CONVERSE – a community network for the scientific response to volcanic eruptions

RCN 2019 – 2022 : Focus on coordinating the collaboration of non-observatory scientists with USGS - Observatory scientists to collect multidisciplinary data/samples during eruptions

2022 – 2024: Track 1 NSF Geohazards Catalyst Center
Converging on Eruption Science with Equity

Focus on: - USGS collaboration/coordination as in RCN
- facilitate participation of US scientists in non-US eruptions (potentially globally)

Tobias Fischer (Center PI), University of New Mexico & Bruce Houghton (co-PI), University of Hawaii

Concept of Community Network for Volcanic Eruption Response (CONVERSE) grew out of the E.R.U.P.T. report as one of three Grand Challenges - Develop a coordinated Volcano Science Community to maximize scientific returns from any event

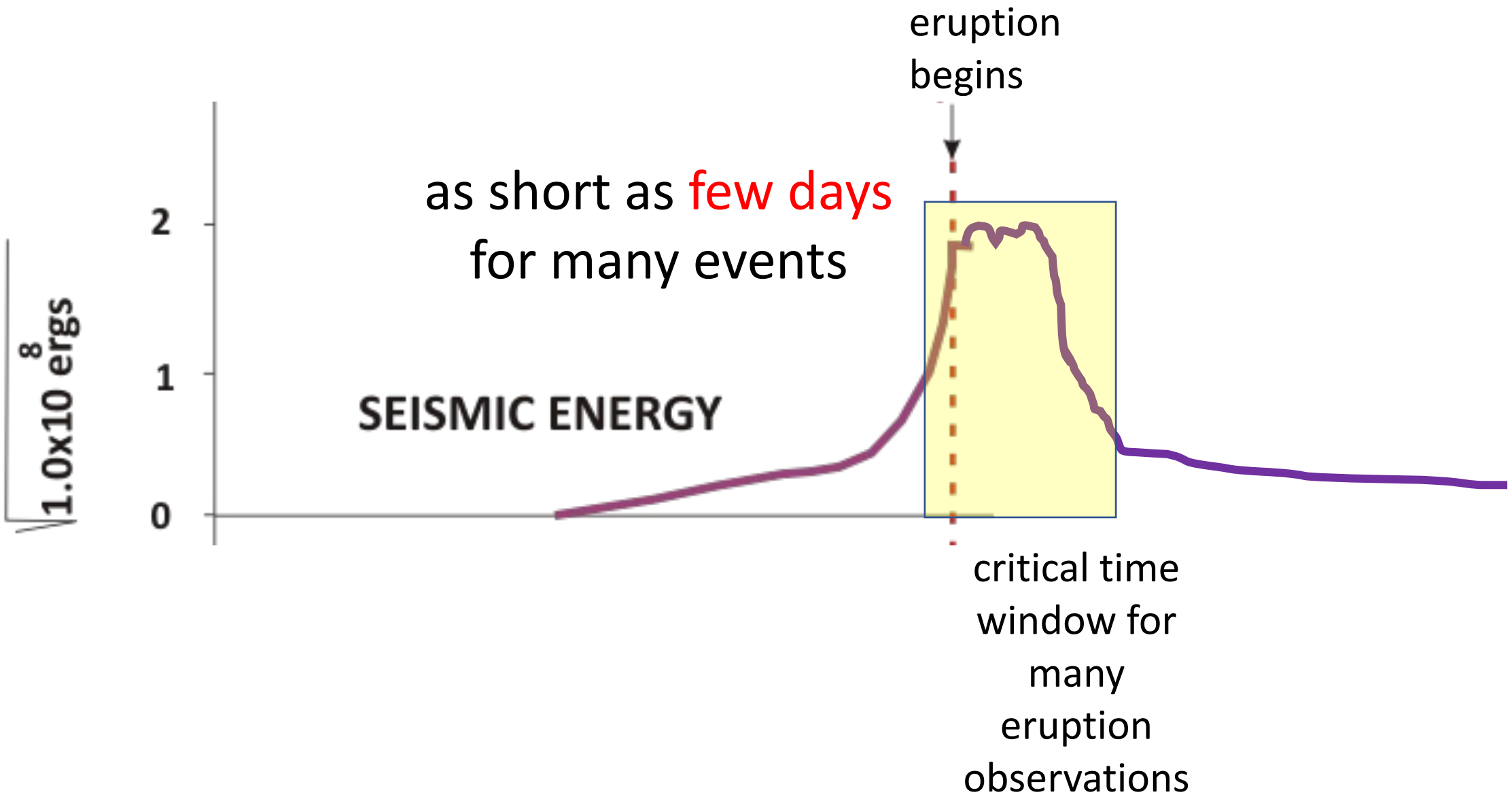
Multi-disciplinary and near-real time instrumental observations combined with collection and rapid analyses of key samples are critical to *advance our current understanding of volcanic systems* and *make progress towards the development of quantitative volcano models* that are fundamentally based in physics and chemistry (NAS, 2017)

