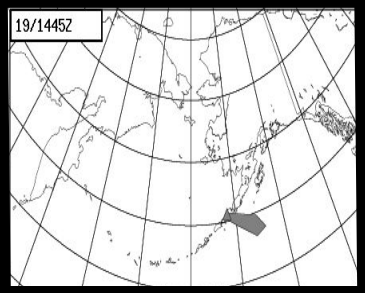
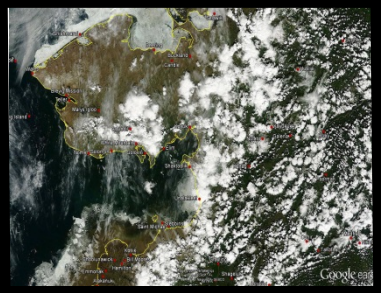
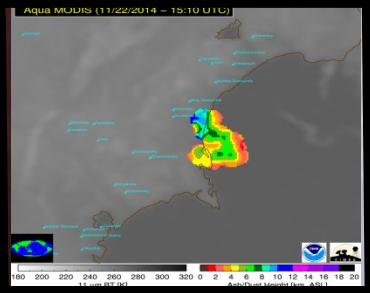
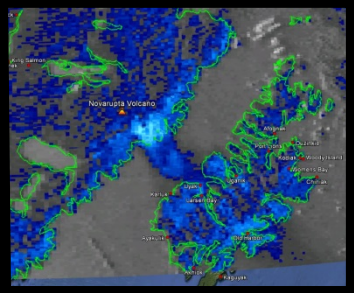
Alaska Aviation Weather Unit (AAWU) & Anchorage Volcanic Ash Advisory Center (VAAC)

