

Research Prioritization in the Alaska-Aleutian Arc

AGU Fall Meeting | New Orleans, LA | November 14, 2025

Madison Myers, Behnaz Hosseini, Nicholas Barber, Xiaotao Yang, Margarete Jadamec, Susanne Straub, Mattia Pistone



Mini-Workshop Schedule

1:30 - 1:40 pm

Introduction by Conveners

1:40 - 2:20 pm

Working Group Updates

1. Structures of Magma Plumbing Systems (Maggie Moss* & Xiaotao Yang)
2. Origins of Along-Arc Magma Diversity (Nicholas Barber*)
3. Diversity of Seismic Sources in Volcanic Systems (Hannah Mark)
4. Linking Volatile and Gas Datasets (Behnaz Hosseini*)

* AGU presentation this week!

2:20 - 3:00 pm

Lightning Talks

3:10 - 3:25 pm

Pre-questions - Coffee Break

3:25 - 4:40 pm

Breakout Groups

4:40 - 5:00 pm

Breakout Group Summaries

5:00-5:10 pm

Conclusion and Future Directions

5:10 pm

Workshop Adjourned - SZ4D Mixer at 6 pm

FLASHBACK AGU 2023:

Prioritizing Community Efforts on Arc Magmatism in Cascadia and the Aleutians

Big picture questions of SZ4D Magmatic Drivers of Eruptions:

Q1: How do trans-crustal processes initiate eruptions at arc volcanoes?

Requires investigating eruption cycles at restless volcanoes.

Q2: What controls magma supply rate?

Requires understanding both eruption cycles and arc scale, trans-crustal processes.

Q3: What is the depth and distribution of magma?

Requires understanding arc scale, trans-crustal processes.



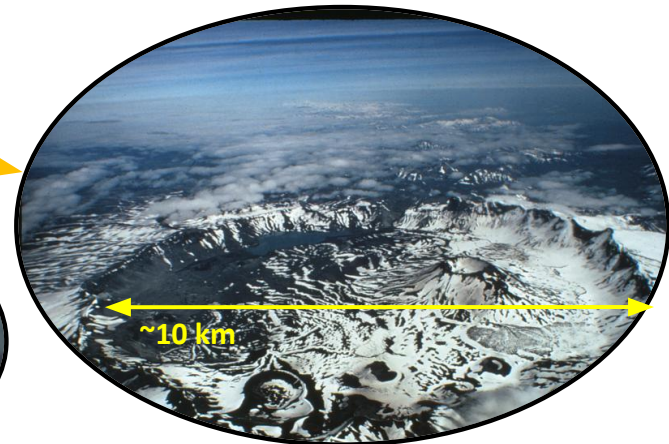
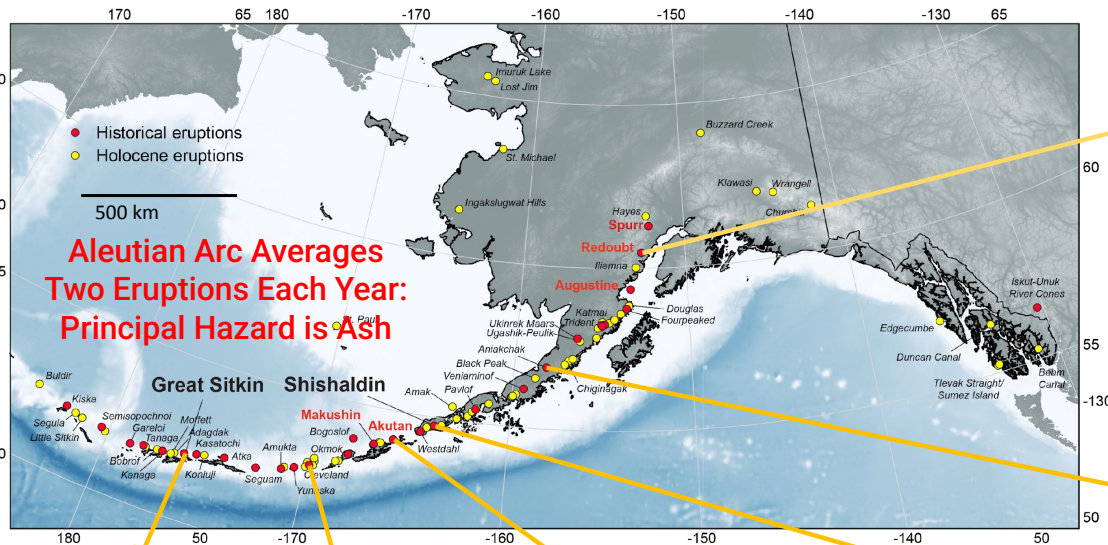
Anaïs Ferot