Need to strengthen volcano science and the ability to collect critical data at an eruption in order to maximize scientific return and overcome observational bias (NAS, 2017)

The National Academies of SCIENCES ENGINEERING MEDICINE

NSF NASA USGS science for a changing world

Importance of collecting data and samples right before, during and right after eruption



Modified from Dan Miller, VDAP and Bruce Houghton, U of Hawaii

Main Activities so far

Disciplinary workshops July 2019 – March 2020

Mount Hood Virtual Eruption Scenario (Nov. 2020) – SAC concept

Distributed Volcanic Field Eruption Scenario (4 weeks, Feb 2022)

80 participants

Kīlauea Eruption coordination of science with HVO Dec 2020 – May 2021

9 proposals submitted

Maunaloa Eruption coordination of science with HVO Nov. 2022

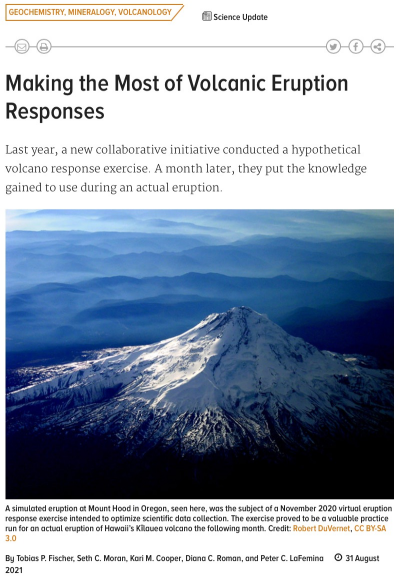
11 proposals submitted

Kīlauea Eruption coordination of science with HVO Jan. 2023

Main Products so far

Scientific Advisory Concept (SAC) with guidelines

Article published in EOS on Mt Hood Scenario (Fischer et al., 2021), Article in press on SAC concept in Bull Vol. (Cooper et al.), Article submitted on DVF scenario to Volcanica (Lin et al.).