Josh Maloy, Warning Coordination Meteorologist

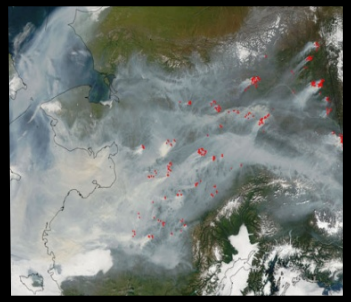











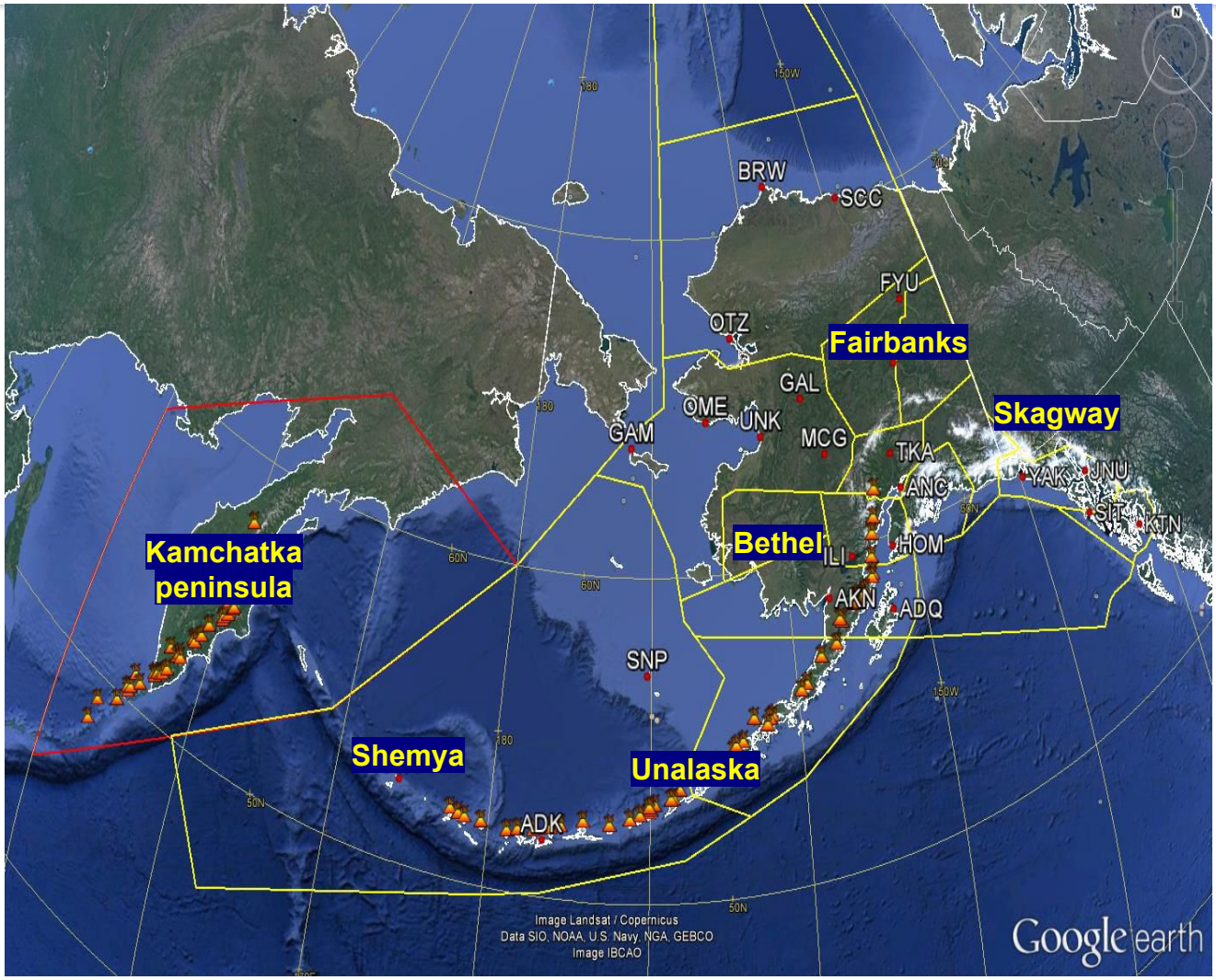
<u>We are two offices in one!!!</u>

Also co-located with the Anchorage Weather Forecast Office, Alaska-Pacific River Forecast Center, and the Alaska Regional Operations Center, at NWS's Sand Lake Complex; just south of Ted Stevens International Airport in Anchorage, AK.

