

# NOAA's National Weather Service Volcanic Ash Advisory Center



**VIRTUAL TOUR  
Welcome!!**





# National Weather Service Alaska Region Facilities

★ Weather Forecast Offices

● Weather Service Offices

T National Tsunami Warning Center

▲ In Anchorage:

- Volcanic Ash Advisory Center
- Alaska Aviation Weather Unit
- Weather Forecast Office
- Alaska Pacific River Forecast Center
- Center Weather Service Unit
- Alaska Regional Headquarters

Center Weather Service Unit



WFO Fairbanks

WFO Juneau

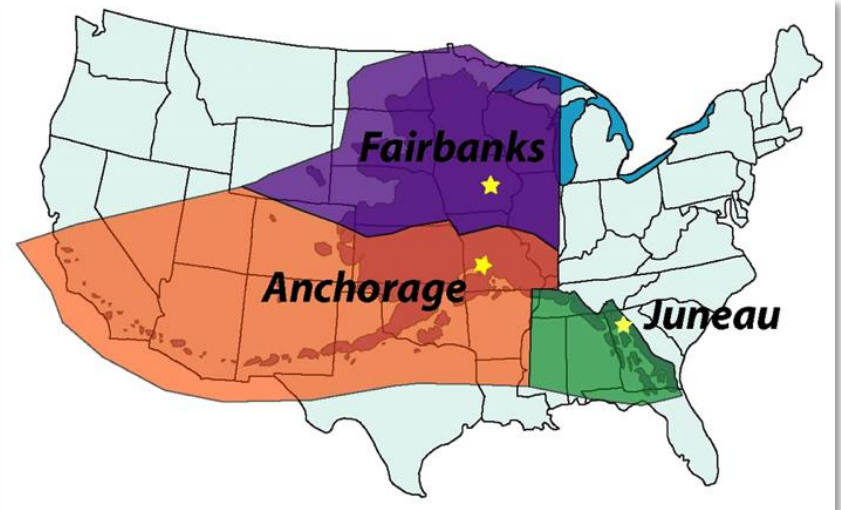
Tsunami Warning Center





# Weather Forecast Office (WFOs) Functions

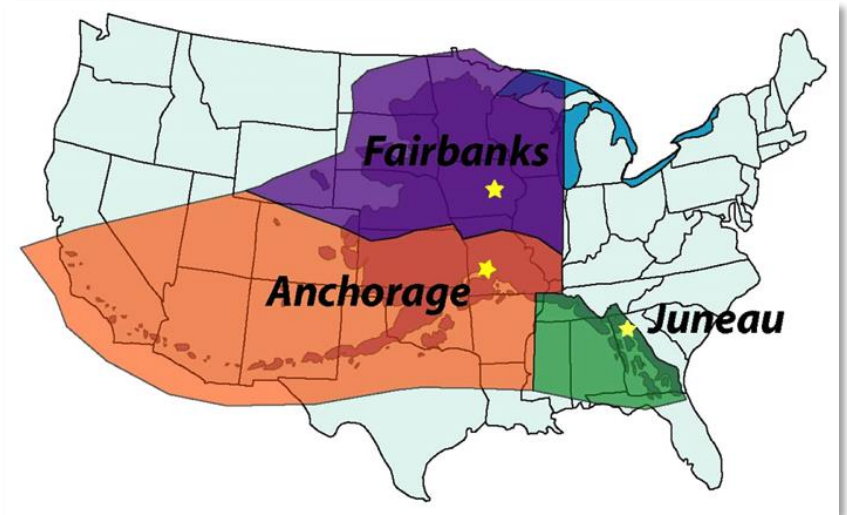
- Public Forecasts for the next 7 days.
  - Watches, warnings, and advisories for higher impact events
- Marine and Fire Weather Forecasts for the next 5 days.
- Terminal Aerodrome Forecasts (TAFs) for the next 24-36 hours
  - Airport specific forecasts
- Sea Ice (Anchorage only)
- Multi-media Broadcasts
  - TV from Anchorage only
- Other functions as needed:
  - Ash fall
  - Flood Warnings and Advisories





# Weather Forecast Office (WFOs) Functions

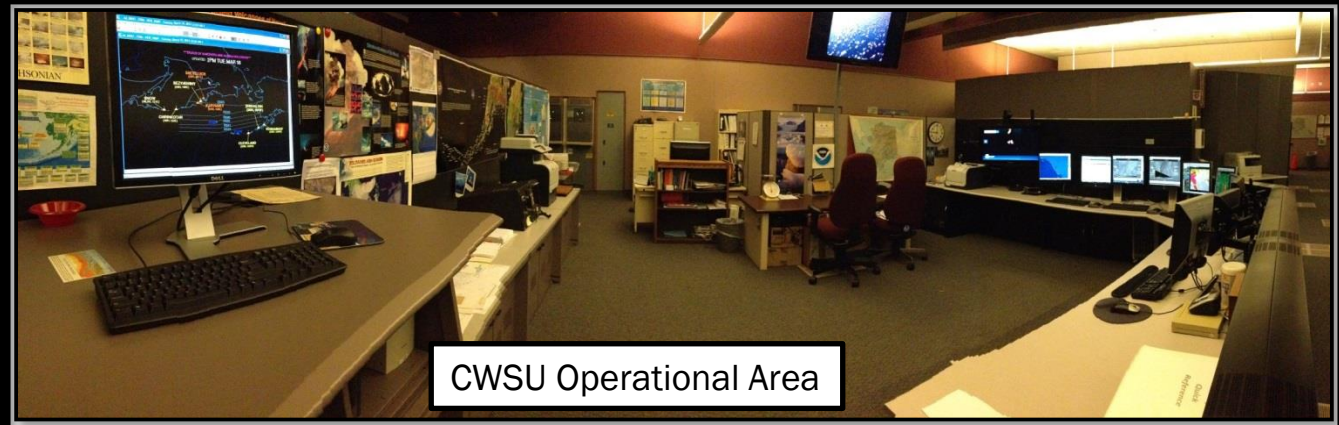
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    - **Ash fall**
      - Flood Warnings and Advisories





# Center Weather Service Unit (CWSU)

CWSU Area of Responsibility



Located in the Air Route Traffic Control Center (ARTCC) and staffed by four NWS meteorologists between 5am and 9pm daily.

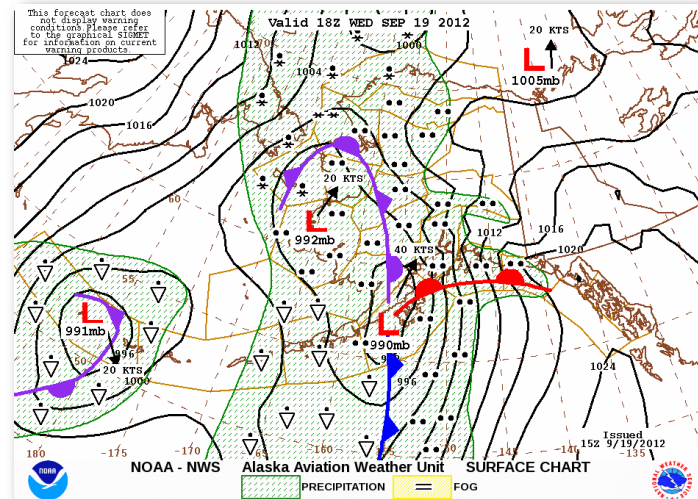
Provide meteorological consultation, forecasts, and advice to managers and staff within the ARTCC and other Federal Aviation Administration supported facilities.

Collaborate with other NWS offices and solicit pilot reports



# Alaska Aviation Weather Unit (Meteorological Watch Office)

- Forecasts for AK's 5.76 million sq. kilometer airspace with involvement from 5 offices (3 WFOs, CWSU, and AAWU)
  - Graphics, Area Forecasts, AIRMETs, and SIGMETs
- Terminal forecasts for 39 airports issued by WFOs
  - Transmitted every 6 hours with routine updates for ANC at 7am & 21UTC (12pm AKST and 1pm AKDT)
- Need for a strong internal collaborative forecast process
- Close partnerships with FAA, industry, and formal Association to help guide services



