions specifically address advances in understanding of wetlands processes, coastal processes and karst hydrogeology that are resulting from the application of high-resolution near surface geophysics techniques. These topical sessions have obvious relevance to the landscape, geology and environmental setting of the Joint Assembly. A notable NS highlight this year is the sessions focusing on new geophysical tools and software for high resolution site characterization that will include a hands on field demonstration of new technologies including fiber optic temperature sensing systems and multi-channel/full resolution ground penetrating radar (GPR). Experts in these technologies will provide demonstrations in the grounds of the conference center.

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2. Near-Surface Geophysics Focus Group lunch, Wednesday May 28:

For all NS members and any others who are interested in attending. Please join us at the Near-Surface Geophysics Focus Group AGU lunch. Be sure to sign up for this event (\$30) when registering for the meeting as the 120 tickets sold out in advance in December. This is a great opportunity for our community to meet and discuss plans for future AGU meetings and other conferences/workshops.

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3. 2007 Fall AGU Meeting NS Outstanding Student Paper Award

"A Mystery Unraveled: Booming Sand Dunes", Vriend N.M., Hunt M.L., and Clayton R. W., California Institute of Technology

"Booming" sand dunes have intrigued travelers and scientists for centuries. These dunes emit a persistent, low-frequency sound during a slumping event or a natural avalanche on the leeward face of the dune. The sound can last for several minutes and be audible from miles away. The resulting acoustic emission is characterized by a dominant audible frequency (70 - 105 Hz) and several higher harmonics. In the work of Vriend et al. (2007), seismic refraction experiments proved the existence of a multi-layer internal structure in the dune that acts as a waveguide for the acoustic energy. Constructive interference between the reflecting waves enables the amplification and sets the frequency of each boom. A relationship was established that correctly predicts the measured frequency in terms of the thickness (~ 2.0 m) and the seismic body wave velocity of the loose, dry surficial layer (~ 240 m/s) and the substrate half-space (~ 350 m/s). The current work highlights additional measurements and simulations supporting the waveguide model for booming sand dunes. Experiments with ground penetrating radar continuously display the subsurface features which confirm the layered subsurface structure within the dune. Cross-correlation analysis shows that the booming sound propagates at speeds close to the measured body wave velocity. Squeaking sounds, which are generated during the onset of the slide and precede the sustained booming emission, have been found to have distinctly different characteristics. These short bursts of sound are emitted at a lower frequency (50 - 65 Hz) and propagate at a lower propagation speed (125 m/s) than the booming emission. The acoustic and elastic wave propagation in the dune has been simulated with a finite difference code. The interaction between the air and the

ground produces a coupling wave along the surface. The reflections in the surficial layer propagate in a dispersive band at a group velocity that is slower than the phase velocity of the layer. Different source mechanisms are used in order to simulate the squeaking and booming emission within the dune.

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#### 4. Call for Abstracts SEG 2008: Submission Deadline April 9

The Near Surface Geophysics Section would like to invite you to submit an Expanded Abstract for oral or poster presentation at the 2008 SEG International Exposition and 78th Annual Meeting in Las Vegas, NV, 9 -14 November, 2008. The abstract submission system opens on 12 March 2008 and the deadline is 9 April 2008. Please visit the website (<http://meeting.seg.org/techprog/index.shtml>) for all abstract submission details, if you have any questions or suggestions please do not hesitate to email Rob Jacob (Robert\_Jacob@brown.edu).

Contributions from all Near Surface and Environmental Geophysics disciplines and from all parts of the world are desired. We encourage paper submissions which emphasize near surface geophysics applied to groundwater resource evaluation, mine dewatering, environmental characterization, engineering evaluation, seismic and geologic hazards assessment, as well as advancements in borehole, surface and airborne geophysical technologies and processing for near surface applications.

There are multiple Near Surface Geophysics (NSG) events planned for the 2008 SEG meeting, including a shin-dig fit to celebrate the NSGS 15th anniversary. This year, the SEG Forum Series will kick off the SEG Technical Program, with a focus on hydrogeophysics, where top executives, researchers, and governmental representatives provide their perspectives on the future direction of using geophysics to better characterize our groundwater resources, leading to better management of our groundwater supplies. In addition to the several Near Surface and Environmental technical sessions that will be developed once abstracts are submitted, the NSGS is sponsoring two special sessions at SEG 2008: Hydrogeophysics in Practice and UXO Detection.

Students are encouraged to apply for one of the multiple NSGS \$500 travel grants to attend SEG 2008. See <http://nsgs.seg.org/travelg.htm> for details.

If you are not a member of the SEG-NSG Section, please consider joining (<http://nsgs.seg.org/join.htm>), NSG Section membership is only \$15 (FREE to students), and SEG membership is not required.

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#### 5. Call for papers SEG The Leading Edge, Special Issue on Near Surface

Articles for consideration for publication in The Leading Edge special issue on Near Surface (November 2008 issue) should be submitted by July 18, 2008 (<http://seg.org/publications/tle/index.shtml>)

For more information contact Rick Miller (rmiller@kgs.ku.edu)

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#### 6. EEGS FastTIMES March issue

EEGS is pleased to announce publication of the March issue of FastTIMES, news for the near-surface geophysical sciences. It is available for download as a low- and high-resolution pdf document from the EEGS website at [www.eegs.org/fasttimes/latest\\_issue.cfm](http://www.eegs.org/fasttimes/latest_issue.cfm)

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EEGS is interested in FastTIMES comments and suggestions. Further, we are always interested in content for the next issue! Please send your submissions to the editorial team - Jeff Paine ([jeff.paine@beg.utexas.edu](mailto:jeff.paine@beg.utexas.edu)), Roger Young ([ryoung@ou.edu](mailto:ryoung@ou.edu)), or Brad Isbell ([bisbell@hgiworld.com](mailto:bisbell@hgiworld.com)).

