# Newsletter

# Center for

# **GeoHazards Studies**

## Fall/Winter 2014/2015

# Letter from the Director

Hello Friends and Colleagues:

I write this "pinch-hitting" for Greg while he enjoys a well-earned sabbatical in Europe. The Center has managed to do all right though at times skype has been a blessing for us, and a curse for Greg.

The Center is going through exciting times. As you will see in the articles below, we have exciting new experimental facility developments – Ingo Sonder our lead scientist has exceeded himself and has put in place a new experimental facility for melt water experiments. Alison Graettinger, reports on last summer's experiments at the ECLIPSE site. Finally, Marcus Bursik reports on the Tephra Workshop co-sponsored by the Center. In addition to these, at least two major grants for the NSF MRI program and Hazard SEES programs were submitted with the center in a lead role. There are early indications that our 3E award from UB will be extended.

Going further, we are hosting two FEMA workshops this month – please sign up at the earliest. The notice for the graduate student awards has been sent out and applications are due Feb 27 – please advise eligible students to apply. We will also co-sponsor a major workshop in May on probabilistic methods for hazard analysis. An exciting lineup of speakers and tutorials is being put together! Watch this space for schedule details.

Please welcome Amjad Aref from CSEE to our advisory committee. Thank you for reading so far – wish you a happy and productive semester.

Abani Patra Interim Director

# Special points of interest:

### STUDENTS:

Interested in becoming more involved?

E-mail Matthew Sweeney at <u>ms428@buffalo.edu</u> to learn about the student committee.

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# **Research Updates**

#### New Rock Melting Facility at ECLIPSE will Test Explosive Melt-Water Interaction By: Ingo Sonder

The Center for Geohazards Studies is building an experimental facility to investigate the interaction of volcanic melts and water at the UB's Geohazards Field Station. The initial focus will lie on the highly explosive molten fuel coolant interaction mechanism (MFCI) which is thought to be responsible for the formation of maar-diatreme volcanoes, and parts of larger eruptions when water is locally available. The experiment will consist of a melting furnace that will be isolated from the explosive part of the experiment. It has a capacity for about 28 L of melt at temperatures up to 1400 °C, which will be poured into an interaction container, where water is injected and brought to interaction. The experimental concept descends from lab-scaled experiments (~0.5 L melt volume) conducted at Würzburg University (by Zimanowski et al.) which demonstrated the governing principles. The ECLIPSE campus provides all necessary infrastructure to address the most serious issues of the MFCI mechanism, which are all related to the experimental scale: Questions addressing the melt-water premix or start (trigger) and efficiency of the explosion can be investigated with a significantly increased melt volume. The experiments are supported by UB's 3E fund and by NSF.

After this initial setup and experiment the facility will be available to all interested researchers. The Center for Geohazards Studies will then provide expertise for experiment setup and design. The focus will lie on experiments targeting all versions of melt-water interaction, but will not be limited to that. For more information contact lead scientist Ingo Sonder (ingomark@buffalo.edu).



Photo of The Center for Geohazards Studies Field Station in Springville, NY. (Photo courtesy of E. Dohring)

# **Research Update continues**

#### Eclipse Field Station Experiments By Dr. Alison Graettinger

In June 2014 another round of Man Made Maars were produced at the ECLIPSE Field Station in Springville, NY. This year we exceeded our previous record of the number of blasts in a day, completing 13 tests on day one, and 7 on day two. This brings the total number of blasts in the dataset to 50 (2012-2014). The focus of the study was the effects of lateral migration of the explosion location on crater structure. This resulted in very dynamic jets, and complex craters. An additional experimental pad was constructed for collaborators from the University of North Carolina, Chapel Hill to focus on very shallow explosions. They brought along a vertical array of infrasound microphones, and even let up include a Go-Pro camera on the top for a unique view. This year included participants from University Blaise Pascal (Andy Harris and Maxime Bombrum), in addition to the familiar groups from INGV (Jacopo Taddeucci), INRS (Pierre-Simon Ross), Otago (James White), and UNC (Johnathan Lees, Danny Bowman). Numerous students from UB and the University of Pittsburgh, plus Center administrators Robyn Wagner and Barb Catalano as well as UB Dean Bruce Pitman and Chuck Mitchel attended to help facilitate the experiments.

These experiments have been accompanied by the acquisition of numerous new sensors and tools for the field station, including a 4K camera, high speed camera, high speed blast sensors, and improved scales for images. These sensors are available for use in future experiments at the field station. The UB team that leads the experiments consists of Ingo Sonder, Alison Graettinger and Greg Valentine. These experiments have led to four peer-reviewed publications led by the team at UB and three led by participants from other institutions, with several more on the way. These experiments are an excellent example of how this facility can enable fruitful collaborations and provide opportunities for students to participate in research.



Image from one of the blasts in the 2014 MMM experiments.

## Tephra 2014 Workshop

Tephra 2014 Workshop held at Portland State University By Dr. Marcus Bursik

The Tephra 2014 Workshop was convened 3-7 August, 2014, to discuss major developments, best practices, and future directions/needs in tephra studies from both volcanological and tephrochronological perspectives. By bringing together an international group of over 70 scientists with a variety of backgrounds who study tephra for different purposes, our hope was to enhance interdisciplinary collaboration and data sharing. To provide training, the workshop also incorporated hands-on sessions on optimal sample collection and treatment, dispersal modeling, and the use of databases. Volcanologists, tephrochronologists, archaeologists, paleoclimatologists, paleoecologists, paleolimnologists, petrologists, geochronologists, tectonophysicists, Quaternary scientists, atmospheric scientists, data managers, and others who work with tephra were represented.