Cargo Jets destined for Anchorage,  
diverted to Fairbanks on Sept 19, 2012





# Alaska Aviation Weather Unit (AAWU) & Volcanic Ash Advisory Center (VAAC)

## Forecast Staff (2 always on duty)

5 Lead Forecasters

6 Journey Forecasters

## Support Staff

1 Science Operations Officer

1 System Administrator

1 Meteorologist in Charge/Volcano  
Ash Advisory Center Manager





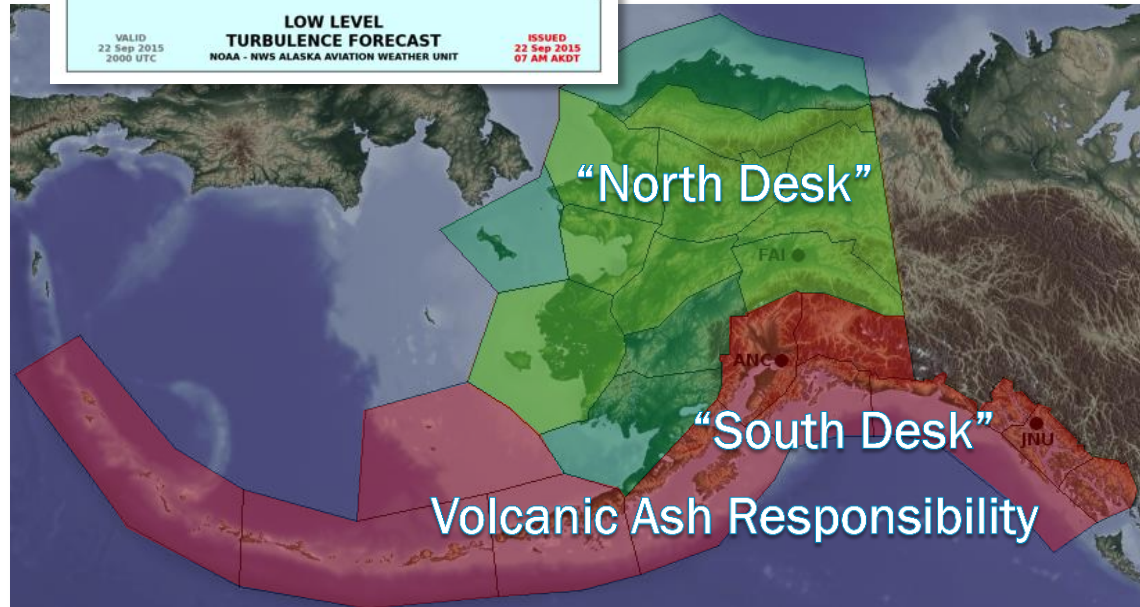
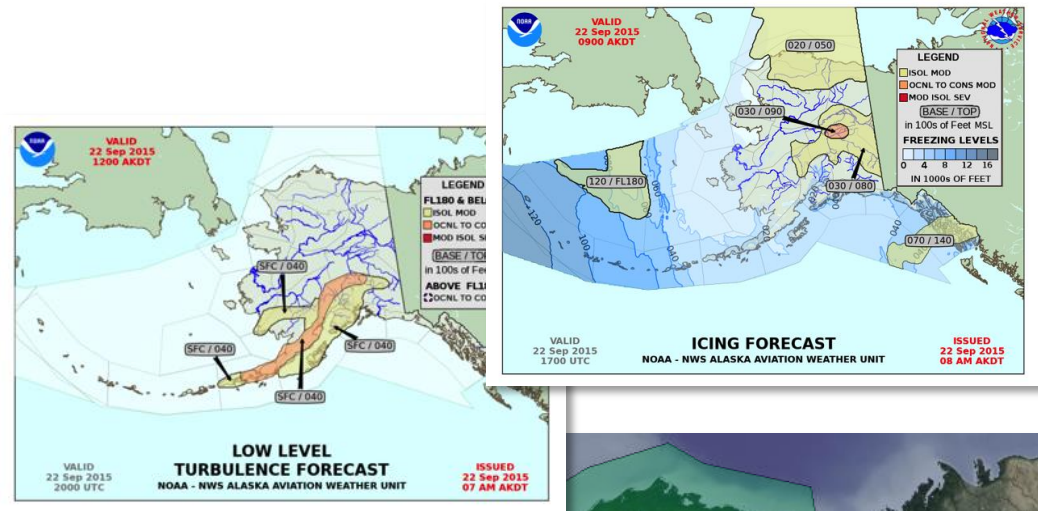
# Meteorological Watch Office (Alaska Aviation Weather Unit) & Volcanic Ash Advisory Center Division of Duties

## North Desk

- Area Forecast
- AIRMETs and SIGMETs
- Icing and Freezing Levels
- Convection
- Flight Category
- 24-60 hour Weather Depiction

## South Desk

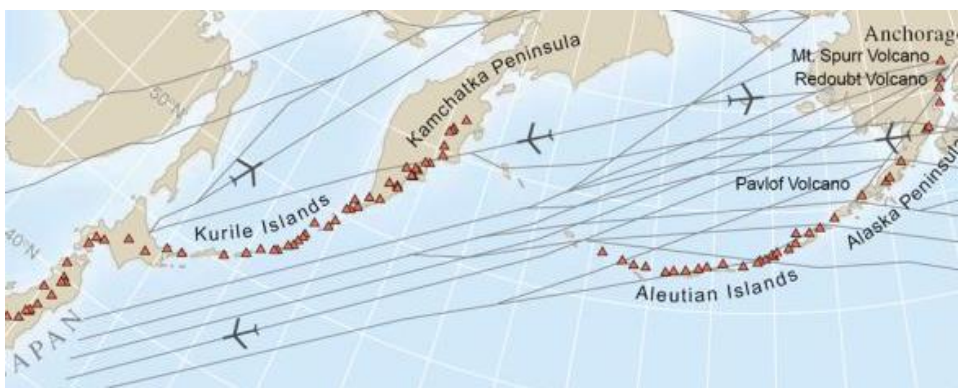
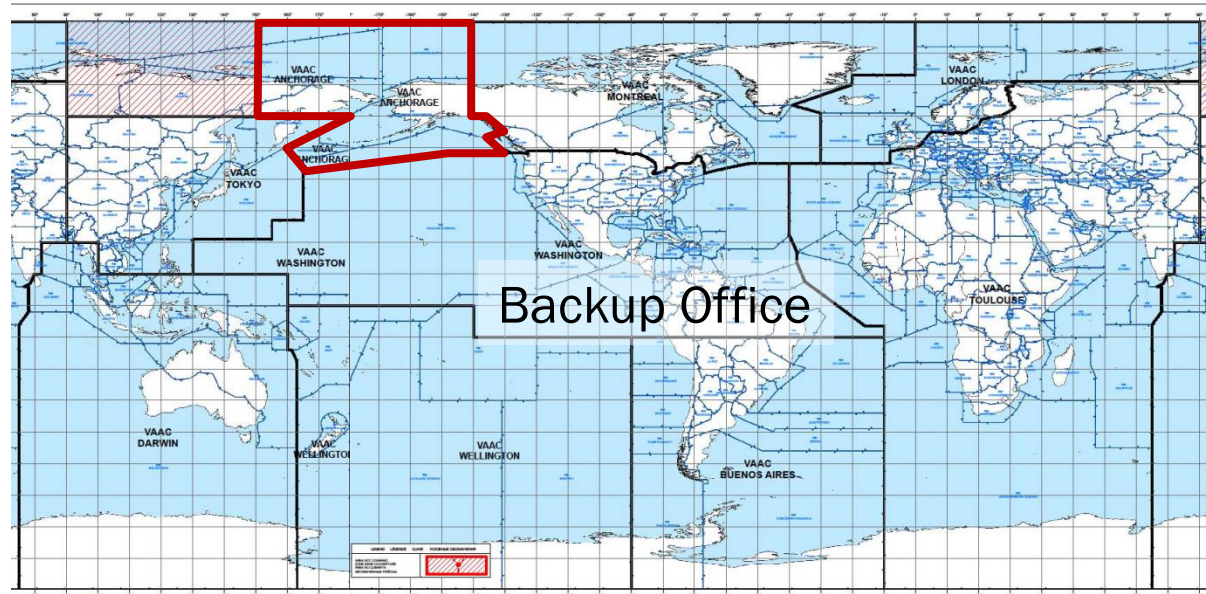
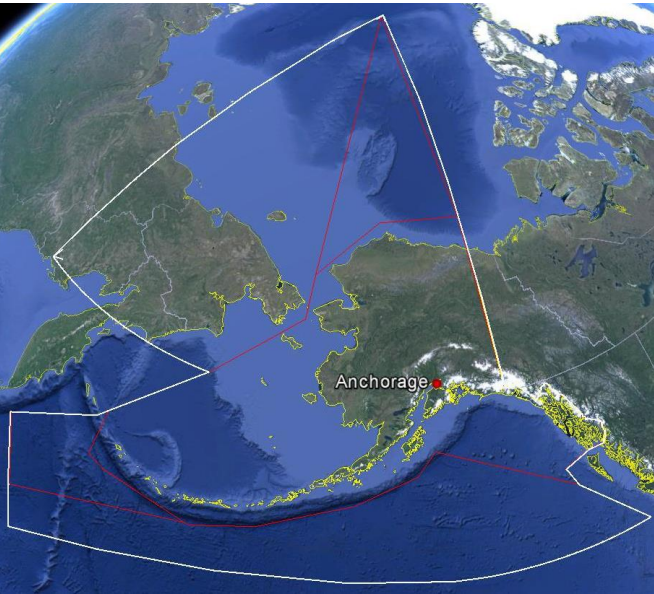
- Area Forecast
- AIRMETs and **SIGMETs**
- Wind and turbulence
- Surface Analysis
- **Volcanic Ash Advisory and Graphic**







