Alaska Interagency Plan for Volcanic Ash Episodes

November 2017

Cover: Pavlof in eruption on March 28, 2016. Photo taken at 20,000 feet, by U.S. Coast Guard. AVO Image URL:

http://www.avo.alaska.edu/admin/imagedb/image.php?imageid=93551&showmenu=0

Table of Contents

Introduction

Drifting ash clouds and ashfall from North Pacific volcanoes can threaten aircraft operations in Alaska and throughout the Nation. Volcanic ash also can significantly impact Alaskan communities, infrastructure, and human health. A well-coordinated response is required to facilitate the flow of timely, consistent, useful information to those at risk. This Interagency Operating Plan provides an overview of an integrated, multi-agency response to the threat of volcanic ash in Alaska. It presents an agency-by-agency description of roles and responsibilities during volcanic ash events. The plan is supported by more detailed standard operating procedures maintained by each participating agency or operating unit.

This plan covers the State of Alaska and the adjacent United States airspace Flight Information Regions (FIRs). This plan also discusses responsibility for volcanic ash transported from volcanoes outside the United States into Alaskan airspace, such as those in Kamchatka and the Kurile Islands, Russia.

The Interagency Operating Plan for Volcanic Ash Episodes in Alaska is an integral part of the Volcano Hazards Implementation Plan that supports a formal Agreement between the National Oceanic and Atmospheric Administration (NOAA) and the Federal Aviation Administration (FAA) on the topic of volcanic hazards. Support from the U.S. Geological Survey (USGS) to this NOAA/FAA Agreement has been formalized in a Letter of Agreement. As such, this Alaska plan describes communication links and actions necessary to support the NOAA/FAA/USGSVolcano Hazards Implementation Plan. The Alaska plan is referenced in the 2007 National Volcanic Ash Operations Plan for Aviation published by the Office of the Federal Coordinator for Meteorological Services (http://www.ofcm.gov/publications/volcanicash/FCM-P35-2007-NVAOPA.pdf).

Information Coordination

Agencies relaying information about volcanic ash events, forecast ash cloud trajectory, and potential impacts must deliver a consistent message. To achieve this, close collaboration via telephone and other means during unrest and eruptions is essential.

Any participant agency may be the first to receive a report of volcanic unrest. Timely validation, processing, and dissemination of information are crucial steps in a successful multiagency response. Considering the comparative rarity of volcanic ash events but high potential for catastrophic loss, all reports should be taken seriously.

Dissemination of Warning Products

Each agency distributes alert and safety information through a variety of communication portals. National Weather Service (NWS) uses NOAA Weather Wire, marine High Frequency (HF) and Very High Frequency (VHF) radio, NOAA Weather Radio (NWR), the statewide Alaska television weathercast, and the Emergency Alert System (EAS) in addition to distribution of text and graphics by its own telecommunications Gateway and through telephone facsimile, and the Internet. FAA distributes aviation

weather forecasts, advisories and warnings from the NWS, flight information, pilot reports, and terminal information via its Aeronautical Fixed Telecommunications Network (AFTN) data links. The Division of Homeland Security and Emergency Management (DHS&EM) State Emergency Operations Center (SEOC) can redistribute critical information via the First Class email system, commercial radio, television, cable and Internet service in addition to the Alaska Warning and Alert System (AKWAS) and the EAS. The Alaska Volcano Observatory (AVO) uses the Internet, telephone, and facsimile as primary means for communication. Details of procedures for sharing information are provided in individual agency sections. By using diverse methods to disseminate information, the collective ability to reach as many people as quickly as possible is optimized. The suite of warning products for volcanic events in Alaska is shown in appendix J.

Plan Management

This is the eighth edition of the Alaska Interagency Operating Plan for Volcanic Ash Episodes. The plan should be reviewed and updated every 2 years. The plan will be maintained by the U.S. Geological Survey or the National Weather Service Alaskan Region (Environmental and Scientific Services Division) or other plan participant as needed. Prior editions from 1994, 1997, 2001, 2004, 2008, 2011 and 2014 are on file at the Alaska Volcano Observatory in Anchorage. Most recent plans are available at: https://www.avo.alaska.edu/downloads/reference.php?citid=3996.

The timeline and processes of updating the 2017 plan:

October 2015: Using the 2014 Plan, AVO reorganized the sections to make them more parallel and clearly state: 1) roles & responsibilities, 2) principal contacts and 3) products and product dissemination.

November 2015: All-hands Interagency meeting at AVO where points of contact (POC) from each agency were in attendance to discuss updates to the existing Plan (2014).

December 2015: Individual agency sections were sent to each agency POC by AVO to review and provide updates.

April 2016: All reviewed agency sections were collated into a single document by AVO (originals on file at AVO).

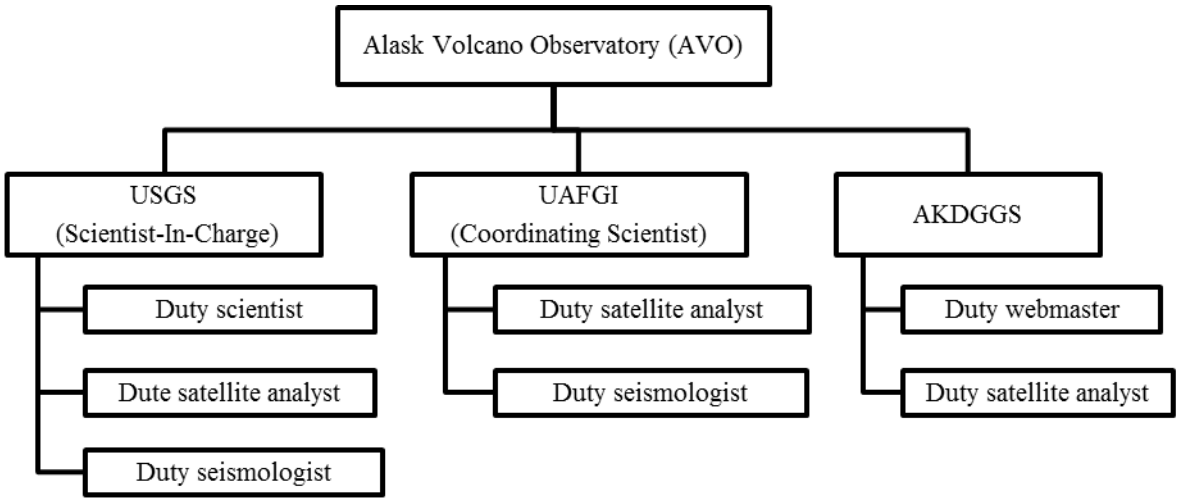
May 2016: All contacts listed throughout the Plan were verified by AVO.

Responsibilities of the Participating Agencies

The following sections contain general outlines of each agency's actions in response to volcanic unrest and eruption.

Alaska Volcano Observatory (AVO)

Organizational Structure



AVO is a joint program of the USGS, the University of Alaska Fairbanks Geophysical Institute (UAFGI), and the Alaska Division of Geological and Geophysical Surveys (ADGGS).

AVO consists of scientists and staff at offices in Fairbanks (UAFGI, ADGGS) and Anchorage (USGS). Geologists and geophysicists at all three agencies share research, data processing, analysis, and hazard communication duties. The AVO facility at the USGS Volcano Science Center in Anchorage serves as the response and operations center during times of increased volcanic activity. Each facility can serve as limited backup to the other. Managerial responsibility for AVO rests with a Scientist-in-Charge (SIC) and a Coordinating Scientist (CS), as described below.

- **Scientist-in-Charge (SIC)**, USGS/AVO – Anchorage, AK
  The SIC is a USGS employee based at the USGS Volcano Science Center in Anchorage, Alaska, and is the official spokesperson and line-manager for AVO/USGS staff. The SIC coordinates all AVO monitoring, hazards assessment, and information dissemination and carries a cell phone 24 hours a day. The SIC ensures that (1) monitoring and hazard assessments are thorough and effective; (2) monitoring and hazard data are adequately analyzed and reviewed; and (3) accurate and timely hazard assessments, forecasts, warnings, and supporting scientific information are issued to all concerned parties, including local, State, and Federal officials, and the public.

- **Coordinating Scientist (CS)**, UAFGI/AVO – Fairbanks, AK
  The CS is currently based at the UAFGI in Fairbanks and acts as principal liaison between the UAFGI and ADGGS in Fairbanks and the SIC in Anchorage. The CS ensures timely communication of monitoring and scientific information gathered at the UAFGI and/or ADGGS to the SIC and AVO staff.

- **Duty Scientist**, USGS/UAFGI/ADGGS/AVO – Anchorage and Fairbanks, AK
  Duty Scientists from the AVO science staff in Anchorage maintain operational awareness of volcanic activity, respond to inquiries regarding suspected volcanic activity, prepare daily status reports and other messages, and carry a cell phone 24 hours a day.
  Duty Seismologists, Duty Satellite Analyst, and Duty Webmaster conduct daily monitoring checks and provide 24/7 points of contact for key elements of monitoring and website communication; these duty scientists may be located in Anchorage or Fairbanks.

Role During Volcanic Unrest/Eruption

The Federal Government, through the Stafford Disaster Relief and Emergency Assistance Act of 1974 (Public Law 93-288), states that the USGS as been delegated the responsibility to issue disaster warnings "... for an earthquake, volcanic eruption, landslide, or other geologic catastrophe."

The Alaska State Legislature has similarly directed that the ADGGS conduct scientific investigations to assess geologic hazards to buildings and transportation facilities (AS 41.08.020).

The UAFGI is instructed to collect and archive seismic data on volcanic eruptions, to assess eruption hazards, and to inform the public, public officials, and industry of risks to lives and property (AS 14.40.075).

The Memorandum of Understanding establishing the AVO coordinates fulfillment of these State and Federal obligations among the USGS, ADGGS, and UAFGI.

In keeping with the statutory responsibilities of its component agencies, AVO has three primary objectives:

1. To conduct monitoring and other interpretive scientific investigations in order to assess the style, timing, duration, and impacts of volcanic activity.
2. To provide timely and accurate information on volcanic hazards, warnings of dangerous activity, and eruption notifications to local, State, and Federal officials and the public.
3. To assess volcanic hazards associated with anticipated activity, including kinds of events, their effects, and areas at risk

Responsibilities During Volcanic Unrest/Eruption

General Operational Procedures

During periods of volcanic quiet, AVO scientists acquire, interpret, and archive monitoring data, gather geologic information to develop eruption scenarios and hazard assessments, and conduct research and outreach. During heightened volcanic activity, AVO at the USGS in Anchorage becomes the principal point

of contact for government agencies, the media, and the public regarding information on volcanic activity and hazards assessment. AVO staff at ADGGS in Fairbanks responds to public inquiries received via the AVO Web email system. AVO staff from all three institutions assist in response duties. As needed, AVO may involve other USGS Volcano Science Center (VSC) staff from Volcano Observatories in the Cascades (CVO), Hawaii (HVO), California (CalVO), and Yellowstone (YVO) or other USGS offices.

AVO issues notification of volcanic activity via telephone call-down to key State and Federal government agencies (see Contacts section) as well as email, fax, and website postings. AVO communicates with International agencies involved in volcanic ash cloud and ashfall warnings including the Geological Survey of Canada (GSC) and the Canadian Meteorological Centre (CMC). AVO assists in responding to significant eruptions from Russian volcanoes (see sections on KVERT and SVERT).

Hours of Operation, Monitoring Network, and Frequency of Data Checks

Normal business hours for AVO are 9:00 a.m. to 5:00 p.m. Monday through Friday. After hours and on weekends, AVO staff can be contacted through an answering service and cell phones. As of January 2017, AVO seismic monitoring networks are operating at 33 Alaskan volcanoes (appendixes A and B). Earthquake activity at these volcanoes is checked twice daily. Occasional station outages and telecommunications problems may occasionally place a volcano in 'unmonitored status'. When necessary, these outages will be formally announced in an AVO Information Release.

AVO Satellite Analysts review satellite imagery and web camera images of Alaska volcanoes daily to look for elevated temperatures and ash clouds. AVO uses a publically available Web-based tool "VolcView" to examine satellite data (http://volcview.wr.usgs.gov/). Web camera imagery is available on our public website (http://www.avo.alaska.edu/webcam/). Data from the World Wide Lightning Location Network (WWLLN) provide near-real-time automated alerts of lightning strikes near Alaska volcanoes that have been shown, on occasion, to be indicative of explosive activity at the volcano. A number of Alaskan volcanoes have real-time GPS networks to detect ground motion that may be related to volcanic unrest (Okmok, Makushin, Akutan, Westdahl, Shishaldin, Augustine, Redoubt, and Spurr). AVO maintains several infrasound arrays to detect volcanic explosions. AVO also utilizes Web cameras, conducts periodic observational overflights, airborne volcanic gas measurements, and other monitoring activities as needed and as resources allow.

Once a volcano has become restless and is elevated to **YELLOW/ADVISORY** or **ORANGE/WATCH** status, AVO or other USGS VSC staff may examine seismic data at an increased frequency to be determined by the SIC. AVO also may increase the frequency of satellite image analysis.

A daily status report is issued for all volcanoes at **YELLOW/ADVISORY**, or higher. With proper notification, the AVO SIC may choose to suspend daily status reports for volcanoes with chronic, low-level unrest.

If a volcano reaches **RED/WARNING**, or at any time the SIC determines that the level of activity warrants around-the-clock, on-site surveillance, AVO begins in-office, 24-hour watch in Anchorage or Fairbanks or both locations.

AVO continues to develop operational seismic, satellite, and other alarm systems to notify staff should monitoring parameters exceed a pre-defined threshold.

Volcanic Activity Notifications

Continuous recording of seismic activity at many Alaskan volcanoes, in combination with other monitoring techniques, usually allows AVO to issue warnings of unrest and the possibility of a volcanic eruption hours to weeks in advance.

As of 2017, more than a dozen historically active volcanoes in Alaska are not monitored with real-time seismic networks (appendixes A and B). For these volcanoes, AVO relies on satellite surveillance, infrasound, lightening strikes, and reporting from other sources including mariners, flight crews, citizens, and others to detect unrest and eruptive activity. Thus, detection and notification of unrest and eruptive activity may be delayed, and future activity cannot be reliably forecast. Once a volcano becomes restless (for example, shows an increasing level of earthquake or other precursory activity), the following actions are taken:

1. The SIC is notified and may choose to activate the call-down procedure immediately or take further action to evaluate the situation.
2. Initial communication of increasing volcano hazard is by telephone call-down to the following interagency list, and then, by fax, email, and web posting (see Contacts section).
3. AVO may contact citizens, pilots, mariners, and other contacts at remote sites for additional information, as needed.
4. AVO will keep in close telephone contact with NWS and FAA so that each agency may provide updates on critical information as it becomes available. Coordination and sharing of information on eruption cloud height and movement is paramount.
5. A written volcanic activity notification (see Products section) is transmitted by fax and email and is posted to the AVO website as soon as possible. To subscription to the Volcano Notification Service (VNS) to receive notification emails about volcanic activity go to: https://volcanoes.usgs.gov/vns2/
6. Call-downs also will occur during each significant change in the status of an eruption or change in Aviation Color Code or alert level; this includes the end of eruptive episodes when ash emission has ceased (see Contacts section).
7. AVO may attempt to overfly or visit the volcano to assess the situation. Airborne gas measurements, deployment of portable seismic and other recording instrumentation, increased satellite surveillance, and field visits also may occur depending on the location of the eruption and severity of hazards.
8. As required, AVO will communicate with appropriate Federal, State, and private land managers who have jurisdiction over the land encompassing the volcano of concern to obtain access permission and coordinate other logistics.

Aviation Color Code and Volcano Alert Level Terms

U.S. Volcano Observatories utilize a dual system of alerts. To address aviation hazards, U.S. Observatories use an Aviation Color Code. U.S. Observatories also issue a Volcano Alert Level to indicate the overall

status of the volcano and its ground-based hazards (for example, ashfall, lahar or mudflow, pyroclastic flow) that employs the terms 'NORMAL, ADVISORY, WATCH, and WARNING'. Definitions of these terms are shown in the tables that follow. Changing Aviation Color Codes and Volcano Alert Levels indicate increasing severity and likelihood of potential impacts and are similar to those used by NWS for severe weather alerts.

The SIC, in consultation with the CS, also may assign an Aviation Color Code and alert level to a volcano that is not seismically monitored based on its past eruptive history, pilot or ground based observations, and/or remote sensing data. However, non-seismically monitored volcanoes can never be in Aviation Color Code **GREEN**/ alert level **NORMAL** because we cannot definitively say the volcano is quiet. AVO will not be able to track increases in seismic activity at volcanoes without a seismic network and, in most cases, will not be able to issue warning or notification of an impending eruption. In those cases, the volcano is listed as Volcano Alert Level **UNASSIGNED**. A status of **UNASSIGNED** indicates that AVO does not have enough information to evaluate whether or not the volcano is at a background (quiet) state of activity.

ALERT-LEVEL TERMS. When the Volcano Alert Level is changed, a Volcano Activity Notice (VAN) is issued.	
NORMAL	Volcano is in typical background, noneruptive state **OR**, *after a change from a higher level*, volcanic activity has ceased and volcano has returned to noneruptive background state.
ADVISORY	Volcano is exhibiting signs of elevated unrest above known background level **OR**, *after a change from a higher level*, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
WATCH	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain, **OR** eruption is underway but poses limited hazards.
WARNING	Hazardous eruption is imminent, underway, or suspected.

AVIATION COLOR CODES When the volcano color code changes, a Volcano Observatory Notification for Aviation (VONA) is issued.	
GREEN	Volcano is in typical background, non-eruptive state **OR**, *after a change from a higher level*, volcanic activity has ceased and volcano has returned to noneruptive background state.
YELLOW	Volcano is exhibiting signs of elevated unrest above known background level **OR**, *after a change from a higher level*, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
ORANGE	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain, **OR** eruption is underway with no or minor volcanic-ash emissions (ash-plume height specified, if possible).
RED	Eruption is imminent with significant emission of volcanic ash into the atmosphere likely **OR** eruption is underway or suspected with significant emission of volcanic ash into the atmosphere (ash-plume height specified, if possible).

Coordination with Other Government Agencies

AVO maintains frequent contact with National Weather Service (NWS), Federal Aviation Administration (FAA), Department of Defence (DOD), Division of Homeland Security and Emergency Management (DHS&EM), U.S. Coast Guard (USCG), Department of Environmental Conservation (DEC), and other Federal, State, and local agencies to ensure effective communication of observational data and consistent interpretations and notifications of volcanic activity and hazards.

AVO's responsibility overlaps and integrates with that of NWS once an ash cloud has been generated, is drifting with the wind, and has the potential to produce ashfall. AVO and NWS strive to communicate frequently to ensure consistent messages regarding ash cloud height, motion, and potential impacts (including ashfall). AVO and NWS work together to ensure formal NWS warning messages (for example, ashfall advisories, marine weather advisories, SIGMETs, etc.) and AVO volcanic activity notifications are well-coordinated and as accurate as possible.

AVO will coordinate as needed with appropriate Federal (U.S. Fish & Wildlife Service, National Park Service), State (Department of Natural Resources), and private land managers who have jurisdiction over the land encompassing an active or restless volcano.

