Department of Commerce • National Oceanic & Atmospheric Administration • National Weather Service

NATIONAL WEATHER SERVICE INSTRUCTION 10-1501
March 30, 2022
Operations and Services
Volcanic Ash, NWSPD 10-15
VOLCANIC ASH ADVISORY CENTERS

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SUMMARY OF REVISIONS: This directive supersedes NWSI 10-1501, "*Volcanic Ash Advisory Centers,"* dated October 28, 2021. The following revisions were made to this directive:

- Updated Section 7 on Backup and Support Procedures as the USAF 557WW is no longer the primary backup to the Washington VAAC.
- Deleted the National Marine Volcano Impacts Team from the instruction as none of the volcanic experts inside and outside NWS have heard of this team.
- Linked to a larger ICAO map under Figure 1.
- Corrected a typo in the second bullet in Section 3.2.1 that made the statement confusing.
- Added Appendix C – Acronym List.

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March 16, 2022

Allison Allen
Director
Analyze, Forecast and Support Office

Date

Volcanic Ash Advisory Centers

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1 Introduction

There are over 150 volcanoes in the United States that scientists consider active. Most are in Alaska with many others in Hawaii, throughout the American West, and across U.S. Territories. Volcanic eruptions are a geologic phenomenon and not weather, but wind can transport volcanic ash from explosive eruptions thousands of miles from a volcano. National Oceanic and Atmospheric Administration (NOAA) meteorologists and satellite analysts monitor the status of active volcanoes, track volcanic ash in the atmosphere during eruptions, and issue advisories and warnings for airborne ash and ashfall.[1]

Volcanic ash poses significant health, aviation, infrastructure, and economic hazards. It is extremely abrasive and can severely damage the exterior of an aircraft even in small concentrations. When ingested into aircraft engines, volcanic ash can lead to engine damage or failure. In addition, ashfall poses substantial health and infrastructure threats to those on the

[1] https://www.weather.gov/safety/airquality-volcanic-ash

ground. Volcanic ash can pollute water supplies, damage or destroy buildings, and when breathed in can result in serious illness or death.

In 1997, the International Civil Aviation Organization (ICAO) established the Volcanic Ash Advisory Centers (VAAC) and defined them in ICAO Annex 3, *Meteorological Service for International Air Navigation*, Section 3.5, as a meteorological center designated by regional air navigation agreement to provide advisory information to Meteorological Watch Offices (MWO), area control centers, flight information centers, World Area Forecast Centers (WAFCs), and international operational meteorological (OPMET) data banks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions.

2 Guidance Bodies

There are several groups within both the United States and internationally that address volcanic ash events and issues.

2.1 Federal Aviation Administration (FAA)

The FAA is the U.S. meteorological authority as defined by ICAO. The FAA has designated the NWS as the U.S. meteorological provider and therefore works closely with the NWS and NESDIS on U.S. VAAC requirements. The FAA represents U.S. interests at ICAO meetings and the U.S. VAAC managers generally serve as technical advisors to the FAA.

2.2 ICAO Meteorology Panel (METP)

The establishment of the METP resulted from ICAO restructuring in 2014. The purpose of the METP is to determine operational requirements for aeronautical meteorological services in support of global air traffic management and coordinate with the World Meteorological Organization (WMO) to meet requirements using sound scientific and technological solutions. To efficiently accomplish tasks in the work program, the METP has established several working groups, two of which have bearing on the VAACs.

2.2.1 ICAO METP Meteorological Operations Group (MOG)

The MOG is responsible for operations of existing systems, including the International Airways Volcano Watch (IAVW) (See Section 2.3) and the World Area Forecast System (WAFS). The MOG monitors these systems to ensure they meet the needs of their users.

2.2.2 ICAO METP Working Group for Meteorological Information and Service Development (WG-MISD) Volcanic Ash Work Stream

The WG-MISD assesses user needs, determines gaps, develops concepts of operations, and identifies functional and performance requirements of meteorological information to support global air navigation. Because of the broad scope, the WG-MISD is divided into several workstreams. The Volcanic Ash Work Stream focuses on tasks related to scientific and technological advances in the provision of volcanic ash information to aviation.

2.3 International Airways Volcano Watch (IAVW)

The IAVW is coordinated by the ICAO and defines the arrangements between volcanological, aeronautical, and meteorological organizations to facilitate the provision of warnings to aircraft on the presence of ash in the atmosphere. Until the ICAO restructuring in 2014 that created the METP, international cooperation and arrangements for monitoring volcanic ash detection and

warning were overseen by the IAVW Operations Group. The METP dissolved the Operations Group but continues to develop requirements for the IAVW in coordination with the WMO. The procedures of the IAVW are described in ICAO Doc 9766, *Handbook on the International Airways Volcano Watch (IAVW).* Any inconsistencies between the Handbook and this document should be brought to the attention of the NWS Volcanic Ash Program Manager and the VAAC Managers.