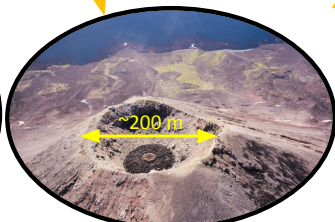
IMPACT: Focus on Alaska!

Redoubt 2009
(AVO/G. McGimsey)

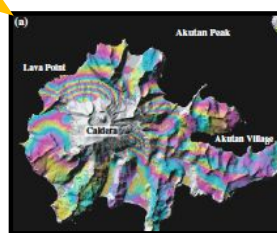
Frequently active and have the full range in size, tectonic framework (obliquity, subduction inputs, convergence rate), chemistry, repose interval, eruption style (closed/open vent), etc.



Great Sitkin 2023
(AVO/M. Loewen)



Cleveland 2015
(AVO/J. Lyons)



Akutan 1996
(Lu & Dzulis, 2014)



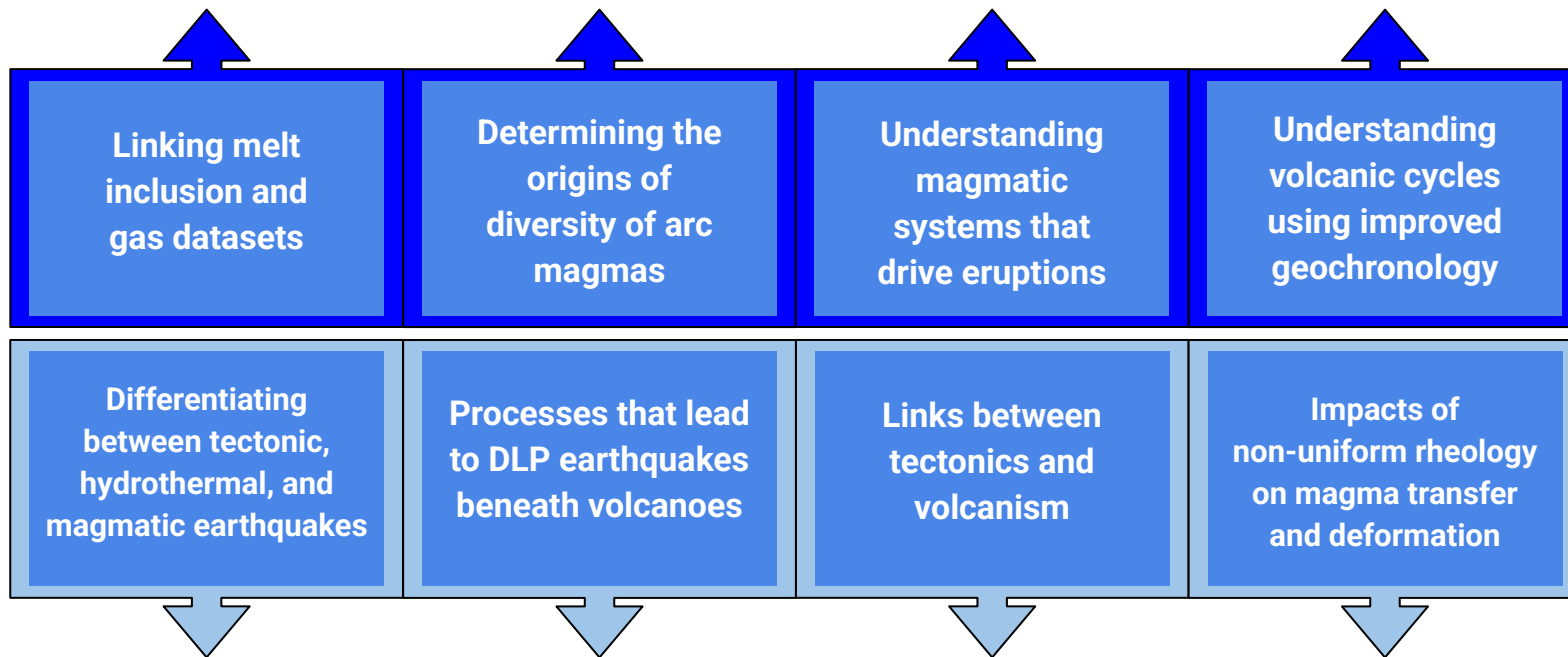
Shishaldin 2023,
(B. Reedy)