Contacts During Unrest/Eruption

Call down Responsibility of AVO Anchorage

Agency	Title	POC number
FAA	Anchorage Air Route Traffic Control Center	(907) 269-1103 (907) 269-1108*
NWS AAWU ANC-VAAC	National Weather Service-Alaska Aviation Weather Unit (AAWU)/Anchorage Volcanic Ash Advisory Center (ANC-VAAC)	(907) 266-5110
NWS-CWSU	National Weather Service-Center Weather Service Unit (CWSU)	(907) 338-1010 (907) 269-1145*
USAF	Joint Base Elmendorf-Richardson (JBER) Weather Station	(907) 552-4397 (907) 269-4903*
557th Weather Wing	2nd Weather Squadron (2 WS)	(402) 294-7264
Washington VAAC	NOAA/SAB, Washington Volcanic Ash Advisory Center	(301) 683-1401 (301) 683-1400*
CMC Montreal VAAC	Canadian Meteorological Centre/Montreal Volcanic Ash Advisory Centre	(514) 421-4635
USCG	Seventeenth Coast Guard District, Juneau	(907) 463-2001 (907) 463-2000*
DOI Emergency Response	Department of the Interior EMERGENCY RESPONSE Phil Johnson (try all #'s before leaving a message) -or- Grace Cochon	 (907) 271-5929 (off.) (907) 277-3783 (cell) (907) 345-0300 (hm) (907) 271-5011 (off) (907) 538-7671 (cell)
	ONLY call if ashfall on a community is expected	
AK-DEC-AQ	AK Department of Environmental Conservation – Division of Air Quality	(907) 748-2142 (cell) (907) 748-2141*
AK-DEC-DWP	AK Department Of Environmental Conservation- Drinking Water Program	(907) 451-2138 (907) 460-6056 (cell)

AK-DHSS	AK Department of Health & Social Services, Health Emergency Response Operations	(907) 903-3721
	ONLY if ash is expected in canada	
Canada	BC Province Emergency Center	(800) 663-3456

(*back-up number)

Call down Responsibility of AVO Fairbanks

Agency	Title	POC number
DHS&EM	Alaska Division of Homeland Security & Emergency Management/State Emergency Operations Center (SEOC)	(907) 428-7100 (800) 478-2337
Alaska Governor's Office	Assistant Chief of Staff Main Governor's Office Chief of Staff	(907) 428-7100
DOD-AF	Eielson AFB Command Post & Fort Wainwright (FWW) MP	(907) 377-1500

(*back-up number)

Call-down messages are brief and include the following general information:

- Name of caller
- Volcano name and location
- Nature of activity and source of information (seismicity, pilot report, etc.)
- Aviation Color Code and Volcano Alert Level status or change in status (see Aviation Color Code and Volcano Alert Level Terms section above)
- Start and stop time of event or activity (if known)
- Height of eruption cloud, how determined, and direction of cloud motion (if known)

Additions or modifications to this call down list require approval of the SIC.

Products & Product Dissemination During Volcanic Unrest/Eruption

The following products are issued by AVO to notify others of volcano hazards or other important information. All are posted on the AVO website and users may receive these products via email by subscribing to the Volcano Notification System (VNS): http://volcanoes.usgs.gov/vns/.

- Volcanic Activity Notice (VAN)
  AVO isses VANs to announce alert-level changes or significant volcanic activity. Upon verification of an eruption and following the call-down procedure, a formatted text message describing the location, time, type, size of the eruption, and likely hazards is distributed by AVO to its website, Federal, State, and local government agencies, the media, members of the public and private sectors including airlines, by Internet fax service and email systems. All VANs are immediately posted to the AVO website. Additional VANs are released as needed, depending on changes in volcanic activity, alert levels, or hazards. VANs also are used to declare the 'all clear' when an eruption is waning or has ceased.

- Volcano Observatory Notice for Aviation (VONA)
  A VONA is a derivative product of the VAN and contains information in a format specifically intended for aviation users (pilots, dispatchers, air-traffic managers, meteorologists) of volcano hazard information with emphasis on ash emission.

- Daily Update
  AVO typically issues a Daily Update for any Alaskan volcano at an elevated alert level or elevated Aviation Color Code (yellow-orange-red). This procedure may be suspended for chronic, low-level unrest at the discretion of the SIC and upon appropriate notification of Interagency partners and the public. These daily reports are posted to the AVO website, and sent by email to interested parties.

- Weekly Update
  AVO issues a weekly summary of volcanic activity in Alaska each Friday. These reports are posted to the AVO website, sent by email to interested parties, and faxed to recipients upon request.

- Current Status Report
  AVO typically issues a Current Status Report to provide an update about volcanic behavior or monitoring activities during ongoing events of unrest or eruption. A status report may be issed multiple times in a single day.

- Information Statements
  AVO issues Information Statements that announce topical information such as new monitored volcanoes, significant operational or monitoring capacity changes, ash resuspension, explanation of non-volcanic events at a volcano, and expanded descriptions of volcanic unrest and likely outcomes.

- Informal Web Updates and Use of Social Media
  As needed, AVO may institute a Web-only update message to provide users with a very brief, time-appropriate comment on the status of an erupting volcano. AVO uses Facebook https://www.facebook.com/alaska.avo and Twitter https://twitter.com/alaska_avo to distribute informal updates and other information.

- Recorded Telephone Message and website
  AVO maintains a recorded phone message line (907-786-7478) that will be updated frequently during significant eruptive activity. The most current information about the status of activity at

Alaskan volcanoes can be found at the AVO website http://www.avo.alaska.edu or the USGS Volcano Hazards website: http://volcanoes.usgs.gov.

- Ashfall and Ash Cloud Forecasting and Reporting
  USGS has developed a graphical ashfall forecast tool (Ash3D) that is used to support NWS ashfall statements and warnings. Graphical products from Ash3D are available to the public via the AVO website via volcano activity pages.

- NOAA Air Resources Laboratory produces forward trajectory graphics using the HYSPLIT model. These are available on the AVO website activity page for restless volcanoes. AVO offers internet access for users to run the PUFF model via the AVO website: http://volcview.wr.usgs.gov/puff/main.pl.

- AVO and the National Weather Service solicit information about ashfall to improve ashfall warning products, and study ashfall processes. The public is encouraged to file reports of ashfall and other observations on the "Is Ash Falling?" page on the AVO website: https://www.avo.alaska.edu/ashfall/ashreport.php.

- AVO also welcomes citizen participation in sampling volcanic ashfall to improve our analyses of eruptions. Detailed instructions are available on the AVO website: (http://www.avo.alaska.edu/ashfall.php).

- Satellite Remote Sensing Tools
  AVO uses VolcView, an online tool for display and analysis of near-real time remote sensing data for the North Pacific. It can be accessed at this website: http://volcview.wr.usgs.gov/.

- Volcanic Ash Impacts & Mitigation website
  This web encyclopedia provides information on the impacts of volcanic ash and mitigation strategies for dealing with them. Content is summarized from expert and peer-reviewed sources. https://volcanoes.usgs.gov/volcanic_ash/

Kamchatka Volcanic Eruption Response Team (KVERT)

KVERT provides information on volcanic activity in Kamchatka and the northern Kurile Islands to international air navigation services. KVERT consists of scientists from the Institute of Volcanology and Seismology (IVS) in Petropavlovsk, Kamchatsky. They utilize seismic information from the Kamchatkan Branch of Geophysical Services (KBGS) who seismically monitors 11 volcanoes of the Kamchatka Peninsula and Paramushir Island in the northern Kuriles (appendixes C and D). KVERT also receives occasional ground observer reports from several field stations and examines daily satellite data for Kamchatka and the northern Kuriles.

KVERT sends daily and weekly updates and Volcanic Activity Notices to a standing list of aviation and meteorology authorities in the region including Anchorage Volcanic Ash Advisory Center (VAAC), AVO, Tokyo VAAC, and many others. These notices are posted on the KVERT website at:

http://www.kscnet.ru/ivs/kvert/index_eng.php. Requests to be added to this email distribution can be sent to: girina@kscnet.ru.

In the event of a major eruption, KVERT notifies the Hydrometeorological Survey at Elizovo Airport near Petropavlovsk (also known as the Aviation Meteorology Center), the Department of Civil Emergencies, Russian media, and local officials by telephone.

KVERT uses the same Aviation Color Code as AVO to indicate the level of aviation hazard at Kamchatka and the northern Kurile Islands volcanoes.

AVO staff maintains situational awareness of volcanic activity in Russia and will assist with analysis and interpretation of Russian volcanic activity, principally using remote sensing tools, as needed. AVO will conduct an abbreviated call down in the event of a large or new volcanic event in Kamchatka and the northern Kurile Islands.

Sakhalin (Kurile) Volcanic Eruption Response Team (SVERT)

SVERT provides information on volcanic activity in the central and southern Kurile Islands (appendixes E and F). SVERT scientists are based at the Institute of Marine Geology and Geophysics in Yuzhno-Sakhalinsk. SVERT utilizes MODIS and NOAA satellite imagery daily to look for evidence of volcanic activity. There are no realtime seismic networks on any Kurile volcano other than an intermittently functional network on Atlasova Island (Alaid Volcano) near the southern tip of Kamchatka.

SVERT sends daily (Monday–Friday) and weekly updates and Volcanic Activity Notices to a standing list of aviation and meteorology authorities in the region including Anchorage Volcanic Ash Advisory Center (VAAC), AVO, Tokyo VAAC, and many others.

SVERT has a written eruption response plan that includes telephone notification of Air Traffic Control and Aviation Weather authorities in Sakhalin, and email notification to AVO, the Anchorage and Tokyo VAAC's, and others if any sign of volcanic activity is detected. These notices are currently posted on the

SVERT website at http://www.imgg.ru/ru. Requests to be added to the email distribution list can be sent to: *rybin@imgg.ru*. SVERT uses the same Aviation Color Code as KVERT and AVO to indicate the level of aviation hazard at Kurile volcanoes.

AVO staff maintains situational awareness of volcanic activity in the Kurile Islands and will assist with analysis and interpretation of Russian volcanic activity, principally using remote sensing tools, as needed. To ensure that proper U.S. authorities are alerted, AVO will conduct an abbreviated call down in the event of a large or new volcanic event in the Kurile Islands.

Call down Responsibility of AVO Anchorage for Significant Russian Volcanic Activity

Agency	Title	POC number
FAA	Anchorage Air Route Traffic Control Center	(907) 269-1103 (907) 269-1108*
NWS AAWU ANC-VAAC	National Weather Service-Alaska Aviation Weather Unit (AAWU)/Anchorage Volcanic Ash Advisory Center (ANC-VAAC)	(907) 266-5110
NWS-CWSU	National Weather Service-Center Weather Service Unit (CWSU)	(907) 338-1010 (907) 269-1145*
USAF/USA	Joint Base Elmendorf-Richardson (JBER) Weather Station	(907) 552-4397 (907) 269-4903*
USCG	Seventeenth Coast Guard District, Juneau	(907) 463-2001 (907) 463-2000*
	CALL ONLY IF ASHFALL IS EXPECTED IN WESTERN ALEUTIANS OR SIGNIFICANT DISRUPTION TO AVIATION	
DHS&EM	Alaska Division of Homeland Security & Emergency Management	(800) 478-7100

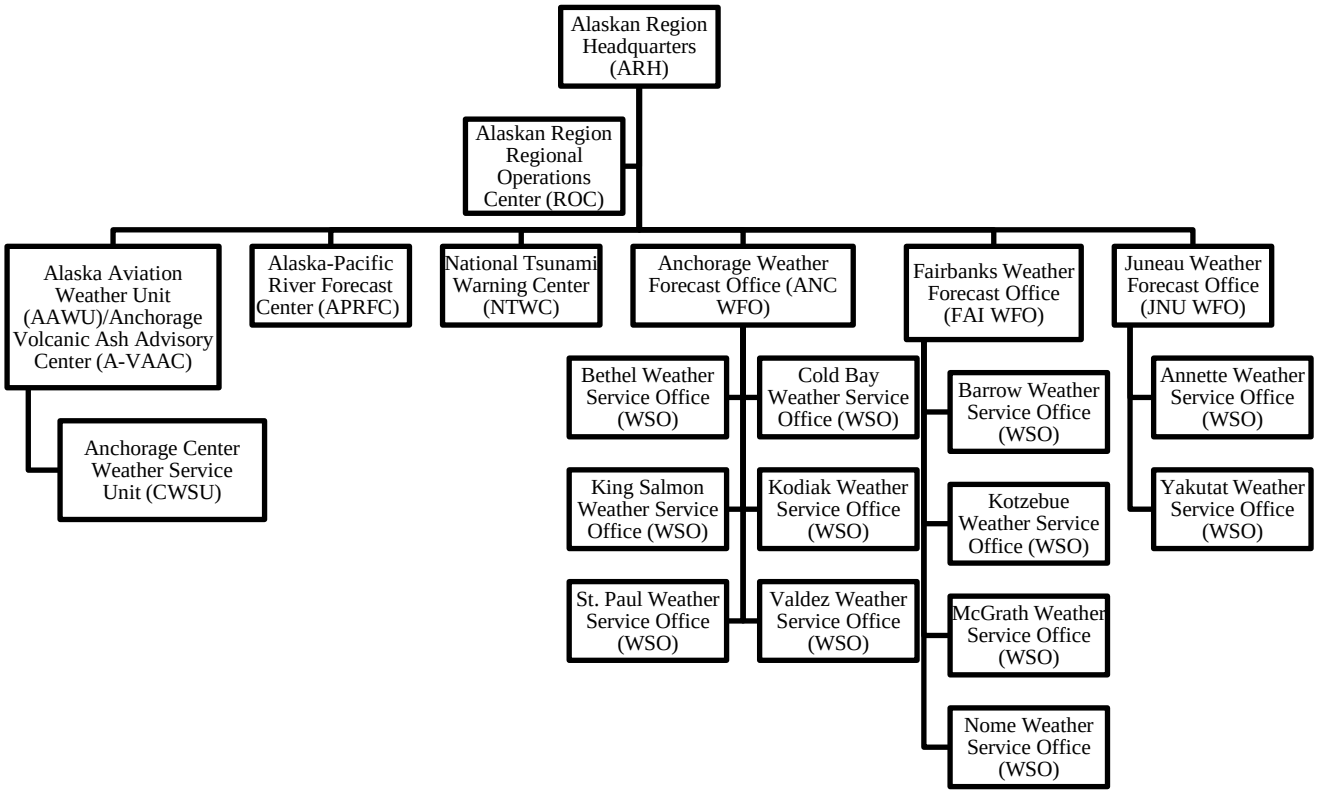
(*back-up number)

National Weather Service (NWS)

Organizational Structure-NWS Alaskan Region

The NWS in Alaska is responsible for forecasting and monitoring the state of the atmosphere, including the presence of volcanic ash clouds ejected into the atmosphere by volcanic eruptions. Several of Alaska's NWS offices share the responsibility of providing the aviation community, State & Federal government agencies, and the public with forecasts & warnings for volcanic ash in the atmosphere and for ashfall on the ground. These offices include:

- Alaska Regional Operations Center (ROC)
- Alaska Aviation Weather Unit (AAWU)/Anchorage Volcanic Ash Advisory Center (VAAC)
- Anchorage Center Weather Service Unit (CWSU)
- Three Weather Forecast Offices (WFOs)
- Twelve Weather Services Offices (WSOs)



Role During Volcanic Unrest/Eruption

- **Alaska ROC**
  The ROC is activated during high-impact volcanic eruptions to prepare and provide coordinated decision support briefings to NWS Headquarters as well as other federal, state, and local government agencies. The ROC assists with media inquiries to ensure a consistent message flows from all NWS field offices to the public.

- **AAWU/Anchorage VAAC**
  The AAWU, located in the NWS's Anchorage forecast facility, is the only International Civil Aviation Organization (ICAO) Meteorological Watch Office (MWO) that is also a VAAC. The AAWU/Anchorage VAAC is the NWS's lead for all volcanic ash warnings, advisories, and forecasts within the Alaska Flight Information Regions (FIRs) and is staffed by two forecasters per shift, 24 hours per day, and has the capability to expand staffing during major eruptive events.

  VAACs are primarily responsible for issuing Volcanic Ash Advisories (VAAs) (see Products section) which provide information on the distribution and forecast movement of ash. MWOs issue Significant Meteorological Information (SIGMETs) (see Products section) which serve as the primary warning product to the aviation community for volcanic ash. See Figure 1 and 2 for maps of the AAWU and Anchorage VAAC's areas of responsibility (AORs).

- **Anchorage CWSU**
  The Anchorage CWSU is located in the Federal Aviation Administration (FAA) Air Route Traffic Control Center (ARTCC) and is staffed by an NWS meteorologist daily from 5am to 9pm local time, covering two shifts. CWSU forecasters provide decision support briefings and advice to ARTCC managers and staff regarding volcanic hazards that may affect air traffic flow or operational safety. The CWSU is also the liaison between FAA facilities and other NWS offices.

  Forecasters issue Center Weather Advisories (CWAs) or Meteorological Impact Statement (MISs) (see Products section), as needed, to provide additional information essential to Air Traffic Managers' decision making processes. See Figure 2 for a map of the Anchorage CWSU's area of responsibility.

- **WFOs**
  The NWS Alaskan Region operates three WFOs, located in Anchorage, Fairbanks, and Juneau. WFOs participate in the volcanic eruption response by issuing ashfall statements, advisories, and warnings (see Products section) for the public and marine communities. Ashfall is included in Terminal Aerodrome Forecasts (TAFs) (see Products section) as appropriate.

- **WSOs**
  WSOs, located in remote locations throughout Alaska, assist in the coordination of information during volcanic events by soliciting ashfall reports and briefing local community members and leadership about potential hazards.

Responsibilities During Volcanic Unrest/Eruption

Initial Collaboration and Warning Process

- *Eruption in Alaska*
  The NWS can receive notification of a volcanic eruption in Alaska through many different channels, such as pilot reports (PIREPs) (see Products section), ship observations, satellite detection, webcam observations, and phone calls from the Alaska Volcano Observatory (AVO). After the initial report of an eruption, NWS forecasters take the following steps:
  1. If an NWS forecaster detects an eruption or receives notice from a source other than the AVO, their first priority is to notify the AVO.
  2. The AAWU/VAAC, CWSU, and AVO coordinate initial eruption details and/or confirm that an eruption has indeed occurred.
  3. If an eruption is confirmed or suspected, the AAWU/VAAC lead forecaster issues an Eruption SIGMET (see Products section) within five minutes of notification of an eruption.
  4. The CWSU forecaster distributes the Eruption SIGMET, shares preliminary information with ARTCC Air Traffic Managers (ATMs), and asks that controllers solicit PIREPs.
     - The AAWU/VAAC lead forecaster notifies ARTCC managers of the eruption and informs them of the associated advisories and warnings if an eruption occurs when the CWSU is closed.
  5. The CWSU forecaster notifies other FAA entities impacted by the ash, such as Air Traffic Control Towers (ATCTs) and Flight Service Stations (FSSs) and asks that controllers solicit PIREPs.
  6. The AAWU/VAAC lead forecaster notifies the ROC of any volcanic eruption likely to significantly impact the Alaska FIRs (generally above FL200) and of any Cook Inlet eruption.
  7. The AAWU/VAAC lead forecaster analyzes satellite imagery, dispersion model output, PIREPs, and other available data sources then issues an updated SIGMET, VAA, and Volcanic Ash Advisory Graphic (VAG) (see Products section), as quickly as possible, if an eruption is confirmed. The SIGMET is canceled if the report is determined to be a false alarm.
  8. If ashfall is expected or occurring, WFO forecasters issue appropriate ashfall statements, advisories, or warnings, and update TAFs for impacted airports. Ashfall forecasts are coordinated with the AAWU/VAAC to ensure consistency.
  9. WSO employees solicit mariners and the public for ashfall reports and ensure leaders in communities near the volcano are aware of potential hazards.
  10. The ROC duty officer initiates coordination calls with the Alaska Division of Homeland Security and Emergency Management (DHS&EM), the State Emergency Operations Center (SEOC), the Department of Health and Social Services (DHSS), NWS leadership, and other State and Federal agencies as appropriate.

- *Resuspension of Ash in Alaska*
  Occasionally ash from the 1912 Novarupta-Katmai eruption is resuspended by strong winds. NWS forecasters are generally notified of resuspended ash through satellite detection, webcam observation, PIREPs, or a phone call from the AVO. When this happens, NWS forecasters take the following steps:
  1. The AAWU/VAAC lead forecaster issues a VAA, VAG, and SIGMET then notify the CWSU, and WFO forecasters as well as AVO (unless they are known to be aware).
  2. The CWSU forecaster distributes the SIGMET to FAA ARTCC ATMs and briefs them of the expected duration of the resuspension event, potential for ash to reach hub airports, and asks that controllers solicit PIREPs.
     - The AAWU/VAAC lead forecaster notifies ARTCC managers of the resuspension and informs them of the associated advisories and warnings if an eruption occurs when the CWSU is closed.
  3. The CWSU forecaster notifies other FAA entities impacted by the ash and asks that controllers solicit PIREPs.
  4. The AAWU/VAAC lead forecaster contacts the AVO's on-duty scientist when a VAA, VAG, and SIGMET are issued for resuspended ash.
  5. If ashfall is expected or occurring, WFO forecasters issue appropriate statements, advisories, or warnings and update TAFs of impacted airports.
  6. WSO employees solicit nearby mariners and the public for ashfall reports and ensure leaders in communities near the volcano are aware of potential hazards.