# Volcanic Ash Advisory Center Anchorage



- VAAC Anchorage of area of responsibility is approximately 12.1 square million kilometers
- North Pacific air routes in close proximity to active volcanoes along with many Alaskan routes



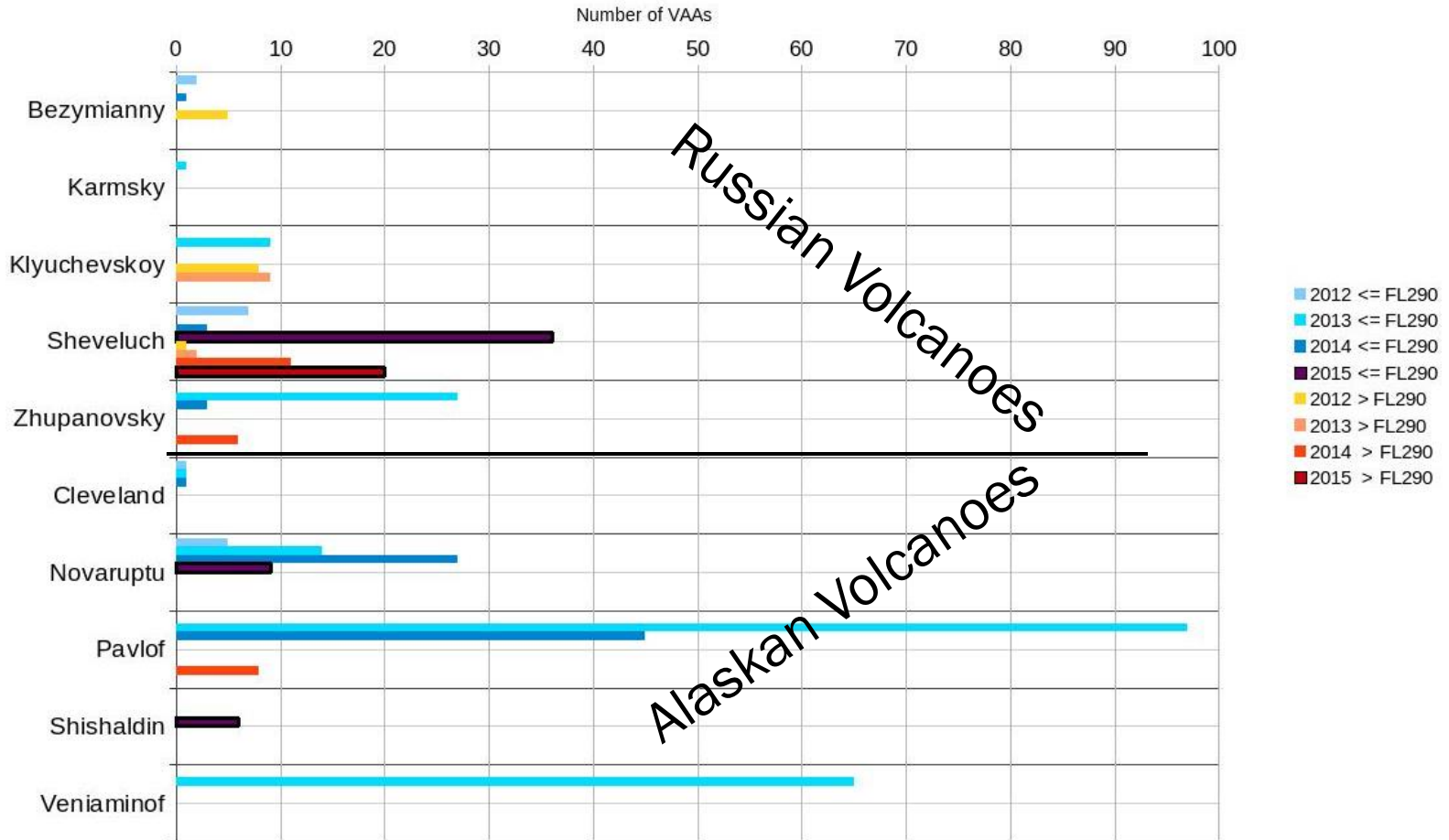
# Most active volcanoes last 30 years in or very near VAAC Anchorage area





# Volcanic Ash Advisories 2012-April 2015

Number of VAAC Anchorage VAAs with a Forecast Issued for VAAC Area of Responsibility (2012-April 2015)