NWS Sand Lake complex, Anchorage, AK

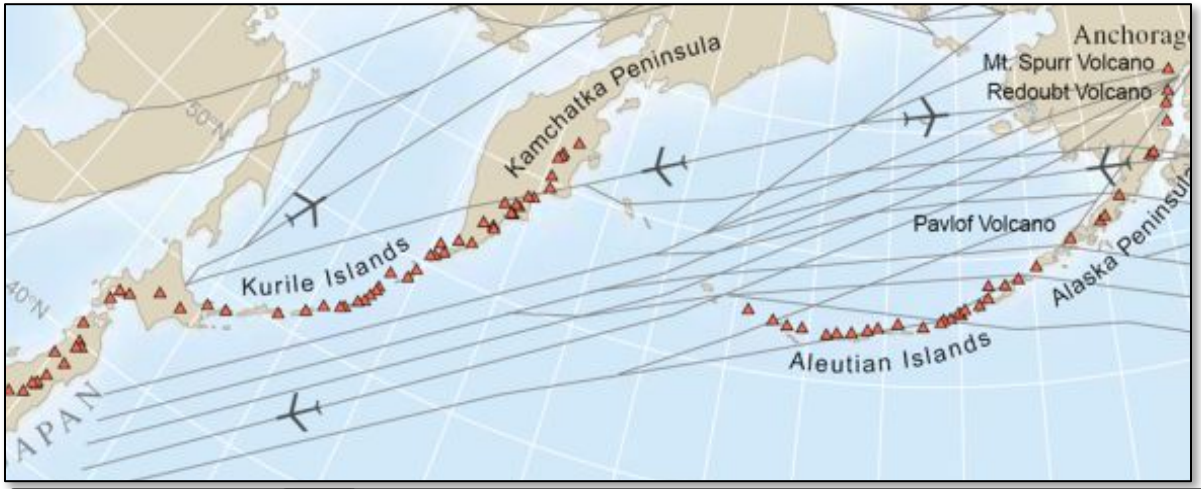
Overview- Meteorological Watch Office

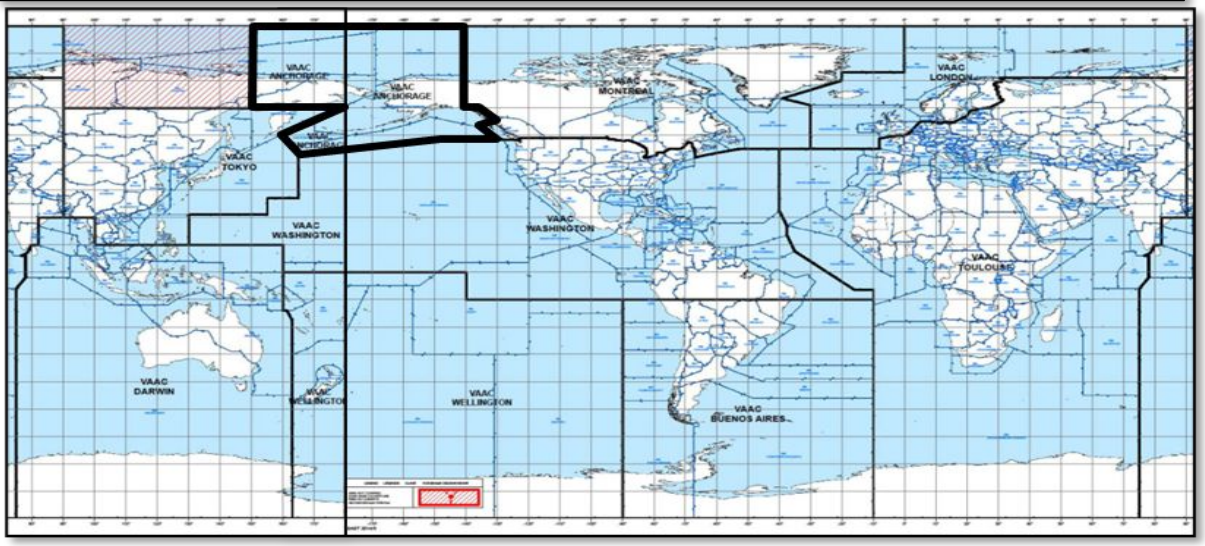
- SIGMETs for Anchorage FIRs; 2.4 million sq. mile airspace
- AIRMETs and Area Forecasts for Flight Service Stations
- Aviation graphics- Icing, Turbulence, Thunderstorms, Flight categories, Outlooks
- Ad-hoc phone briefings to general aviation community; coordination with CWSU
- Briefings for government agencies, exercises and missions (ie Arctic Heat/ARCEX)



Overview- Volcanic Ash Advisory Center

- Detect and track volcanic ash for more than fifty (50) active volcanoes in AK
- Several Kamchatka peninsula volcanoes with downstream impacts on Anchorage FIRs
- Domestic and International coordination
- Volcanic Ash Advisories and graphics to fulfill the International Airways Volcano Watch





AAWU/VAAC staffing profile

Operations Staff
5-Lead Aviation Meteorologists
6-Journey Aviation Meteorologists

Administrative Staff
1- Meteorologist-in-Charge
1-Science Operations Officer
1-Warning Coordination Meteorologist

Only fourteen (14) staff to carry out both MWO and VAAC responsibilities 24/7/365; and that is when fully staffed!

