

Terry Plank, LDEO

Cleveland Volcano, AK • Sept 2022
pc: Jasper Baur

*AVERT:
Anticipating
Volcanic Eruptions in
Real Time, with data*





Anticipating Volcanic Eruptions in Real-Time

GORDON AND BETTY
MOORE
FOUNDATION

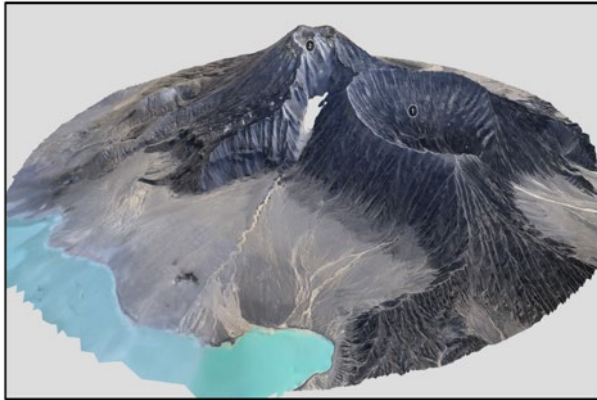


 COLUMBIA CLIMATE SCHOOL
LAMONT-DOHERTY EARTH OBSERVATORY

Project Leads: Terry Plank, Einat Lev • Engineering Lead: Nick Frearson (LDEO)
AVO Liaison: John Power (USGS) • AVERT Post Doc: Conor Bacon

- Open, Real-time Data to Improve Eruption Forecasting
- Novel Instrumentation and Array Development
- Community Transfer

**Okmok
has been
inflating since
2008 VEI 4
eruption**



Structure from Motion Intracaldera Cones (2021)
Pc: Jasper Bauer, AVO-AVERT Team



Web cam at CLCL (December 29, 2022)
AVO-AVERT Team

**Cleveland,
with active gas
plume, has had
explosive
eruptions
almost every
year since 2001**

Open, Real-time Data to Improve Eruption Forecasting



Satellite Telemetry

Wind Generator
(50W)

BGAN Satellite
Antenna



CLCO Comms Hub on Cleveland
Sept 2022



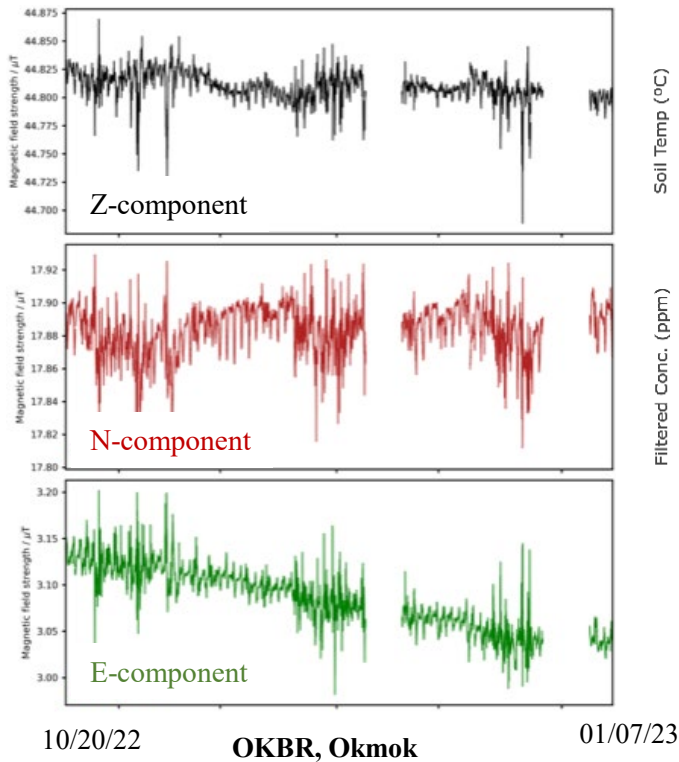
Ft Glenn VSAT
Comms Hub on
Okmok
July 2021