Aniakchak Caldera 1977,
(M. Williams)

AVO-Identified Science Priorities



Advancing our Understanding of Volcanic Cycles and Plumbing Systems



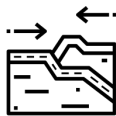
Analyzing Real-Time Datasets For Improved Interpretation of Active Systems

Alaska-Aleutian Arc Pros & Cons

Research Pros:



Frequent unrest & eruptions



Full range of tectonic frameworks



High rates of earthquake activity



High rates of plate convergence



Abundant existing datasets*

(AVO EQ Catalog & Geologic DB)

Research Cons:



Inclement weather



Remote/inaccessible

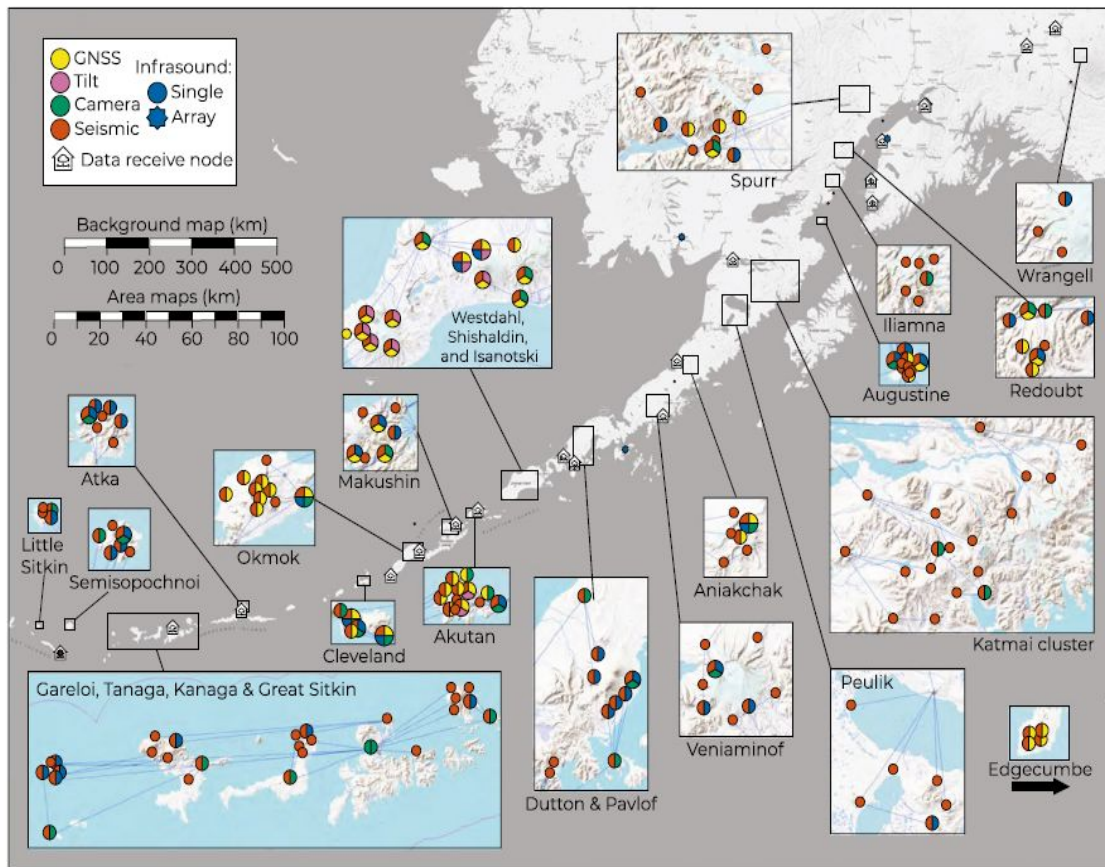


Expensive logistics



Land use permitting

Existing Datasets, Infrastructure, & Community Exercises



Existing datasets= lower cost research opportunity

GeoDIVA

Eruptions
2.6 Ma to
present
(~1 k events,
~500
eruptions)

ImageDB
(>35K)

References
(>5,600)

Sample
metadata
geology,
gas, water
(32K+)

Whole-rock
geochem
(>13,700)

Glass EPMA
(4.3K)

Petrography

Field
Projects

May 2025 Workshop Recap



PLANNING COMMITTEE

MADISON MYERS



Montana State University

MICHELLE COOMBS



USGS-AVO

MATT HANEY



USGS-AVO

JOHN POWER



USGS-AVO

KRISTI WALLACE



USGS-AVO

CHERYL CAMERON



Alaska Division of
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Surveys

RONNI GRAPENTHIN



University of Alaska
Fairbanks

KARI COOPER



UC Davis

ORGANIZING COMMITTEE

MADISON MYERS



Montana State University
Lead Organizer

ADAM KENT



Oregon State University
Lead Organizer

KARI COOPER



UC Davis
Lead Organizer