2.4 Alaska Interagency Volcanic Ash Services Working Group

The Alaska Interagency group meets two to three times each year. The face-to-face meetings alternate between the U.S. Geological Survey (USGS) Alaska Volcano Observatory (AVO) and the NWS Weather Forecast Office (WFO) in Anchorage. The group consists of members from NOAA/NWS, NOAA/NESDIS, FAA, USGS AVO, the United States Coast Guard (USCG), the Alaska Department of Homeland Security and Emergency Management, the State of Alaska Department of Environmental Conservation Division of Air Quality, the State of Alaska Health and Human Services, and the Joint Task Force Alaska (Department of Defense (DOD).

2.5 Interagency Meteorological Coordination Office (IMCO)

In December 2020, as part of Public Law 115-25, Weather and Research and Forecasting Innovation Act (2017), also known as the "Weather Act", the Office of the Federal Coordinator for Meteorology (OFCM) transitioned to the Interagency Meteorological Coordination Office (IMCO). The IMCO is the administrative and logistical office, providing support to and operating under guidance from the Interagency Council for Advancing Meteorological Services (ICAMS). ICAMS is the formal mechanism by which all relevant Federal departments and agencies coordinate the implementation of policy and practices to ensure U.S. global leadership in the meteorological services enterprise.

ICAMS is organized under four primary committees:

- Observational Systems;
- Cyber, Facilities, and Infrastructure;
- Services; and
- Research and Innovation

Each of these committees oversees subcommittees and working groups focused on different aspects of meteorological services and work to coordinate the Council's priorities across the Federal Government.

The Working Group (WG) in Atmospheric Transport, Dispersion, and Volcanic Ash is located within the subcommittee on Atmospheric Composition and Information Services under the Services Committee. This WG covers meteorological elements dealing with the chemistry, transport, and dispersion of pollutants and volcanic ash. It includes research and measurements of transport of pollutants and the requirements of the dispersion modeling, including wind speeds, wind directions, atmospheric boundary layer, the marine atmospheric boundary layer, etc. An additional topic within this WG includes volcanic ash dispersion and its effects on aviation to support the National Volcanic Ash Operations Plan for aviation.

2.6 NOAA Volcanic Ash Working Groups

A historic and information group within NOAA known as the Volcanic Ash Working Group

(VAWG) has had participants from throughout NOAA as partners in these collaborative groups and associated activities as needed. This now ad-hoc working group can be stood up as needed to coordinate on volcanic ash issues that arise and need attention across NOAA line offices.

3 Volcanic Ash Advisory Centers (VAACs)

VAACs are primarily responsible for issuing text-based Volcanic Ash Advisories (VAA) and associated Volcanic Ash Graphics (VAG), which provide information on the distribution and forecast movement of ash (See Appendix A). This is accomplished by using a wide array of remote sensing information (e.g., satellite, radar), in situ data (METAR, PIREP, Volcano Observatory reports), as well as ash dispersion and meteorological modeling output. In addition, each of the VAACs provides advice and consultation to the Meteorological Watch Offices (MWO), NWS WFOs, NWS Center Weather Service Units (CWSU), VOs, FAA Air Route Traffic Control Centers (ARTCC), and many other partners and users. The VAA message and VAG provide guidance to the appropriate MWO, which then prepares and distributes the Volcanic Ash (VA) Significant Meteorological Information (SIGMET) product. The VA SIGMET is the official aviation warning product.

