

## **The Role of Remote Sensing in Monitoring Volcanoes in Polar Regions: Case Study of the 2006 Eruption of Augustine Volcano**

P. Webley, Arctic Region Super Computing Centre (ARSC), 909 Koyukuk Drive, University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775, [pwebley@gi.alaska.edu](mailto:pwebley@gi.alaska.edu); K. Dean, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775; J. Dehn, Alaska Volcano Observatory (AVO)/Geophysical Institute, University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775; J. Bailey, Arctic Region Super Computing Centre (ARSC), 909 Koyukuk Drive, University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775; D. Schneider, Alaska Volcano Observatory (AVO)/USGS, 4200 University Drive, Anchorage, Alaska; R. Wessels, Alaska Volcano Observatory (AVO)/USGS, 4200 University Drive, Anchorage, Alaska; J. Lovick, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775; P. Rinkleff, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775; P. Izbekov, Alaska Volcano Observatory (AVO)/Geophysical Institute (GI), University of Alaska Fairbanks (UAF), Fairbanks, Alaska 99775

The Alaska Volcano Observatory (AVO) operationally monitors the volcanoes in the Polar Region of the North Pacific. One particular volcano of interest is Augustine Volcano, which recently erupted explosively starting on 11 January 2006 and over the next few weeks many more events followed disrupting air traffic throughout the region. Some of the volcanic clouds drifted to 70°N latitude over the Arctic Alaskan Coast. Augustine Volcano is located in the Lower Cook Inlet, 275 km (171 miles) SW of Anchorage, Alaska. It is situated at 59.37° N, 153.42° W and has an elevation of 1260m (4134ft). Satellite data were used to detect and monitor surface and airborne components of the eruption. Augustine became seismically active with subtle ground inflation starting in May 2005. On 12 December a 75 km long, low level gas plume was observed blowing to the SE. Airborne thermal imaging detected increased surface heating in early January. The volcano erupted multiple times between 11 - 28 January sending ash clouds up to 40,000 feet. The 13<sup>th</sup> and 14<sup>th</sup> eruptions consisted of six separate events resulting in 6 simultaneously drifting ash clouds in the Alaska region. From 28 January to 4 February the volcano was in a state of continuous eruption. After this period, activity decreased. Pyroclastic flows and lahars occurred throughout the eruption. A light ash fall was observed at many locations in the region. This presentation will focus primarily on the detection and analysis of volcanic clouds and thermal anomalies observed on satellite data. Data from three groups of satellites: GOES, AVHRR and MODIS were analyzed using visible and infrared wavelengths from time sequential data sets. Animations showing the dispersion of the ash clouds were simulated using the Puff model and compared to ground based instruments and ash fall observations. Changes in the

temperature and morphology of thermal anomalies are related to heating of the dome, pyroclastic flows and lahars.