AAWU/VAAC workstation

Web-based collaboration tools

-Notifications when SIGMETs or volcanic bulletins are posted

-Discuss forecast challenges as needed

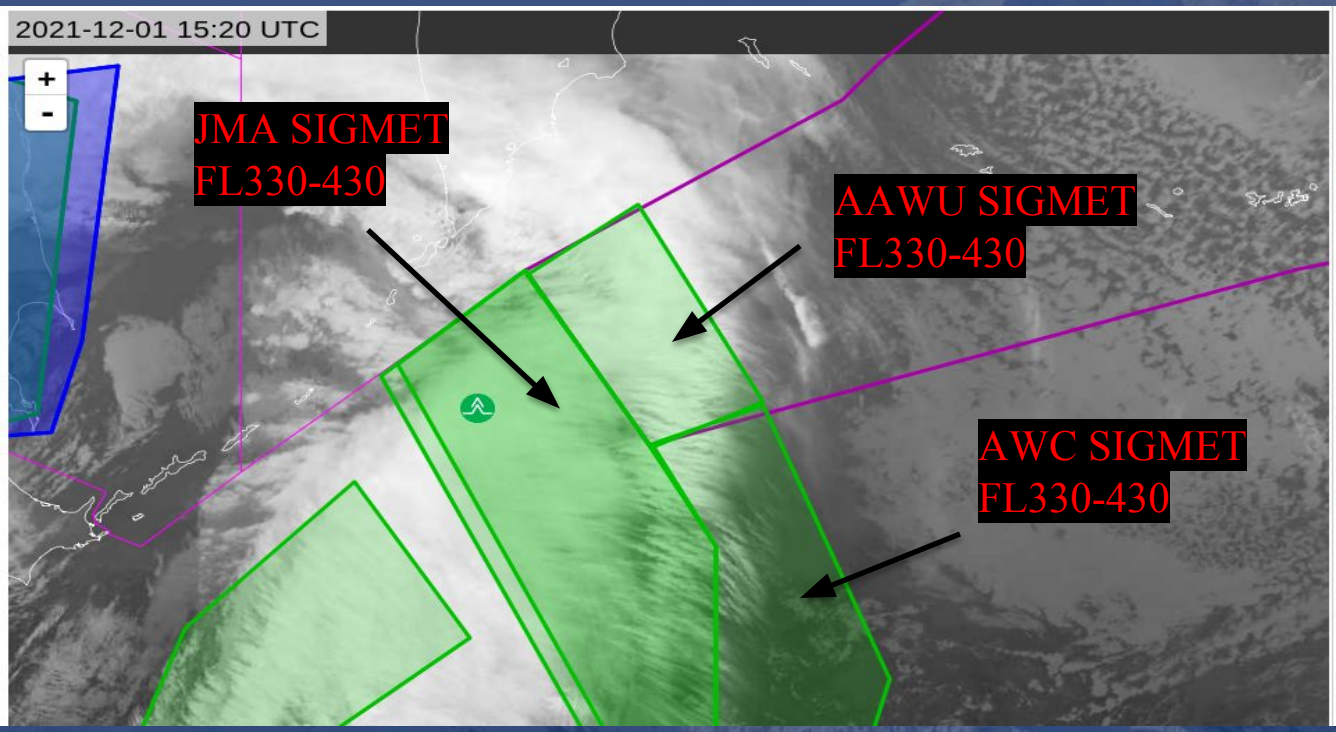
-Collaborate with other MWOs or VAACs

aawuchat
Alaska Aviation Wx Chat

(6/21/2022 6:44:44 PM) nwsbot: AWU issues Non-Convective SIGMET
(6/22/2022 5:47:15 AM) nws-bill.ludwig: Convective grids posted.
(6/22/2022 5:47:36 AM) nws-bill.ludwig: FlightCat graphics posted.
(6/22/2022 6:24:31 AM) nws-bill.ludwig: Icing graphics posted.
(5/10/2012 11:58:00 AM) **The topic is: Alaska Aviation Wx Chat**
(7:20:02 AM) **nws-carol.baqui entered the room.**
(7:22:12 AM) **nwsbot left the room.**
(6/21/2022 8:26:33 AM) **nws-AAWU-joshua.maloy:** Flight cat graphics amended (SE Upper Yukon Valley/ERN Tanana Valley/YK-delta/NRN and SRN Seward Peninsulas/Copper River Basin/Kodiak Island)
(6/21/2022 12:13:28 PM) **nws-AAWU-joshua.maloy:** Turb graphics posted.
(6/21/2022 12:19:19 PM) **nws-AAWU-joshua.maloy:** Icing graphics posted.
(6/21/2022 12:20:49 PM) **nws-AAWU-joshua.maloy:** Convective graphics posted.
(6/21/2022 12:34:59 PM) **nws-AAWU-joshua.maloy:** 00Z SFC map posted.
(6/21/2022 12:50:38 PM) **nws-AAWU-joshua.maloy:** Low-lvl turb graphics amended (Cook Inlet/NRN Gulf coast)
(6/21/2022 1:38:33 PM) **nws-AAWU-joshua.maloy:** Strong area of TS over the SE Upper Yukon valley/ERN Tanana valley/NE Copper River Basin. Tops FL320...mov S 15kt. SIGMET Juliet 1 posted.
(6/21/2022 1:38:49 PM) nwsbot: AWU issues Non-Convective SIGMET
(6/21/2022 2:58:33 PM) nwsbot: AWU issues Non-Convective SIGMET
(6/21/2022 3:01:17 PM) nws-carol.baqui: AWU issued an amended SIGMETUuliet 2 to include the western parts of White Mts. Tops FL3230 mov S 5kt.
(6/21/2022 4:00:01 PM) nwsbot: ------ Jun 22, 2022 [UTC] ------
(6/21/2022 6:44:44 PM) nwsbot: AWU issues Non-Convective SIGMET
(6/22/2022 5:47:15 AM) nws-bill.ludwig: Convective grids posted.
(6/22/2022 5:47:36 AM) nws-bill.ludwig: FlightCat graphics posted.
(6/22/2022 6:24:31 AM) nws-bill.ludwig: Icing graphics posted.
(5/10/2012 11:58:00 AM) **The topic is: Alaska Aviation Wx Chat**
(7:30:07 AM) **nwsAAWU-carrie.haisley entered the room.**