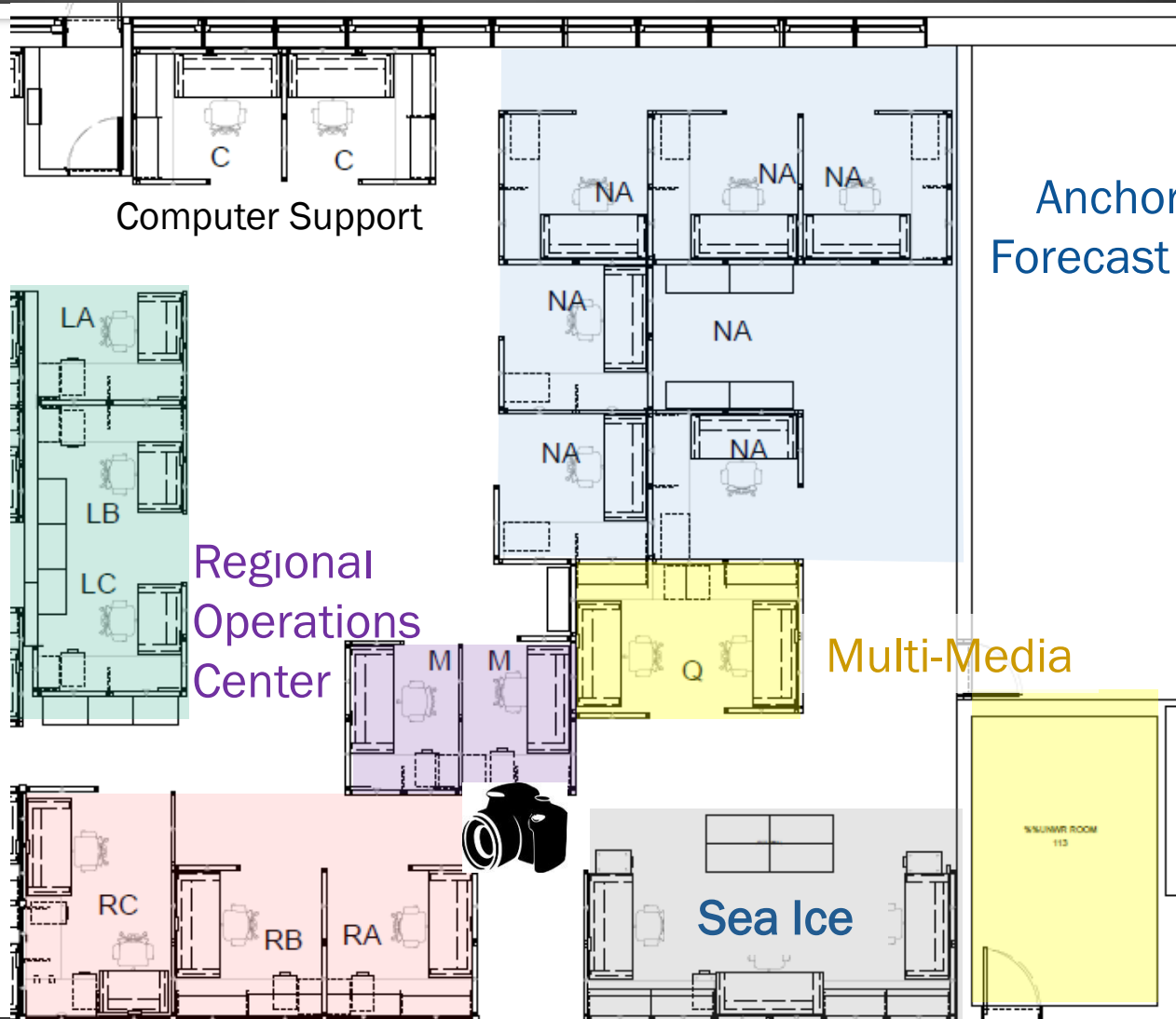


# Alaska Aviation Weather Unit and Volcanic Ash Advisory Center





# Forecast Operations Layout



River Forecast Center

Computer Support

Anchorage Forecast Office

Regional Operations Center

Multi-Media

Alaska Aviation Weather Unit and Volcanic Ash Advisory Center

Sea Ice



# Forecast Facility in Anchorage, Alaska Weather Water and Climate Center

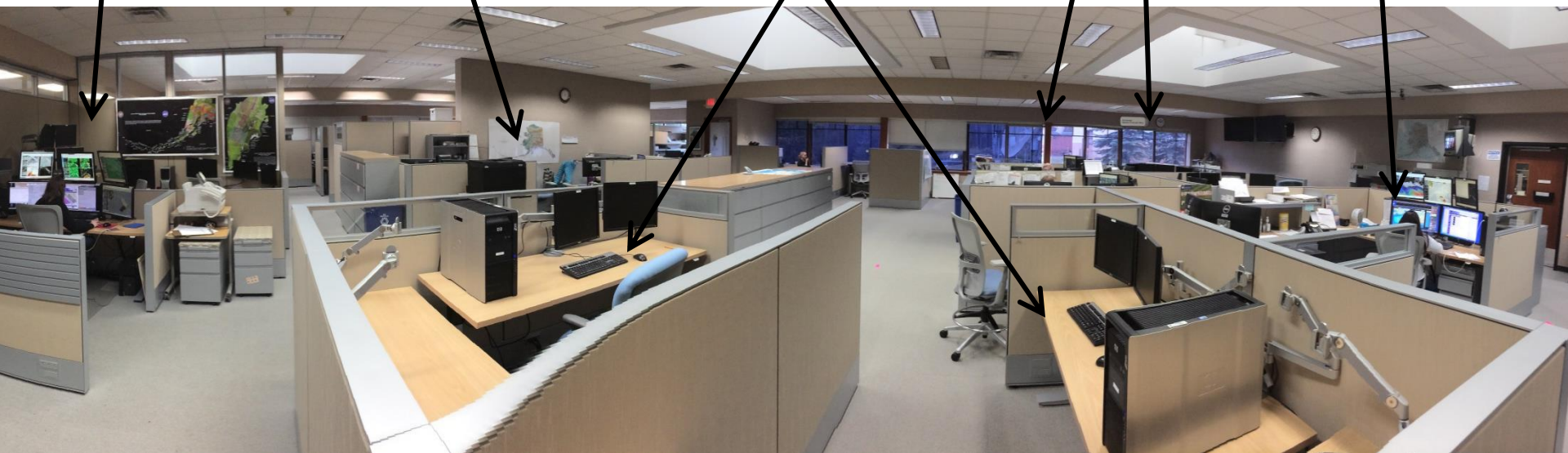
Volcanic Ash Advisory Center

Anchorage Forecast Office

Alaska River Center

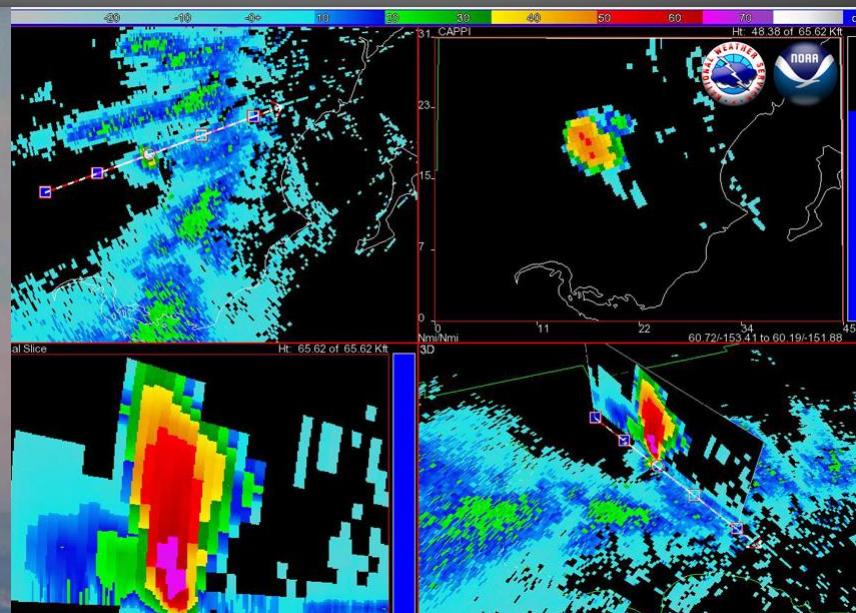
Regional Operations  
Center

Multi-Media  
Dissemination





# What if there's a major Mount Redoubt Eruption?





# Functions During Major Cook Inlet Volcanic Eruption

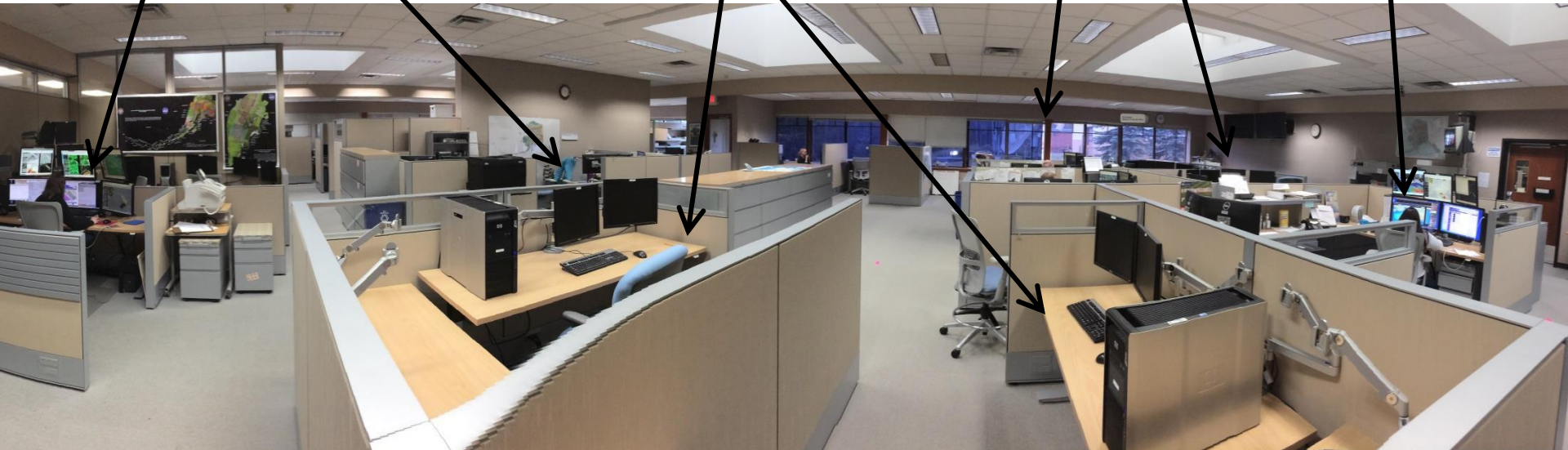
Ash in atmosphere  
(Lead office)

Lahar and Ash Fall

Lahar

State-wide internal  
coordination and with  
external partners

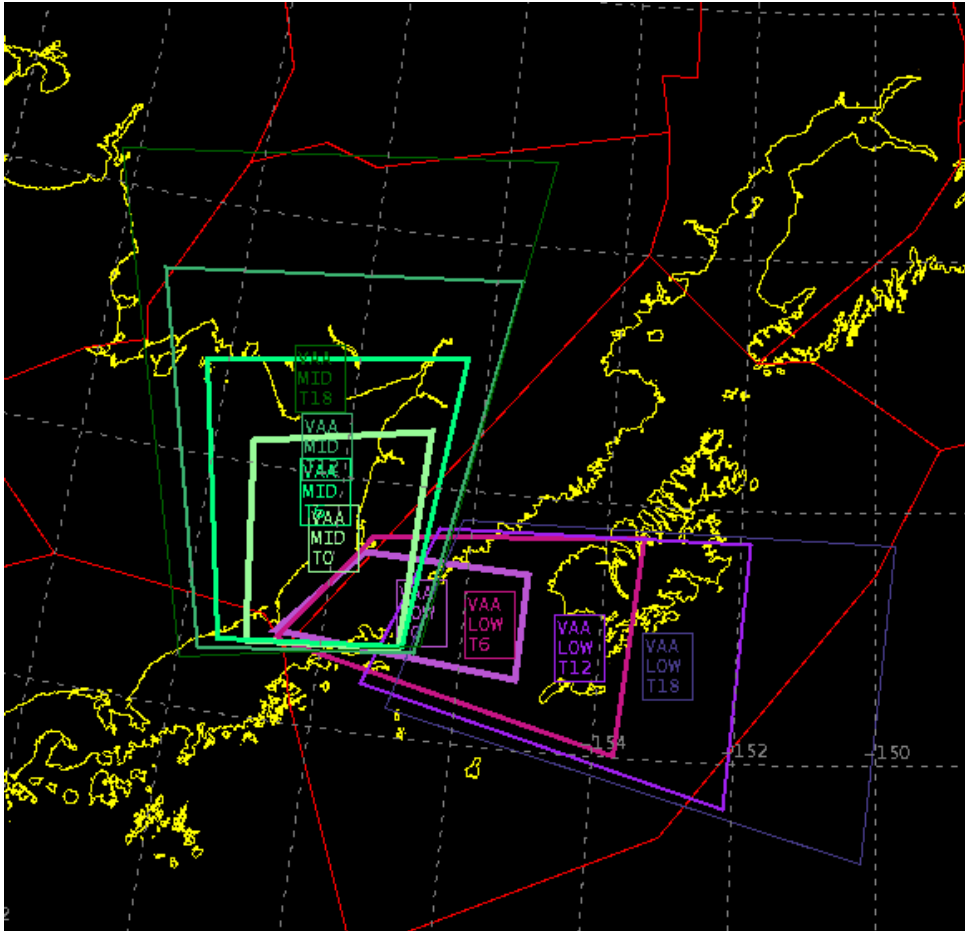
Specialized  
Dissemination







# Volcanic Ash Advisory and SIGMET Forecast Process



- Heavily based on observational data such as satellite, radar, web cams, vertical soundings, pilot reports, and seismic data
- Numerical guidance used more heavily for longer prediction times, with consideration of current errors and biases
- Collaboration with partners and other offices (NWS and VAACs)