BEHNAZ HOSSEINI



Montana State University
Catering Services & Website Design

SKYE KUSHNER



University of Alaska Anchorage
Conference & Catering Services

ELIZABETH GRANT



UC Davis
Workshop Activities Organizer

Workshop Objectives



Utilize the rich and diverse datasets covering Alaska's highly active volcanoes to **answer pressing open questions** in subduction zones, through an interdisciplinary lens.

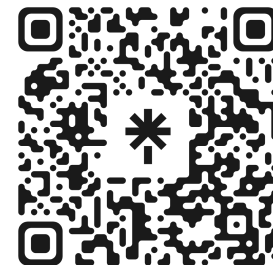


Introduce new researchers to the region and **strengthen partnerships with local knowledge holders.**



→ **3-day NSF-funded workshop** hosted at University of Alaska Anchorage

Linktree



→ **>70 participants from >40 academic institutions and government agencies**

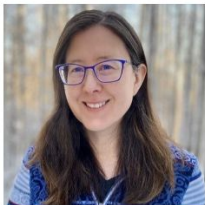


CONOR BACON



LDEO, Columbia University

CHERYL CAMERON



Alaska Division of Geological & Geophysical Surveys

MICHELLE COOMBS



U.S. Geological Survey -
Alaska Volcano Observatory

KARI COOPER



UC Davis

KRISTI WALLACE



U.S. Geological Survey -
Alaska Volcano Observatory

DIANA ROMAN



Carnegie Institution for Science

YouTube Channel



HANNAH DIETTERICH



U.S. Geological Survey -
Alaska Volcano Observatory

MAX ENDERS



U.S. Geological Survey -
Alaska Volcano Observatory

DAVID FEE



UAF Geophysical Institute

JEFF FREYMULLER



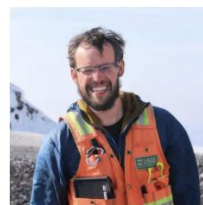
UAF Geophysical Institute

RONNI GRAPENTHIN



UAF Geophysical Institute

MATT LOEWEN



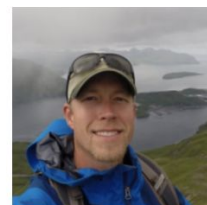
U.S. Geological Survey -
Alaska Volcano Observatory