17 people in room
nwsbot
awc-scott.minnick
nws-AAWU-joshua.maloy
nws-adam.przepiora
nws-APRFC michelle.mcauley
nws-caleb.cravens
nws-carol.baqui
nws-erin.billings (AFG)
nws-FAI-scotty.berg
nws-jason.ahsenmacher
nws-michael.vuotto
nws-nicole.ferrin (JNU)
nws-peter.chan
nws-robert.bianco
nws-sean.c.oneil
nws-timothy.bruno-PASN
nws-timothy.markle

Web-based collaboration tools



Katie / KansasCity *2021-12-01 15:02:35Z*
Hi JMA! We agree with the continued threat of turbulence along our borders. Thank you for the update!

Joshua/AAWU / Anchorage *2021-12-01 14:57:57Z*
To: KansasCity, JMA
JMA...we concur with the continued threat of SEV TURB along the FIR border for the next several hours.

Jun / JMA *2021-12-01 14:53:22Z*
Hi NWS,
Attached is SIGWX Summary in Fukuoka FIR.

Joshua/AAWU / Anchorage *2021-12-01 14:50:47Z*
To: KansasCity, JMA
JMA...understood...thank you for the information.

Jun / JMA *2021-12-01 14:46:28Z*
We received the SEV PIREP at FL340, so we updated the level of SIGMET D（FL330/430）.

Improving the harmonization of SIGMETs along the FIR borders; present a more consistent picture of aviation hazards!