# Greatest Challenges in Short Term Forecasting of Volcanic Ash Clouds

- Meteorological clouds obscuring eruptions
  - Especially challenging for eruptions below 7.5km (25,000 feet )
- Determining and communicating ash cloud heights
- Identifying the edge of ash clouds or determining hazards when ash cloud dissipating



# External Collaborative Efforts in Alaska

Alaska Volcano Observatory



Anchorage VAAC

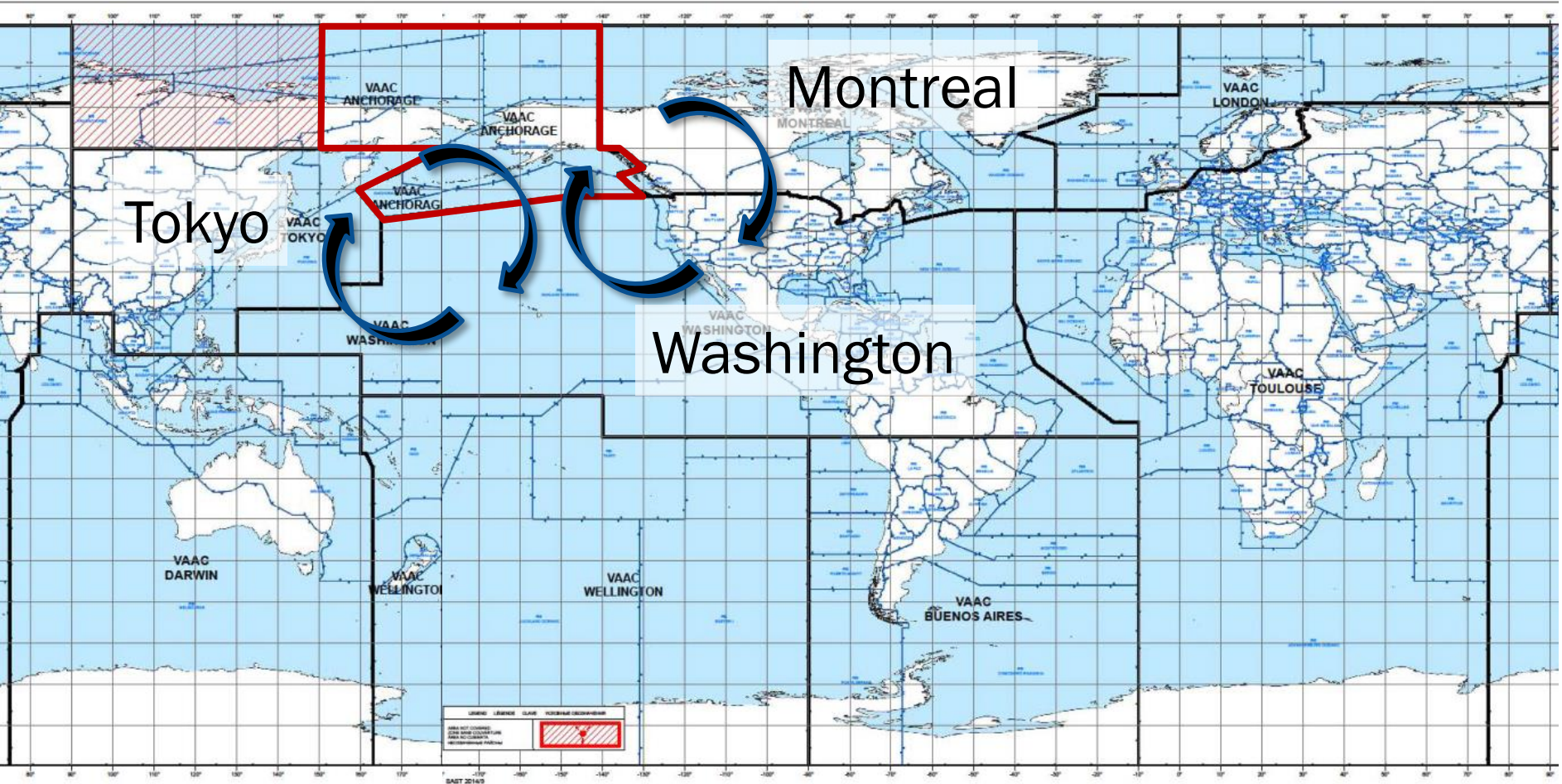


Center Weather Service Unit Anchorage





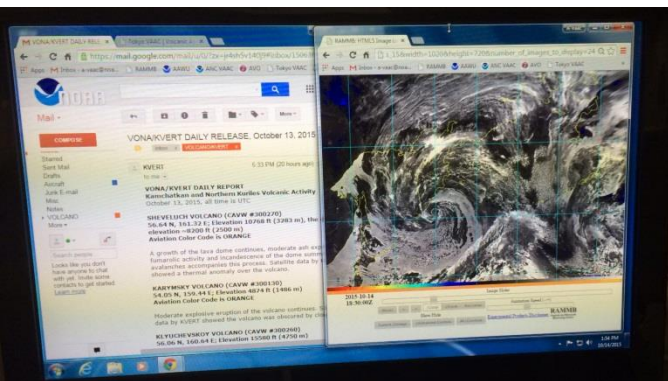
# External Collaborative Efforts





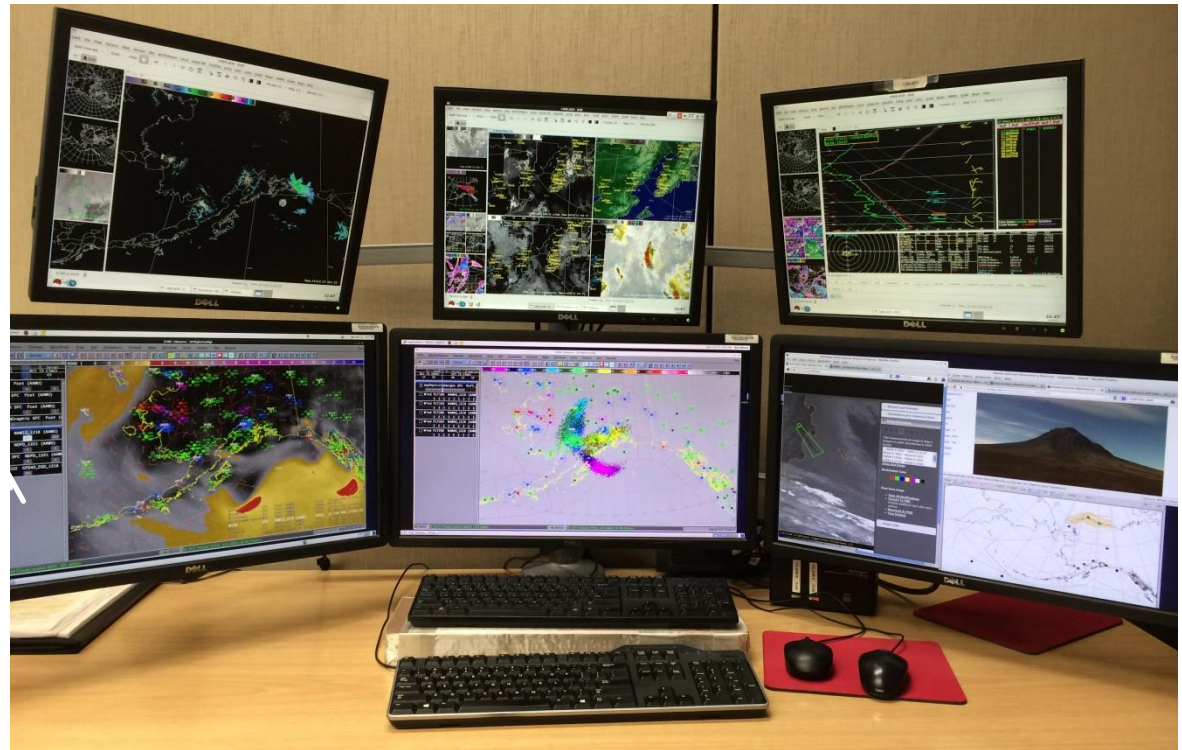
# Operational Computer System

Product Preparation and  
Interactive Analysis of Meteorological Data



Situational Monitor

VAAC Collaboration  
and email notification  
and supplemental  
monitoring





# Automated Satellite Detected Volcanic Ash Alerts Routinely Provided starting June 2014

@\*\*\*\*\*VOLCANIC ALERTS\*\*\*\*\*  
STARTING DATE/TIME OF IMAGE: 2013-05-18 13:38:51 [UTC]  
PRIMARY INSTRUMENT: Aqua MODIS  
WMO SPACECRAFT ID: 784  
LOCATION/ORBIT: LEO