- *Eruption in Kamchatka or the Kurile Islands*
  The NWS is generally notified of an eruption on Russia's Kamchatka Peninsula or in the Kurile Islands by receipt of a VAA and VAG from the Tokyo VAAC or a SIGMET from the Petropavlovsk MWO. Notification may also be by email from the Kamchatka Volcanic Eruption Response Team (KVERT), Sakhalin Volcanic Eruption Response Team (SVERT), or satellite detection by an NWS forecaster. When an eruption on Kamchatka or in the Kurile Islands occurs, NWS forecasters take the following steps:
  1. If Tokyo VAAC does not forecast ash to move into the Anchorage FIR, ash clouds are monitored by forecasters in the AAWU/VAAC and CWSU but no products are issued by NWS offices.
  2. If Tokyo VAAC forecasts ash to move into the Anchorage FIR, the AAWU/VAAC, CWSU, and AVO coordinate eruption details, ash tops, and ash movement.
  3. The CWSU forecaster disseminates the VAA from Tokyo VAAC and the Russian SIGMET (if available) to ARTCC ATMs, provides updates for the timing of ash movement and potential impacts to high-level jet tracks, and asks that controllers solicit PIREPs.
  4. The AAWU/VAAC issues a Near VAA (see Products section) within 15 minutes of receipt of a VAA and VAG from Tokyo VAAC.
  5. The AAWU/Anchorage VAAC notifies the ROC of eruptions likely to disrupt high-level air traffic.

- **Alaska ROC**
  The ROC duty officer (DO) provides briefings to regional and national NWS leaders to summarize ash forecasts, advisories, and warnings issued by Alaska field offices. Leadership briefings also include information about impacts to aviation & marine operations and impacts from ashfall in communities.

  The ROC DO serves as the NWS's primary point of contact for most state and federal agencies with whom operational forecasters do not directly coordinate, such as DHS&EM, DHSS, and the SEOC. The ROC may produce and deliver briefings to other government agencies or facilitate conference calls for forecasters to provide decision support briefings directly.

  The ROC DO produces or coordinates posts to social media (Facebook, Twitter, and YouTube). They also serve as the point of contact for most inquiries from the new media.

- **AAWU/Anchorage VAAC**
  AAWU/VAAC forecasters continuously monitor satellite imagery to detect and track volcanic ash in the atmosphere within the AORs and over the Kamchatka Peninsula in Russia. Eruption and ash cloud details are coordinated with the CWSU, WFOs, AVO, and neighboring MWOs & VAACs as appropriate.

  During on-going eruptive events, VAAs, VAGs, and SIGMETs are updated at least every six hours. Products are updated for all new eruptions and any time satellite data, PIREPs, or other data sources indicate changes to existing products are necessary.

  Once ash is no longer identifiable on satellite, no further reports of ash are received from the impacted area, and explosive eruptions have ceased, the AAWU/VAAC forecaster will issue a final VAA stating that ash is no longer identifiable and cancel the SIGMET.

  - **Coordination with Volcano Observatories**
    The AAWU/VAAC receives daily status reports from the AVO, KVERT, and SVERT via fax and email. AAWU/VAAC forecasters coordinate with AVO scientists throughout eruptive events to share PIREPs, satellite interpretations, and other observations. Ash cloud height determinations are frequently determined through a collaborative effort between the AVO, AAWU/VAAC, and the CWSU.

  - **Handover Procedures**
    Only one VAAC will issue VAAs for a continuous ash cloud at one time, although two VAACs may issue simultaneous VAAs for different ash clouds from the same volcano. As ash nears and crosses VAAC boundaries, VAACs transfer, or handover, responsibility of VAA issuance to the downstream VAAC.

    Anchorage VAAC frequently accepts handovers from Tokyo VAAC and commonly hands over responsibility of VAA issuance to the Washington VAAC, whose AOR borders that of

Anchorage VAAC to the south, and to Montreal VAAC, whose AOR borders that of Anchorage VAAC to the east. Handovers between Tokyo VAAC and Anchorage VAAC are completed with using a bilingual Handover Request Sheet (HRS) that is sent through email. Handovers between Anchorage VAAC and Washington VAAC or Montreal VAAC are coordinated over the phone. Anchorage VAAC, Washington VAAC, and Tokyo VAAC can also coordinate handovers and eruption details using the web-based chat client NWSChat.

The AAWU issues SIGMETs for the Anchorage FIRs. The AAWU's AOR is bordered to the south by the Oakland Oceanic FIR, for which the Aviation Weather Center (AWC) in Kansas City, Missouri has SIGMET responsibility. The AAWU's AOR is bordered to the east by that of the Canadian Meteorological Centre (CMC). AAWU forecasters coordinate with the AWC and CMC to determine whether one MWO will issue a single SIGMET spanning two AORs or if multiple SIGMETs will be issued for a single ash cloud.

- **Backup Operations**
  If the AAWU/VAAC is unable to issue VAAs and/or SIGMETs, Washington VAAC will issue VAAs and AWC will issue SIGMETs on behalf of the AAWU/VAAC.

  The AAWU/VAAC notifies the ARTCC of eruptive activity and ensures receipt of VAAs and SIGMETs when the CWSU is closed, between 9pm and 5am local time.

- **Anchorage CWSU**
  CWSU forecasters continuously monitor satellite imagery to detect and track volcanic ash in the atmosphere within the AORs and over the Kamchatka Peninsula in Russia. Eruption and ash cloud details are coordinated with key partners as appropriate.

  - **Decision Support for Anchorage ARTCC, FSSs and ATCTs**
    CWSU forecasters disseminate to the Anchorage ARTCC SIGMETs and VAAs for volcanic ash in or near the Anchorage FIR. Forecasters provide frequent updates of volcanic ash height, location, trajectory, and critical information determined through satellite and radar analysis, PIREPs, spotter reports, and news stories to the affected Alaskan FAA Facilities. CWSU forecasters also solicit PIREPs and spotter reports from the Anchorage ARTCC, FSSs, and ATCTs.
  - **Coordination with the National Aviation Meteorologists (NAMs) at the FAA Air Route Traffic System Command Center (ARTSCC)**
    CWSU forecasters communicate volcanic ash information to the NAMs in the ARTSCC when a volcanic eruption may affect the National Airspace System (NAS).
  - **Collaboration with the AVO, AAWU/VAAC, and WFOs**
    CWSU forecasters collaborate with the AVO, AAWU/VAAC, and WFOs to help ensure all products and warnings contain consistent ash tops, observed location, and forecast locations. CWSU forecasters also share reports from PIREPs and spotters.
  - **Coordination with Oakland CWSU**
    Anchorage CWSU forecasters share information with the Oakland CWSU forecasters when volcanic ash is forecasted to impact the Oakland Flex Tracks within the Anchorage FIR and/or move from the Anchorage FIR into the Oakland FIR.

- **WFOs**
  During on-going eruptive events, ashfall statements, advisories, and warnings are updated at least every six hours. Products are updated for all new eruptions and any time ashfall reports received from WSOs and the AVO.
    - **Coordination with the United States Coast Guard (USCG)**
      An automated process will email Marine Weather Statements (MWSs) and Special Marine Warnings (SMWs) (see Product section) to the three USCG command centers in Alaska.
        - 17th District Command Center: *JRCCJuneau@uscg.mil*
        - Sector Juneau Command Center: *SCCJuneau@uscg.mil*
        - Sector Anchorage Command Center: *Sector.Anchorage@uscg.mil*
    - **Coordination with the Ocean Prediction Center (OPC)**
      WFO forecasters coordinate as needed with the OPC, located in College Park Maryland, for OPC to issue a statement regarding ashfall hazards in the High Seas Forecast (see products section). These statements should contain up-to-date information about expected ashfall and other potential impacts from ash over offshore waters 100 nm or more from the Alaska coast

Contacts During Unrest/Eruption

Agency	Point of Contact	Phone Number
AVO	Duty Staff	(907) 786-7497 (907) 632-2275
NWS: Alaska ROC	Duty Officer	(907) 271-6540
NWS: AAWU/Anchorage VAAC	Operations	(907) 266-5110 (907) 266-5109
	Meteorologist-in-Charge	(907) 266-5116
NWS: Anchorage CWSU	Operations	(907) 338-1010 (907) 269-1145
	Meteorologist-in-Charge	(907) 269-1245
NWS: Anchorage WFO	Operations	(907) 266-5172
	Warning Coordination Meteorologist	(907) 266-5117
NWS: Fairbanks WFO	Operations	(907) 458-3708
	Warning Coordination Meteorologist	(907) 458-3712
NWS: Juneau WFO	Operations	(907) 790-6827

	Warning Coordination Meteorologist	(907) 790-6803
NWS: AWC	International SIGMET Desk	(816) 584-7220
NWS: Oakland CWSU	Operations	(510) 745-3434
NWS: OPC	Operations	(301) 683-1520
NWS: Washington VAAC	Operations	(301) 683-1405
	NCEP Senior Duty Meteorologist	(301) 683-1500
Montreal VAAC	Operations	(514) 421-4639
Tokyo VAAC	Operations	9-011-81-3-32-6203
Canadian Meteorological Centre	Operations	(780) 951-8904
FAA: Anchorage Air Traffic Control Center (ARTCC)	Watch Supervisor	(907) 269-1103
	Traffic Management Unit	(907) 269-1108
AK DHS & EM	State Emergency Operations Center	(907) 428-7100
AK DHSS, Health & Social Services	Health Emergency Response Operations Duty Officer	(907) 903-3721
USCG 17th District Command Center	Operations	(907) 463-2000
USCG Sector Juneau Command Center	Operations	(907) 463-2980
USCG Sector Anchorage Command Center	Operations	(907) 428-4100

Products and Product Dissemination During Volcanic Unrest/Eruption

- **AAWU/Anchorage VAAC**
  SIGMETs and VAAs are disseminated through several global networks such as the NWS's Telecommunications Gateway and the FAA's Aeronautical Information System Replacement

  (AISR). SIGMETs are available on the AAWU's website: http://aawu.arh.noaa.gov/ and VAAs are available on Anchorage VAAC's website: http://vaac.arh.noaa.gov/.

The following products are issued by the AAWU/Anchorage VAAC for volcanic activity:

- Eruption SIGMET
  An eruption SIGMET is issued within five minutes of the first detection or notification of a volcanic eruption in Alaska and is intended to be a first-alert to the aviation community of a potential ash hazard.
- SIGMET
  The SIGMET is the official warning message issued by the NWS for airborne ash. Ash SIGMETs identify the volcano's name, time of eruption, observed position of the ash cloud, and the forecasted positions of ash clouds six hours after issuance. SIGMETs are updated at least every six hours.
- VAA
  A VAA is a text message that identifies the volcano's name, time of eruption, observed position of the ash cloud, and the forecasted positions of ash clouds six, 12, and 18 hours after issuance. The VAA is intended to serve as guidance to MWOs, CWSUs, and WFOs as well as other government agencies; it is not the official warning message. VAAs are updated at least every six hours. For ash in the AAWU's AOR, VAAs and SIGMETs issued by the AAWU/Anchorage VAAC are transmitted at the same time
- VAG
  The VAG is the graphical representation of the VAA and depicts the observed and forecasted positions of ash clouds. Like the VAA, the VAG is updated at least every six hours and is transmitted at the same time as the VAA.
- Retransmission VAA (Near VAA)
  Anchorage VAAC will issue a Retransmission VAA, more commonly known as a Near VAA, when ash is forecast by a neighboring VAAC to move into Anchorage's AOR. For eruptions with an ash top below FL250, Near VAAs are issued when ash is forecast to move into the Anchorage VAAC's AOR within six hours. For eruptions with an ash top of FL250 or higher, Near VAA's are issued when ash is forecast to move into the Anchorage VAAC's AOR within 12 hours. Near VAAs are commonly issued by Anchorage VAAC for eruptions on the Kamchatka Peninsula.

- **CWSU**

The CWSU's primary responsibility is to provide decision support services to the FAA. For volcanic events, this is generally accomplished through in-person briefings and the creation of supplemental graphical ash forecasts using the Weather and Radar Processor (WARP) system. Such products are disseminated internally within the ARTCC and are displayed on briefing computers on the air traffic control floor. The CWSU also disseminates all ash SIGMETs, VAAs, and VAGs to ARTCC Air Traffic Managers and displays graphical plots of SIGMETs on briefing computers on the air traffic control floor.

For high impact eruptions, it may be necessary for the CWSU to issue CWAs or an MIS to compliment or enhance existing ash forecasts. These products are disseminated through several global networks and can be found on the CWSU's website: www.weather.gov/zan/ and AWC's website: http://aviationweather.gov.

- CWA
  The CWA is a 0-2 hour forecast and may be issued to add extra details that are specific to decisions being made by Air Traffic Managers. Timing of impact to specific airports, such as Ted Stevens Anchorage International Airport, or a North Pacific Flight Track, may be included in this product.
- MIS
  The MIS is a 2-12 hour product used for Air Traffic Flow longer ranged planning purposes and may be issued to include details of expected volcanic ash impacts to Air Traffic critical decision areas.
- Decision Support Briefings
  CWSU forecasters continuously brief ATMs during eruptive or re-suspension events expected to impact air traffic operations. Minor eruptions and resuspension events can disrupt air traffic on local airways and at airports near the volcano. Large eruptions can disrupt air traffic operations on the north Pacific high-level jet tracks.
- PIREP
  All PIREPs containing information about volcanic eruptions and ash are considered urgent and disseminated through AISR by FAA flight data operators immediately upon receipt from an air traffic controller. CWSU forecasters may back-up flight data and disseminate urgent PIREPs (UUAs) through AISR, if needed. Weather coordinators at the ARTCC may also issue UUAs, especially during times the CWSU is closed. CWSU forecasters often share UUAs containing ash information with other NWS offices through NWSChat.

- **WFOs**
  The three WFOs in Alaska are located in Anchorage, Fairbanks, and Juneau. All WFOs are capable of issuing ashfall statements, advisories, and warnings but these products are most commonly issued by the Anchorage WFO because most of Alaska's volcanoes are located in Anchorage WFO's AOR. Products issued by the WFOs are disseminated through several global networks such as the NWS's Telecomunications Gateway, broadcast over NOAA Weather Radio, and are available on the NWS Alaskan Region website: www.weather.gov/arh/.

  Upon receipt of a VAA and VAG from the Anchorage VAAC, a WFO will issues products as appropriate:
  - Marine Weather Statement (MWS)
    A WFO will issue a MWS for forecasted ashfall of a trace to 0.03 inches over marine locations. The statement will not include the words "advisory" or "warning."
  - Special Weather Statement (SPS)
    A WFO will issue a SPS for forecasted ashfall of less than 0.03 inches over land. The statement will not include the words "advisory" or "warning."
  - Marine Ashfall Advisory
    A WFO will issue a MWS as a Marine Ashfall Advisory for forecasted ashfall between 0.03 and 0.24 inches over marine locations.

  - Public Ashfall Advisory
    A Non Precipitation Warning (NPW) will be issued as a Public Ashfall Advisory for forecasted ashfall between 0.03 and 0.24 inches over land.

- Marine Ashfall Warning
  A WFO will issue a Special Marine Warning (SMW) as a Marine Ashfall Warning for forecasted ashfall of 0.25 inches or greater over marine locations.
- Public Ashfall Warning
  A NPW will be issued as a Public Ashfall Warning for forecasted ashfall of 0.25 inches or greater over land.
- TAFs
  TAFs are airport specific forecasts that include cloud layers, visibility, expected weather, & wind information and issued for selected airports throughout Alaska. TAFs include volcanic ash (VA) as a weather element if ashfall is expected at the airport. VA may lower ceilings and reduce visibility; TAFs include these restrictions.

- **Ocean Prediction Center (OPC)**
  Forecasts issued by OPC are disseminated through the satellite based safetyNet service, and are available on the office's website: http://www.opc.ncep.noaa.gov/.
  - High Seas Forecast
    The High Seas Forecast product contain a description of winds and waves for the issuance time and include a 24- and 48-hour wind and wave forecast. Upon receipt of a VAA and VAG and after coordination with the corresponding WFO, OPC forecasters will include ashfall in the High Seas Forecast product.

- **Products Issued by Partner Offices**
  On rare occasions, VAAs and SIGMETs covering the AAWU and/or Anchorage VAAC's AOR may be issued by VAACs and MWOs besides the NWS offices in Alaska. This is most common when an ash cloud crosses VAAC and/or MWO boundaries. Products from coordinating offices are disseminated through several global networks and are available on the offices' websites:
  - Washington VAAC: http://www.ssd.noaa.gov/VAAC/washington.html
  - Tokyo VAAC: http://ds.data.jma.go.jp/svd/vaac/data/
  - Montreal VAAC: https://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=6B59FE0C-1
  - Aviation Weather Center (AWC): https://www.aviationweather.gov/
  - NAV Canada Aviation Weather: https://flightplanning.navcanada.ca/

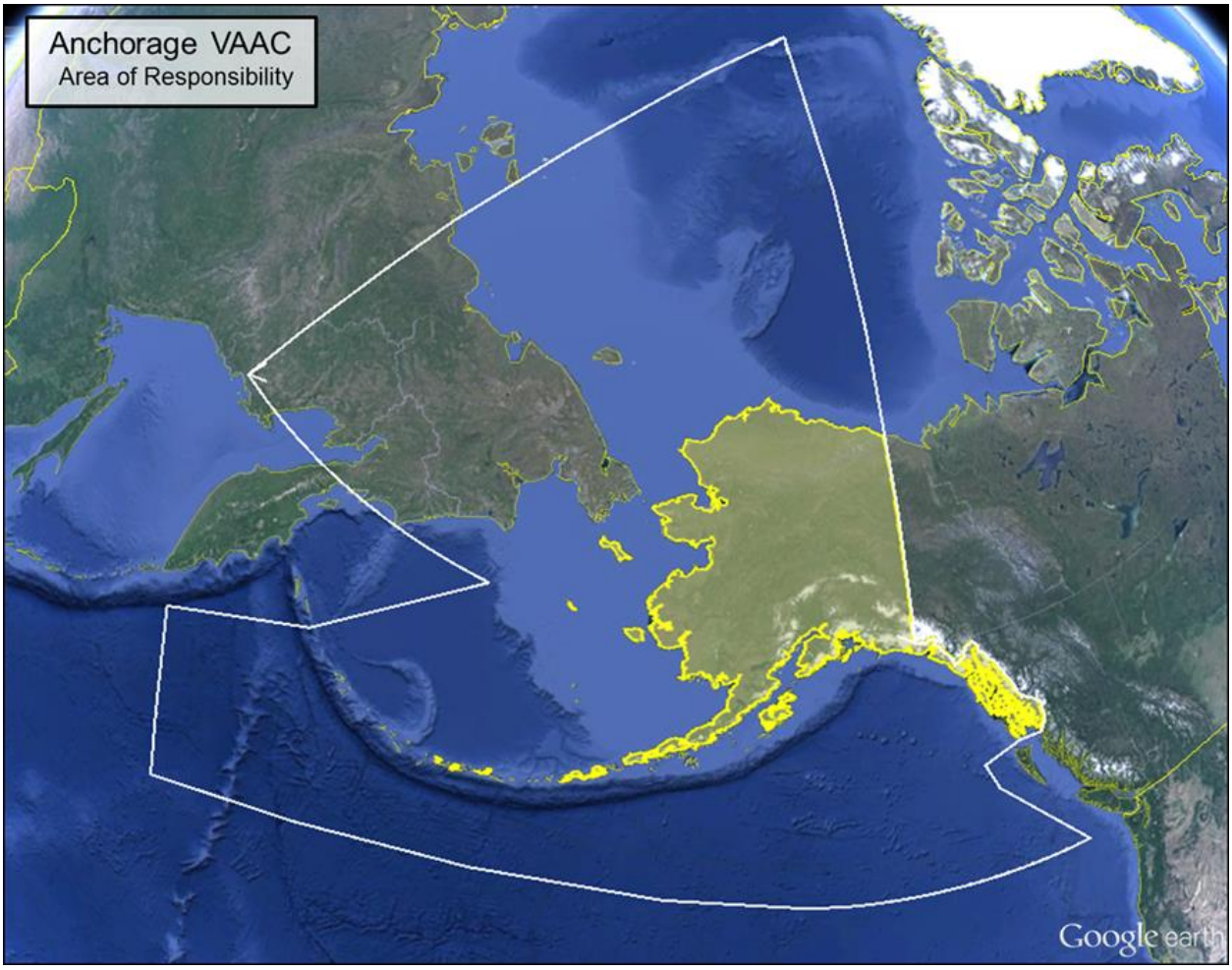


Figure 1: Anchorage Volcanic Ash Advisory Center (VAAC) Area of Responsibility.