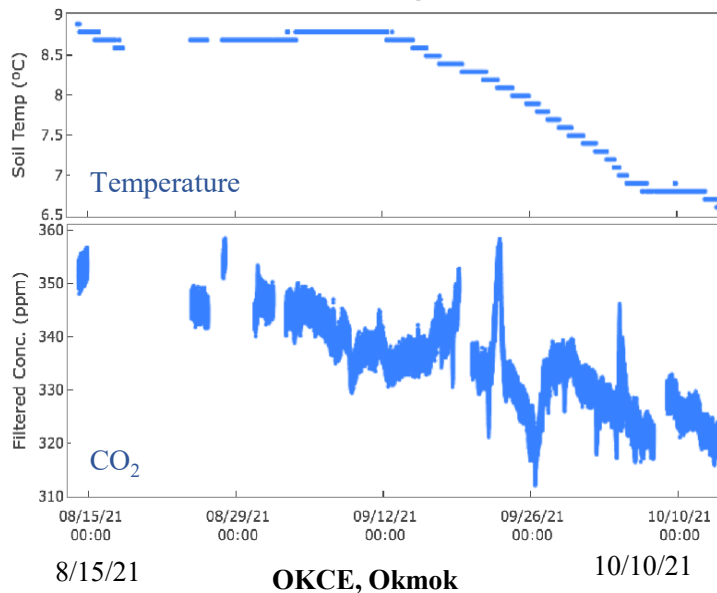
SpaceX: Starlink Satellite Internet
Aleutians online October 2022

Novel Instrumentation

Fluxgate Magnetometer Continuous, Real-Time @ IRIS Since Oct 2022



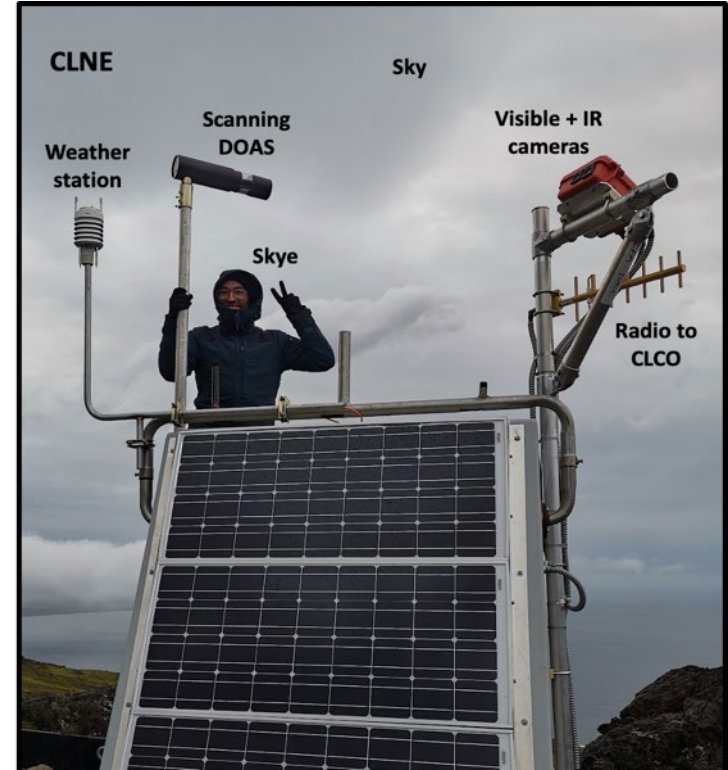
T and CO₂ Soil Probe Continuous, Realtime @ AVO/AVERT Since Aug 2021