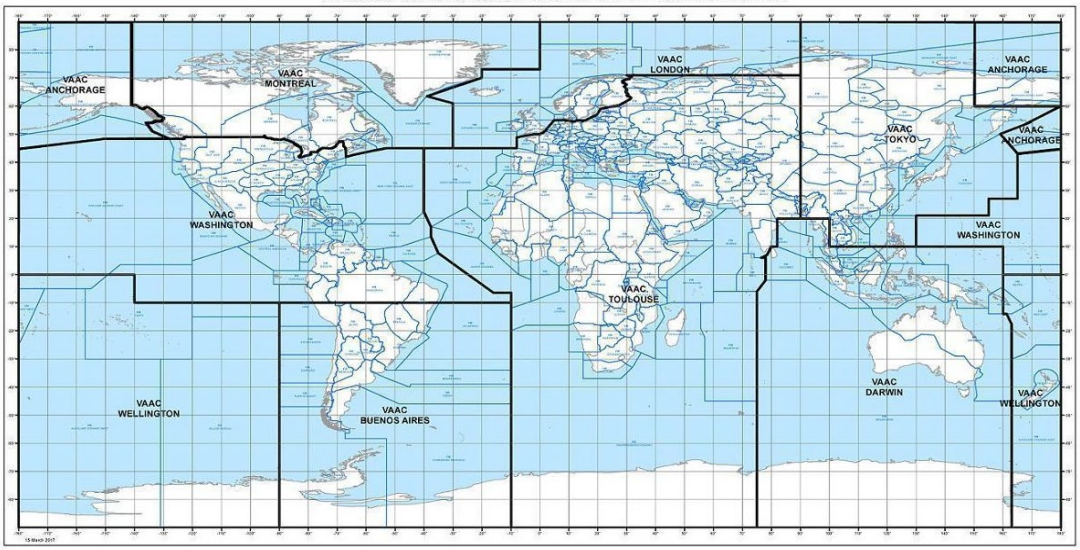


Figure 1: VAACs of the World (from ICAO Doc 9766)
NOTE: Click here for a larger map image courtesy of the ICAO.

The Anchorage and Washington VAACs are two of nine VAACs around the world that have been established within the framework of the IAVW. They are responsible for the detection, analysis, and forecasting of volcanic ash plumes across their respective Areas of Responsibility (AOR) (Figure 1).

Each VAAC performs the following functions:

- Provides model input parameters to the National Centers for Environmental Prediction (NCEP) Central Operations (NCO) Senior Duty Meteorologist (SDM), who executes volcanic ash dispersion models in real-time.
- Maintains situational awareness of volcanic activity within the respective region.

- Continuously uses satellite information to identify volcanic ash and to discriminate volcanic ash clouds from weather clouds.
- Issues VAAs and provides guidance to MWOs for SIGMETs involving volcanic ash.
- Issues VAGs that provide visual context to all VAAs.
- Updates VAAs and VAGs at least every six hours.
- Cancels VAAs and VAGs when ash is no longer discernible or has entirely moved into adjacent VAAC areas of responsibility (See Section 6).
- Provides advisory service to Regional Area Forecast Centers, MWOs, VOs, CWSUs, and other VAACs.
- Coordinates with the aviation community, the public, and neighboring VAACs about volcanic episodes.

3.1 Anchorage VAAC (A-VAAC)

The Anchorage VAAC is a NWS entity operated by the Alaska Aviation Weather Unit (AAWU) and is part of the NWS Alaska Region. The AAWU also serves as the MWO for the Anchorage Flight Information Region (FIR). The AAWU/Anchorage VAAC staffs two desks 24x7x365. During a volcanic event, the AAWU lead forecaster is the Anchorage VAAC forecaster. Additional personnel may be called in during rare instances to assist during large volcanic ash events, however, due to limited staffing to meet both AAWU and Anchorage VAAC missions, this is extremely uncommon. The AAWU/Anchorage VAAC is co-located with the Anchorage WFO and the Alaska-Pacific River Forecast Center (RFC) in the NWS Sand Lake Facility in Anchorage, Alaska.

The Anchorage VAAC area includes the entire Anchorage FIR and three international FIRs, an area bounded on the west by 150 degrees east and on the south by 60 degrees north. This area includes all of the volcanoes within the state of Alaska, and the staff closely monitors adjacent volcanoes located on the Kamchatka Peninsula and the Northern Kurile Islands of Russia. Although the area of the Anchorage VAAC is one of the smallest VAAC areas, it covers air routes over some of the most active volcanic areas in the world. Alaska has 80 percent of all active U.S. volcanoes and eight percent of the active volcanoes worldwide. Alaska contains over 100 volcanoes and over 40 of these have been active recently.

The North Pacific air routes connecting Alaska to East Asia carry 10,000 people per day, and up to 50,000 aircraft per year. Some routes pass over the Kamchatka Peninsula and can be quickly affected by one of its 32 volcanoes. The Anchorage VAAC in cooperation with the AVO and the Kamchatka Volcanic Eruption Response Team (KVERT) has initiated a series of informal agreements to provide advisory assistance about volcanic activity on the Kamchatka Peninsula.