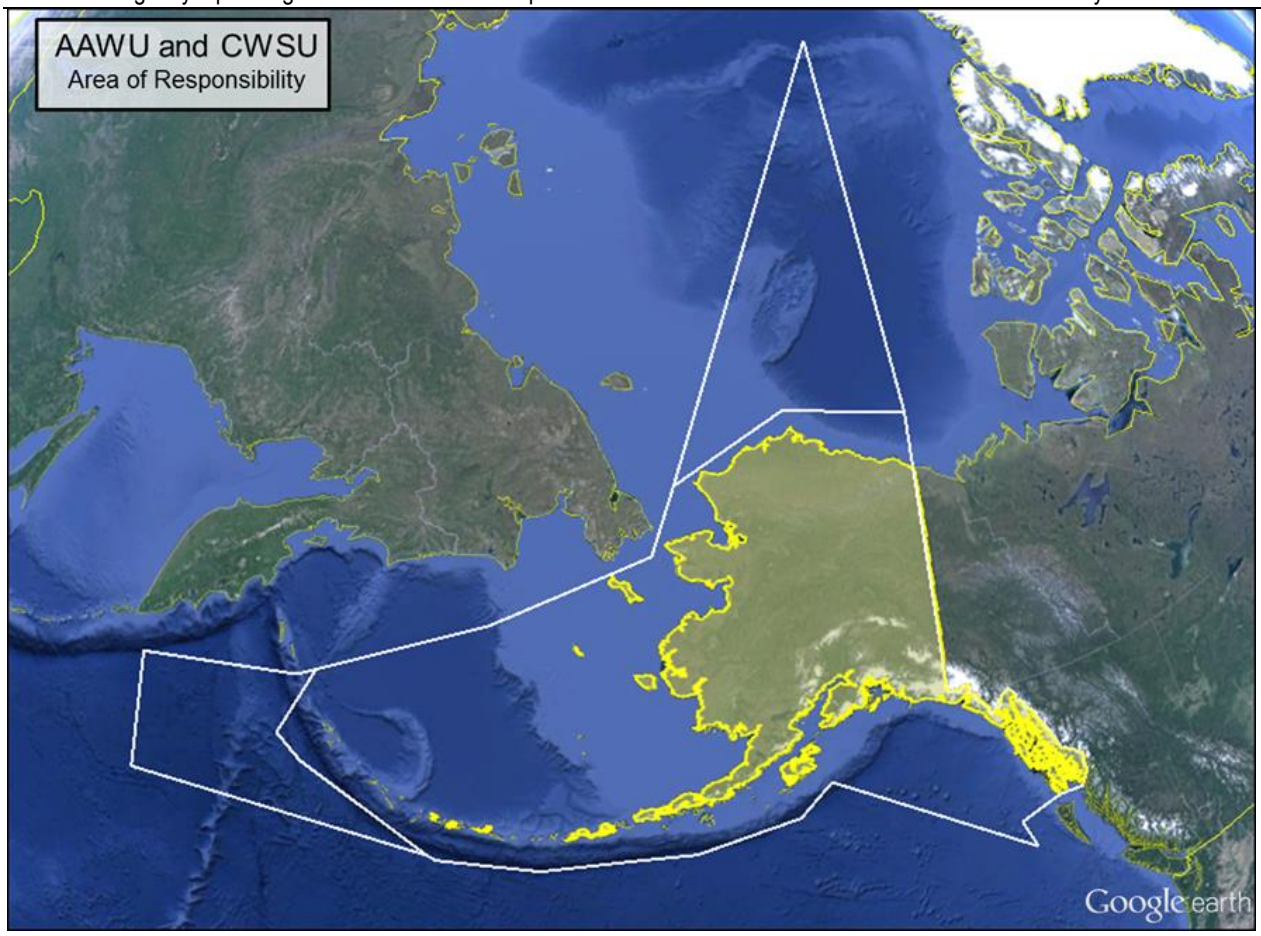
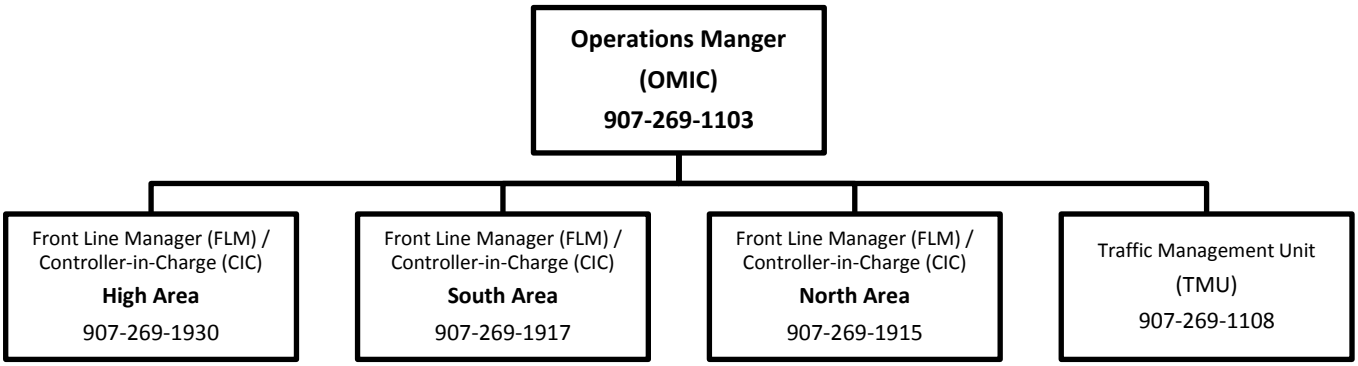


Figure 2: Alaska Aviation Weather Unit and Anchorage Center Weather Service Unit (AAWU) Area of Responsibility.

Federal Aviation Administration (FAA)

Organizational Structure



Role During Volcanic Unrest/Eruption

- The FAA Anchorage Air Route Traffic Control Center (ARTCC) collects and disseminates volcanic information received from various sources, including AVO, the FAA Regional Operations Center (ROC), the Air Force Regional Air Operations Center (RAOC), the Anchorage VAAC, the Tokyo VAAC, KVERT, SVERT, airline operators, pilot reports (PIREPs), other FAA facilities, or the public.
- The Alaskan Region FAA contact is the Anchorage ARTCC Watch Supervisor (see Contacts section).
- The FAA does not generate primary information pertaining to volcanic ash episodes, nor track or predict volcanic ash cloud movement. The FAA relies on information provided by the NWS, AVO, and pilot reports for current and forecast conditions.

Responsibilities During Volcanic Unrest/Eruption

Upon receiving notification of an eruption or possible eruption:
Watch Supervisor will:

1. Verify the occurrence of volcanic activity with AVO.
    a. Non Eruptive event (Cook Inlet - Augustine/Iliamna/Redoubt/Spurr)
        - If AVO advises that there is increased seismic or other precursory activity of a Cook Inlet volcano, but an eruptive event has not occurred, issue an Increased *Volcanic Activity Notice to Airmen (NOTAM)* **and** notify personnel and facilities as listed in 2a. If the Aviation Color Code has been elevated to "**ORANGE**" or "**RED**" notify personnel and facilities listed in 2b as well.

b. Non Eruptive event (All other volcanoes)
    - If AVO advises there is increased seismic or other precursory activity of any volcano from anywhere other than Cook Inlet, but an eruptive event has not occurred, issue an *Increased Volcanic Activity Notice to Airmen (NOTAM)* **and** notify personnel and facilities listed in 2a.

2. Take the following action if a volcanic eruption is verified by the AVO.
    a. All volcanoes, notify (see Contacts section):
        - The Center Weather Service Unit (CWSU). If an eruption occurs when the CWSU meteorologist is not on duty (after hours), the Weather Coordinator (WC) will:
            - issue an *Urgent Pilot Report (UUA)*,
            - contact the Alaska Aviation Weather Unit (AAWU),
            - and – if required, contact a CWSU Meteorologist to report immediately to Anchorage Air Route Traffic Control Center (ARTCC).
        - Frontline Manager (FLM)/Controller-in-Charge (CIC).
        - Regional Operations Center (ROC).
        - Traffic Management Unit (TMU).
    b. Cook Inlet volcano or other volcanic eruptions affecting air traffic within ZAN FIR, notify:
        - Anchorage ARTCC Air Traffic Manager (ATM),
        - Anchorage ARTCC Staff Manager,
        - Traffic Management Officer (TMO),
        - Operations Manager (OM) of affected area,
        - Flight Service Station (FSS) closest to the volcanic activity,
        - Anchorage Approach (A11) Watch Supervisor,
        - Service Operations Center (SOC),
        - Air Traffic Control System Command Center (ATCSCC).
    c. Issue an FDC Flight Restriction NOTAM (TFR) if it is determined that the volcanic event could endanger airborne aircraft and occupants,
    d. Designate a Weather Coordinator (WC) if necessary,
    e. Issue a Volcanic Ash Advisory NOTAM, including the Aviation Color Code "**ORANGE**" or "**RED**", if any ash may be present
        - If a **Cook Inlet** volcano's (Augustine, Iliamna, Redoubt or Spurr) Aviation Color Code is upgraded to **"YELLOW"** or greater (increased seismic or other precursory activity), but an eruptive event has *not* occurred, issue an Increased Volcanic Activity NOTAM,

FLM/CIC will:

1. Ensure that PIREPs are solicited by controllers and recorded on a PIREP form,
2. Ensure when submitting a PIREP via AISR they are entered as URGENT,
3. Disseminate NOTAM, PIREP, TFR, MIS, SIGMET, and current conditions information to controllers on duty,

Traffic Management Unit will:

1. Provide assistance to the Watch Supervisor as needed.

2. Evaluate the areas impacted by volcanic activity to determine if any Traffic Management Initiatives (TMIs) are required.
3. Prior to initiating TMIs, advise the Watch Supervisor and FLM/CIC.
4. Coordinate TMIs with affected facilities and the ATCSCC.
5. Monitor the affected area and any resulting TMIs, and modify as needed.
6. Request AVO to participate in TELCONs to provide volcanic activity updates as needed.
7. Not publish NOPAC routes within 10 miles of volcanic activity when an ORANGE or RED Aviation Color Code alert has been issued.
8. Invite AVO to participate in the FAA TELCON between Anchorage Center (ZAN) and Oakland Center (ZOA) when a significant eruption event (above FL290) occurs on the Kamchatka peninsula or Aleutian chain.

Controllers will:

1. Ensure that all aircraft in the affected area are aware of the most current information available concerning the volcanic eruption and any resultant ash dispersal.
2. With pilot concurrence, suggest headings or reroutes around known ash or possible ash cloud locations.
3. Assist VFR aircraft to the extent possible in avoiding known ash cloud locations.
4. Solicit PIREP information and record on a PIREP form. Forward this information to the FLM/CIC.
5. Broadcast information received relating to the volcanic event/ash drift.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
NWS-CWSU	Meteorologist	Duty Staff	(907) 338-1010 (907)269-1145*
NWS-AAWU	Aviation Forecaster	Duty Staff	(907) 266-5110
Anchorage ARTCC	Frontline Manager (FLM) /Controller-in-Charge (CIC)		(907) 269-1103
FAA WSA	Regional Operations Center (ROC)		(907) 271-5936
Anchorage ARTCC	Traffic Management Unit (TMU)		(907) 269-1108
Anchorage ARTCC	Staff Supervisor	Steve Kessler	(907) 269-2730
Anchorage ARTCC	Air Traffic Manager (ATM)	Paul McEwen	(907) 269-1137
Anchorage ARTCC	Traffic Management Officer	Kevin Ford	(907) 269-1252
Anchorage ARTCC	Operations Manager (OM) of	OMIC	(907) 269-1103

	affected area		
Anchorage Approach (A11) /ATCT (ANC)	Watch Supervisor		(907) 271-2711
Anchorage ARTCC	Service Operations Center (SOC)		(907) 269-1803
Air Traffic Control System Command Center (ATCSCC)			(540) 422-4135

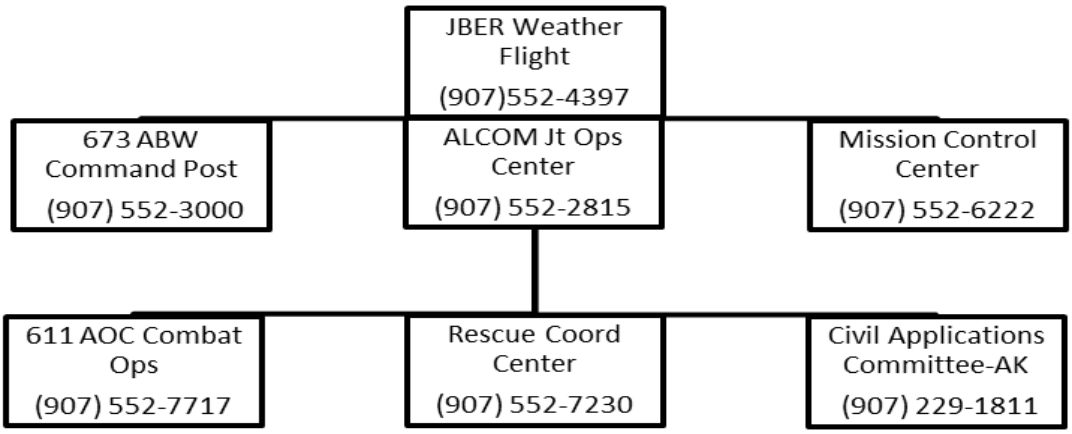
(*back-up number)

Products & Product Dissemination During Volcanic Unrest/Eruption

- Increased Volcanic Activity Notice to Airmen (NOTAM) is issued by the FAA-ARTCC Watch Supervisor when AVO has advised that there is increased seismic or other precursory activity of any Alaska volcano, but an eruptive event has not occurred. NOTAM's are disseminated to controllers on duty by the FLM/CIC and passed on to aircraft operators in the affected area.
- Urgent Pilot Report (UUA) are issued by the Weather Coordinator when an eruption occurs. UUA are disseminated to controllers on duty by the FLM/CIC and passed on to aircraft operators in the affected area.
- FDC Flight Restriction NOTAM (TFR) is issued by FAA-ARTCC Watch Supervisor if it is determined that the volcanic event could endanger airborne aircraft and occupants. TFR's are disseminated to controllers on duty by the FLM/CIC and passed on to aircraft operators in the affected area.
- Volcanic Ash Advisory NOTAM is issued by FAA-ARTCC Watch Supervisor if any ash may be present, including the Aviation Color Code "**ORANGE**" or "**RED**". NOTAM's are disseminated to controllers on duty by the FLM/CIC and passed on to aircraft operators in the affected area.

Department of Defense (DOD)

Organizational Structure



Role During Volcanic Unrest/Eruption

The 3rd Operations Support Squadron Weather Flight (3 OSS/OSW) at Joint Base Elmendorf-Richardson (JBER) has DOD coordination responsibility for this plan. The 3 OSS/OSW is the primary liaison between the AVO and JBER.

Responsibilities During Volcanic Unrest/Eruption

1. When a volcanic episode alert or update is sent from the AVO to the 3 OSS/OSW, the **3 OSS/OSW** will initiate a checklist and start a call down.
    a. The 3 OSS/OSW will notify the 673 Air Base Wing Command Post (673 ABW/CP) via telephone and an email with the applicable details.
        i. The 673 ABW/CP will then notify key personnel on JBER, including base commanders, of any potential threat.
    b. Additionally, based on the specific color code change and severity of the situation, the 3 OSS/OSW will notify the Alaskan Command Joint Operations Center (ALCOM JOC)/Joint Task Force Alaska (JTF-AK), the Mission Control Center, the 11th Air Force Rescue Coordination Center (RCC), the Civil Applications Committee Alaska Liaison, as well as the 611th Air Operations Center's Weather Support Team (611 AOC/CODW). The 611 AOC/CODW will then notify the Alaskan North American Aerospace Defense Command Region (ANR). The United States Coast Guard has the responsibility of informing their key personnel.
    c. The 3 OSS/OSW will coordinate to provide imagery from the Defense Meteorological Satellite Program (DMSP) as well as any other polar orbiting satellites via Mark IVB

software, the 17th Operational Weather Squadron or the 557th Weather Wing. Polar Orbiting imagery will be made available through the normal communication means and will be

provided as long as no scheduling conflicts occur with Air Force mission requirements. In case of a conflict, Air Force requirements will be met first, and any excess satellite time will be devoted to volcanic activity imaging.

i. The 17 OWS and weather units from JBER (3 OSS/OSW), Eielson AFB (354 OSS/OSW), and Fort Wainwright (1st WS, Det 3) will transmit both civilian and military pilot weather reports (PIREPS) that they receive containing volcanic activity information and will encode them as Urgent PIREPs (UAA) in accordance with Air Force Manual (AFMAN) 15-124.

ii. In the event of a significant volcanic eruption, these weather units will also ensure aircrews requesting weather briefings are made aware of the estimated horizontal and vertical extent of the ash cloud.

2. The **2d Weather Squadron (2 WS)**, 557th Weather Wing (557 WW) at Offutt Air Force Base has the responsibility of:
   a. Informing key personnel at the U.S. Northern Command's Domestic Warning Center, Peterson AFB, Colorado, North American Aerospace Defense Command, Peterson AFB, CO, and the Air Mobility Command's Tanker Control Center (TACC), Scott AFB, Illinois of any volcanic activity which may affect their operations.
   b. Issuing 557th Weather Wing (557th WW) Volcanic Activity Notifications.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
DOD	Flight Commander, captain USAF - current OIC	Carl Densford	(907) 552-4397
JBER	JBER weather station	Duty Staff	(907) 552-4397
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
NWS-VAAC	Aviation Forecast	Duty Staff	(907) 266-5110
557th Weather Wing	Flight Commander	Ryan Newman	(402) 232-6817

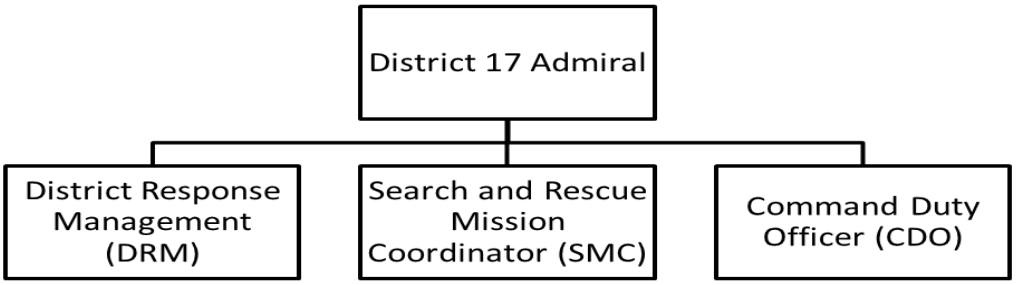
Products & Product Dissemination During Volcanic Unrest/Eruption

- Pilot Reports (PIREPS) - civilian and military pilot weather reports (PIREPS) containing volcanic activity information will encode them as Urgent PIREPs (UAA) in accordance with Air Force Manual (AFMAN) 15-124.

- 557th Weather Wing Volcanic Activity Notifications are issued daily and as eruptions are reported and can be found at: https://weather.af.mil/AFW_WEBS/VolcanicEvents/.

United States Coast Guard (USCG)

Organizational Structure



- **District 17 Admiral**: Filled by a Rear Admiral Upper Half (two star). The Coast Guard's direct representative in Alaska. Responsible for all Coast Guard personnel, assets, instillations, and missions that occur within the Alaskan Area of Responsibility (AOR).

- **District Response Management (DRM)**: Senior staff position filled by a Captain. CDO and SMC both report to DRM. DRM is responsible for the oversight of all Coast Guard responses to maritime emergencies or otherwise that occur within the AOR of Alaska.

- **Search and Rescue Mission Coordinator (SMC)**: CDO works for the SMC. SMC has ultimate authority over any proposed missions brought forth by the CDO. Gives the final "go / no go" in relation to the use of any Coast Guard assets.

- **Command Duty Officer (CDO)**: Officer or senior enlisted member in charge of the Command Center for the specific watch period. Command's direct representative. Will be the first point of contact with any volcanic reports and initiating any Coast Guard response there in related.

Role during Volcanic Unrest/Eruption

U.S. Coast Guard aviation assets fly missions on a routine basis throughout the State of Alaska. If during these missions, Coast Guard aircrews notice any suspected volcanic activity, they shall attempt to report that activity to the nearest FAA Flight Service Station.