Soil probe installation
Tarsilo Girona



Hut-1 = Seismometer, GNSS, Magnetometer,
Wind Generator

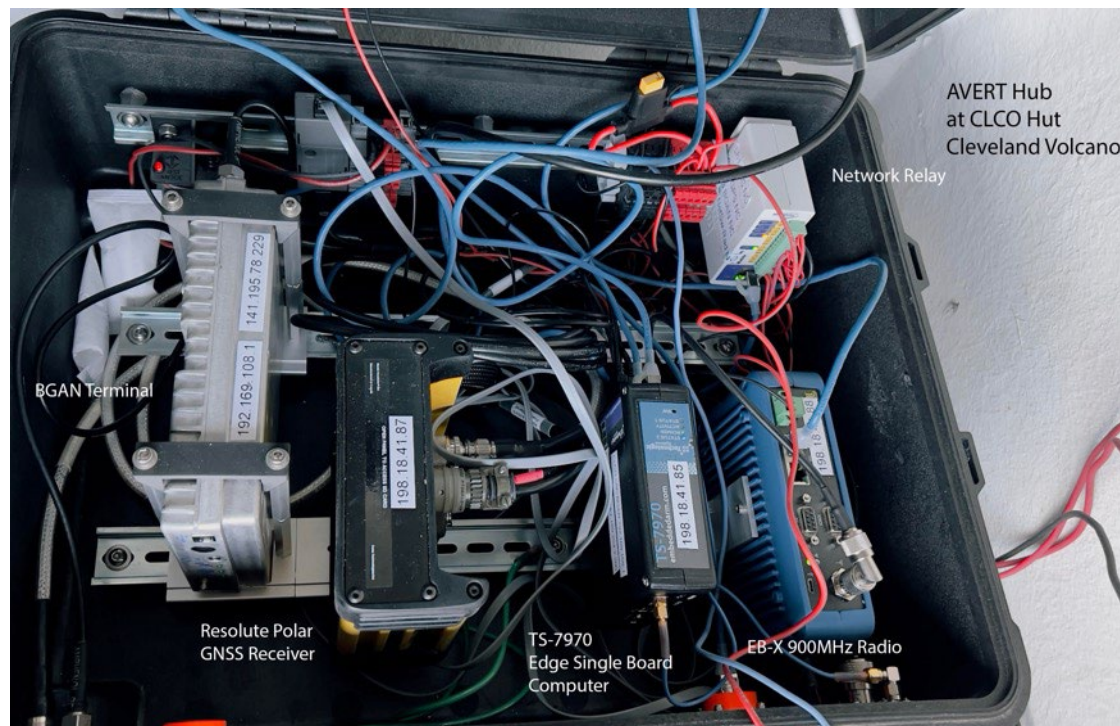


Hut-2 = Synched IR-Viz Cameras,
Scanning DOAS, Met Station

Array Development

Rugged, Low-power Single Board Computer at each Node and Hub

- Smart Power
 - Flexible Sleep-Wake Mode
- Edge Computing
 - Earthquake Location & Triggering
 - Machine Learning Plume Imaging



AVERT Comms Hub at CLCO Hut, Cleveland

Community Transfer



International Workshops



Next:
Novel Data Analysis to Anticipate Volcanic Eruptions
Spring 2023

450 registrants, 35 countries, 50% early career

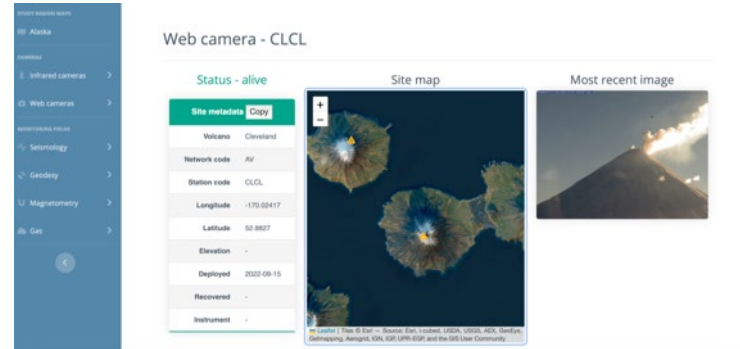
Third Volcano Array in 2023

High accessibility,
community involvement

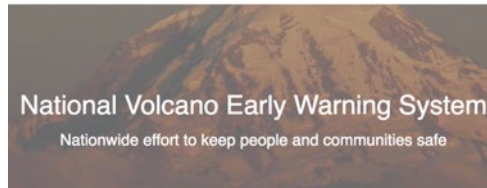


Web Portal:

Visualize & download data
in real-time, accessible



Legacy of Instruments And Design



AVERT still has 2-3 years –
Reach out if you have ideas or
Want to collaborate