The AVO continuously monitors several of the Aleutian volcanoes and relays its observations and forecasts to the NWS and the FAA through the following process:

- AAWU VAAC meteorologists use input from the AVO, satellite and radar imagery, webcams, and pilot reports (PIREP) to determine if an eruption has occurred and to understand the intensity of the eruption.
- An eruption SIGMET is issued to warn pilots about the danger.
- One or more computer models are used to forecast ash movement in the atmosphere (e.g., the NOAA Hybrid single Particle Lagrangian Integrated Trajectory (HYSPLIT), PUFF, Ash3D, and/or the Canadian MLDP0).

- A VAA is issued describing the three-dimensional location of the ash with an accompanying VAG.
- SIGMETs and advisories are updated to stay current with the situation.

3.1.1 Anchorage VAAC Duties

During a volcanic event, the AAWU lead forecaster is the Anchorage VAAC forecaster. A volcanic event can range from a minor impact event (e.g., low-level eruption in Kamchatka or Aleutians) to a high impact event (e.g., Cook Inlet volcano event). The Anchorage VAAC responsibilities are handled by the AAWU lead forecaster; however, during significant eruptive events, the AAWU lead will shift and prioritize AAWU duties in order to meet the VAAC mission.

The following products are issued by the Anchorage VAAC forecaster:

- VAA and VAG (every six hours and updated as needed)
- Volcanic Ash SIGMET (every six hours and updated or amended as needed – AAWU ONLY)
- Coordinate input parameters with NCEO for HYSPLIT runs
    - Validate correct solution based on the four ash reduction results provided by NCO, remote sensing, and observational data.
    - Coordinate with NCO on which reduction to disseminate long line.
    - Run the PUFF model (see Section 4) and use hypothetical trajectories provided by the NOAA Air Resources Laboratory (ARL) to aid in VAA/VAG/SIGMET production.

A-VAAC Product Headers are:

AFTN address	via KWBCYMYX
VAA WMO Header	FVAK21-25 PAWU
VAG WMO Header	PFXD21-25 PAWU

See Appendix A for VAAC product examples.

3.2 Washington VAAC (W-VAAC)

The Washington VAAC is a partnership between the NWS and the National Environmental Satellite and Data Information Service (NESDIS) Office of Satellite and Product Operations (OSPO) Satellite Analysis Branch (SAB) in College Park, MD. The NESDIS OSPO SAB is responsible for the detection, analysis, and forecasting of volcanic ash plumes, while the NCEP NCO is responsible for running and distributing the HYSPLIT ash dispersion model. The Washington VAAC staff, located at SAB, is also responsible for other programs such as tropical weather, marine pollution, heavy precipitation, and fire/smoke analysis. The Washington VAAC is staffed 24x7x365. Both groups (NESDIS OSPO SAB and NCO) are physically located in the NOAA Center for Weather and Climate Prediction in College Park, MD. The Washington VAAC services two U.S. and 21 international MWOs.

The Washington VAAC's area of reasonability stretches from 40 degrees west to 130 degrees east and includes the areas of the United States Continental, New York, and Oakland FIR, and southward through Central America, the Caribbean to 10 degrees South in South America.

3.2.1 Washington VAAC Duties

The analysis of imagery and issuance of both the VAA and VAG are done by the SAB satellite analyst. When ash is reported or detected within the Washington VAAC boundaries, the analyst will discontinue other operational activities and immediately begin gathering information about the ash/eruption. The volcanic ash desk is monitored 24/7 and always has a satellite analyst monitoring satellite imagery and other vital information. The following provides a quick guideline of activities to consider:

- The first priority is to notify the affected MWOs, usually by phone, to facilitate their issuance of a Volcanic Ash SIGMET.
- Next, the analyst prepares an Initial (e.g., Quick) or Full Standard VAA.
- A VAG consists of the current horizontal and vertical extent of the ash cloud and the +06, +12, and +18 hour forecasted positions of the ash.
- A dispersion model is run if needed for more moderate to larger eruptions.

While the analysis of the ash cloud is being conducted, the NCEP SDM sets up a file containing the inputs for the volcanic ash plume provided by SAB. The SDM then runs the model by requesting the NCO Systems Operations Specialist to run the computer job to generate the HYSPLIT graphic. Upon model completion, the graphic output is reviewed by the SAB analyst for consistency with the meteorology fields, satellite imagery, and any other observed data in the vicinity of the ash cloud. Once satisfied with the HYSPLIT depiction, another computer job is run to disseminate the HYSPLIT output to users. VAA, VAG, and HYSPLIT are updated at least every six hours, but sooner if the ash situation changes substantially.

W-VAAC Product Headers are:

FVXX KNES 20-27 and PFXD20-27 KNES

See Appendix A for VAAC product examples.