GEOCHEMISTRY, MINERALOGY, VOLCANOLOGY

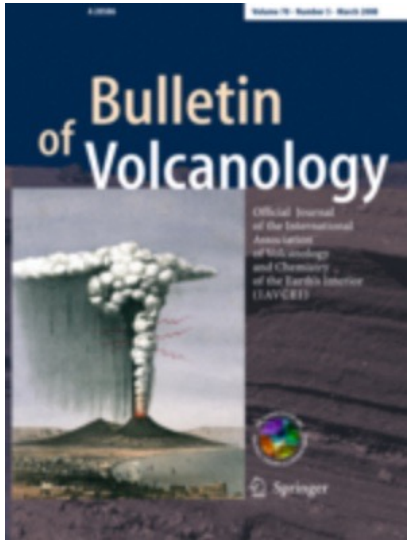
Science Update

Making the Most of Volcanic Eruption Responses

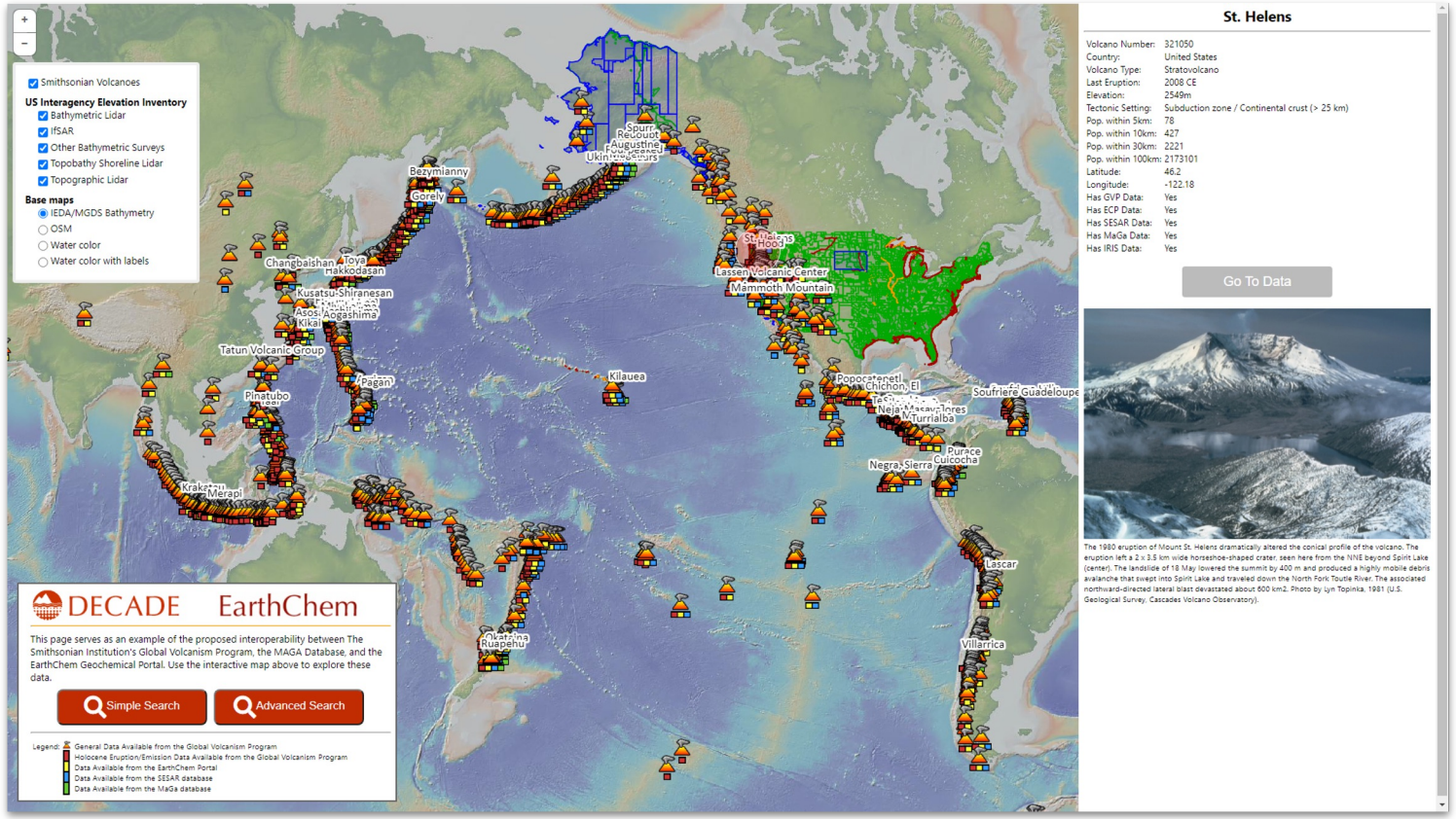
Last year, a new collaborative initiative conducted a hypothetical volcano response exercise. A month later, they put the knowledge gained to use during an actual eruption.

A simulated eruption at Mount Hood in Oregon, seen here, was the subject of a November 2020 virtual eruption response exercise intended to optimize scientific data collection. The exercise proved to be a valuable practice run for an actual eruption of Hawaii's Kīlauea volcano the following month. Credit: Robert DuVernet, CC BY-SA 3.0

By Tobias P. Fischer, Seth C. Moran, Kari M. Cooper, Diana C. Roman, and Peter C. LaFemina · 31 August 2021



Volcano Portal (aka DECADE Portal) https://decade.earthchem.org



- ❑ Volcano Data and Sample Discovery Portal
- ❑ Access to data in partner databases
- ❑ Now allows users to define & store polygons for data access (not public yet).

