What's Happening in the...

Earth and the Environmental Sciences

Summer 2013
Newsletter

This newsletter outlines fieldwork that volcanologists in LEC have been undertaking in Chile as part of their research into obsidian flows. These are extraordinary lava flows composed of black volcanic glass and are thick enough to submerge a ten-story building. They are formed towards the end of some of the most powerful volcanic eruptions on Earth.

Volcanic rumblings in Chile

A Lancaster University researcher has recently witnessed spectacular and unusual activity on the Chilean volcano Cordón Caulle. Volcanologist Dr Hugh Tuffen, whose film of fieldwork on the exploding mountain was featured on Volcano Live (BBC2) last year, returned to the volcano expecting all to be quiet and the eruption over. However, Hugh was amazed to hear loud rumbling sounds whilst climbing through fog towards the crater, and found an advancing obsidian flow – a thick, creaking mass of black volcanic glass moving down the volcano flanks as slowly as a glacier.

This is the first time that obsidian lava has been observed in action and, together with Dr Mike James and colleagues at the Lancaster Environment Centre, Hugh is piecing together the unique evidence that he collected in the field about this enigmatic and poorly-understood kind of lava. The team collected hundreds of photographs of the lava in the field and used the latest photo-reconstruction techniques to create 3D models of the lava as it advanced and evolved. Climbing carefully onto stable parts of the lava allowed the team to collect dozens of fist-sized samples. The bubble and crystal textures of these samples are now being studied to determine how the lava was squeezed out of the vent and then slowly advanced and cooled.

Students in LEC are working with Hugh and Mike to analyse samples and data from Chile as part of the research effort to understand obsidian flows and the eruptions that form them. The students are using specialist high-temperature furnaces to melt lava samples in the lab to measure how quickly bubbles and crystals grow, as well as constructing 3D models to determine how obsidian lava advances over timescales of hours to years. This provides our students with training in cutting-edge research techniques and the opportunity to work with unique data and samples. The combination of theoretical knowledge with practical skills and experience we offer our students puts them in a strong position to continue in postgraduate education or opt for a career outside of academia.

The images above are from recent expeditions to the Chilean volcano Cordón Caulle. **Top**: Hugh on Cordón Caulle in 2012. **Middle**: The lava steams vigorously after a torrential rain storm in January 2013, reflecting the incredible heat within (the centre of the lava is hotter than 900 ^{o}C). **Bottom**: Hugh and colleague watch from a safe distance as huge boulders collapse from the slowly-advancing lava.

For Hugh's 2012 BBC2 film about the Chilean eruption see:
http://tinyurl.com/ngx4xh4

For a photo gallery of the 2013 expedition see:
http://tinyurl.com/pbcphbr

To interact with a 3D model of the lava see:
http://tinyurl.com/pcc-lava3D

For more details about the reports above or about Earth Science and Environmental Science courses on offer at Lancaster University please contact the Earth and Environmental Science Admissions Staff,

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