Web-based tools- webcams

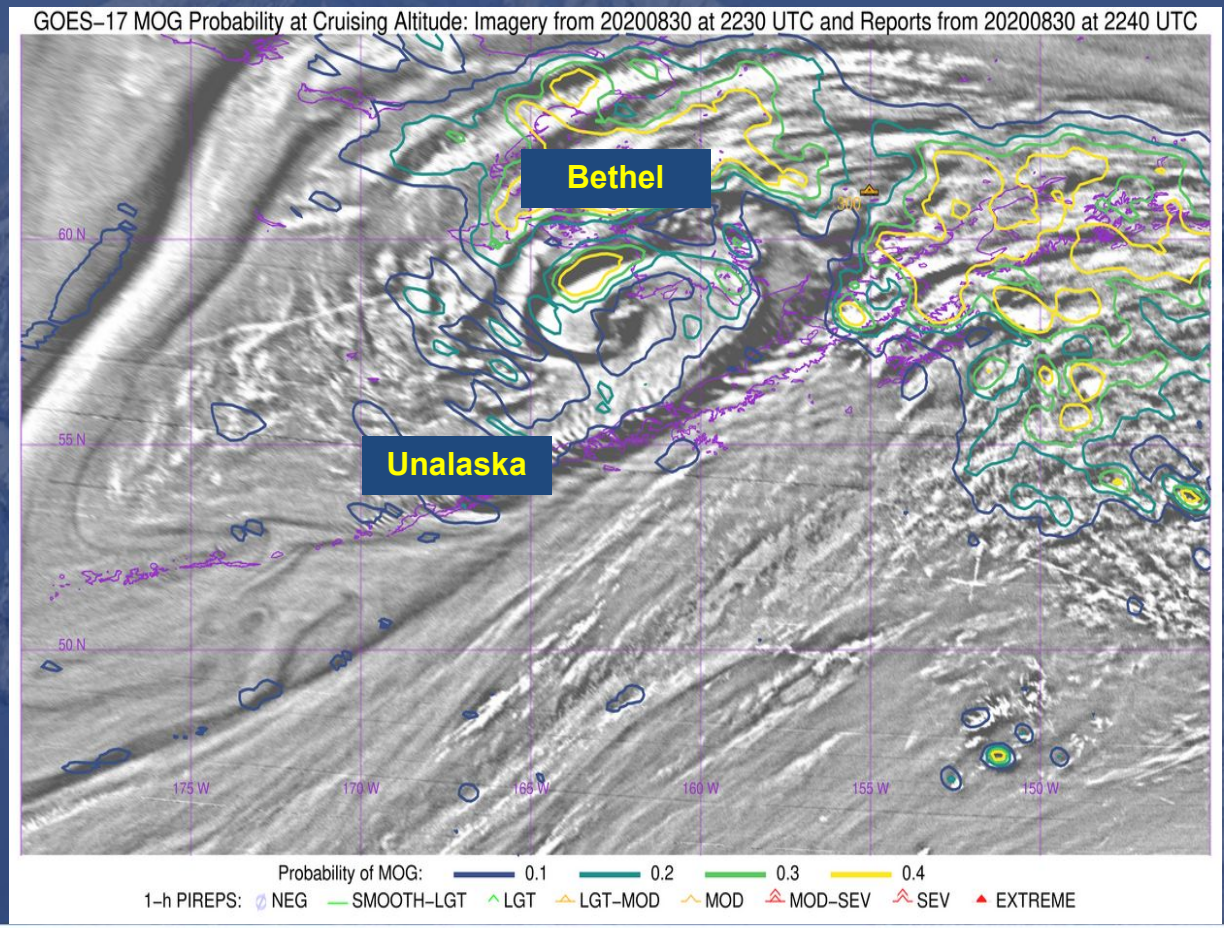
Pilots aren't the only ones using these webcams; they are invaluable to aviation meteorologists as well!

Web based tools- Turbulence

-Probability of Moderate or Greater turbulence (MOG)

-Cross check with balloon soundings and PIREPs

-Diagnostic tool for analysis; does not project out in time



Web-based tools USFS Blue Sky

BlueSky Daily Runs* (v2.0 beta)

Run Status | Viewer | HRRR | FireWork | Multi-Model | Report A Bug

ALERT: The high fire activity has resulted in model runs taking a long time to complete. Significant changes are underway to address this.
Please stay tuned and thank you for your patience!
Configuration of runs being migrated to the Fire Information System (FIS) - Spider - BlueSky Pipeline with HYSPLIT v4.9.
The current date and time in UTC is: **20220712 02:51 Z. (All times listed in UTC.)**

Run	Starts	Today (20220712)	Yesterday (20220711)	Avail KMZs
CONUS: *Uses meteorological forecast data from the National Weather Service model runs*				
CONUS 12-km 84 hr forecast, NWS 12-km met, 0.15 deg analysis	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
	12Z	Scheduled	MAP | KMZ	(yesterday) KMZ
CONUS 3-km 48-hr forecast, NWS 3-km met	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
	12Z	Scheduled	MAP | KMZ	(yesterday) KMZ
Northwest: *Uses meteorological forecast data from the NWRMC regional model runs and NWS Fire Weather Domains*				
CMAQ Modeled PNW 4-km 72-hr forecast, NWRMC 4-km met; CMAQ Air Quality Model; includes carryover smoke	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
PNW 4-km 72-hr forecast, NWRMC 4-km met	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
	12Z	Scheduled	MAP | KMZ	(yesterday) KMZ
CMAQ Modeled PNW 1.33-km 60-hr forecast; NWRMC 1.33-km met; CMAQ Air Quality Model; includes carryover smoke	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
PNW 1.33-km 60-hr forecast, NWRMC 1.33-km met	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ
	12Z	Scheduled	MAP | KMZ	(yesterday) KMZ
FireWx 1.27-km (MT/ID) 36-hr forecast, NWS 1.27-km met	00Z	Scheduled	MAP | KMZ	(yesterday) KMZ

