Volcano-seismic monitoring: what is possible now?

Glenn Thompson1\*

1Alaska Volcano Observatory, University of Alaska Fairbanks, AK 99775-7320, USA

(\*correspondence: gthompson@alaska.edu)

While volcano-seismic research is important, equally important is the ability to build robust software systems which exploit that research in a real-time monitoring environment at volcano and seismic observatories. This sort of work isn’t well represented in research journals, but saves lives.

Regional monitoring agencies typically focus on producing a catalog of earthquakes, and this is all off-the-shelf software is designed to support. Such systems are generally not well designed for monitoring the wider range and much higher rates of seismicity that occurs near volcanoes. Capturing seismic signals like tremor, swarms, and corresponding to rockfalls, pyroclastic flows, explosions and lahars is key to understanding volcanoes.

In this presentation we follow the evolution of volcano-seismic monitoring over the past 20 years, as computing power, the world-wide web and relational databases have allowed improved our ability to monitor volcanic seismicity in real-time. We also look at today’s research to see where we might be in 5 years time.

We focus particularly on developments that have come from the USGS Volcano Hazards Program, the Alaska Volcano Observatory and the Montserrat Volcano Observatory. These include RSAM, web-based spectrograms, tremor and swarm alarm systems, Earthworm/Glowworm, rockfall/PF/tremor location systems, automated event classification, Winston, VALVE, the waveform toolbox and GISMO. We also look at the importance of using digital telemetry.