Responsibilities during Volcanic Unrest/Eruption

1. If during these missions, the U.S Coast Guard aircrews notice any suspected volcanic activity, they shall attempt to report that activity to the nearest FAA Flight Service Station.

2. During eruptions, the USCG may issue a Marine Information Broadcast to alert mariners of hazardous conditions related to volcanic activity (see products section).
    a. Upon receipt of NWS Marine Weather Statements (WHAKF8 PAFC) and Special Marine Warnings (FZAK78 PAFC) related to a volcanic eruption and subsequent ashfall, the USCG will issue a Marine Information Broadcast for the impacted area(s).

Contacts During Unrest/Eruption

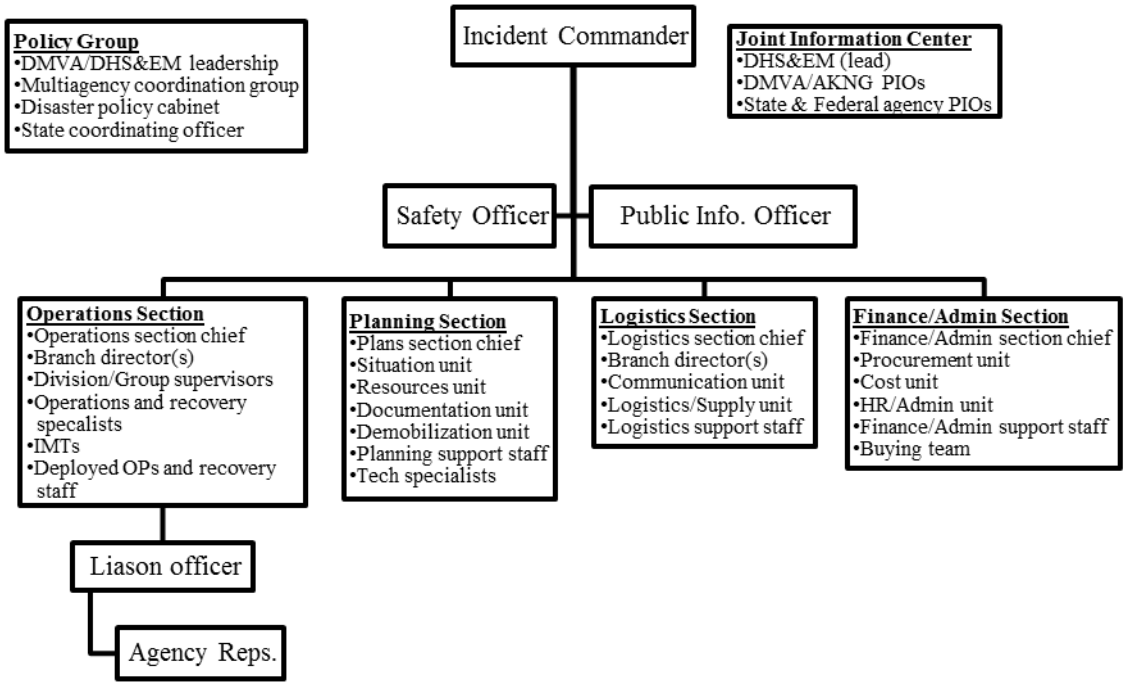
Agency	Title	Point of Contact	Phone Number
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
NWS-Weather Forecast Office (WFO)	Warning Coordination Meteorologist	Louise Fode	(907) 266-5117 (907) 266-5167 (volcano desk)

Products & Product Dissemination during Volcanic Unrest/Eruption

- Marine Information Broadcast - may be issued to alert mariners of hazardous conditions related to volcanic activity. These broadcasts are issued via VHF Channel 16 or 4125 KHZ by one of three Coast Guard Communication Centers (Communications Detachment Kodiak – Kodiak Island (HF frequencies), Sector Juneau Command Center – Juneau, AK (VHF frequencies), and Sector Anchorage Command Center – Joint Base Elmendorf/Richardson (VHF frequencies). Broadcast are issued for at least a one hour period but may continue for any period of time that is deemed necessary.

Division of Homeland Security & Emergency Management (DHS&EM)

Organizational Structure



Role during Volcanic Unrest/Eruption

Coordinate State and community actions for a single imminent volcanic event.

Responsibilities during Volcanic Unrest/Eruption

DHS&EM will conduct the following actions upon notification from AVO that any volcano has been upgraded to Code **ORANGE/WATCH** or Code **RED/WARNING**.

1. Determine the appropriate level of activation for the State Emergency Operations Center (SEOC).
2. Notify potentially affected political subdivisions and/or communities of the situation.
3. Determine if any of the above political subdivisions and/or communities intend to activate local emergency operations centers for the incident.

4. Brief the DHS&EM Public Information Officer (PIO) and provide information for Social Media and press releases as appropriate.

5. Coordinate with DEC, the Municipality of Anchorage (MOA) Department of Health and Human Services (DHHS), and local communities to distribute appropriate emergency preparedness information.

6. Determine if any of the above political subdivisions and/or communities want to participate in a volcano briefing conference call (see below), coordinated by DHS&EM.

    a. For a volcano upgraded to **ORANGE/WATCH**, DHS&EM will consult with AVO and NWS to determine if a conference call is needed based upon the potential community impacts and need for information.

    b. For a volcano upgraded to **RED/WARNING**, the conference call will be scheduled approximately 1 hour after the upgrade or as soon as practical.

    c. Conference calls will include representation from the Alaska Volcano Observatory (AVO), the National Weather Service (NWS), the Alaska Department of Environmental Conservation (for air quality information), Alaska Department of Health and Social Services (Division of Public Health), DHS&EM, and other agencies as appropriate.

    Note: During periods of volcanic unrest, AVO may frequently upgrade and downgrade a volcano to ORANGE/WATCH or RED/WARNING. Once an initial interagency conference call for a volcano is conducted, DHS&EM will coordinate a consensus decision with AVO, NWS, and other agencies each time a volcano is upgraded to determine if additional interagency conference calls are warranted. The decision will be based upon substantial changes in hazards to the public or the area impacted.

The purpose of the volcano briefing conference call is to:

- Allow AVO and NWS to provide a situational briefing on current conditions and potential impacts.
- Provide the opportunity for the local representatives to ask questions.
- Coordinate any State or local response actions.
- Determine if additional coordinating conference calls will be needed, at what time, and with what agencies, communities or individuals participating. DHS&EM will make arrangements for and host any needed conference calls.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
NWS-Weather Forecast Office (WFO)	Warning Coordination Meteorologist	Louise Fode	(907) 266-5117 (907) 266-5167 (volcano desk)
AK-DEC-Air Quality	Manager	Barbara Trost	(907) 748-2142 (907) 748-2141*
AK-DHSS, Health Emergency Response Operations	Duty Officer	Duty Officer	(907) 903-3721
MOA-Air Quality	Environmental Health Program manager	Shelley Griffith	(907) 343-4744, (405) 234-0954 cell
MOA-DHHS	MOA Department of Health & Human Services Deputy Director	DeeAnn Fetko	(907) 343-6976

(*back-up number)

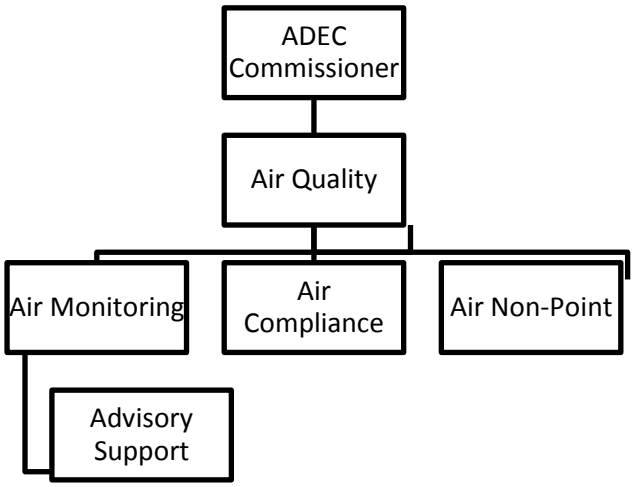
Products & Product Dissemination during Volcanic Unrest/Eruption

- SEOC Situation Reports and situation information are posted in the DHS&EM First Class system, DHS&EM website (http://www.ready.alaska.gov/) and other information systems as appropriate.
- Press Releases & Social Media to provide information as appropriate to the DHS&EM Public Information Officer (PIO).
- Distribute appropriate emergency preparedness information as needed through coordination with the Department of Environmental Conservation, the Municipality of Anchorage (MOA) Department of Health and Human Services (DHHS), and local communities.
- Warnings and statements for the public (received by other agencies) are disseminated by DHS&EM through the DHS&EM First Class email system, the DHS&EM Daily Situation Update and the DHS&EM website (http://www.ready.alaska.gov/). This network reaches the majority of the emergency services organizations in Alaska.

Alaska Department Of Environmental Conservation (AK-DEC)

Division of Air Quality (DEC-AQ)

Organizational Structure



Role during Volcanic Unrest/Eruption

- Monitor human air quality (if possible)
- Issue formal Air Quality Advisories as needed
- Coordinate with other government agencies to allow for preemptive action as needed

Responsibilities during Volcanic Unrest/Eruption

1. Upon notification of increased seismic or volcanic activity in Alaska, the DEC Division of Air Quality staff will evaluate the need for deploying particulate monitors to measure human air quality in the event of an eruption.
    a. Monitoring site location(s) will be selected based on the potential ashfall trajectory, ability to physically site a monitor, and the protection of public health.
    b. Additional consideration will be given to local emergency response needs, availability of onsite technical support, proximity to population centers and anticipated duration of the event.
    c. Other DEC programs will be contacted to provide technical assistance as needed.
2. Timely notification of explosive eruptions by AVO to the DEC AQ manager will initiate a call down by the DEC Air Quality manager to the:
    a. Municipality of Anchorage (MOA) Air Quality manager (if ashfall is expected in the MOA) and,

   b. the Alaska State Department of Health and Social Services (AK-DHSS) to allow time for preemptive action if needed.
3. Once an ash cloud is reported and the levels of ash due to ash cloud motion and fallout are expected to exceed the National Ambient Air Quality Standards (NAAQS) for particulates or monitoring data indicates that high levels of ash exist, DEC AQ will issue an air quality advisory. The decision to issue the advisory is based on input from the NWS and AVO regarding the intensity and movement of the ash cloud. Advisories are often forecast in nature and will be adjusted once observations of ash or actual monitoring data are received.
4. During an ashfall event, the Alaska State Department of Health and Social Services (DHSS) coordinates with Department of Environmental Conservation (DEC) to include appropriate health information and guidance in Public Service Announcements for the general public and special needs populations such as those with chronic respiratory conditions. People who experience respiratory difficulty during an ashfall event are advised to contact their local healthcare provider. After ash fallout, DHSS coordinates with DEC to assure that personnel performing recovery operations are aware of health risks and personal protection required during clean up.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
AK-DEC-Air Quality	Manager	Barbara Trost	(907) 748-2142 (907) 748-2141*
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
MOA-Air Quality	Air Quality Technician	Chris Salerno	(907) 343-6520 (405) 243-0954 cell
NWS-Weather Forecast Office (WFO)	Warning Coordination Meteorologist	Louise Fode	(907) 266-5117 (907) 266-5167 (volcano desk)
AK-DHSS, Health Emergency Response Operations	Duty Officer	Duty Officer	(907) 903-3721

(*back-up number)

Products & Product Dissemination during Volcanic Unrest/Eruption

- Air Quality Advisories are issued when ashfall is expected to exceed the National Ambient Air Quality Standards (NAAQS) for particulates or monitoring data indicates that high levels of ash exist.

- Standards are violated when the average concentration of ash greater than 10 microns in diameter (PM-10; considered inhalable) exceeds 150 µg/m3 for 24 hours. This is equivalent to an Air Quality Index (AQI) value of 100 (refer to table).

- The air quality advisory will contain information concerning the predicted movement of the ash cloud, where ash is expected to fall, anticipated duration of poor air quality, and how bad the air quality is expected to become. The advisory also identifies steps the public can take to protect their health and the health of other sensitive individuals if they encounter ashfall. The following chart depicts air quality categories:

Table of PM-10 Particulate Levels and the Air Quality Index (AQI)

AQI Value	Actions to Protect Your Health From Particle Pollution
Good (0 - 50)	None
Moderate (51 - 100*)	Unusually sensitive people should consider reducing prolonged or heavy exertion.
Unhealthy for Sensitive Groups (101 - 150)	The following groups should reduce prolonged or heavy outdoor exertion: - People with heart or lung disease - Children and older adults
Unhealthy (151 - 200)	The following groups should avoid prolonged or heavy exertion: - People with heart or lung disease - Children and older adults Everyone else should reduce prolonged or heavy exertion.
Very Unhealthy (201 - 300)	The following groups should avoid all physical activity outdoors: - People with heart or lung disease - Children and older adults Everyone else should avoid prolonged or heavy exertion.

*For particles up to 2.5 micrometers in diameter: An AQI of 100 corresponds to 35 micrograms per cubic meter (averaged over 24 hours).

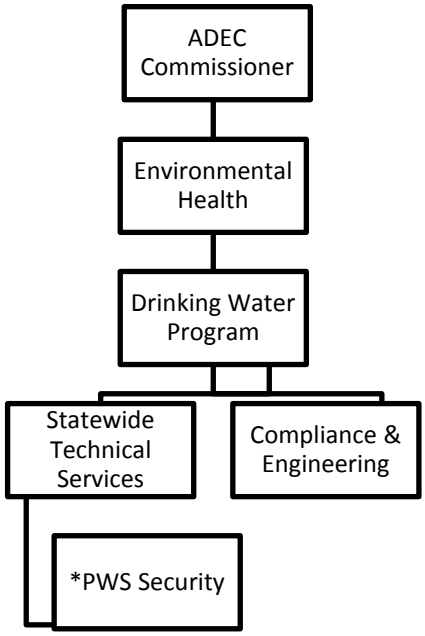
For particles up to 10 micrometers in diameter: An AQI of 100 corresponds to 150 micrograms per cubic meter (averaged over 24 hours).

- Air Quality Advisories will be posted to the State DEC AQ Web page at: https://myalaska.state.ak.us/dec/air/airtoolsweb/Advisories.aspx. On this web page, there also are links to sign up for email and/or Twitter notification. Advisories will automatically be disseminated via email and Twitter to anyone who signs up. This includes individuals and local and State government agencies who request updates.

- Near real-time particulate data (i.e. hourly averages) are available for the State's population centers. The data and associated AQI can be viewed at: http://dec.alaska.gov/applications/air/envistaweb/.

Alaska Division of Environmental Health, Drinking Water Program (DEC-DWP)

Organizational Structure



Role during Volcanic Unrest/Eruption

Coordinate with public water systems (PWS) operators about potential ashfall on surface water supply facilities in the State of Alaska.

Coordinate with other government agencies to allow for preemptive action as needed.

Responsibilities during Volcanic Unrest/Eruption

1. **Notification of Ash Producing Events.** AVO will coordinate with the Alaska Department of Environmental Conservation (DEC) Drinking Water Program during ashfall events by providing information on the expected distribution and timing of ashfall during eruptions in Alaska. This information also may be provided by NWS as part of their ashfall statements and advisory products.
    a. At their discretion, the DEC Drinking Water Program staff will communicate with operators of public water systems (PWS) to inform them of possible or pending ashfall and discuss appropriate guidance for dealing with ash-impacted water (i.e. fill tanks before ashfall begins, etc.) and emergency response.

b. During an ashfall event, the Alaska Department of Health and Social Services (DHSS) coordinates with the DEC to include appropriate health information and guidance in Public Service Announcements for the general public and special needs populations.

2. **Ash Leachates**
   a. If ash leachates are expected to cause water quality to exceed national drinking water standards or monitoring data indicates that high levels of ash leachates exist, the DEC Drinking Water Program will determine whether it is appropriate to issue a Drinking Water Advisory. Advisory statements are often forecasts in nature and will be adjusted once observations of ash leachates or actual monitoring data are received. Monitoring data may include water quality information from PWS operators or ash leachate analyses provided by AVO.
   b. The Drinking Water Program will determine whether the Environmental Protection Agency's (EPA) Maximum Contaminant Level (MCL) standards have been exceeded for a regulated contaminant following an ashfall event. The Drinking Water Program staff will independently work with operators of public water systems to determine the appropriate course of action to protect public health following a MCL exceedance. EPA drinking water standards can be found at this URL: http://water.epa.gov/drink/contaminants/index.cfm#List.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
AK-DEC-Drinking Water Program	PWS Emergency Preparedness Coordinator	Rachel Westbrook	(907) 269-8924
ADEC- Drinking Water Program	Environmental Program Specialist	Jeanine Vance	(907) 269-2007
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
NWS-Weather Forecast Office (WFO)	Warning Coordination Meteorologist	Louise Fode	(907) 266-5117 (907) 266-5167 (volcano desk)
AK-DHSS, Health Emergency Response Operations	Duty Officer	Duty Officer	(907) 903-3721

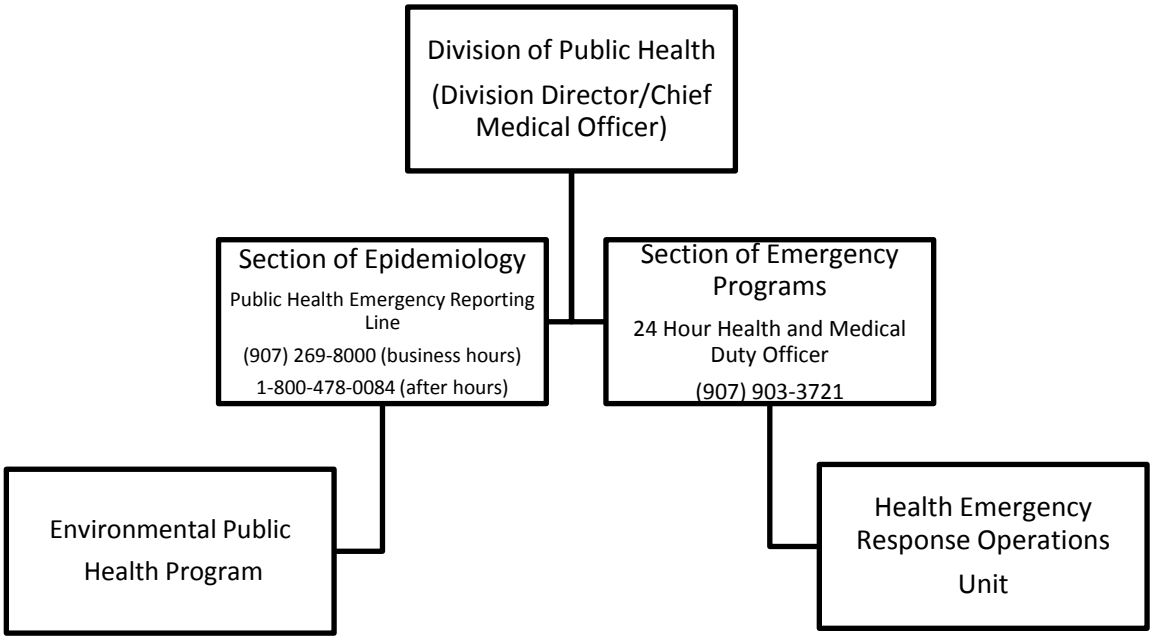
Products & Product Dissemination during Volcanic Unrest/Eruption

- Drinking Water Advisories will be issued if ash leachates are expected to cause water quality to exceed national drinking water standards or monitoring data indicates that high levels of ash leachates exist.

- Drinking Water Advisories or guidance statements will contain information concerning regulated contaminants and water quality parameters, such as pH value, sulfate levels, etc., in the ash-impacted water.
- The advisory also identifies steps the public can take to protect their health and the health of other sensitive individuals if they encounter ash in their water as well as information about what is being done by PWS operators and other officials to ensure good water quality.
- Drinking Water Advisories will be disseminated by the Public Water System to their consumers and if appropriate the Drinking Water Program would send out a press release regarding the Drinking Water Advisory and information could also be shared through the DEC Facebook page. Press releases are posted to the DEC page at: http://dec.alaska.gov/commish/press_releases/index.htm.