/data/common/VOLCAT\_DATA/alerts/Volcat\_Alert\_Volcano\_Database\_May14\_2013\_164631.txt  
NUMBER OF ASH CLOUD ALERTS: 1  
NUMBER OF VOLCANIC Cb ALERTS: 0  
NUMBER OF VOLCANIC THERMAL ANOMALY ALERTS: 0  
NUMBER OF SO2 CLOUD ALERTS: 0

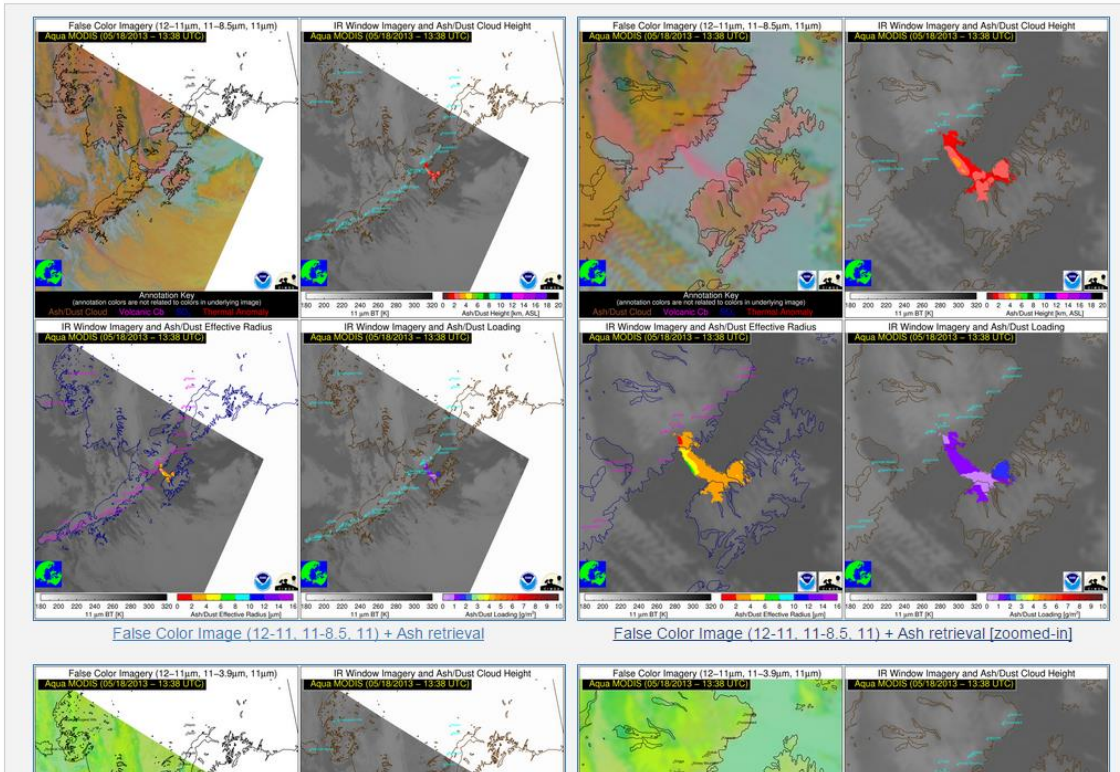
REPORT WITH IMAGES:  
<http://volcano.ssec.wisc.edu/alert/report/3202>

-----  
POSSIBLE VOLCANIC ASH CLOUD FOUND  
Alert Status: Newly detected feature  
Latitude of Radiative Center: 57.783 [degrees]  
Longitude of Radiative Center: -153.843 [degrees]

Maximum Height [AMSL]: 3.9 [km] (12684.28 [ft])  
-----

## Volcanic Cloud Alert

Aid: 4562  
Alert Type: Possible Volcanic Ash Cloud  
Date: 2013-05-18 13:38:51 Show details ▲



Disclaimer: The NOAA/CIMSS Volcanic Cloud Monitoring website is hosted and populated at the Space Science and Engineering Center at the University of Wisconsin. While reliability is quite high, outages, including unannounced outages, will occasionally occur. Outages may include, but are not limited to, any of the following: website offline, specific sensor processing to cease, email and/or text message distribution outages, database outages, computer malfunction, etc. While every effort is made to correct problems as soon as they arise, the SSEC is not staffed 24/7. As such, any user implicitly agrees to use the services and data available through this website as is with no warranty issued or implied and should be used for informational purposes only. Any use of this data for decision making processes is done at the sole risk of the end user.

Problems with website: [Webmaster contact form](#)





# Handover and Collaboration Procedures with VAAC Tokyo

## Ash clouds that are continuous

- For eruptions where a continuous ash cloud (or an ash cloud with only minor breaks) is extending from the volcano into the Anchorage VAAC AOR, Tokyo VAAC will continue issuing VAAs for the ash cloud until it reaches 180 degrees longitude. Once this continuous ash cloud reaches 180 degrees, Anchorage VAAC send a Handover Request Sheet (HRS) to Tokyo VAAC to coordinate the handover, and then after acceptance assume responsibility for the Anchorage VAAC AOR only (See Figure 2). Tokyo will continue issuing VAAs for their AOR until there is an obvious break in the ash cloud from the volcano. The option does exist to take over ash responsibility prior to the ash reaching 180 degrees, but this just be well coordinated with Tokyo VAAC via the HRS. This should also rarely be done since the preference from the users is to have as few VAAs as possible, for a single ash cloud, to reduce inconsistencies. Once the eruption has ended, Tokyo VAAC will request handover. Anchorage VAAC will then assume responsibility for the entire ash cloud, including in Tokyo VAACs AOR. Anchorage VAAC will never issue a VAA extending to a volcano in Tokyo VAACs AOR. The VAA should only extend to the back edge of the ash cloud, or to an obvious break in the ash cloud if another eruption occurs. This will be coordinated with Tokyo VAAC via the HRS.

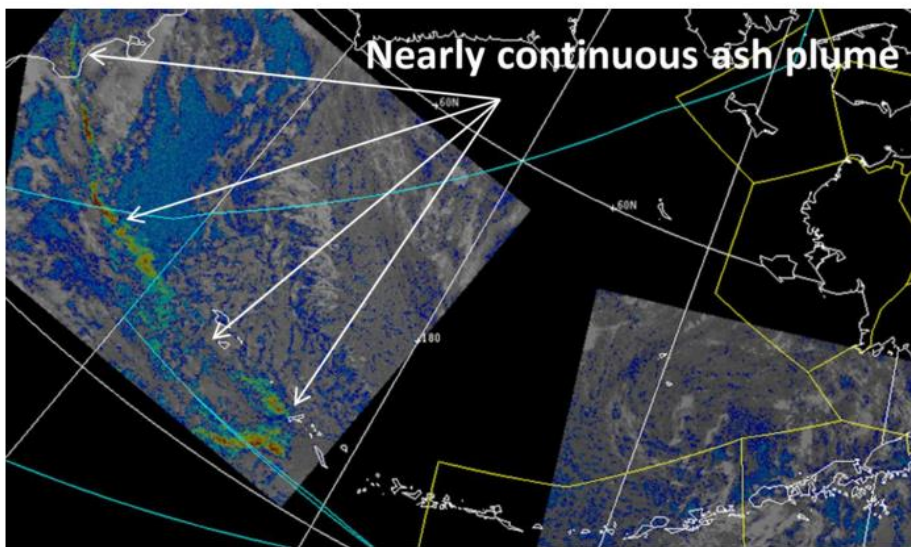


Figure 2. A continuous ash cloud is shown moving to 180 degrees in Anchorage VAAC airspace, and extending back to the volcano on the Kamchatka Peninsula. Anchorage VAAC takes handover from Tokyo VAAC and issues VAA only in Anchorage VAA's area of responsibility (AOR). Tokyo VAAC issues VAA in their AOR.