Portal Data Sources

Eruption & Emissions Data in **GVP**

Geochemistry and mineral chemistry in **EarthChem** Library & EarthChem Portal

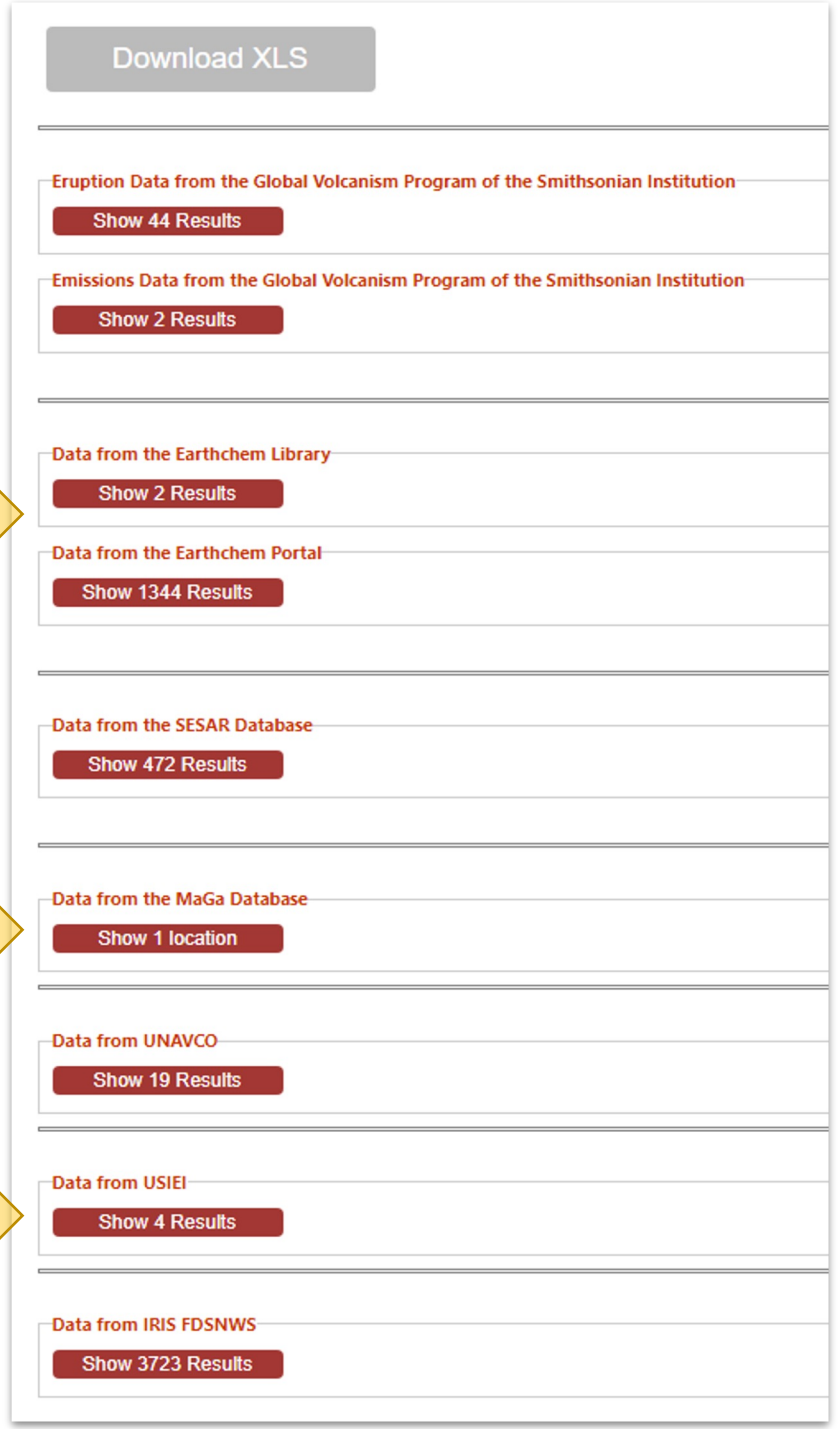
Samples catalogued in **SESAR**

Volcanic gas compositions & flux from **MaGa**

Geodetic stations from **UNAVCO**

US Interagency Elevation Inventory

Earthquake data (by year) from **IRIS**



CONVERSE Center

Senior personnel			**US based Partners (self-funded)**	
name	institution	expertise	Institution	main contact
Tobias Fischer (PI)	UNM	gas geochemistry	USGS Volcano Science Center	Tina Neal
Bruce Houghton (co-PI)	UH Mānoa	eruption dynamics	NASA JPL	Paul Lundgren
Kari Cooper	UC Davis	petrology	Smithsonian GVP	Ben Andrews
Mathew Fricke	UNM	machine learning	American Museum of Nat. History	Ro Kinzler
Karl Kim	UH Mānoa	hazard planning	IEDA Data Repository and Portal	Kerstin Lehnert
Einat Lev	LDEO	eruption modeling	The Santa Fe Institute	Melanie Moses
Yolanda Lin	UNM	hazard communication		
Michael Lindell	U Wash.	emergency management		
Michael Manga	UC Berkeley	fluid dynam./modeling		
Chriselle Wauthier	Penn State	geodesy		

CONVERSE is International: UNA/OVSICORI, Costa Rica (Marino Protti); INETER, Nicaragua (Wilfried Strauch); IG, Ecuador (Silvana Hidalgo); INVOLCAN, Canary Islands (Nemesio Pérez); INGV, Italy (Jacopo Taddeucci); Earth Observatory of Singapore (Susanna Jenkins); University of Iceland (Thor Thordarson); Center of Volcanology, Indonesia (Andiani); GNS, New Zealand (Graham Leonard)… and others.

Center supports:

0.5 FTE Center Coordinator at UNM

0.5 FTE Instrument Development Coordinator at UH

https://conversecenter.org/planning-a-future/

CONVERSE
Converging on Eruption Science with Equity

Planning a Future

Upcoming workshop will be held in Portland, Oregon, on the evening of March 27th through March 30th at noon (2023)

The CONVERSE Center is a newly NSF-funded Geohazards Catalyst Center that is dedicated to coordinating the academic response to volcanic eruptions to maximize the scientific return. The center follows on from the CONVERSE Research Coordination Network that has been operational since 2018 with the same goal of coordinating the scientific response to volcanic eruptions between the US Volcano Observatories and the non-observatory scientific community. The current center continues this effort and also aims to coordinate the science response of US academic institutions to eruptions occurring outside the US.