Alaska Department of Health & Social Services (AK-DHSS)

Organizational Structure



There are two sections within the Department of Health and Social Services/Division of Public Health that have primary responsibility in regards to a volcanic eruption and/or ashfall event. The Section of Epidemiology's Environmental Public Health Program works collaboratively with other agencies to evaluate, surveil, and provide guidance in regards to health issues associated with the eruption. The Section of Emergency Programs' Health Emergency Response Operations Unit engages in statewide health and medical preparedness and disaster response, and it also manages the DHSS Emergency Operations Center (DHSS EOC). The DHSS EOC is activated when significant coordination is needed to respond to the health and medical aspects of a disaster or emergency.

Role During Volcanic Unrest/Eruption

- Coordinate with other State of Alaska government agencies to allow for pre-emptive action as needed and respond to health and medical issues that result from the eruption.

Responsibilities During Volcanic Unrest/Eruption

1. During an ashfall event, the DHSS coordinates with the Department of Environmental Conservation (DEC) Division of Air Quality to include appropriate health information and guidance in Public Service Announcements for the general public and special needs populations such as those with chronic respiratory conditions.
2. After ash fallout, DHSS coordinates with the DEC-Division of Air Quality to assure that personnel performing recovery operations are aware of health risks and personal protection required during clean up.
3. During an ashfall event, the DHSS coordinates with the DEC-Drinking Water Program to include appropriate health information and guidance in Public Service Announcements for the general public.

Contacts During Unrest/Eruption

Agency	Title	Point of Contact	Phone Number
AK-DEC-Air Quality	Manager	Barbara Trost	(907) 748-2142 (907) 748-2141*
AK-DEC-Drinking Water Program	Quality Assurance	Jeanine Vance	(907) 269-2007
AVO	Operations	Duty Staff	(907) 786-7497 (907) 632-2275
AK-DHSS, Health Emergency Response Operations	Duty Officer	Duty Officer	(907) 903-3721
AK-DHSS, Section of Epidemiology, Environmental Public Health Program	Program Manager	Sandrine Deglin	(907) 269-8000 (business hours) 1-800-478-0084 (after hours)

(*back-up number)

Products & Product Dissemination During Volcanic Unrest/Eruption

- Public Service Announcements
- The website: http://dhss.alaska.gov/dph/Epi/Pages/volcanoes/default.aspx has links to fact sheets on the following topics:
    - Key facts about protecting yourself during a volcanic eruption
    - Health effects associated with volcanic eruptions
    - Key facts about volcanic eruptions

List of Acronyms

AAWU	Alaska Aviation Weather Unit
ACC	Area Control Center
ADGGS	Alaska Division of Geological and Geophysical Surveys
AFB	Air Force Base
AFTN	Aeronautical Fixed Telecommunications Network
AFWA	Air Force Weather Agency
AISR	Aeronautical Information System Replacement
ALCOM	Alaskan Command
ANR	Alaska North American Aerospace Defense Command
AQ	Air Quality
AQI	Air Quality Index
ARTCC	Air Route Traffic Control Center
ATCSCC	Air Traffic Control System Command Center
AVO	Alaska Volcano Observatory
AWC	Aviation Weather Center
AWIPS	Advanced Weather Information Processing System
CANERM	Canadian Emergency Response Model
CIC	Controller in Charge
CMC	Canadian Meteorological Centre
CVO	Cascades Volcano Observatory
CWA	Center Weather Advisory
CWSU	Center Weather Service Unit
CWT	Combat Weather Team
DAWN	Digital Aviation Weather Network
DEC	Alaska Department of Environmental Conservation
DHS&EM	Alaska Division of Homeland Security and Emergency Management
DHSS	Alaska Department of Health and Social Services
DHHS	Municipality of Anchorage Department of Health and Human Services
DMSP	Defense Meteorological Satellite Program
DOC	Department of Commerce
DOD	Department of Defense
EAS	Emergency Alert System
FAA	Federal Aviation Administration
FDC	Flight Data Center
FIR	Flight Information Region
FLM	Front Line Manager
FSS	Flight Service Station
FTP	File Transfer Protocol
GSC	Geological Survey of Canada
HF	High Frequency
HVO	Hawaiian Volcano Observatory
ICAO	International Civil Aviation Organization
IVS	Institute of Volcanology and Seismology
JBER	Joint Base Elmendorf-Richardson

JMA	Japan Meteorological Agency
JTF-AK	Joint Task Force Alaska
KBGS	Kamchatkan Branch of Geophysical Services
KVERT	Kamchatkan Volcanic Eruption Response Team
LVO	Long Valley California Volcano Observatory
MOA	Municipality of Anchorage
METSAT	Meteorological Satellite
MIS	Meteorological Impact Statement
MLDP0	Modele Lagrangien de Dispersion des Particules
MSC	Meteorological Services of Canada
MWO	Meteorological Watch Office
NAAQS	National Ambient Air Quality Standards
NCEP	National Centers for Environmental Prediction
NOAA	National Oceanic and Atmospheric Administration
NOPAC	NOrth PACific
NOTAM	NOTice to AirMen
NWR	NOAA Weather Radio
NWS	National Weather Service
OM	Operations Manager
168 ARW	168th Air Refueling Wing
OPC	Ocean Prediction Center (NOAA)
OSIC	Operational Supervisor-in-Charge
3 OSS/OSW	3rd Operations Support Squadron Weather Flight
OSS	Operations Support Squadron
OSW	Operations Support Weather
OWS	Operational Weather Squadron
PIREP	Pilot Weather Report
PM-10	Particulate Matter, 10 microns and smaller
PWS	Public Water Supply
RAOC	Air Force Regional Air Operations Center
ROC	Regional Operations Center (NWS)
SAB	Satellite Analysis Branch
SDM	Senior Duty Meteorologist
SEOC	State Emergency Operations Center
17 OWS	17th Operational Weather Squadron
SIC	Scientist-In-Charge
SIGMET	SIGnificant METeorological Information
611 AOC/CODW	611th Air Operations Center Weather Support Team
673 ABW/CP	673rd Air Base Wing Command Post
SOC	Service Operations Center
SVERT	Sakhalin Volcanic Eruptions Response Team
TFR	Temporary Flight Restriction
3 WG/CP	3rd Wing Command Center
354 FW/CP	354th Fighter Wing Command Center
TMI	Traffic Management Initiative
TMO	Traffic Management Officer
TMU	Traffic Management Unit

UAFGI	University of Alaska Fairbanks Geophysical Institute
USARAK	United States Army Alaska
USCG	United States Coast Guard
USGS	United States Geological Survey
UUA	Urgent Pilot Report
VAAC	Volcanic Ash Advisory Center
VAA	Volcanic Ash Advisory
VACT	Volcanic Ash Collaboration Tool
VAFTAD	Volcanic Ash Forecast Transport and Dispersion
VAN	Volcanic Activity Notice
VONA	Volcano Observatory Notice for Aviation
VHF	Very High Frequency
WAFS	World Area Forecast Service
WARP	Weather and Radar Processor
WC	Weather Coordinator
WFO	Weather Forecast Office
WMSCR	Weather Message Switching Center Replacement
WS	Weather Squadron
WSO	Weather Service Office
YVO	Yellowstone Volcano Observatory
ZAN	Anchorage Air Route Traffic Control Center

Principal Contacts & Agency Web Pages

Alaska Volcano Observatory (AVO)
http://www.avo.alaska.edu/
Volcanic Ahs Impacts & Mitigation: http://volcanoes.usgs.gov/ash/
U.S. Volcanoes and Current Activity Alerts: http://volcanoes.usgs.gov

National Weather Service (NWS)
Alaskan Region: www.weather.gov/arh/
AAWU: www.weather.gov/aawu/
CWSU: www.weather.gov/zan/
Anchorage VAAC: www.weather.gov/vaac/

Federal Aviation Administration (FAA)
Main website: http://www.faa.gov
Alaskan Region: https://www.faa.gov/airports/alaskan/

Department of Defense (DOD)
Air Force Weather Agency: https://weather.afwa.af.mil
(.mil domain sites only)

United States Air Force (USAF)
Air Force Weather Agency: https://weather.afwa.af.mil
(.mil domain sites only)

United States Coast Guard (USCG)
http://www.uscg.mil/d17/

Division of Homeland Security and Emergency Management (AK-DHS&EM)
http://www.ready.alaska.gov/

Department of Environmental Conservation (AK-DEC)
Main website: http://www.dec.state.ak.us/index.htm
Air Quality Advisories: http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories/
Volcanic Ash Info: http://www.dec.state.ak.us/air/volcano.htm
Drinking Water Volcano Preparedness: http://dec.alaska.gov/eh/dw/security/sec_Natural_disaster.html

Alaska Department of Health and Social Services (AK-DHSS)
Section of Epidemiology/Public Health Emergencies
(907) 269-8000 or (800) 478-0084 after hours
http://dhss.alaska.gov/dph/Epi/Pages/volcanoes/default.aspx

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Appendix A. Historically Active Volcanoes of Alaska

MAP#	NAME	GVP Number[a]	LOCATION	LAST HISTORICAL ERUPTION	ELEVATION
1	Wrangell	315020	62°00'N, 144°01' W	2002	14,163'; 4,317 m
2	Spurr	313040	61°18'N, 152°15' W	1992	11,070'; 3,374 m
3	Redoubt	313030	61°28'N, 152°45' W	2009	10,197'; 3,108 m
4	*Iliamna*	313020	60°02'N, 153°06' W	1876	10,016'; 3,053 m
5	Augustine	313010	59°23'N, 153°26' W	2005-2006	4,134'; 1,260 m
6	*Douglas*	312270	58°52'N, 153°32' W	**	7021'; 2,140 m
7	Fourpeaked	312260	58°46'N, 153°40' W	2006	6,903’; 2,104 m
8	*Kukak*	312230	58°27'N, 154°21' W	**	6,693’; 2,040 m
9	*Snowy*	312200	58°20'N, 154°41' W	**	7,090’; 2,161 m
10	*Griggs*	312190	58°21'N, 155°06' W	**	7,602'; 2,317 m
11	Katmai	312170	58°16'N, 154°59' W	1912	6,716'; 2,047 m
12	Novarupta	312180	58°16'N, 155°09' W	1912	2,759'; 841 m
13	Trident	312160	58°14'N, 155°07' W	1974	3,599'; 1,097 m
14	*Mageik*	312150	58°11'N, 155°14' W	**	7,103'; 2,165 m
15	*Martin*	31214	58°10'N,	1953	6,102'; 1,860 m

		0	155°21' W		
16	Ugashik-Peulik	312130	57°45'N, 156°21' W	1852?	4,836'; 1,474 m
17	Ukinrek	312131	57°50'N, 156°30' W	1977	299'; 91 m
18	*Chiginagak*	312110	57°08'N, 157°00' W	1998	7,005'; 2,135 m
19	Aniakchak	312090	56°53'N, 158°10' W	1931	4,400'; 1,341 m
20	Veniaminof	312070	56°10'N, 159°23' W	2013	8,225'; 2,507 m
21	*Kupreanof*	312060	56°45'N, 159°47' W	1987	6,217'; 1,895 m
22	Pavlof	312030	55°25'N, 161°54' W	2016	8,261'; 2,518 m
23	*Emmons Lake*	312020	55°20'N, 162°04' W	**	4806; 1,465 m
24	*Dutton*	312011	55°11'N, 162°16' W	**	4,833'; 1,473 m
25	*Amak*	311390	55°25'N, 163°09' W	1796	1683'; 513 m
26	Shishaldin	311360	54°45'N, 163°58' W	2015	9,373'; 2,857 m
27	Fisher	311350	54°39'N, 164°26' W	1830	3,648'; 1,112 m
28	Westdahl	311340	54°31'N, 164°39' W	1991-92	5,118'; 1,560 m
29	*Gilbert*	No entry	54°15'N, 165°40' W	**	2,684'; 818 m
30	Akutan	311320	54°08'N, 165°58' W	1992	4,275'; 1,303 m
31	Makushin	311310	53°53'N, 166°56' W	1995	6,680'; 2,036 m
32	Bogoslof	31130	53°56'N,	2017	492'; 150 m

		0	168°02' W		
33	Okmok	311290	53°24'N, 168°10' W	2008	3,520'; 1,073 m
34	*Recheshnoi*	311280	53°09'N, 168°32' W	**	6,509'; 1,984 m
35	*Vsevidof*	311270	53°08'N, 168°41' W	1957?	7,050'; 2,149 m
36	*Kagamil*	311260	52°58'N, 169°43' W	1929	2,930'; 893 m
37	*Carlisle*	311230	52°54'N, 170°03' W	1987?	5,315'; 1,620 m
38	Cleveland	311240	52°49'N, 169°57' W	2016	5,676'; 1,730 m
39	Yunaska	311210	52°38'N, 170°38' W	1937	1,804'; 550 m
40	Amukta	311190	52°30'N, 171°15' W	1997	3,497'; 1,066 m
41	Seguam (Pyre Peak)	311180	52°19'N, 172°31' W	1993	3,458'; 1,054 m
42	Korovin (Atka Is.)	311161	52°23'N, 174°09' W	2007	5,029'; 1,533 m
43	Kliuchef (Atka Is.)	311160	52°20'N, 174°08' W	1995?	5,030'; 1,533 m
44	Kasatochi	311130	52°11'N, 175°30' W	2008	1,030'; 314 m
45	Great Sitkin	311120	52°05'N, 176°08' W	1974	5,709'; 1,740 m
46	Kanaga	311110	51°55'N, 177°10' W	2012	4,288'; 1,307 m
47	Tanaga	311080	51°53'N, 178°08' W	1914	5,925'; 1,806 m
48	Gareloi	311070	51°47'N, 178°48' W	1996?	3,458'; 1,573 m
49	Semisopoc	31106	51°56'N,	1987	2,625'; 800 m

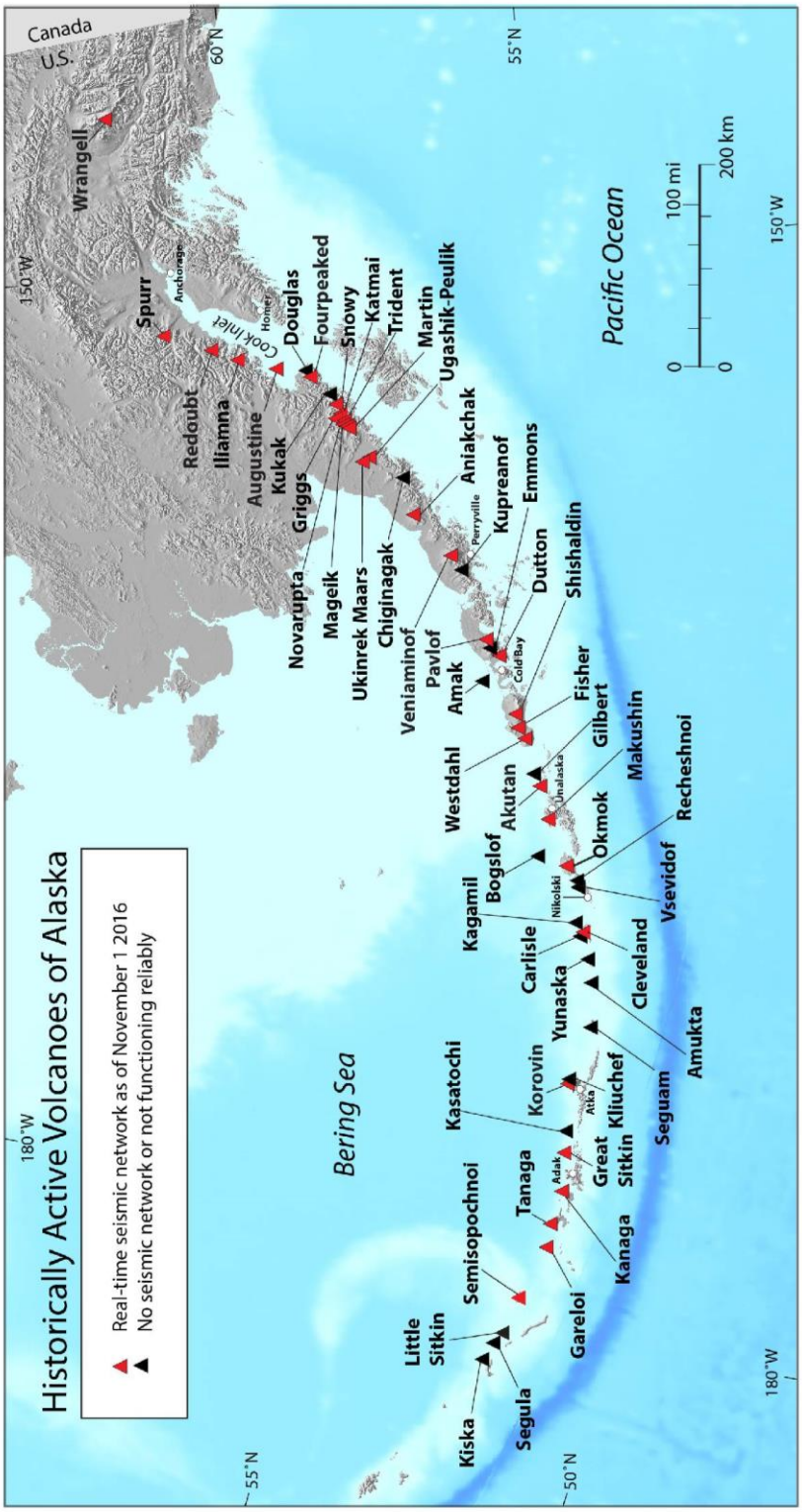
	hnoi (Cerberus)	0	179°35'E		
50	Little Sitkin	311050	51°57'N, 178°32'E	1900?	3,898'; 1,188 m
51	*Segula*	311030	52°50'N, 178°08'E	**	3,783'; 1,153 m
52	Kiska	311020	52°06'N, 177°36'E	1990	4,003'; 1,220 m

[a]This unique number has been assigned to each volcano by the Global Volcanism Project of the Smithsonian Institution and replaces the old numbers from the Catalog of Active Volcanoes. http://www.volcano.si.edu/

**Italics: Volcanoes with no historical (AD 1760–present) eruptions but considered hazardous because of plausible historical eruptions, vigorous fumarolic activity, intense earthquake swarms, or volcanic deformation.

Data sources: (1) Miller, T.P. and others., 1998, Catalog of the historically active volcanoes of Alaska: U.S. Geological Survey Open-File Report 98-582, 104 p; (2) the on-line database of the Global Volcanism Program of the Smithsonian Institution (http://www.volcano.si.edu/); (3) published and unpublished AVO reports and internal files; (4) AVO's website and online database of volcanoes called GEODIVA. Some inconsistencies among data sources remain unresolved. This list may change through time as new information becomes available.