4 Dispersion and Trajectory Models

Dispersion and trajectory model output is used by the VAACs to assist with the preparation of forecast ash boundaries. The models should be initiated as soon as possible after ash is detected to allow timely preparation of forecast positions. The model output may also assist with the detection of ash on satellite imagery, as it can help locate where the ash may be expected to be on the image.

The primary (official) dispersion model used by the Anchorage and Washington VAACs is the HYSPLIT model. Other models are also used such as the University of Alaska PUFF model, the USGS Ash3D, and the Canadian MDLP0. NOAA's ARL also distributes trajectory forecasts that are frequently used by the forecasters as well. The link to ARL's Forecast Trajectory Maps for volcanoes is:

https://www.ready.noaa.gov/READYVolcAsh.php

5 Distribution of Products

VAA dissemination over NWS and international circuits use a text convention (i.e., Traditional Alphanumeric Code or TAC). In accordance with ICAO Annex 3 requirements (as amended), VAACs will simultaneously disseminate VAAs using the ICAO Weather Information Exchange Model (IWXXM) data standard. IWXXM is a machine-readable language that enables digital communications, such that VAAs (and other TAC products) can be ingested and used digitally for visualizations and in decision tools. VAA conversion from TAC to IWXXM will be done automatically during VAAC production or prior to dissemination via NOAA telecommunications systems.

VAAC products are available from the following communication circuits:

- **VAA:** Global Telecommunications System ad Family of Services
- **VAA and VAG, SIGMETS:** AAWU and Anchorage VAAC web pages
- **VAA (no graphic), HYSPLIT:** World Area Forecast Satellite Broadcast System
- **HYSPLIT:** Digital Facsimile (DIFAX)
- **VAA and VAG:** NCEP AWIPS (Advanced Weather Interactive Processing System) and N-AWIPS
- **VAA (no graphic):** AWIPS and Aeronautical Fixed Telecommunications Network (AFTN)
- **VAA: Volcanic Ash ListServ** – Washington VAAC
- **Washington VAAC Twitter page** - @WashVAAC

NOTE: Faxing services are **discouraged** as an operational method of dissemination.

6 Transfer of Responsibility of Volcanic Ash Products

In cases where a volcanic ash cloud crosses the boundary between VAAC areas of responsibility, the first VAAC should retain responsibility for the issuance of advisories until the hand-over of responsibility has been agreed upon between VAACs. In other words, only one VAAC will issue advisories at any time, even if the volcanic ash cloud straddles the common boundary, and these advisories are sent by each VAAC to MWOs and Area Control Centers (ACCs) in their respective areas of responsibility. Standardized operational procedures for the coordination and

transfer of responsibility between VAACs for the volcanic ash events are located in the IAVW Handbook (DOC 9766) and are explained below.

VAACs should insert a note in their "last"/"first" advisory of the message and graphical series in the remarks section that the "handover" will take place at the message/graphic number (See Appendix B).

As soon as a VAACs learns of an eruption for a volcano erupting within five degrees latitude of the VAACs boundary or when an ash cloud is expected to come within five degrees latitude of the VAACs and/or FIR boundary, the forecaster of the "lead VAAC" will make an information/coordination phone call. The possibility of a hand-over will be discussed, if appropriate.

Handover of operational responsibility is coordinated by the "lead VAAC" with adjacent affected VAACs and MWOs when the ash cloud is not less than five degrees latitude from a VAAC and/or FIR boundary. In the rare situation of large or persistent ash emissions, adjacent responsible VAACs, upon coordination, may agree to divide the operational forecast responsibility.

7 Backup Operations and Support

The Washington VAAC performs backup operations for the Anchorage, Buenos Aires, and Montreal VAACs. The Montreal and Darwin VAACs perform primary backup for the Washington VAAC (see Figure 2). During backup operations, the Montreal VAAC will monitor the Continental U.S. (CONUS), Hawaii, Mexico, the Caribbean, and parts of the Pacific and the Atlantic Ocean (areas hatched in yellow in Figure 2); the Darwin VAAC will monitor Central America, northern South America including the Galapagos Islands, parts of the Pacific, and the Marianas Islands (areas hatched in green in Figure 2).

In the event that the Montreal or Darwin VAACs could not provide backup support, the U.S. Air Force 557th Weather Wing (557WW) would take over backup operations for the Washington VAAC. Backup procedures are defined in Appendix D of the IAVW Handbook (DOC 9766).

