

Lessons learned for encouraging early-career researcher (ECR) participation in volcanic eruption response and planning activities.

(Dave Hyman, Brenna Halverson, Behnaz Hosseini; August 12, 2022)

ECRs with strong pre-existing relationships with USGS personnel and more senior researchers are best equipped to participate in eruption responses (real and exercise), underscoring the need for ECRs to develop networks and collaborations in blue-sky conditions, rather than during unrest.

ECRs were included in many of the phases of the scenario responses; however, attempts to hold space for their intellectual contributions were at times ineffective. This was particularly noticeable when the opportunities for ECR contributions were introduced into the large group discussions as a result of having to follow well-known and respected researchers. As a result of this perceived intimidation factor, few ECRs contributed in these settings, although ECRs spoke up much more in breakouts and via the Slack channels. Going forward, smaller group discussions and web-based networking tools are likely to be key sites for ECR contributions.

“Introductions” posts on Slack (Hello, name, brief background) at the beginning of the Distributed Volcanic Field (DVF) scenario exercise were perceived to be helpful since most ECRs are relatively unknown to senior researchers and to each other. Critically, their skill sets and level of experience are rapidly evolving, making it difficult for other researchers to know how ECRs can contribute to responses.

ECRs expressed less confidence in the SAC proposal process due to the perceived lack of guidance by senior scientists. Although many ECR proposals were submitted to the K-SAC during the 2020-2021 Kīlauea eruption (Cooper et al.) as well during the DVF scenario, there was a perceived lack of guidance from more senior researchers.

It has been mostly agreed that currently, proposals must come with their own funding in order to be considered in a response scenario. In the future, there might be some form of CONVERSE seed funding possible. Although there are many research funding opportunities open to ECRs, few ECRs are aware of many of them. This is due to a combination of factors: opportunities cover a broad range of organizations and funding levels, are not always offered, and many ECRs experience insufficient mentoring, among other factors.

Draft guidelines for encouraging early-career researcher (ECR) participation in volcanic eruption response and planning activities.

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Inter-eruptive (“Blue Sky”) Period

1. It is recommended that at least one position on each Science Advisory Committee (SAC) be filled by an ECR. These personnel will perform the additional role of ECR liaison by providing the ECR community with transparency about SAC issues under discussion, as well as advocating for ECR involvement. These liaison duties are expected to be curtailed during unrest/eruption to ensure the ability of the ECR SAC member to focus on the crisis.
2. ECRs are strongly encouraged to make and cultivate connections with USGS staff and CONVERSE participants outside of their institutions during blue-sky conditions. It is critical that this networking occurs well in advance of unrest when USGS and SAC personnel will be too busy to meaningfully foster new connections.
3. CONVERSE should facilitate training, workshop, internship, and mentorship opportunities for ECRs to develop connections and gain the hard skills necessary to participate in an eruption response. This should include sub-discipline-specific training (e.g., geodesy, infrasound, modeling) with an emphasis on both field techniques and data collection and processing. It is also recommended that CONVERSE facilitate coordination between observatories and ECR’s for the purpose of baseline data collection and analysis, either at those volcanoes which are ‘under-studied’ or due to a backlog of data. This provides both coordination of ECRs with the eruption response community well in advance of eruption, but also the hands-on skills and experience indicated previously. Additionally, CONVERSE coordinators are encouraged to organize outreach efforts to ECRs such as networking events at scientific assemblies (e.g., IAVCEI, AGU, GSA).
4. It is currently strongly encouraged that there will be science communication training for those interested facilitated by CONVERSE (as was indicated in the 2021 Communication Response Report). This was proposed as training for communication skills, using different media types, communicating over social media, communication of hazards, and roles, responsibilities, and protocols of agencies.
5. To maximize the benefit of the above CONVERSE-facilitated training and workshops, the ECR community and CONVERSE coordinators are encouraged to develop a formalized ECR personnel database or directory. This would promote establishment of lateral connections and help link more senior scientists with ECRs who share interests or can contribute to data collection or other projects. This should include names, affiliations and current stage, and response-relevant skills, being produced and updated in blue-sky times for quicker call-down during responses.
6. The ECR community is encouraged to work with CONVERSE coordinators to develop an organized and searchable clearinghouse of ECR-relevant volcano (and adjacent) research funding opportunities hosted on a CONVERSE webpage. This could simply be a list of brief descriptions, eligibility criteria and links to solicitation pages; hopefully updated regularly as program elements change.

Unrest, Eruption Lead-up, and Eruptive Period

1. ECRs are recommended to get involved in science initiatives during eruption, by putting forward SAC proposals themselves, or by joining a proposal under another PI or senior researcher. The former provides a good opportunity for ECRs to gain experience without perceived or real management expectations and responsibilities. In the latter case, senior researchers writing SAC proposals are encouraged to treat these circumstances as training opportunities for all students, not only their own.
2. In order for ECR's to keep informed during unrest/eruptions it is encouraged that parties (including USGS) convening response coordination meetings or science briefings include in some capacity ECRs when doing so does not compromise said response or those participating in it. This could depend upon the level of involvement on a person-by-person basis. This provides an opportunity for ECR's to feel involved in the response and keep abreast of the official outputs from the observatories, as well as learn how such responses are handled.
3. It has been suggested that those ECR's who are interested become citizen social media responders during crisis response. These ECR's are required to use civilian accounts and are strongly reminded that care must be taken to disseminate accurate information without speculation. It is recommended to refer and guide interested parties back to official sources of information (typically webpages and social media posts from USGS, Civil Defense, etc.) This mitigates the possibility of deviation from official USGS/agency responses. This position allows for remote ECR involvement that would help facilitate community understanding and relieve pressure from agency personnel.

Post-Eruptive Period

1. ECRs need to receive credit in a timely fashion for open data they help create during responses since their timeline for using those credits (e.g., first proposals, job search) is much shorter than more senior researchers in permanent or long-term appointments. Scientists publishing open data generated in responses are encouraged to select hosting databases which assign a DOI and report the number of downloads for datasets. This allows ECRs to indicate interest in their research without necessarily having their articles already be cited or citable by the time of job search.
2. Scientists coordinating the work are encouraged to give ECRs a chance to lead-author articles. Furthermore, lead authors are encouraged to offer authorship to ECRs who participated in the data collection during a response as well as any other phase of the CRediT taxonomy.
3. In the wake of a response, senior researchers are encouraged to guide ECRs who may not have been able to join the response to newly created datasets and integrate them into these collaborations.
4. ECRs are encouraged to work with senior scientists to develop plans for long-term sample and data preservation as they transition between institutions. This should be done well in advance of these job changes.