Appendix B. Map of Active Volcanoes of Alaska



Appendix C. Active Volcanoes of the Kamchatka and Northern Kuriles

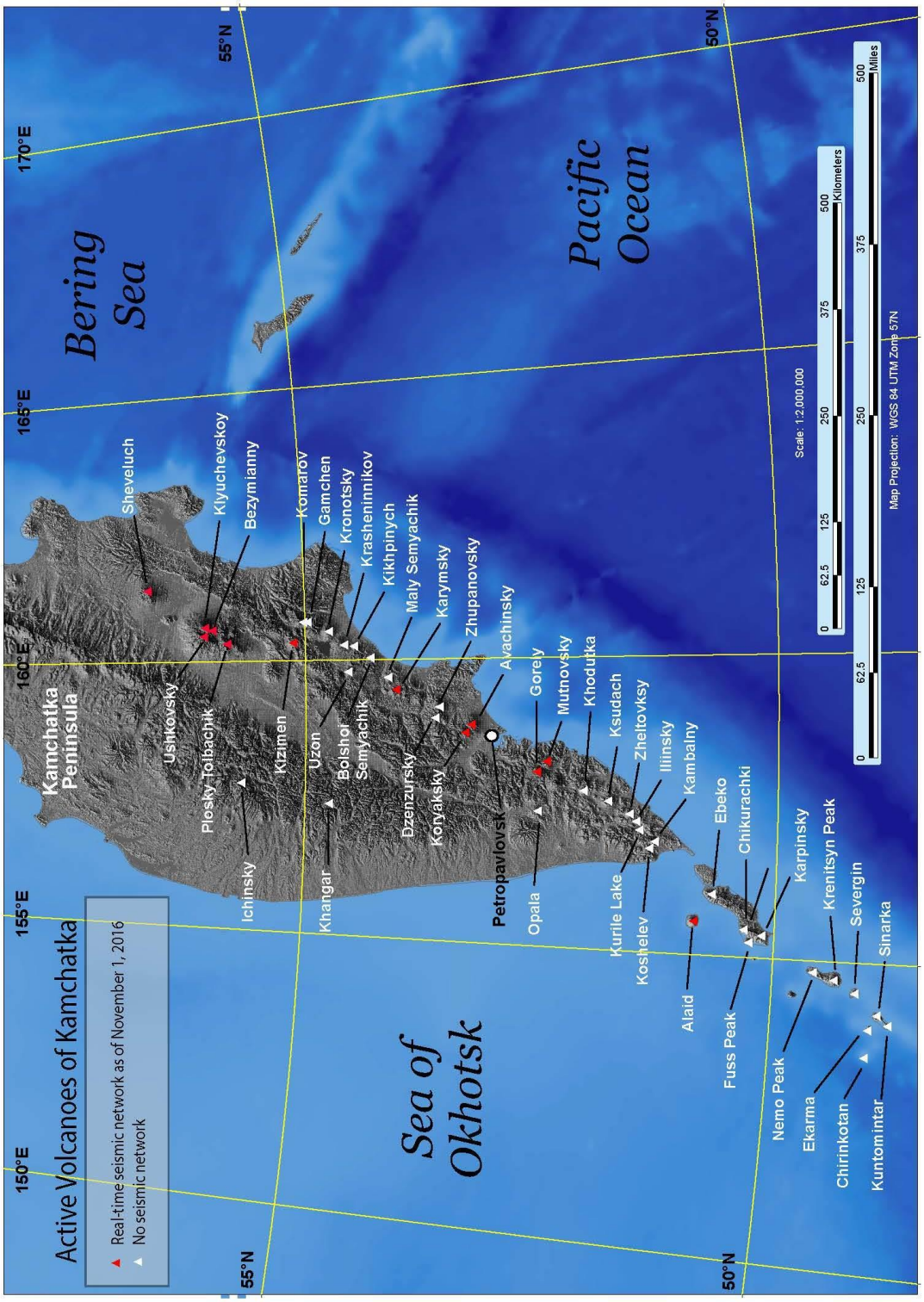
MAP#	NAME	GVP Number[a]	LOCATION	LAST HISTORICAL ERUPTION	ELEVATION
NORTH					
1	Sheveluch	300270	56°39'N, 161°21'E	2016	10,768'; 3,283 m
					active lava dome ~8,200 ft; ~2,500 m
2	Klyuchevskoy	300260	56°03'N, 160°39'E	2016	15,584'; 4,750 m
3	Ushkovsky	300261	56°04'N, 160°29'E	1890	12,933'; 3,943 m
4	Bezymianny	300250	55°58'N, 160°36'E	2016	9,498'; 2,895 m
5	Plosky Tolbachik	300240	55°49'N, 160°24'E	2012-2015	10,121'; 3,085 m
6	*Ichinsky*	300280	55°40'N, 157°43'E	**	11,877'; 3,621 m
CENTRAL					
7	Kizimen	300230	55°12'N, 160°19'E	2010-2013	8,151'; 2,485 m
8	*Gamchen*	300210	54°58'N, 160°42'E	**	8,449'; 2,576 m
9	*Komarov*	300220	55°04'N, 160°43'E	**	6,790'; 2,070 m
10	Kronotsky	300200	54°45'N, 160°30'E	1922-23	11,572'; 3,528 m
11	*Krasheninnikov*	300190	54°35'N, 160°16'E	**	6,088'; 1,856 m
12	*Kikhpinych*	300180	54°29'N, 160°14'E	**	5,091'; 1,552 m
13	Uzon	300170	54°30'N, 159°55'E	1986	5,303'; 1,617 m
14	Bolshoi Semiachik	300150	54°19'N, 160°01'E	1953?	5,642'; 1,720 m
15	Maly Semiachik	300140	54°08'N, 159°40'E	1952	5,117'; 1560 m
16	Karymsky	300130	54°03'N, 159°27'E	2016	4,874'; 1,486 m
17	*Dzenzursky*	300110	53°37'N, 159°00'E	**	7,497'; 2,285 m
18	Zhupanovsky	300120	53°35'N, 159°08'E	2016	9,702'; 2,958 m

19	Koryaksky	300090	53°19'N, 158°41'E	2008-2009	11,336'; 3,456 m
20	Avachinsky	300100	53°15'N, 158°51'E	2001	8,890'; 2,751 m
SOUTH					
21	Opala	300080	52°32'N, 157°20'E	1894	8,118'; 2,475 m
22	Gorely	300070	52°33'N, 158°02'E	2014	6,000'; 1,829 m
23	Mutnovsky	300060	52°27'N, 158°12'E	2013	7,621'; 2,323 m
24	Ksudach	300050	51°49'N, 157°32'E	1907	3,539'; 1,079 m
25	Zheltovsky	300040	51°35'N, 157°20'E	1923	6,406'; 1,953 m
26	Iliyinsky	300030	51°30'N, 157°12'E	1901	5,176'; 1,578 m
27	Koshelev	300020	51°21'N, 156°45'E	1690	5,943'; 1,812 m
28	Kambalny	300010	51°18'N, 156°54'E	1769	7,072'; 2,156 m
Other potentially active volcanoes of Kamchatka					
29	*Khodutka*	300053	52°04'N, 157°42'E	**	6,855'; 2,090 m
30	*Kurile Lake*	300023	51°28'N, 157°06'E	**	400'; 122 m
31	*Khangar*	300272	54°45'N, 157°22'E	**	6,560'; 2,000 m
SECTION ATLASOVA AND PARAMUSHIR ISLANDS (Northern Kuriles)					
32	Alaid	290390	50°52'N, 155°34'E	2016	7,674'; 2,339 m
33	Ebeko	290380	50°41'N, 156°01'E	2016	3,793'; 1,156 m
34	Chikurachki	290360	50°19'N, 155°28'E	2016	5,958'; 1,816 m
35	Fuss Peak	290340	50°16'N, 155°15'E	1854	5,814'; 1,772 m
36	Karpinsky Group	290350	50°08'N, 155°22'E	1952	4,413'; 1,345 m

[a]This unique number has been assigned to each volcano by the Global Volcanism Project of the Smithsonian Institution and replaces the old numbers from the Catalog of Active Volcanoes. http://www.volcano.si.edu/

***Italics: Last eruption date unknown or highly uncertain.
Data sources: (1) On-line database of the Global Volcanism Program of the Smithsonian Institution http://www.volcano.si.edu/ ; (2) Active Volcanoes of Kamchatka, S.A. Fedotov and Yu. P. Masurenkov, (eds.), Moscow Nauka Publishers (Moscow), vols. 1, 2; (3) KVERT information and other published and unpublished AVO reports and internal files. Some inconsistencies among data sources remain unresolved.

Appendix D. Map of Active Volcanoes of Kamchatka



Appendix E. Active Volcanoes of the Kurile Islands

MAP#	NAME	GVP Number[a]	LOCATION	LAST HISTORICAL ERUPTION	ELEVATION
NORTHERN KURILES (1-13 are also shown on Kamchatka Map, Appendix D)					
1	Alaid (Atlasova Is.)	290390	50°52'N, 155°34'E	2016	7,674'; 2,339 m
2	Ebeko (Paramushir Is.)	290380	50°41'N, 156°01'E	2016	3,793'; 1,156 m
3	Chikurachki (Paramushir Is.)	290360	50°19'N, 155°28'E	2016	5,959'; 1,816 m
4	*Tatarinova (Paramushir Is.)*	No entry	50°18'N, 155°27'E	**	5,020'; 1,530 m
5	Fuss Peak (Paramushir Is.)	290340	50°16'N, 155°15'E	1854	5,814'; 1,772 m
6	Karpinsky Group (Paramushir Is.)	290350	50°08'N, 155°22'E	1952	4,413'; 1,345 m
7	Nemo Peak (Onekotan Is.)	290320	49°34'N, 154°48'E	1938	3,342'; 1,019 m
8	Krenitzyn Peak (Tao-Rusyr Caldera; Onekotan Is.)	290310	49°21'N, 154°42'E	1952	4,344'; 1,324 m
9	Severgin (Harimkotan Is.)	290300	49°07'N, 154°30'E	2007?	3,796'; 1,157 m
10	Sinarka (Shiashkotan Is.)	290290	48°52'N, 154°11'E	2014	3,064'; 934 m
11	Kuntomintar (Shiashkotan Is.)	No entry	48°45'N, 154°01'E	1924	2,717'; 828 m
12	Ekarma (Ekarma Is.)	290270	48°57'N, 153°56'E	2010	3,842'; 1,171 m
13	Chirinkotan (Chirinkotan Is.)	290260	48°59'N, 153°28'E	2015	2,375'; 724 m
CENTRAL KURILES					
14	Raikoke (Raikoke Is.)	290250	48°17'N, 153°15'E	1924	1,808'; 551 m
15	Sarychev Peak (Matua Is.)	290240	48°06'N, 153°12'E	2009	4,744'; 1,446 m
16	Rasshua (Rasshua Is.)	290220	47°45'N, 153°01'E	1957	3,113'; 949 m
17	*Ushishir (Yankich Is.)*	290210	47°31'N, 152°48'E	1884	1,276'; 389 m
18	Ketoi (Pallas Peak; Ketoi Is.)	290200	47°20'N, 152°29'E	1960	3,248'; 990 m
19	Prevo Peak (Simushur Is.)	290190	47°01'N, 152°07'E	1914	4,462'; 1360 m
20	Zavaritzii (Simushur Is.)	290180	46°55'N, 151°57'E	1957	2,050'; 625 m
21	Goryachaya sopka (Simushur Is.)	290170	46°50'N, 151°45'E	1944?	2,923'; 891 m
SOUTHERN KURILES					
22	Cherny (Chirpoi Is.)	290150	46°31'N, 150°52'E	2012	2,047'; 624 m
23	Snow (Chirpoi Is.)	290150	46°31'N, 150°52'E	2016	1,296'; 395 m
24	Berg (Kolokol Group, Urup Is.)	290120	46°03'N, 150°04'E	2009?	3,215'; 980 m
25	Kudryavy (Medvezhii; Iturup Is.) Also called Moyorodake	290100	45°23'N, 148°50'E	1999	3,235'; 986 m
26	*Men'shiy Brat (Iturup Is.)*	No entry	45°23'N, 148°47'E	~400 yrs BP	1,847'; 563 m
27	Chirip cluster (Bogdan Khmelnitzky; Iturup Is.)	290090	45°23'N, 147°55'E	1860?	5,131'; 1,564 m
28	Baransky (Iturup Is.) Also called Sashiusudake	290080	45°06'N, 148°01'E	1951	3,717'; 1,133 m
29	Ivan Grozny (Iturup Is.) Also called Etorofu-Yake-yama	290070	45°01'N, 147°52'E	2013	3,802'; 1,159 m

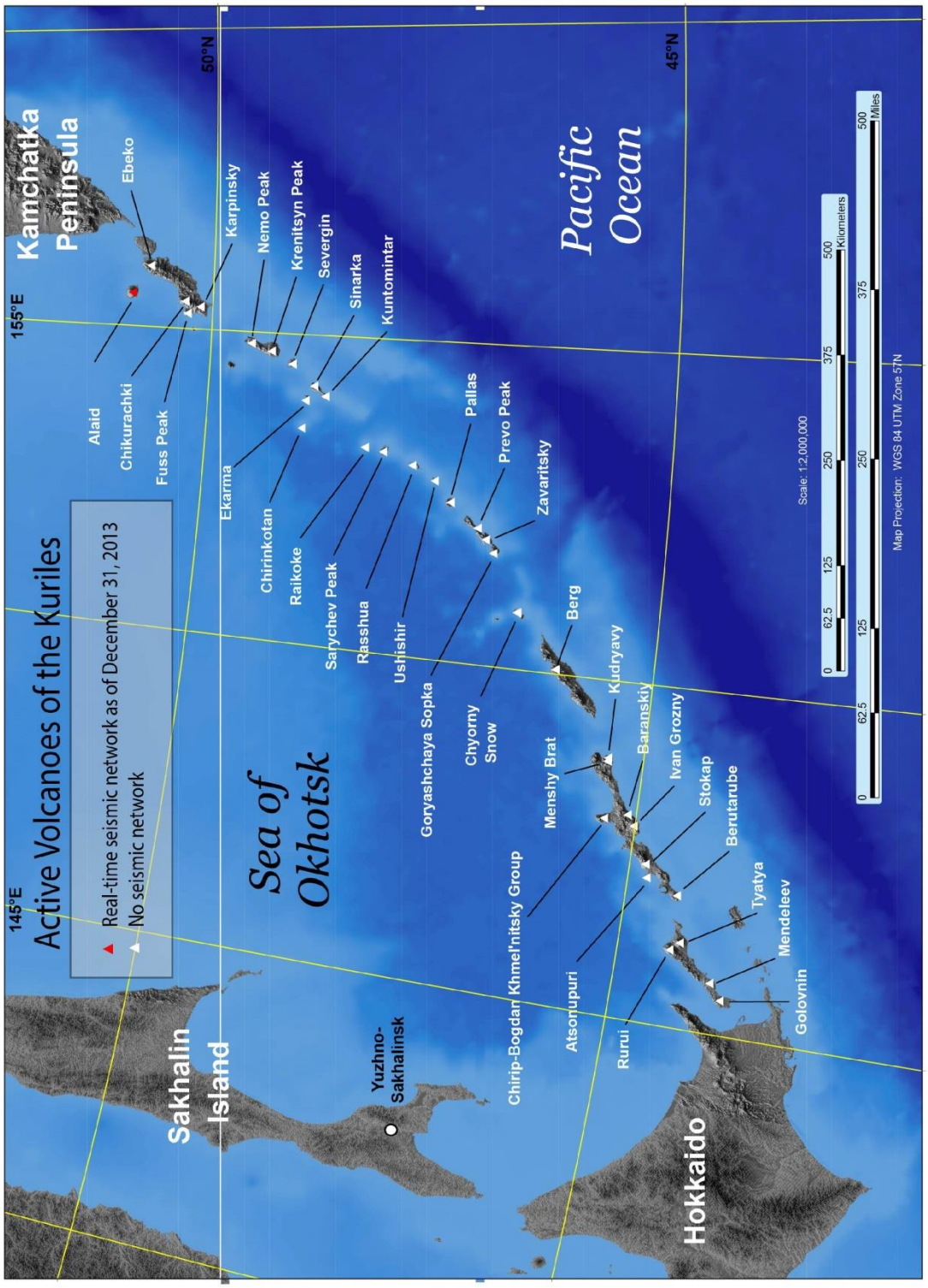
30	*Stokap or Bogatyr Ridge (Iturup Is.) Also called Nishihitokappuya*	290060	44°50'N, 147°20'E	**	5,361'; 1,634 m
31	Atsonupuri (Iturup Is.)	290050	44°48'N, 147°08'E	1932	3,953'; 1,205 m
32	*Berutarube (Iturup Is.)*	290040	44°27'N, 146°56'E	1812	4,003'; 1,220 m
33	*Ruruy or Smirnov (Kunashir Is.) Also called Ruruidake*	290021	44°27'N, 146°08'E	**	4,872'; 1,485 m
34	Tyatya (Kunashir Is.) Also called Chachadake	290030	44°27'N, 146°15'E	1981	5,968'; 1,819 m
35	Mendeleev (Kunashir Is.) Also called Raususan	290020	43°59'N, 145°44'E	1977	2,910'; 887 m
36	*Golovnin (Kunashir Is.)Also called Tomariyama*	290010	43°51'N, 145°30'E	1848	1,775'; 541 m

[a]This unique number has been assigned to each volcano by the Global Volcanism Project of the Smithsonian Institution and replaces the old numbers from the Catalog of Active Volcanoes. http://www.volcano.si.edu/

** Italics: Last eruption date unknown or highly uncertain. These volcanoes often display thermal activity at the surface.

Data sources: (1) Alexander Rybin and Marina Chibasova, IMGG (working from Russian maps at scales of 1:50,000 and 1:200,000), (2) On-line database of the Global Volcanism Program of the Smithsonian Institution (http://www.volcano.si.edu/). Some inconsistencies between sources remain unresolved. This list may change as new geological information becomes available.

Appendix F. Map of Active Volcanoes of the Kuriles



Appendix G. Public Phone Numbers for Volcanic Ash Episodes in Greater Cook Inlet

Volcanic Activity Information
Alaska Volcano Observatory (AVO)
(907) 786-7497

Flight Restrictions (FAA) for pilots
1-800 Weather Brief
1 (800) 9328-4372-7433

General Preparedness
Alaska Homeland Security and Emergency Management (DHS&EM)
(907) 428-7000 or 1-800-478-2337

Volcanic Ash Impacts & Mitigation Website
https://volcanoes.usgs.gov/volcanic_ash/

Air Quality Monitoring
Alaska Department of Environmental Conservation -Division of Air Quality
(907) 269-7676

Municipality of Anchorage Air Quality Hotline
(907) 343-4899

Health - Ash Impacts
Alaska Department of Health and Social Services-Section of Epidemiology
Public Health Emergencies
(907) 269-8000 or 1-800-478-0084 after hours

Alaska Department of Health and Social Services: Section of Emergency Programs
24 Hour Health and Medical Duty Officer
(907) 903-3721

Marine Safety
USCG Command Center District 17 Search and Rescue or related topics
1-800-478-5555 or (907) 463-2000

Coast Guard Sector Anchorage (Kodiak, Cook Inlet, Prince William Sound)(907) 428-4100

Marine Safety, continued

Coast Guard Sector Juneau (Juneau, Sitka, Ketchikan, Dixon Enterance)
(907) 463-2980

Communications Detachment Kodiak
(907) 487-5778

LAND MANAGER
Alaska Department of Natural Resources
(907) 269-8566

Alaskan Region NPS Public Relations (Anchorage)
(907) 644-3513 and (907) 644-3512

Katmai National Park and Preserve (King Salmon)
(907) 246-3305

Lake Clark National Park and Preserve (Homer)
(907) 235-7903

LOCAL BOROUGHS/MUNICIPALITIES
Bristol Bay Borough
(907) 246-4224

Lake and Peninsula Borough
(907) 246-3421 and 800-764-3421

Kenai Peninsula Borough Office of Emergency Management
(OEM) (907) 262-4910

Kodiak Borough Manager's Office
(907) 486-9300 use Option 1 for Manager's Office

Anchorage Office of Emergency Management
(907) 343-1401

Appendix H. Public Websites for Volcanic Ash Episodes in Greater Cook Inlet

Volcanic Activity Information
Alaska Volcano Observatory (AVO)
http://www.avo.alaska.edu/

Ashfall Warnings, Marine Advisories and SIGMETS (NOAA/NWS)
Ashfall and Marine Advisories: www.weather.gov/afc/
SIGMET, AIRMET: www.weather.gov/aawu/
HYSPLIT wind trajectories: http://www.arl.noaa.gov/ready/traj_alaska.html
NWS RADAR: http://www.weather.gov/afc/
Anchorage Volcanic Ash Advisory Center: www.weather.gov/vaac/

Flight Restrictions (FAA)
Flight Information: https://www.faa.gov/air_traffic/flight_info/
TFRs: http://tfr.faa.gov/tfr2/list.jsp
NOTAMs: https://www.notams.faa.gov/dinsQueryWeb/

General Preparedness
Alaska Department of Homeland Security and Emergency Management
http://www.ready.alaska.gov/

Air Quality Monitoring
Alaska Department of Environmental Conservation - Division of Air Quality
http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories

Drinking Water Volcano Preparedness
Alaska Department of Environmental Conservation – Drinking Water Program
http://dec.alaska.gov/eh/dw/security/sec_Natural_disaster.html

Health - Ash Impacts
Alaska Department of Health and Social Services:
Section of Epidemiology/Public Health Emergencies
http://dhss.alaska.gov/dph/Epi/Pages/volcanoes/default.aspx

Marine Safety

U.S. Coast Guard District 17 Search and Rescue: http://www.uscg.mil/d17/

U.S. Coast Guard Alaska Public Affairs: http://www.uscgnews.com/go/doc/4007/2156574/17th-District-Alaska

Tsunami Warnings

West coast Alaska Tsunami Warning Center

www. tsunami.gov

Land Managers

Alaska Department of Natural Resources: http://dggs.alaska.gov/

Katmai National Park and Preserve:http://www.nps.gov/katm/index.htm

Lake Clark National Park and Preserve: http://www.nps.gov/lacl/index.htm

Local Boroughs/Municipalities

Bristol Bay Borough: http://www.bristolbayboroughak.us/

Lake and Peninsula Borough: http://www.lakeandpen.com/

Kenai Peninsula Borough: http://www.borough.kenai.ak.us/emergency/

Kodiak Borough: http://www.kodiakak.us/

Municipality of Anchorage: http://www.muni.org/departments/oem/pages/default.aspx

Appendix I. Ashfall severity terms in use in Alaska

[Official text products from NWS and other agencies, attempt to utilize consistent terminology when describing ashfall events and amounts.]