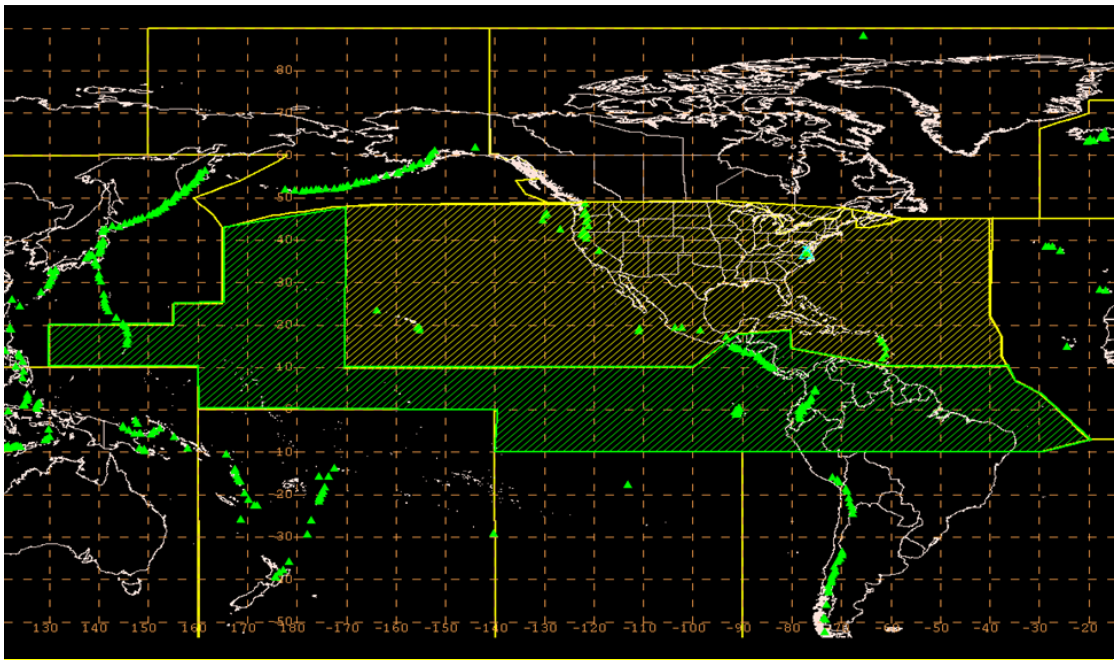


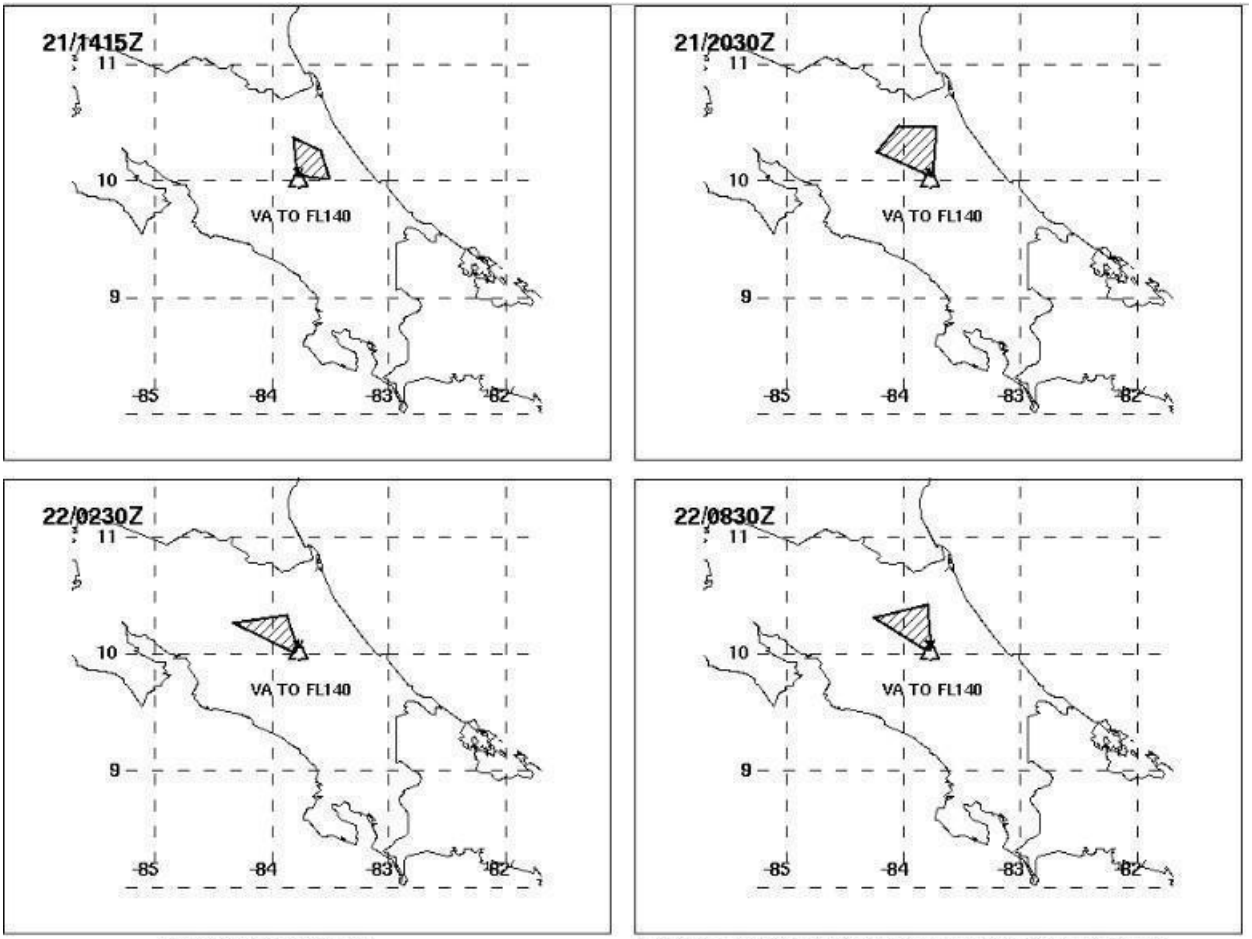
Figure 2: Backup Boundary Map for the Washington VAAC