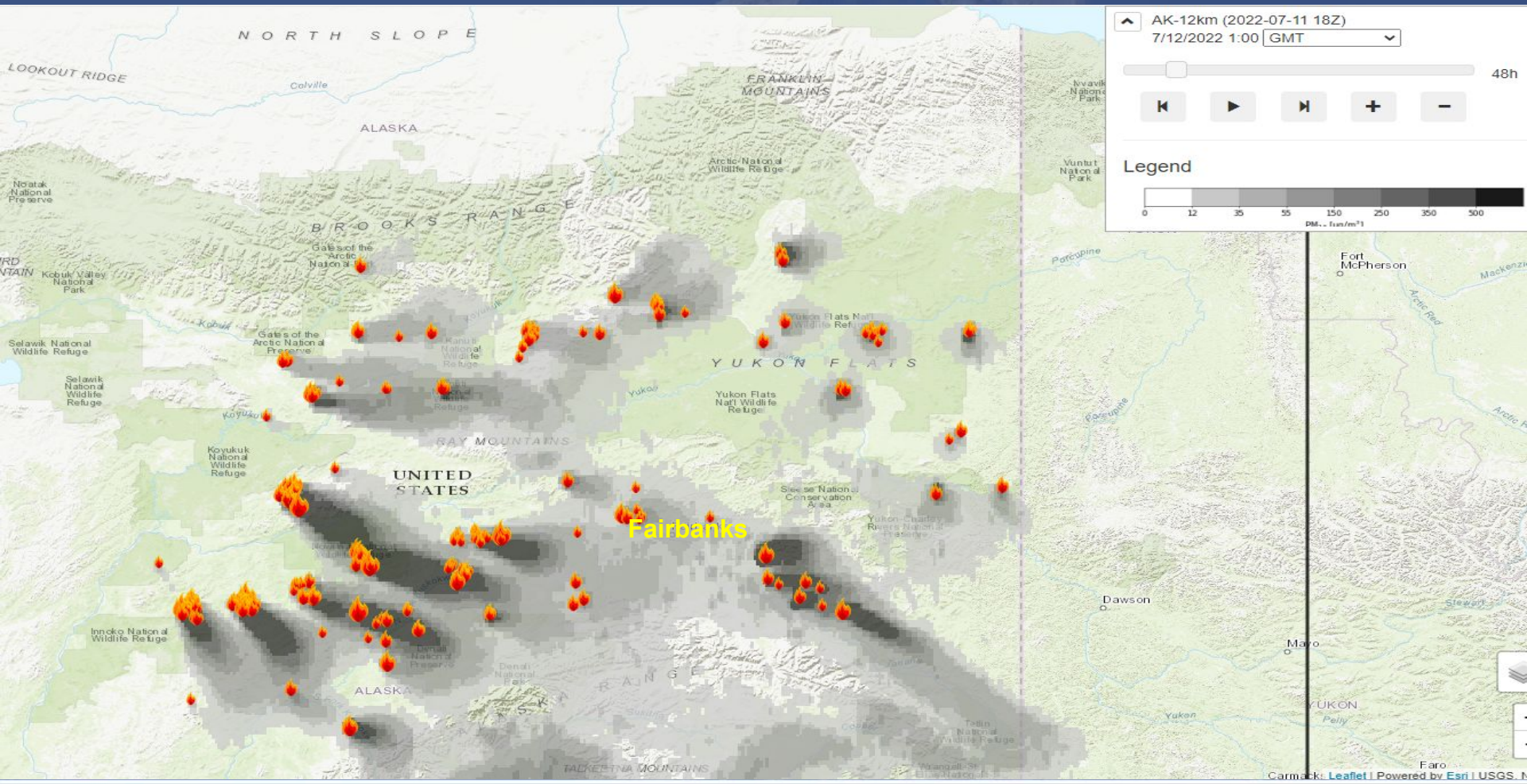
Web-based tools USFS Blue Sky

Alaska:

Uses meteorological forecast data from the National Weather Service model runs and NWS Fire Weather Domains