TERM	APPROXIMATE ACCUMULATION	NWS MESSAGE	KEY IMPACTS (cumulative with increasing ash)	RECOMMENDATIONS (cumulative with increasing ash)
Trace or Dusting	< 1/32 in (0.031 in) < 0.8 mm	Special Weather Statement Marine Weather Statement	Eye and respiratory irritant. Very low-level impacts for most people.	Avoid excessive exposure to ash, especially those with respiratory sensitivities. Protect critical electronics and other equipment from contamination.
Minor	1/32–1/4 in (0.031– 0.25 in) 0.8 –6.4 mm	Ashfall Advisory Marine Weather Statement	Possible harm to crops, animals; minor equipment and infrastructure damage. Reduced visibility. Widespread clean-up may be necessary.	Seal windows and doors. Protect electronics and cover air intakes and open water supplies. Minimize driving. Listen to your radio station for further information.
Substantial	1/4 –1 in (0.25 –1 in) 6.4 –25.4 mm	Ashfall Warning Special Marine Warning	Disruption of services and utilities (water, sewer, electric) possible. Ash removal efforts significant.	Seal windows and doors. Protect electronics and cover air intakes. Avoid driving. Listen to your radio station for further information.
Heavy	1 –4 in 25.4 –100 mm	Ashfall Warning Special Marine Warning	Weaker roofs and structures can fail at ~4-5 inches of wet ash (~40 lbs/square ft). Crop damage. Livestock loss. Services, utilities interrupted.	Remain indoors unless absolutely necessary. Use extreme caution clearing rooftops of ash. Avoid driving. Listen to your radio station for further information.
Severe	> 4 in > 100 mm	Ashfall Warning Special Marine Warning	Significant danger of roof collapse; heavy damage to trees and crops. Essential services severely disrupted. Heavy animal loss. Roads unusable.	Remain indoors unless absolutely necessary. Use extreme caution clearing rooftops pf ash. Avoid driving. Listen to your radio station for further information.

Appendix J. Official Volcano Warning Products in Use in Alaska

[Primary warning agencies in Alaska involved in volcanic eruption hazard communication and the names of public warning products for events in Alaska and the Flight Information Region of the Alaska Aviation Weather Unit. Some messages are very specific in their intended audience (e.g. Notices to Airmen [NOTAMs] and Urgent Pilot Reports [UUAs] are for airlines and pilots) and others are of broader use (e.g. Ashfall Advisories, Air Quality Advisories, and Information Releases). Significant redundancy is inherent in this system and proactive coordination is necessary to ensure that messages are consistent. UUAs can be issued by either FAA or NWS personnel. Not all messages will be issued for every eruption or episode of volcanic unrest]

Alaska Volcano Observatory (AVO)	**National Weather Service (NWS)**	**Federal Aviation Administration (FAA)**	**Alaska Department of Homeland Security and Emergency Management (DSHEM)**	**U.S. Coast Guard (USCG)**	**Alaska Department of Environmental Conservation, Division of Air Quality (DEC)**	**Alaska Department of Environmental Conservation, Drinking Water Program (DEC)**	**Alaska Department of Health & Social Services (DHSS)**	**Municipality of Anchorage (MOA)**	**Department of Defense (DOD)**
Information Release	SIGMET (Significant Meteorologic Information)	NOTAM (Notice to Airman)	SITREP (Situation Report)	Marine Info. Broadcast (Notice to Mariners)	Air Quality Advisory or guidance statements	Drinking Water Advisory or guidance statements	Public Service Announcement	Air Quality Advisory	Volcanic Ash Notification (VAN)
Weekly Update	VAA (Volcanic Ash Advisory)	UAA (Urgent Pilot Report)	Community Alert Press Release						
Daily Update	MIS (Meteorologic Impact Statement)	TFR (temporary flight restriction)							
Current Status Report	CWA (Center Weather Advisory)								
Activity Volcanic Notice (VAN)	Public Ashfall Advisory & Warning								
Observatory Notice for Aviation Volcano (VONA)	Marine Ashfall Advisory & Warning								
	Special Weather & Marine Weather Statements								
	TAF								

Appendix K. Examples of Select Products listed by Agency

Alaska Volcano Observatory (AVO)

VOLCANIC ACTIVITY NOTICE (VAN)/VOLCANO OBSERVATORY NOTICE TO AVIATION (VONA)

Example:

(1) **VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA)**	
(2) Issued:	(20161024/2219Z)
(3) Volcano:	Cleveland (VNUM #311240)
(4) Current Color Code:	**ORANGE**
(5) Previous Color Code:	YELLOW
(6) Source:	Alaska Volcano Observatory
(7) Notice Number:	
(8) Volcano Location:	N 52 deg 49 min W 169 deg 56 min
(9) Area:	Aleutians
(10) Summit Elevation:	5676 ft (1730 m)
(11) Volcanic Activity Summary:	AVO detected an explosion at Cleveland Volcano in both infrasound (air pressure) and seismic data today (10/24/2016) at 13:10 AKDT (21:10 UTC). Residents in Nikolski 45 miles (75 km) from Cleveland reported hearing the explosion. Cloudy weather obscures the volcano in satellite images from 13:30 AKDT (21:30 UTC), however no evidence of an eruption cloud is detected above the weather cloud deck height of 28,000 ft. The summit is currently obscured by cloudy weather in web camera images. Previous Cleveland explosions have typically produced ash emissions. AVO is raising the color code/alert level of Cleveland Volcano from YELLOW/ADVISORY to ORANGE/WATCH.
(12) Volcanic cloud height:	No ash cloud observed above met. cloud deck of 28,000 ft.
(13) Other volcanic cloud information:	No cloud observed.
(14) Remarks:	Cleveland volcano forms the western portion of Chuginadak Island, a remote and uninhabited island in the east central Aleutians. The volcano is located about 75 km (45 mi) west of the community of Nikolski, and 1500 km (940 mi) southwest

	of Anchorage. The most recent significant period of eruption began in February, 2001 and produced 3 explosive events that generated ash clouds as high as 39,000 ft above sea level. The 2001 eruption also produced a lava flow and hot avalanche that reached the sea. Since then, Cleveland has been intermittently active producing small lava flows, often followed by explosions that generate small ash clouds generally below 20,000 ft above sea level. These explosions also launch debris onto the slopes of the cone producing hot pyroclastic avalanches and lahars that sometimes reach the coastline.
(15) Contacts:	Michelle Coombs, Scientist-in-Charge, USGS mcoombs@usgs.gov (907) 786-7497 Jeff Freymueller, Coordinating Scientist, UAFGI jeff.freymueller@gi.alaska.edu (907) 322-4085
(16) Next Notice:	A new VAN will be issued if conditions change significantly or alert levels are modified. While a VAN is in effect, regularly scheduled updates are posted at

National Weather Service (NWS)

SIGNIFICANT METEOROLOGICAL INFORMATION (SIGMET)

Example:

WVAK02 PAWU 012334
WSVAK2
ANCJ WS 012330
PAZA SIGMET JULIET 1 VALID 012330/020530 PANC-
ANCHORAGE FIR VA ERUPTION CLEVELAND VOLCANO PSN N5250 W16957
VA CLDS OBS AT 2330Z WI N5305 W16944 - N5336 W16822 - N5303 W16752 - N5246 W16926 - N5305 W16944 - N5305 W16944 SFC/FL110.
MOV E 20KT. WKN.
FCST 0530Z NO VA EXP.

BRIEF MINOR ERUPTION WITH FAINT VA PLUME VISIBLE IN SATELLITE IMAGERY.

CHA MAR 2016 AAWU

Explanation of terms:

WVAK02 PAWU 012334 **WSVAK2** **ANCJ WS 012330**	• Header identifying the issuing office and the time of issuance
PAZA SIGMET JULIET 1 VALID 012330/020530 PANC-ANCHORAG FIR	• PAZA - Indicates the SIGMET is in or near the airspace controlled by the Anchorage Air Route Traffic Control Center. • Juliet 1 - SIGMET name and number in series. If more than one ash cloud is present, multiple SIGMETS will will be issued with unique series names • 012330/020530 - Valid from 1st day of the month at 2330Z until the 2nd day of the month at 0530Z ○ Ash SIGMETS are valid for up to six hours • PANC-ANCHORAGE FIR - Area covered by the SIGMET is within the Anchorage Flight Information Region
VA ERUPTION CLEVELAND VOLCANO PSN N5250 W16957	• Volcano name and position • N5250 - 52.50° N

	• W16957 - 169.57°W
VA CLDS OBS AT 2330Z WI N5305 W16944 - N5336 W16822 - N5303 W16752 - N5246 W16926 - N5305 W16944 - N5305 W16944	• VA CLDS OBS AT 2330Z - Time volcanic ash was observed • WI - within • N5305 W16944 - Latitude and longitude of corner point of polygon enclosing ash cloud
SFC/FL110	• Ash cloud base/Ash cloud top • SFC - Surface • 110 - 11,000 ft
MOV E 20KT	• Ash moving east at 20 kts
WKN	• Trend expected during the six hour valid period • WKN - Weakening • NC - No Change • INTSF - Intensifying
FCST 0530Z NO VA EXP	• Forecasted ash position six hours after SIGMET issuance. • NO VA EXP - No ash expected • If ash is expected, a second set of latitude and longitude points will be given to identify a polygon enclosing the forecasted position of the ash cloud
BRIEF MINOR ERUPTION WITH FAINT VA PLUME VISIBLE IN SATELLITE IMAGERY.	• Optional remarks, given in free form text to clarify the SIGMET
CHA MAR 2016 AAWU	• CHA - Initials of issuing forecaster • MAR 2016 - Current month and year • AAWU - Issuing office

PILOT WEATHER REPORTS (PIREP)

Example:

UUA /OV ANC200025 /TM 2116 /FL160 /TP B737/SK BKN045 /OVC080-TOP 120 /WX FV03SM VA HZ /TB LGT /TA 04 /RM VA TOP EST TO FL200

Explanation of terms:
UUA (Urgent) /OV (Location) /TM (Time) /FL (Flight level) /TP (Aircraft type) /SK (Sky cover) /WX (Visibility and weather) /TA (Temperature) /WV (Wind) /TB (Turbulence) /IC (Icing) /RM (Remarks)

1. **UA -** Routine PIREP
   UUA - Urgent PIREP
   - Coded as a UUA if volcanic ash *was* encountered
   - Coded as a UA if volcanic ash was *was not* encountered

2. **/OV -** Location
   - Given as a three letter airport identifier and may include a direction and distance from the airport
     - /OV CDB - Cold Bay Airport
     - /OV ANC200025
       - ANC - Anchorage International Airport
       - 200 - 200 degrees (SSW) from ANC
       - 025 - 25 nautical miles

3. **/TM -** Four digit time, given in GMT

4. **/FL -** Flight level
   - Given using three digits for hundreds of feet above mean sea level, if known
   - /FLUNKN - Unknown flight level
   - /FL DURC - During Climb (or DURD for decent)
   - /FL 160 - 16,000 ft MSL

5. **/TP -** Aircraft type

6. **/SK -** Sky cover
   - Height of cloud base, given in hundreds of feet
     - /SK BKN045 /OVC080-TOP 120 - Broken clouds at 4,500 ft, overcast at 8,000 ft, and cloud tops at 12,000 ft

7. **/WX -** Flight visibility and weather
   - Given in statute miles and may include weather type given in METAR code.
     - /WX FV03SM VA HZ - Visibility of 3 statute miles with volcanic ash and haze

8. **/TA -** Air temperature, given in Celsius

9. **/WV -** Wind direction and speed, given in knots
    - /WV 28008KT - Wind from 280 degrees (W) at 8 kts

10. **/TB -** Turbulence intensity, type, and height

11. **/IC -** Icing intensity, type, and height

12. **/RM -** Remarks, given in free form text to clarify the report

Note: Not all sections will be included in every PIREP.

SPECIAL WEATHER STATEMENT (SWS)

Example:

WWAK82 PAFC 152131
SPSALU

SPECIAL WEATHER STATEMENT
NATIONAL WEATHER SERVICE ANCHORAGE AK
1231 PM AKST SAT NOV 15 2014

AKZ181-160945-
ALASKA PENINSULA-
INCLUDING THE CITIES OF...COLD BAY...SAND POINT
1231 PM AKST SAT NOV 15 2014

...A DUSTING OF ASHFALL IS POSSIBLE UNTIL 6 PM AKST NEAR PAVLOF VOLCANO...

PAVLOF VOLCANO AT 55.25N 161.53W IS CURRENTLY ERUPTING AND
PRODUCING AN ASH PLUME. A PILOT HAS REPORTED AN ASH PLUME TO
30,000 FEET ABOVE THE VOLCANO. A DUSTING OF ASHFALL IS POSSIBLE
IN THE IMMEDIATE VICINITY OF THE VOLCANO AND TO THE NORTHWEST OF
THE VOLCANO.

AVOID EXCESSIVE EXPOSURE TO ASH WHICH IS AN EYE AND RESPIRATORY
IRRITANT. THOSE WITH RESPIRATORY SENSITIVITIES SHOULD TAKE EXTRA
PRECAUTION TO MINIMIZE EXPOSURE.

ASHFALL ADVISORY

Example:

AKZ121-271400-
/X.NEW.PAFC.AF.*Y*.0006.090327T0824Z-090327T1400Z/

WESTERN KENAI PENINSULA-
INCLUDING THE CITIES OF...KENAI...SOLDOTNA...HOMER...
COOPER LANDING
1224 AM AKDT FRI MAR 27 2009

...ASHFALL ADVISORY IN EFFECT UNTIL 6 AM AKDT EARLY THIS MORNING...

THE NATIONAL WEATHER SERVICE IN ANCHORAGE HAS ISSUED AN ASHFALL ADVISORY...WHICH IS IN EFFECT UNTIL 6 AM AKDT EARLY THIS MORNING.

MOUNT REDOUBT ERUPTED TO 38,000 FT AT 1148 PM THURSDAY. MINOR ASHFALL OF A TRACE TO ONE EIGHTH INCH IS EXPECTED THROUGH EARLY FRIDAY MORNING.

MOUNT REDOUBT REMAINS ACTIVE AND ADDITIONAL ERUPTIONS ARE POSSIBLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

AN ASHFALL ADVISORY MEANS THAT ASH WILL BE DEPOSITED IN THE ADVISORY AREA. PEOPLE IN AREAS OF ASHFALL SHOULD SEAL WINDOWS AND DOORS. PROTECT ELECTRONICS AND COVER AIR INTAKES AND OPEN WATER SUPPLIES. MINIMIZE DRIVING. LISTEN TO YOUR RADIO STATION FOR FURTHER INFORMATION.

U.S. Department of Defense (DOD)

557th WEATHER WING VOLCANIC ACTIVITY NOTIFICATION

Example:

FVAW23 KGWC 160901
VOLCANIC ASH ERUPTION ALERT

VOLCANO: PAVLOF 1102-03

LOCATION: 5525N 16154W AREA: ALASKA

SUMMIT ELEVATION: 8264 FT (2519 M)

1. DETECTION SOURCE: DMSP F18 BROADBAND VISIBLE IMAGE.

2. ERUPTION DETAILS: REPORT OF ASH AT 16/0830Z.
TRAJECTORY: ASH TO FL200 MOVING NW AT 20-25KTS.

3. REMARKS: ASH VISIBLE ON 16/0617Z DMSP F18 BROADBAND VISIBLE IMAGE
EXTENDING 65NM NW OF SUMMIT.

HYSPLIT DETAILS: GFS MODEL WIND FIELD DATA IS NOT REPRESENTATIVE OF
THE CURRENT ASH TRAJECTORY; THEREFORE, THE HYSPLIT MODEL FORECAST
WILL NOT BE ISSUED.

4. FOR FURTHER INFORMATION SEE LATEST FVAK PAWU BULLETIN.

WEBSITE INFO: FOR METSAT ANALYSIS SEE HTTPS://WEATHER.AF.MIL/AFW_WEBS/VOLCANICEVENTS (ALL UPPER CASE).

FOR OFFICIAL VAAC FORECAST VISIT WWW.OSPD.NOAA.GOV/PRODUCTS/ATMOSPHERE/VAAC/ (LOWER-CASE EXCEPT FOR P
IN PRODUCTS). EACH VAAC IS ACCESSIBLE FROM THIS PAGE BY CLICKING YOUR
AREA OF INTEREST ON THE MAP.

5. THIS BULLETIN WILL BE UPDATED BY 16MAY2013 AT 1530Z.

PREPARED BY BURLINGHAM/QC BY JOCSON

Additional volcanic activity information is available on:

Air Force Weather Webs (AFW-WEBS). From the
AFW-WEBS Main Page, select Classic, then Category, then "Volcanic Events."

For questions about volcanic activity call:
HQ AFWA, 2 WS Intel Flight
DSN: 271-7264 or Comm (402)294-7264

Alaska Department of Environmental Conservation (DEC)

AIR QUALITY ADVISORY

Example:

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Air Quality
SITUATION REPORT
AIR QUALITY ADVISORY
Aleutian Southwest Alaska #2016-Pav1

LOCATION(S) IMPACTED: Eastern Aleutians Sand Point and surrounding area.

TIME/DATE OF UPDATE: Monday, March 28, 2016, 10:00 AM.

VALID TIME: Valid until Wednesday, March 30, 2016, 10:00 AM.

TIME/DATE OF THE NEXT REPORT: If necessary Wednesday, March 30, 2016, 10:00 AM or if conditions change significantly and warrant a timelier advisory.

ADVISORY: Winds are from the south west and will vary between south and southwest over the next 72 hours. Any ash from Pavlov Volcano will travel to the north to north east. Trace amounts of volcanic ash from eruptions of the Pavlov Volcano are possible in Nelson Lagoon, Port Moller and all areas to the north and northeast of the volcano. Should enough ashfall to cover the ground, the possibility of health risks still continues from the ash on the ground any time winds or human activity can cause ash to be re-entrained into the air. People with respiratory conditions should be aware for the potential of ashfall in their area, and to use caution if it is observed.

VOLCANIC DUST AND PUBLIC IMPACT: Ashfall restricts visibility, and is a general nuisance. Individuals exposed to airborne volcanic ash may experience various eye, nose and throat irritation. Although ash can cause discomfort, short-term breathing of volcanic ash is not known to pose a significant health hazard for healthy individuals. However, exposure to ash can make breathing difficult for infants, the elderly and those with respiratory ailments. People with existing respiratory conditions, such as chronic bronchitis, emphysema and asthma, are more at risk for developing acute respiratory symptoms from breathing volcanic ash. Anyone in these risk groups should be particularly careful to avoid exposure. Contact your health provider if you are concerned about symptoms.

DEC advises everyone to avoid unnecessary exposure to ash. Wear a disposable face mask outdoors to reduce inhalation of ash particles. Dust masks can be purchased at most hardware stores. Masks that seal to the face provide the best protection. Alternatively, a wet cloth or bandana placed over the mouth and nose can help reduce contact.

Contact lens wearers are advised to switch to eye glasses to reduce eye irritation from ash exposure. Wearing goggles can help to protect your eyes and wearing long sleeved shirts as well as gloves may be helpful. Remember that pets are also susceptible to all of these same symptoms, and should be kept indoors or sheltered from ashfall as well.

FOR MORE INFORMATION: For specific information about the Pavlof Volcano, including seismic activity and the status of the current eruptions, visit the Alaska Volcano Observatory website at **http://www.avo.alaska.edu** . They also have a recording on the status of the volcano at **(907) 786-7478** (local Anchorage number) or (907) 786-7497.

For more information on steps to take in the event of ashfall, visit the Department of Environmental Conservation, Air Quality Division, Volcanic Ashfall page at **http://www.dec.state.ak.us/air/volcano.htm.**

Sign up to automatically receive Air Quality Alerts via email or Twitter at:
http://dec.alaska.gov/Applications/Air/airtoolsweb/Home/Index
For information on this advisory, contact Michael Gravier, Division of Air Quality, (907) 269-7676 or State Cell Phone (907) 748-2142