During three days of presentation and discussion, tephra scientists discussed challenges, opportunities and solutions in studies ranging from physical volcanology to archeology. A consensus-seeking session was held at the end of the meeting, in which the current state of the science and emergent issues were raised. Most of the discussion in the session revolved around formulating common best practices among the different scientific communities and establishing common data archiving and retrieval mechanisms. Best practices were discussed in terms of sample collection and laboratory treatment. It was felt that a starting point for ensuring some uniformity in collection and laboratory work was to develop data sheets or templates, in addition to a consensus document. Such data sheets would be constructed in such a way to allow scientists who might not be expert in one field to nevertheless collect and analyze data that would be of importance to scientists in another field. With respect to data archiving and retrieval, the discussion revolved in large part around databases, what is currently available, their use, and development of common standards for submission and data format.

#### **Group Presentations**

On Thursday, 10:30—11:30, we broke up into working groups. Members of separate groups were chosen to ensure a mix of disciplines within each group. The organizers asked that each group consider preliminary questions that had been formulated, prioritize them, and discuss what to them are the three most important questions. In discussing the three most important questions, each group considered the challenges and opportunities represented, and possible solutions or paths forward. After this, from 11:30—12:00, we reconvened. Each group gave a brief presentation about their prioritized list, the three most important questions, and their proposed responses. The group presentations can be found here: Working Group Presentations



Below: Participants discussing Tephra samples at Mt. St Helen

#### Fall/Winter 2014/2015

# **Upcoming events**

The Center for Geohazards Studies is sponsoring two FEMA classes at The University of Buffalo Center for Tomorrow on February 25th & 26th, 2015. Presented by: National Domestic Preparedness Training Center (NDPTC)

Social Media for Disaster Response and Recovery on February 25th, 2015 (Free Course)

*Prior registration required.* Click on the link below for more information on registration.

Flyer 2-25-15 SM Buffalo NY

**Winter Weather Awareness** on February 26th, 2015 (Free Course) Presented by: National Domestic Preparedness Training Center (NDPTC)

*Prior registration required.* Click on the link below for more information on registration.

Flyer 2-26-15 AM WWA Buffalo NY

### **Center for Geohazards Student Research Grant**

The UB Center for Geohazards Studies is pleased to announce a research grant opportunity for graduate students to support research in any discipline that is related to natural hazards. Proposals are due 27 February 2015. The total amount of available funding is \$2,000.

Please follow the link for the call for proposals:

CGHS Research Award Application 2015-2

**Dr. Janet Yang**, Assistant Professor in the Department of Communications at the University of Buffalo and a *member* of the GeoHazards Advisory Group is scheduled to teach a graduate seminar on Science Communication in the Fall, 2015. Below is a brief description of the course.:

#### COM632 Science Communication Seminar 3credits

The course is meant to provide an academic introduction to graduate-level study of science communication, including the sub-fields of environmental and risk communication, as well the broader area of health communication. The course will particularly focus on issues and theories relevant to the social science of mass communication. Because science communication research often deals with issues at play in the public arena, the course will also touch on issues in political communication, including deliberation and civic engagement.

At the heart of science communication research is a desire to understand the role of communication in how individuals and society attempt to manage complex issues, as well as how those charged with communicating science can do so in an effective way. Appreciating the social processes at the heart of science communication can help the evaluation of science communication efforts, including health and environmental campaigns. Nevertheless, the course will emphasize theoretical and research-oriented topics, rather than practical skills.

## **5th International Maar Meeting**



Photo is from Alberca de los Espinos, Michoacan Mexico

The 5<sup>th</sup> International Maar conference was held in Querétaro Mexico this November. The Center for Geohazard Studies was represented by Greg Valentine, Ingo Sonder, Alison Graettinger and students Matt Sweeney and Elodie Macorps to present their latest work on maar-diatreme volcanoes and related experiments. This included Greg giving a key note talk about the state of our understanding of maar-diatremes and suggesting some of the future research needed to improve this understanding (including how the UB experimental facility will be a part of this). Small conferences like this provide an excellent opportunity to engender new collaborations and have in depth discussions of new findings. The conference also had a pre-conference field trip that Alison and Matt attended, and took the entire congregation on a midconference field trip to take important conversations in front of outcrops. At the close of the conference Greg Valentine was awarded the Luhr award to recognize his ingenuity to begin the Man Made Maar experiments at UB.

#### The Center for GeoHazards Studies

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# **GeoHazards Studies**

Have changes to your employment, research interests, or contact information? Let us know at

geohaz@buffalo.edu.

The *Center for GeoHazards Studies* seeks to decrease harmful societal effects of natural phenomena such as volcanic eruptions, landslides, mudflows, and avalanches through research, service, and education. Our team of scientists and engineers works together with social scientists, urban planners and public health researchers to evaluate the broader harmful impact of hazardous natural phenomena. One of our principal goals is to integrate analyses of various hazards with predictions of their effects on human infrastructure and ecosystems in order to evaluate approaches that could lead to a reduction of injury and death. Hazards that are affected or triggered by changes in climate are included within the Center's scope.

Special thanks to:

#### Advisory Committee Members:

Amjad Aref, University at Buffalo Marcus Bursik, University at Buffalo Beata Csatho, University at Buffalo Alison Graettinger, University at Buffalo Abani Patra, University at Buffalo Chris Renschler, University at Buffalo Michael Sheridan, University at Buffalo Ingo Sonder, University at Buffalo Andrew Whittaker, University at Buffalo Janet Yang, University at Buffalo Jun Zhuang, University at Buffalo

Student Representative: Matthew Sweeney, University at Buffalo



Send your research updates to Barb Catalano (bac6@buffalo.edu) to be included in the next newsletter or eblast!

Center for GeoHazards Studies