## Handover Request Sheet (HRS)



To: Anchorage VAAC

From: Tokyo VAAC  
 Fax: +81-3-3212-6446  
 Phone: +81-3-3211-7952  
 Email: vaac@eqvol2.kishou.go.jp

Date/Time of Request (依頼日時):	24	d	15:20	UTC
Volcano Name (火山名):	SHIVELUCH			
VAA No. (VAA情報番号):	2014/100			
Attachments (添付資料):	<input checked="" type="checkbox"/> VAA text	<input checked="" type="checkbox"/> VAG	<input checked="" type="checkbox"/> VAGI	
	<input type="checkbox"/> Other:			

(Some part of) ash clouds (indicated in VAGI) are approaching/intruding to your area of responsibility.  
 (VAGIに示した)火山灰の一部が貴方の責任領域に接近・侵入しています

Keeping issuance (発表を継続する) ※返信不要  
 We would like to keep issuance of VAA for these ash clouds. Any reply to this HRS is not needed.  
 引き続き当方よりVAA発表を継続する。本通信には返信不要。

Requesting Handover to you (貴方への引継を依頼する) ※返信希望  
 We would like to transfer the responsibility for indicated clouds to you. We are waiting for your reply on approval or refusal.  
 指定した火山灰雲の責任を貴方に委譲したい。可否につき要返信。

(Some part of) ash clouds (indicated in VAGI) are approaching/intruding to our area of responsibility.  
 (VAGIに示した)火山灰の一部が当方の責任領域に接近・侵入しています

Requesting Handover to us (当方への引継を要請する) ※返信希望  
 We invite you to transfer the responsibility for indicated clouds to us. We are waiting for your reply on approval or refusal.  
 指定した火山灰雲の責任を当方に委譲してほしい。可否につき要返信。

Comments (追記事項)  
 Among the two volcanic ash areas, VAAC Tokyo will keep issuance for the area of FL190.  
 VAAC Tokyo will request a hand-over for the area of FL380.



# Example Chat Coordination for Handover with VAAC Tokyo

(08 Oct 1:24 AM) nws-ANCH VAAC-joshua.maloy: Hello Tokyo VAAC. We have received your HRS for VA assoc with Sheveluch. We accept handover and will reply to the HRS soon.

(08 Oct 1:25 AM) nws-ANCH VAAC-joshua.maloy: We will issue the next bulletin at 08/1000 UTC.

(08 Oct 1:26 AM) international-yohko.igarashi: This is Tokyo VAAC.

(08 Oct 1:26 AM) international-yohko.igarashi: I see.

(08 Oct 1:27 AM) international-yohko.igarashi: I see . I will issue VAA soon. Please issue VAA after our advisory.

(08 Oct 1:27 AM) nws-ANCH VAAC-joshua.maloy: Very well. We will issue after your final advisory.

(08 Oct 1:27 AM) nws-ANCH VAAC-joshua.maloy: Thank you for coordinating.

(08 Oct 1:31 AM) international-yohko.igarashi: Thank you.

(08 Oct 1:32 AM) international-yohko.igarashi: Could you return HRS by e-mail?

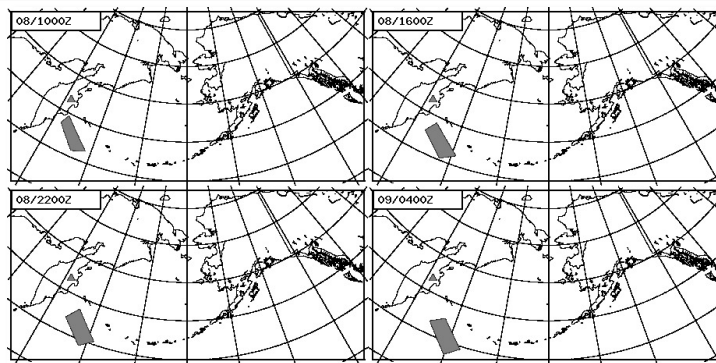
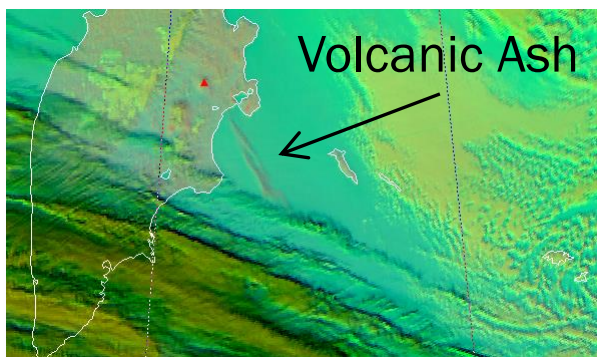
(08 Oct 1:34 AM) nws-ANCH VAAC-joshua.maloy: We have just transmitted the HRS reply.

(08 Oct 1:34 AM) nws-ANCH VAAC-joshua.maloy: You should receive an e-mail in your inbox very shortly.

(08 Oct 1:49 AM) international-yohko.igarashi: Thank you. Now I have just issued final VAA.

(08 Oct 2:11 AM) nws-ANCH VAAC-joshua.maloy: Thank you Tokyo VAAC. Our 1000 UTC bulletin has likewise been posted.


(08 Oct 2:59 AM) international-yohko.igarashi: Thank you for your cooperation, regards.







# VolcView (USGS)– Web based interface for satellite information, useful for collaboration



USGS Home  
Contact USGS  
Search USGS

Volcano Hazards Program - VolcView Hide Controls

Sector: Shishaldin

Sector Options:

All	Mid-IR	Thermal IR	TIR BTID	Visible
AVHRR	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MODIS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

191 Images available:  
27 Nov 2014 01:40 to  
06 Dec 2014 00:16

Limit to Date Range:  
Start:   
End:

Limit Image Total: 10  
10 images selected. (LIMITED TO 10)

Sort Images: Oldest First

Animation: 1 Second  
Choose Image:

06 Dec 2014 00:16  
10/10

Shishaldin  
Image Date/Time UTC  
Now: 06 Dec 2014 01:40  
Image: 06 Dec 2014 00:16  
Age: 1:24  
Image Type  
Band: Visible  
Data Type: MODIS

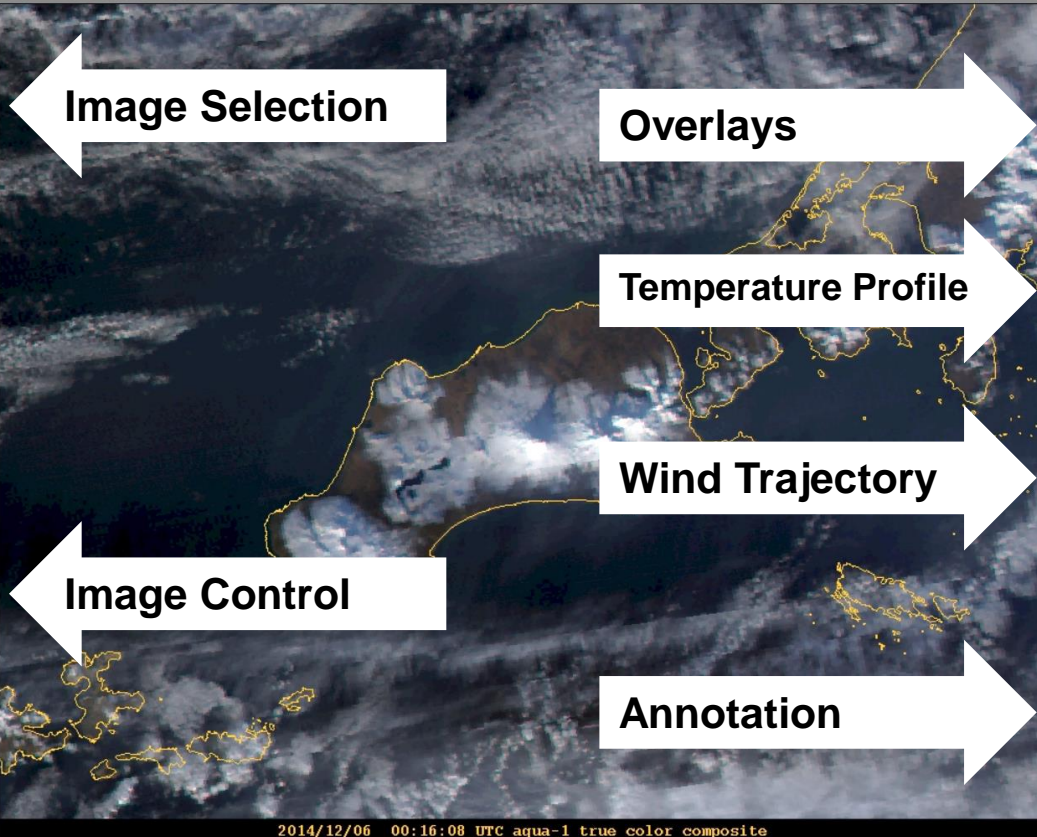


Image Selection

Overlays

Temperature Profile

Wind Trajectory

Image Control

Annotation

2014/12/06 00:16:08 UTC aqua-1 true color composite

volcview.wr.usgs.gov

**Notation**  
 Red  Orange  Yellow  
 Green  Unassigned  
 Show Volcano Names  
 Show Cursor Information  
 Show Lat/Long Grid  
Show: Choose Volcano