TARYN LOPEZ



UAF Geophysical Institute

JOHN LYONS



U.S. Geological Survey -
Alaska Volcano Observatory

18 speakers presented on different aspects of **Alaska-Aleutian Arc science**, including **geochemistry**, **geophysics**, and **network operations**

MADISON MYERS



Montana State University

ABBEY NASTAN



Alaska Division of Geological & Geophysical Surveys

TERRY PLANK



LDEO, Columbia University

JOHN POWER



U.S. Geological Survey -
Alaska Volcano Observatory

5 speakers presented
available **databases** or
datasets relevant to
the **Alaska-Aleutian Arc**



Terry Plank



Mattia Pistone

YouTube Channel



Margarete Jadamec



Susanne Straub



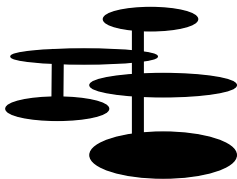
Bennett Van Horn



→ Visit to the **Geologic Materials Center** to learn about **sample archiving and sampling procedures**



→ Visit to the **USGS-Alaska Volcano Observatory** to learn about **operations and monitoring**



**Structures of Magma
Plumbing Systems**



**Edifice Stability
and Landslides**



**Origins of Along-Arc
Magma Diversity**



**Eruptive Cycles
and Compositional
Variation and Processes**



**Linking Melt Inclusion
and Gas Datasets**



**Diversity of
Seismic Sources
in Volcanic Systems**

2025 AGU Mini-Workshop



**Highlight
the
current
state of
knowledg**

e on

Alaska's



**Build on research
ideas** developed
during May 2025
workshops



**Bring new
researchers** into
the fold

Mini-Workshop Objectives

Mini-Workshop Planning & Organizing Committee



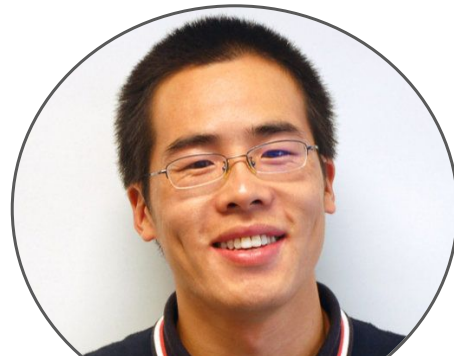
Anaïs Ferot



Madison Myers



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V41A-04Petrologic and Geophysical Synthesis of the Magmatic System at Akutan Volcano

Maggie Moss¹, Madison Myers², Hannah F Mark³, Xiaotao Yang⁴, Yitian Cheng⁵, Ronni Grapenthin⁶, Ya-Li Lizik⁴, Daniel Evan Portner⁷, Wei Jie Daniel Lee⁸, Sin-Mei Wu⁹, Jessica F Larsen¹⁰, Michelle L Coombs¹¹, Jeffrey Todd Freymueller¹² and Geoff Abers: Cornell University, Jack Foisy: University of Alaska Anchorage, Stephen McNutt: University of South Florida, (1)Colorado State University Fort Collins, Fort Collins, CO, UNITED STATES, (2)Montana State University, Bozeman, MT, United States, (3)Lamont - Doherty Earth Observatory, Palisades, United States, (4)Purdue University, Department of Earth, Atmospheric, and Planetary Sciences, West Lafayette, IN, United States, (5)Geophysical Institute, University of Alaska Fairbanks, Fairbanks, Alaska, United States, (6)University of Alaska Fairbanks, Geophysical Institute, Fairbanks, AK, United States, (7)University of North Carolina at Chapel Hill, Olney, United States, (8)Lamont-Doherty Earth Observatory, Palisades, United States, (9)University of Hawaii at Manoa, Department of Earth Sciences, Honolulu, United States, (10)Alaska Volcano Observatory, Fairbanks, United States, (11)U.S. Geological Survey, Alaska Volcano Observatory, Anchorage, United States, (12)Michigan State University, Earth and Environmental Sciences, East Lansing, MI, United States





