

Summary of CONVERSE Meeting Albuquerque, Double Tree Hotel, November 27, 2018

The first meeting of the Community Network for Volcanic Eruption Response (CONVERSE) RCN was held in the afternoon of November 27, 2018 in Albuquerque. At this meeting participation was restricted to CONVERSE steering committee members and disciplinary leaders in order to focus discussions on academia-government agencies interaction, lessons learned from recent eruptions and next steps forward.

The meeting began with an introduction on how CONVERSE relates to Grand Challenge #3 from the ERUPT report that addresses the *Development a coordinated volcano science community to maximize scientific returns from any volcanic event.*

Tom Murray (USGS) provided perspectives on volcano response with the specific example from the Kilauea 2018 eruption. Emphasis included the processes and challenges of the observatory and science communities interacting with the federal incident response entities (FEMA and others) and obtaining access to the volcano during the eruption to make meaningful measurements for documentation, forecasting and science advances.

Presentations by Michelle Coombs (AVO) and David Fee (AVO, U of Alaska) provided further key insights into the response to the 2018 Kilauea eruption and recent eruptions in Alaska. Michelle stressed the point that there is a high work load during an eruption crisis and everyone participating in the response should expect to be asked to participate in the monitoring efforts. During the Kilauea crisis, specific expertise was brought on site. Proposed projects from the academic community were evaluated through ad hoc review processes that included internal and external evaluators. David highlighted the model of AVO where long-standing collaboration between academia and USGS has been established and is maintained through in-person meetings and discussions that have prepared the community for crisis responses. Einat Lev (LDEO) talked about her experience participating in response to the 2018 Kilauea eruption and showed that the effective use of drones can provide unprecedented details on lava flow morphology and eruption rates. Seth Moran (USGS) showed us what would be involved in a rapid response to a Cascade volcanic eruption and highlighted the need to speak with one voice to incident response officials and the press while acquired data and resulting ideas should be accessible to everyone working on the volcano. Diana Roman (Carnegie) talked about lessons learned from an eruption response to Momotombo in 2014, the success of obtaining an NSF RAPID award to go to the eruption, the values of having long-standing relationships with the local observatory. She also highlighted some of the challenges of pulling everything together on a very short time scale and in crisis mode. Liz Cottrell (Smithsonian) discussed the benefits and challenges of making samples that are collected during rapid volcano response available to the community.

Following the presentations we had extensive discussions. The main points that came out of these deliberations and are relevant for a successful academia-federal agency response to eruptions are:

1. *Set up protocols before an eruption starts well in advance.* This includes but is not limited to: what science can potentially be addressed? What monitoring/instrumentation will be needed? What are the access issues for each volcano? How will data and samples

be shared? Which academic groups can obtain the data needed for the science and how can they also help with day-to-day needs for monitoring of the eruption?

2. *A mechanism for evaluating science proposals from groups.* Set up a committee in advance that consists of academics, USGS, Park Service, Forest Service as needed and have a list of potential outside reviewers ready who are aware of this evaluation mechanism.
3. *Have 'shovel-ready' projects in place from each academic community group that is interested in participating.* This implies, specific plans about what science will be addressed, who will do it, what instruments will be used, what data or samples will be collected and how the data will be shared. Specific plans about how to obtain necessary funding need to be in place and implemented on short notice. There also needs to be a mechanism on how to prioritize these projects.
4. *Longer-term, non-crisis mode academic research on US volcanoes* is always encouraged to provide a framework for crisis response in terms of personnel, equipment and outstanding science questions.
5. *Have a plan for public outreach* and addressing requests that are outside of the realm of feasibility.

The remainder of the meeting was used to discuss general programmatic issues. Highlights are:

- Main purpose for the involvement of the academic community needs to be driven by the realization that data is acquired to advance the science related to better understanding volcanic eruptions, and their precursors.
- Currently CONVERSE structure is divided into disciplines. For most effective future meetings, it may make sense for some disciplines to have joint meetings around specific science questions and the necessary data to be obtained during an eruption to address these.
- It is up to the leaders of the disciplines and SC to decide what best serves their community in order to achieve the necessary preparations to be ready for a response.
- Communication between academic disciplines with federal agencies are essential to set us up for success during the next volcanic crisis and achieve maximum scientific return.

In the days following the meeting discussion by email continued and focused on the following points:

1. disciplinary (or grouped meetings) should produce a standardized output that can be synthesized into an overarching plan that can be implemented in case of eruptions.
2. to channel this output, we can have groups think about hypothetical eruptions which would require different approaches:
 - a. Cinder cone eruption in distributed volcanic field (case: Pahvant

Butte, Utah)

- b. Effusive eruption at complex multi-vent system (Kilauea 2018)
- c. Large volume Plinian eruption (Katmai 2012)
- d. Moderate-size dome-building eruption (Mt. St. Helens, 2004-2008)
- e. Major episode of caldera unrest (Long Valley 1980s)
- f. Volcanoes that have not erupted in a while (Mt. Hood, Shasta, Mauna Loa)

3. For each scenario above, each disciplinary group should define:

- Key science questions/fundamental gaps in understanding guided by ERUPT report and COVE meeting but with more details
- Discipline-specific observations necessary to address these questions
- Ideal instrumentation/sampling/observation scenario (e.g., how many instruments, where deployed, over what timescale, what samples) - design this around the 'case' eruption/volcano.
- Other key and specific considerations (e.g., need for baseline info, geological record of eruptions, etc.).
- Data that are available already for these location and how we can make them easily accessible, i.e. in usable databases.
- specifics about academia - fed agencies partnerships (which observatory, which people, land issues, etc.)

There was much discussion on how to best approach this and how to find the most effective balance between workshops that are cross-disciplinary and more focused meetings of the disciplinary groups. We anticipate a cross-disciplinary meeting for Fall 2019 with an initial 'table-top' exercise for hypothetical eruption scenarios.

Attendees	role
Emily Brodsky	SC
Michelle Coombs	SC (rotating)
Kari Cooper	Petrology/Geochemistry
Liz Cottrell	SC and Communication
David Fee	Infrasound
Ronni Grapenthin	Geodesy
Bruce Houghton	Tephra and Eruption dynamics
Einat Lev	Modeling
Paul Lundgren	SC (rotating)
Seth Moran	SC (rotating)
Tom Murray	SC (rotating) and agency academia coordination
Diana Roman	Seismology
Christy Till	Experimental Petrology
Paul Wallace	Petrology/Geochemistry
Christelle Wauthier	SC
Tobias Fischer	SC and Gas