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## 7. Graduate Student Opportunities at Oklahoma State University

Funding opportunities in the form of research and/or teaching assistantships, and fellowships are available for graduate students within The Boone Pickens School of Geology at Oklahoma State University (OSU) in several areas including biogeophysics, tectonophysics, near surface geophysics, structure and tectonics, hydrology, stable isotope geochemistry, quaternary geology, organic geochemistry, petroleum geology and sequence stratigraphy. The School of Geology has state-of-the-art geophysical and geochemical laboratories. In addition the School has recently constructed the Devon Teaching and Research Laboratory, which contains state-of-the-art 3-D image processing facilities. For more information, see: <http://geology.okstate.edu> . You must apply online to the OSU Graduate College: <http://gradcollege.okstate.edu/default.htm>. For information regarding the different research projects, contact Prof. Estella Atekwana ([estella.atekwana@okstate.edu](mailto:estella.atekwana@okstate.edu)).

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## 8. PhD Student Position in Hydrogeophysical Data Integration, the University of Lausanne

The Institute of Geophysics at the University of Lausanne has an opening for a PhD student in the field of hydrogeophysical data integration.

The overall project involves exploring, both computationally and experimentally, novel approaches for the stochastic integration of diverse geophysical and hydrological data sets for the purpose of improved numerical modeling of groundwater flow and contaminant transport. The position is funded for four years and available as early as May 2008. At the time of appointment, the successful candidate must have the equivalent of an MSc degree in geophysics, hydrology, or a closely related quantitative discipline. We are looking for a highly motivated individual with strong analytical and computational skills, and a solid understanding of geophysical inverse theory and statistical methods. An understanding of French is an advantage, but not a requirement for the position as all essential interactions within the research group are conducted in English. This is an excellent opportunity for a young researcher to launch his or her career by joining a dynamic, international research group. Our institute is well equipped and scenically located on the shores of Lake Geneva, a region of outstanding natural beauty offering a vibrant cosmopolitan atmosphere and an extremely high quality of life.

To apply, please send a cover letter stating your overall goals along with your curriculum vitae and the names, telephone numbers and e-mail addresses of two referees to either Professor Klaus Holliger ([klaus.holliger@unil.ch](mailto:klaus.holliger@unil.ch), <http://www.unil.ch/ig/page28054.html>) or Dr. James Irving ([james.irving@unil.ch](mailto:james.irving@unil.ch), <http://www.unil.ch/ig/page39884.html>), Institute of Geophysics, Amphipôle Building, University of Lausanne, CH-1015 Lausanne, Switzerland

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## 9. Near Surface Seismic Reflection Processing--an AAPG short course in San Antonio, Texas, April 19-20, 2008

Instructor: Roger Young, University of Oklahoma, Norman, OK.

This is an interactive, computer-based course of instruction in the fundamentals of seismic reflection processing with an emphasis on environmental applications. The course is designed to extend the understanding of principles taught by lectures in an introductory college course in seismic exploration; it consists of lectures and a sequence of 12 computer laboratory exercises. For more information please visit <http://www.aapg.org/sanantonio/course05.cfm>.

A few student slots at reduced rate are still available at the time of this announcement. Non-AAPG-conference participants may register for this course for an additional fee of \$30 USD.

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## 10. Request for Published Geophysical Case Studies of Relevance to the Construction of Large Pipelines (from George Tuckwell)

Dear all,

I write to tap the collective knowledge of the engineering geophysics community, and in particular to solicit details of published case studies of relevance to the construction of large pipelines. There is an initiative through IPLOCA to provide guidance documents to address aspects of onshore pipeline construction. See the IPLOCA web pages for more general information about the association. <http://www.iploca.com/>

Of particular interest to the international geophysical community is the remit of the group working on the Trenching Guideline document.

Technical input into this working group and its subsequent guidance document is an opportunity to raise the profile, and therefore the commercial use, of shallow investigative geophysics.

The most convincing evidence to place before the group is published case studies, and I request that any case studies you have undertaken, or know of in the literature, be sent to me to be collated and forwarded on. Any and all geophysical techniques are to be included, including airborne techniques. Peer reviewed publications are best, but other published examples may also be useful, although out and out publicity material is inappropriate.

A current working list of common issues (and environments) against which to evaluate the potential for geophysics to provide an effective solution is as follows:

For an existing pipeline: detection of pipeline; detection of trench outline; state of compaction of backfill

For all terrains: Rockhead depth, with type, strength and jointing as a plus; Soil strata boundaries, with soil type and strength as a plus; Water table; Voids/cavities Excavatability, for all types of ground  
Glacial terrain, boulders, boulder size and frequency  
Swamp/wetland/muskeg terrain, depth of swamp

Desert: thickness of strong caprock/caliche/duricrust, with underlying material unknown, often soil; salts; depth of soft wet sabkha soils  
Permafrost or frozen ground: depth of frozen ground; ice content; soil type

It would be ideal to compile a list of relevant case studies against each of these (where appropriate of course).

Could references, and pdfs of publications where possible, be emailed to [george.tuckwell@stats.co.uk](mailto:george.tuckwell@stats.co.uk).

Yours in anticipation of an enthusiastic community-wide response,

George

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

George Tsoflias    [tsoflias@ku.edu](mailto:tsoflias@ku.edu)    <<mailto:tsoflias@ku.edu>>

DEADLINE: Material must be received 2 full business days prior to the first of each month. Failure to meet the deadline will likely result in missing the next issue.

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 hyperlink 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). Do not submit e-mail attachments for distribution.