 352 (NOLA CC)

Thursday, 18 December 2025 : 09:00 - 09:10

V51E-0085The Aleutian-Alaskan System: Revisiting the Correlations between Magma Geochemistry and Tectonic Parameters along the Northern Arc of the Ring of Fire

Mattia Pistone¹, Nicholas Barber², Susanne M Straub³, Alexander Hammerstrom⁴, Margarete Ann Jadamec⁵, Nathan A. Graham⁶, Bennett Van Horn⁷, Brennan Williams-Mieding⁸, Natali Kragh⁹, Sloane Kennedy⁷, Samuel Oxhorn¹⁰ and Elizabeth Grant¹¹, (1)University of Georgia, Athens, GA, United States, (2)Washington and Lee University, Department of Earth and Environmental Geoscience, Lexington, VA, United States, (3)Lamont Doherty Earth Observatory at the Columbia University, Palisades, United States, (4)University of Massachusetts Amherst, Department of Earth, Climate, and Geographic Sciences, Amherst, MA, United States, (5)University at Buffalo, Department of Geology; Institute for Artificial Intelligence and Data Science, Buffalo, NY, United States, (6)University of Alaska Fairbanks, Department of Geosciences, Fairbanks, United States, (7)Oregon State University, Corvallis, United States, (8)Boise State University, Geosciences, Boise, United States, (9)Montana State University, Department of Earth Sciences, Bozeman, United States, (10)OceanaGold Corporation, Kershaw, United States, (11)University of Washington Seattle, Sacramento, CA, United States



 Hall EFG (Poster Hall) (MCCNO)

Friday, 19 December 2025 : 08:30 - 12:00

V21B-0054A Community Approach to Rapidly Characterize Melt Inclusion Compositions from the June 1992 Explosive Eruption of Mount Spurr, Alaska

Behnaz Hosseini¹, Dr. Shuo Ding², Emily R Johnson³, Penny E Wieser⁴, Jessica F Larsen⁵, Matthew Loewen⁶, Michael R Hudak⁷, Madison Myers⁸, Richard L Hervig⁹, Nathan A. Graham⁵, Eilyn Huggins¹⁰ and Claudia Cannatelli¹¹, (1)Montana State University, Department of Earth Sciences, Bozeman, MT, United States, (2)University of Florida, Department of Geological Sciences, Ft Walton Beach, FL, United States, (3)U.S. Geological Survey, Cascades Volcano Observatory, Vancouver, United States, (4)University of California Berkeley, Department of Earth and Planetary Science, Berkeley, United States, (5)University of Alaska Fairbanks, Department of Geosciences, Fairbanks, United States, (6)U.S. Geological Survey, Alaska Volcano Observatory, Anchorage, AK, United States, (7)Williams College, Williamstown, MA, United States, (8)Montana State University, Bozeman, MT, United States, (9)Arizona State University, School of Earth and Space Exploration, Tempe, United States, (10)Cornell University, Department of Earth and Atmospheric Sciences, Ithaca, United States, (11)University of Alaska Anchorage, Department of Geological Sciences, Anchorage, United States



 Hall EFG (Poster Hall) (MCCNO)

Tuesday, 16 December 2025 : 08:30 - 12:00

- 1. Structures of Magma Plumbing Systems - Akutan**
- 2. Origins of Along-Arc Magma Diversity - Seguam, Redoubt, Adagdak, Hayes, Gareloi(?), + Synthesis Across Arc**
- 3. Diversity of Seismic Sources in Volcanic Systems - Akutan**
- 4. Linking Volatile and Gas Datasets - Spurr & Pavlof**

What Aleutian research priority areas do you have interest in that may not be represented by our existing working groups? Share your ideas, and upvote your favorite!

Nobody has responded yet.

Hang tight! Responses are coming in.



What ideas do you have for advancing research in Alaska-Aleutians given the current challenging (and uncertain) funding environment?

Nobody has responded yet.

Hang tight! Responses are coming in.



