

1998 Fall Meeting

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volcano thompson

HR: 1330h
AN: V12B-09
TI: Near-Real-Time WWW-Based Monitoring of Alaskan Volcanoes: The IceWeb System
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AB: The Alaska Volcano Observatory (AVO) seismically monitors 18 active volcanoes in the Alaska peninsula and Aleutian islands. The IceWeb project is an extension to the infrastructure provided by IceWorm, a real-time seismic data acquisition and processing system in operation at the Geophysical Institute. IceWeb has two main purposes: (1) to enable scientists to see near-real-time plots of Alaskan volcano-seismic data via the World-Wide Web, (2) to send automatic alarms when a significant increase in volcanic tremor is detected. IceWeb produces spectrograms, reduced displacement and pseudo-helicorder plots for selected seismic data. These plots are displayed on the AVO internal web page.

Reduced displacement and spectrograms are considered to be an improvement over RSAM (Real-time Seismic Amplitude Measurement) and SSAM (Seismic Spectral Amplitude Measurement) respectively, which are commonly used at volcano observatories worldwide. Reduced displacement is a normalized measure of tremor amplitude, equal to RMS displacement corrected for geometrical spreading (assuming that volcanic tremor consists of surface waves). Each point plotted corresponds to the maximum reduced displacement in a frequency range of 0.8-10 Hz for a 10 minute data sample. Increased levels of reduced displacement lead to triggering of automatic alarms, which are sent to a pager and by e-mail. There is the flexibility to set a whole series of automated alarms based on frequency and/or amplitude. Spectrograms are calculated using FFTs of 10-s moving windows of data with 5-s overlap, and colour coded according to spectral amplitude. Frequency resolution is 0.1 Hz. Pseudo-helicorder plots are raw seismic data filtered between 0.8 and 5 Hz (to reduce storm and wind noise) and displayed in the form of a paper helicorder record.

IceWeb is supported by one Ultra-10 Sun workstation. At present 8 volcanoes are monitored, and data are acquired every 10 minutes (this time period is a compromise between number of stations monitored and computing power). The goal is to monitor all 18 volcanoes and reduce the acquisition period to a few seconds. In addition extra tools will be added, e.g. polarization plots, moment tensor inversion, f-k plots. Also on the AVO internal web page are other volcano-seismic data (e.g. locations and counts of a-type and b-type events, RSAM data etc.) and latest satellite images, though these are not part of IceWeb.

DE: 8419 Eruption monitoring (7280)
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