Appendix A – Product Examples

Example of a Volcanic Ash Advisory

```
FVXX21 KNES
211526 VA
ADVISORY
DTG: 20160921/1526Z

VAAC: WASHINGTON

VOLCANO: TURRIALBA
345070 PSN: N1001
W08346

AREA: COSTA.RICA

SUMMIT ELEV: 10958 FT (3340

M) ADVISORY NR: 2016/186

INFO SOURCE: GOES-EAST. GFS WINDS. VOLCANO WEB
CAMERA. OVSICORI-UNA.

ERUPTION DETAILS: NEW EM BEGINNING

1415Z. OBS VA DTG: 21/1415Z

OBS VA CLD: SFC/FL140 N1022 W08349 - N1015 W08334
- N1001 W08330 - N1002 W08347 - N1022 W08349
MOV N 10KT


FCST VA CLD +6HR: 21/2030Z SFC/FL140 N1028
W08402 - N1028 W08343 - N1002 W08344 - N1014
W08414   N1028 W08402

FCST VA CLD +12HR: 22/0230Z SFC/FL140
N1020 W08352 - N1002 W08346 - N1000 W08348
- N1016 W08419 - N1020 W08352

FCST VA CLD +18HR: 22/0830Z SFC/FL140
N1025 W08347 - N1002 W08345 - N1002 W08348
- N1019 W08414 - N1025 W08347

RMK: VA EXTENDS 10 NM FROM THE SUMMIT TO
NW...N...AND NE. HGT OF VA HAS INCREASED
SLIGHTLY BASED ON VO RPRT.   SZATANEK

NXT ADVISORY: WILL BE ISSUED BY 20160921/2130Z
```

Example of a Volcanic Ash Graphic (VAG)



Appendix B – Example of Event Transfer of Responsibility

Once a handover has been decided, the last volcanic ash advisory issued by the "lead VAAC" before hand-over will include the following at the end of the message (in the REMARKS):

"THE RESPONSIBILITY FOR THIS ASH EVENT IS BEING TRANSFERRED TO VAAC **aaaa** THE NEXT ADVISORY WILL BE ISSUED BY VAAC **aaaa** BY **xxxx** UTC UNDER HEADER **bbbb**."

Where:
aaaa is the name of the VAAC taking over
bbbb is the bulletin header that will be used by the VAAC taking over (FVCN01 CWAO, FVXX21 KWBC, FVAK20 PANC, etc.)
xxxx is the time in UTC

Example:
"THE RESPONSIBILITY FOR THIS ASH EVENT IS BEING TRANSFERRED TO VAAC MONTREAL. THE NEXT ADVISORY WILL BE ISSUED BY VAAC MONTREAL BY 2200 UTC UNDER HEADER FVCN01 CWAO."

The first volcanic ash advisory issued by the VAAC that has taken over responsibility will include the following:
"VAAC **cccc** HAS TRANSFERRED RESPONSIBILITY OF THIS EVENT TO VAAC **dddd**. THIS ADVISORY UPDATES MESSAGE **eeee**."