We are holding an in-person workshop in Portland, Oregon from March 27 (evening) – 30 (noon), 2023 to launch the new NSF-funded Geohazards Track 1 Catalyst Center. The CONVERSE Catalyst Center provides an opportunity to engage in activities that prepare for the preparation of a proposal for a Full (Track 2) Geohazards Center which will be submitted in March 2024.

The purpose of the meeting is to inform the volcano science community about the activities of the current Catalyst Center and obtain suggestions for the structure and activities of the Full Center.

There will also be a virtual participation option and the application process will be made available on this site.

Some additional Information and FAQs

General

What is the CONVERSE mission?

- Coordination during eruption response to maximize scientific return

What is the envisaged funding structure for CONVERSE?

- Funded by NSF plus additional funding from institutions and partners

How is field based science important to the CONVERSE mission, and what types of field activities will be involved?

- Field based science is at the core of CONVERSE. All types of field-based activities related to obtaining time-sensitive data at eruptions are important to CONVERSE

PI participation

How does a scientist get involved with CONVERSE?

- Contact one of the participants, post a message on the message board (yet to come)

What are the expectations of participant? Is there direct support?

- Subsidized participation in workshops, including eruption scenarios, participation in field training. No support in phase 1 beyond travel to workshops.

How will you handle pre and post field work logistics and organizational support?

- We have a program manager at UNM and an instrument designer/coordinator at U of H

How is field support handled with respect to budgeting – centralized or via individual PI/proposals?

- CONVERSE supplies resources but does not fund projects.

Samples and Data

How will you handle sample and data allocation, archival, storage, dissemination (physical, virtual, electronic)?

- We have started data and sample sharing protocols but more will be decided during workshops.

Will there be a moratorium on the data? If so, how will that work?

Outreach and Stakeholders:

How does your organization deal with outreach, broader impacts, collective impacts?

- Mainly through scenario exercises

How will you facilitate interactions with local stakeholders/ local community/ local scientists?

- Mainly through CONVERSE personnel working in and alongside communities