

Guidelines for coordinating the broader scientific community and the USGS Volcano
Observatories during the run up to and during a volcanic eruption.
(T. Fischer, fist draft August 12, 2022; Final October 14,2022)

The main goal of these guidelines is to maximize scientific return from an eruption. Science drivers should be clearly stated and guide the scientific response to the eruptive event. Some of these science drivers may vary in priority during the event and continually assessing these priorities is important. Every researcher responding to an event needs to be cognizant of the USGS federal mandates with regards to eruption response in the US.

The Scientific Advisory Committee (SAC)

Scientific Advisory Committees (SACs) are the primary points of contact between the USGS Volcano Observatories and the broader non-observatory science community. SACs are region specific. Currently the Hawaii-SAC (H-SAC) is operational and staffed. The current recommendations for the makeup of a SAC are described in Appendix SAC1.

During the run up to and during an eruption members of the broader science community are encouraged to go through the SAC process if they require access to the volcano, samples or data. The details of this process are SAC-specific and can be found on the volcanoresponse.org website. In general, this process requires the submission of a 1 page proposal that describes the science questions that will be addressed, the data/samples that would be collected, what resources are in hand to do the proposed work and what resources, including support from Observatory staff, are requested from the Observatory. The proposal needs to address whether the proposed work is feasible and safe to do. In addition, the proposal needs to make the case of why the data or the samples need to be collected during the eruption (time sensitiveness) and how the obtained information will help with forecasting the eruption if data are collected during run up or forecasting the progression of the eruption if data are collected during the eruption. If some data can be collected at a later stage, that should also be indicated in the proposal. The proposal also outlines what mechanisms will be used to make data and samples available to the CONVERSE community. Details on the proposal evaluation process that guide the writing of the proposal can be found in Appendix SAC2.

Once the proposed work has the approval of the Observatory's Scientist in Charge (SIC), the PI can go ahead and begin the process of obtaining permits from the National Park or other entities as needed.

We note that there may be eruptions in localities that are not as restricted in access as eruptions in Hawaii, the Cascades, and Alaska. At those localities, for example in the US Basin and Range, it is still recommended to work through the SAC to coordinate the scientific response.

Working as a team during the eruption

It is expected that the PI and team work closely with the Observatory scientists during the course of the project, respect the time and priorities of the USGS scientists and share data and samples as described in the Samples and Data Sharing document. It is also expected that the PI will take advantage of the lists of people/institutions/labs that have been 'vetted' by CONVERSE during blue-sky times (see guidelines documents during non-eruption periods).

Communication during the eruption

Communication during the eruption is essential for transparency and successful coordination between all parties involved. CONVERSE will set up a Slack (or alternative) workspace for the eruption. All communication about the eruption response from the broader science community will be in Slack. CONVERSE members who are not directly responding to the eruption are also encouraged to participate in the Slack workspace and are sent an invitation to join. Requests for membership in the Slack workspace can be made to a designated set of members of the CONVERSE Steering Committee. Communication via frequent teleconferences (e.g., via zoom), is encouraged to enable efficient coordination of the various entities involved.

An interactive map (for example Google Earth map) is made available by CONVERSE to track where instruments are being deployed and where samples are being collected. PIs and observatory scientists are encouraged to use this platform to indicate their activities and keep it updated during the eruption response. Keeping track of these activities will be challenging during an eruption and an approach that imports station files from IRIS and UNAVCO would significantly streamline this process.

An online spreadsheet is made available that shows what groups or researchers are collecting what type of data and what samples. This includes information on the types of analyses that are being performed and where the data are made available. PIs and observatory scientists are expected to keep this spreadsheet updated as the eruption progresses.

A 'discipline dashboard' of researchers participating in the eruption response should be maintained. This will enable all participants to see what expertise is available to the eruption response team. In this dashboard there will be a tally of what proposals have been submitted to the SAC and which proposals have received the 'green light' from the SIC.

CONVERSE will organize eruption 'open-houses' via Zoom where Observatory scientists (as available) will work with PIs involved in the eruption to provide information on the course of the eruption and the activities that are occurring at the eruption. These events will be accompanied by newsletter-type summaries highlighting the eruptive events and the science response. These are opportunities for the broader science community, including those researchers who are not part of CONVERSE to learn about the eruption and ongoing science response.

Issues of access to the volcano

Access to the volcano can become more restricted as an eruption proceeds. It is critical that changes in volcano access are clearly communicated to the broader science community involved in the eruption response and that the PIs adjust their plans accordingly in close consultation with the observatory. It is important to realize that access issues are likely to change during the progress of the eruption and that these access issues also affect USGS Observatory scientists as well as non-observatory investigators. Access issues are likely to be in flux and obtaining information about access during an eruption may be slower than expected.

Data and sample sharing

Data and sample sharing are critical aspects of an eruption response. The details of this aspect are in the Data and Sample Sharing document. In general, if researchers are participating in the response through CONVERSE it is expected and strongly encouraged that obtained data are shared immediately with the Observatory and other groups participating in the eruption response.

Researchers are also expected to share obtained samples with other members of CONVERSE who may be interested in performing complementary analyses. In the case of samples collected by Observatory staff, a sample request form could be used and is made available. It is expected that all data collected on shared samples will be made available to the community involved in the eruption response. The samples that were collected and the analyses that were made on shared samples will be documented in the online spreadsheet in order to be discoverable and accessible.

Early Career Researchers (ECR) Involvement

Science teams responding to the eruption are encouraged to include ECRs in the eruption response wherever feasible. Activities such as working on data collection, evaluation, running models are examples where ECRs can make significant contributions. Researchers are encouraged to credit ECRs during every stage of the eruption response and provide ECRs with opportunities to gain visibility. This aspect includes roles in newsletter writing, leading Zoom calls, and being points of contact for entries into spreadsheets. More details and suggestions are in the ECR document.

Publication of findings

PIs participating in the scientific response to the eruption are expected to share their data with the broader community in a timely manner and be inclusive in authorship when they publish their findings (i.e. Observatory scientists, graduate students, lab personnel that may have worked in the background even if they did not go out in the field). Researchers are expected to be cognizant of constraints with regards to publishing such as internal USGS reviews and not allowing pre-print distribution.