Where:
cccc is the name of the VAAC which had the lead before the hand-off
dddd is the name of the VAAC which has taken over
eeee is the full bulletin header (e.g., FVAK PANC 261200) of the last message issued by the VAAC which had the lead before the hand-off.

Example:
"VAAC ANCHORAGE HAS TRANSFERRED RESPONSIBILITY OF THIS EVENT TO VAAC MONTREAL. THIS ADVISORY UPDATES MESSAGE FVAK20 PANC 261200."

When the "lead VAAC" is issuing messages covering a portion of another VAAC's area of responsibility, or an ash cloud is approaching within five degrees latitude the area of responsibility of a "non-lead VAAC", the "non-lead VAAC" should issue a volcanic ash advisory directing the user to the correct product. It should be noted that the Washington and Anchorage VAACs refer to these as **"near"** or **"pointer"** VAAs.

The following wording is suggested:

"PLEASE SEE **ffff** ISSUED BY VAAC **gggg** WHICH DESCRIBES CONDITIONS OVER OR NEAR THE VAAC **hhhh** AREA OF RESPONSIBILITY."

Where:
ffff is the full bulletin header of the message issued by the "lead VAAC"
gggg is the name of the "lead VAAC"
hhhh is the name of the VAAC re-broadcasting the "lead VAAC" message

Example of rebroadcast message issued by VAAC Montreal:
PLEASE SEE FVAK20 PANC 121200 ISSUED BY VAAC ANCHORAGE WHICH DESCRIBES CONDITIONS OVER OR NEAR THE VAAC MONTREAL AREA OF RESPONSIBILITY"

For situations in which two or more distinct ash clouds would be present (different eruptions or one eruption for which the ash cloud has divided in two or more distinct parts), the "handover" only applies to the ash cloud approaching or crossing VAAC boundaries.

The ending of an advisory for a volcanic ash event is performed by the "lead VAAC" upon coordination with the adjacent affected VAACs and MWOs.

Only the "lead VAAC" issues volcanic ash advisories in graphical format on the NWS International Services and Communication Systems (ISCS) or Satellite Distribution System (SADIS).

Appendix C – Acronym List

557WW	United States Air Force 557th Weather Wing
AAWU	Alaska Aviation Weather Unit
ACC	Areal Control Center
AOR	Area of Responsibility
APRFC	Alaska/Pacific River Forecast Center
ARL	Air Resources Laboratory
ARTCC	Air Route Traffic Control Center
AVO	Alaska Volcano Observatory
AWIPS	Advanced Weather Interactive Processing System
CONUS	Continental United States
CWSU	Center Weather Service Unit
DIFAX	Digital Facsimile
DOD	Department of Defense
FAA	Federal Aviation Administration
FIR	Flight Information Region
HYSPLIT	Hybrid single Particle Lagrangian Integrated Trajectory
IAVW	International Airways Volcano Watch
ICAMS	Interagency Council for Advancing Meteorological Coordination Office
ICAO	International Civil Aviation Organization
IMCO	Interagency Meteorological Coordination Office
IWXXM	ICAO Weather Information Exchange Model
KVERT	Kamchatka Volcanic Eruption Response Team
ListServ	List Server
METAR	METeorological Aerodrome Report
METP	ICAO Meteorology Panel
MOG	ICAO METP Meteorological Operations Group
MWO	Meteorological Watch Office
N-AWIPS	National Centers Advanced Weather Interactive Processing System
NCEP	National Centers for Environmental Prediction
NCO	NCEP Central Operations
NESDIS	National Environmental Satellite Data and Information Service
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OFCM	Office of the Federal Coordinator for Meteorology
OPMET	Operational Meteorological
OSPO	Office of Satellite and Product Operations
PIREP	Pilot Report
RFC	River Forecast Center
SAB	Satellite Analysis Branch
SDM	Senior Duty Meteorologist
SIGMET	Significant Meteorological Information
TAC	Traditional Alphanumeric Code

USCG	United States Coast Guard
USGS	United States Geological Survey
VA	Volcanic Ash
VAA	Volcanic Ash Advisory
VAAC	Volcanic Ash Advisory Center
VAG	Volcanic Ash Graphics
VAWG	Volcanic Ash Working Group
WAFC	World Area Forecast Center
WFO	Weather Forecast Office
WG	Working Group
WG-MISD	ICAO METP Working Group for Meteorological Information and Service Development
WMO	World Meteorological Organization