**Temperature Profile:**  
• Click below, then on image, to generate profile.  
 Generate Temperature Profile

**Wind Trajectories:**  
• Click below, then on image, to place trajectories.  
• Forward trajectories indicate wind direction.  
• Backward trajectories (dashed lines) indicate wind source.  
• Only available for recent images.  
• Colors indicate different altitudes in feet above ground level (AGL):  
5,000', 10,000', 20,000', 30,000', 40,000', 50,000'.  
• Circles along each line are spaced one hour apart.  
 Place Forward Trajectory  
 Place Backward Trajectory

**Image Modification**

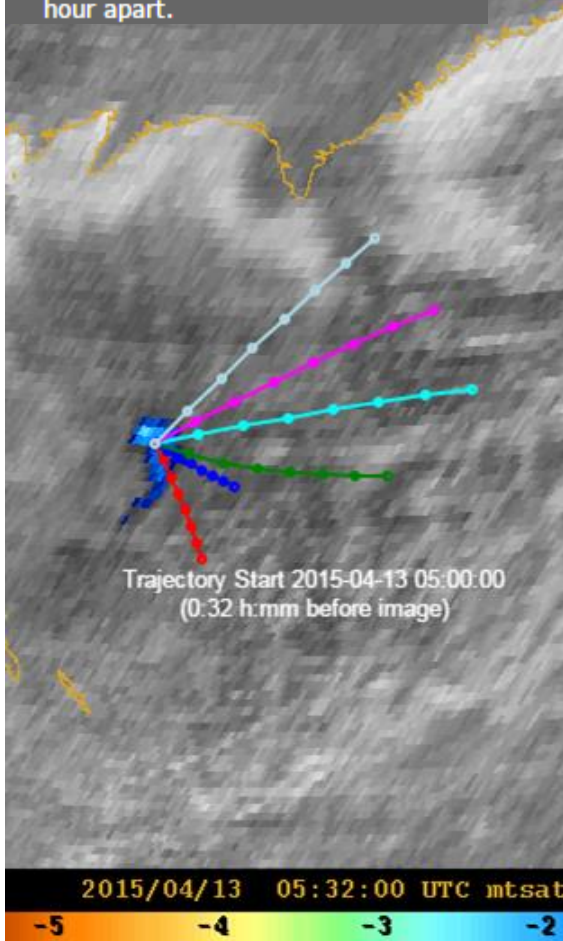
**Clear/Save Image**  
• Clear All Modifications  
• Convert To PNG  
Enables additional right-click menu options.  
• Download As PNG  
• View Original



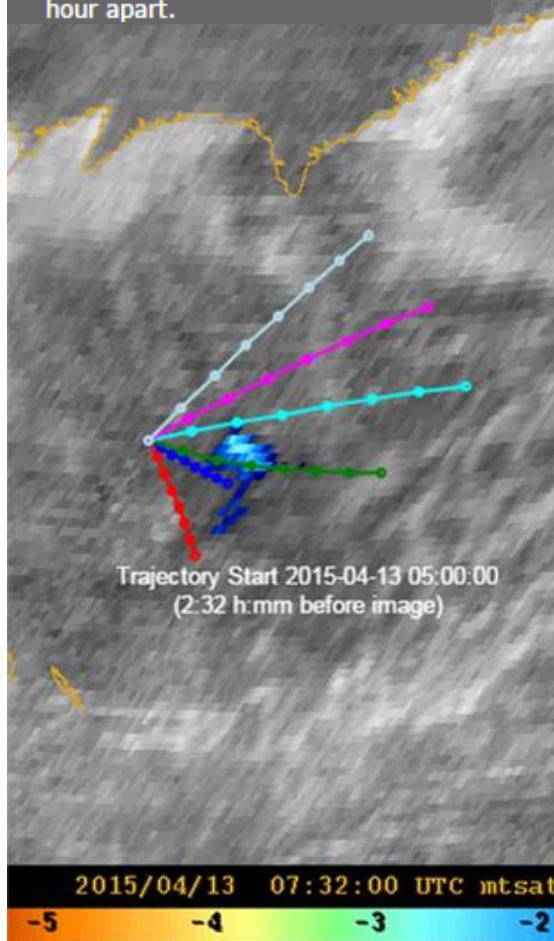


# Collaboration– Web based display of satellite information, Forward Trajectory [volcview.wr.usgs.gov](http://volcview.wr.usgs.gov)

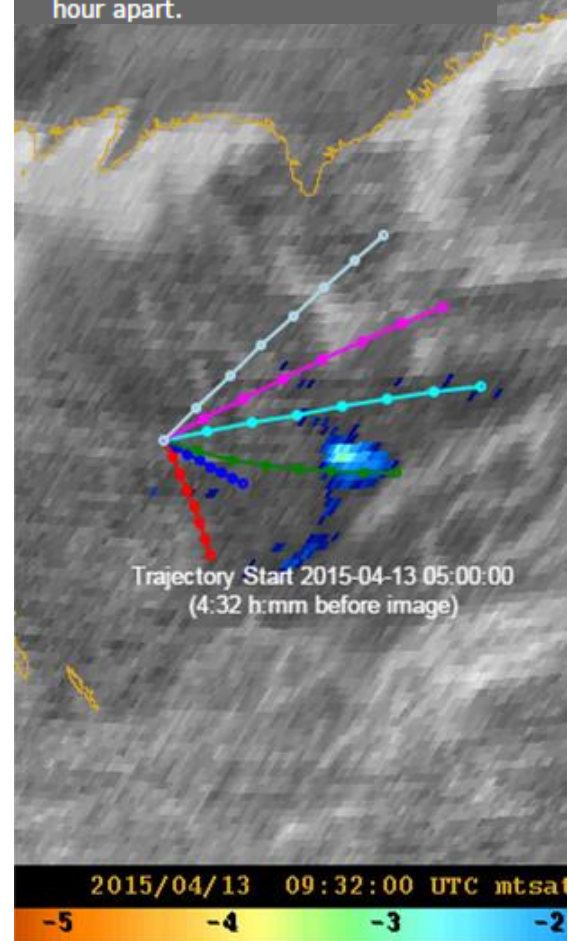
- Colors indicate different altitudes in feet above ground level (AGL): 5,000', 10,000', 20,000', 30,000', 40,000', 50,000'.
- Circles along each line are spaced one hour apart.



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- Circles along each line are spaced one hour apart.



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- Circles along each line are spaced one hour apart.





# Internet Services

**Anchorage, AK**  
**vaac.arh.noaa.gov**  
**Volcanic Ash Advisory Center**

Home Site Map News Organization Search  NWS All NOAA

Local forecast by "City, St"  Go

**Active ICAO Volcanic Ash Advisories and Sigmet**

**QICP Compliant Products**

QICP Compliant Products Link

**Current Volcano Status (courtesy of the AVO)** Zoom

US Dept of Commerce  
 National Oceanic and Atmospheric Administration  
 Volcanic Ash Advisory Center, Anchorage  
 6930 Sand Lake Road  
 Anchorage, AK 99502-1845  
 Page Author: AAWU Web Authors

**NOAA's National Weather Service**  
**Alaska Aviation Weather Unit**

Home News Organization

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**aawu.arh.noaa.gov**

NOAA's National Weather Service  
 Alaska Aviation Weather Unit  
 6930 Sand Lake Road  
 Anchorage, AK 99502-1845

**National Weather Service**  
**Alaska Region Headquarters**  
**weather.gov/Alaska**

Home Site Map National News Organization Search  NWS All NOAA Go

Local forecast by "City, St" or Zip Code  Go

**Regional News:**

- Winter Outlook: NOAA's Climate Prediction Center issued the U.S. Winter Outlook calling for warmer temperatures statewide, wetter conditions in southcentral and southeastern Alaska, and drier conditions prevailing in central and western portions of the state. Click here for more information. (10/15/15)

>Current Hazards< | Satellite | Radar | Surface Analysis | Text Only | Printer Friendly |

**Watches, Warnings, and Advisories:**

- 411: Bering Sea Offshore West of 180 and East of the International Dateline gale warning today... (issued: 03:45 10/15/2015)
- 352: Gulf of Alaska Offshore South of 57 North, North of 55 North and West of 144 West gale warning today... (issued: 03:25 10/15/2015)
- 351: Gulf of Alaska Offshore North of 57 North and West of 144 West gale warning through tonight... (issued: 03:25 10/15/2015)
- 310: Gulf of Alaska North of 55 Degrees North and East of 144 Degrees West gale warning through tonight... (issued: 03:35 10/15/2015)
- 245: Flaxman Island to Demarcation Point



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# Thank You! Questions?