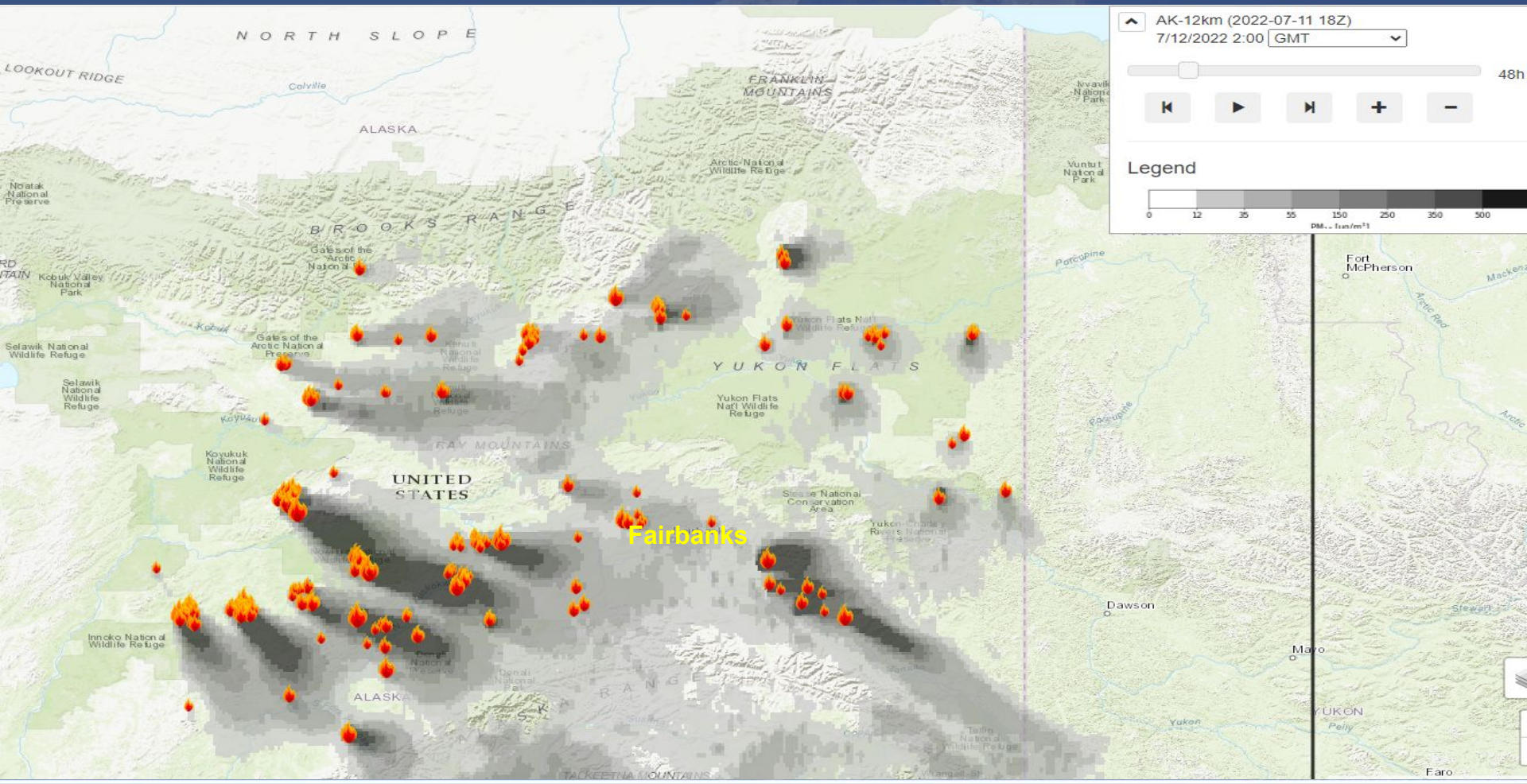
Alaska 12-km 48-hr forecast, NWS 12-km met	00Z	**Scheduled**	MAP | KMZ	(yesterday) KMZ
	06Z	**Scheduled**	MAP | KMZ	(yesterday) KMZ
	12Z	**Scheduled**	MAP | KMZ	(yesterday) KMZ
	18Z	**Scheduled**	MAP | KMZ	(yesterday) KMZ

Smoke progs to 48-hrs; but no VIS

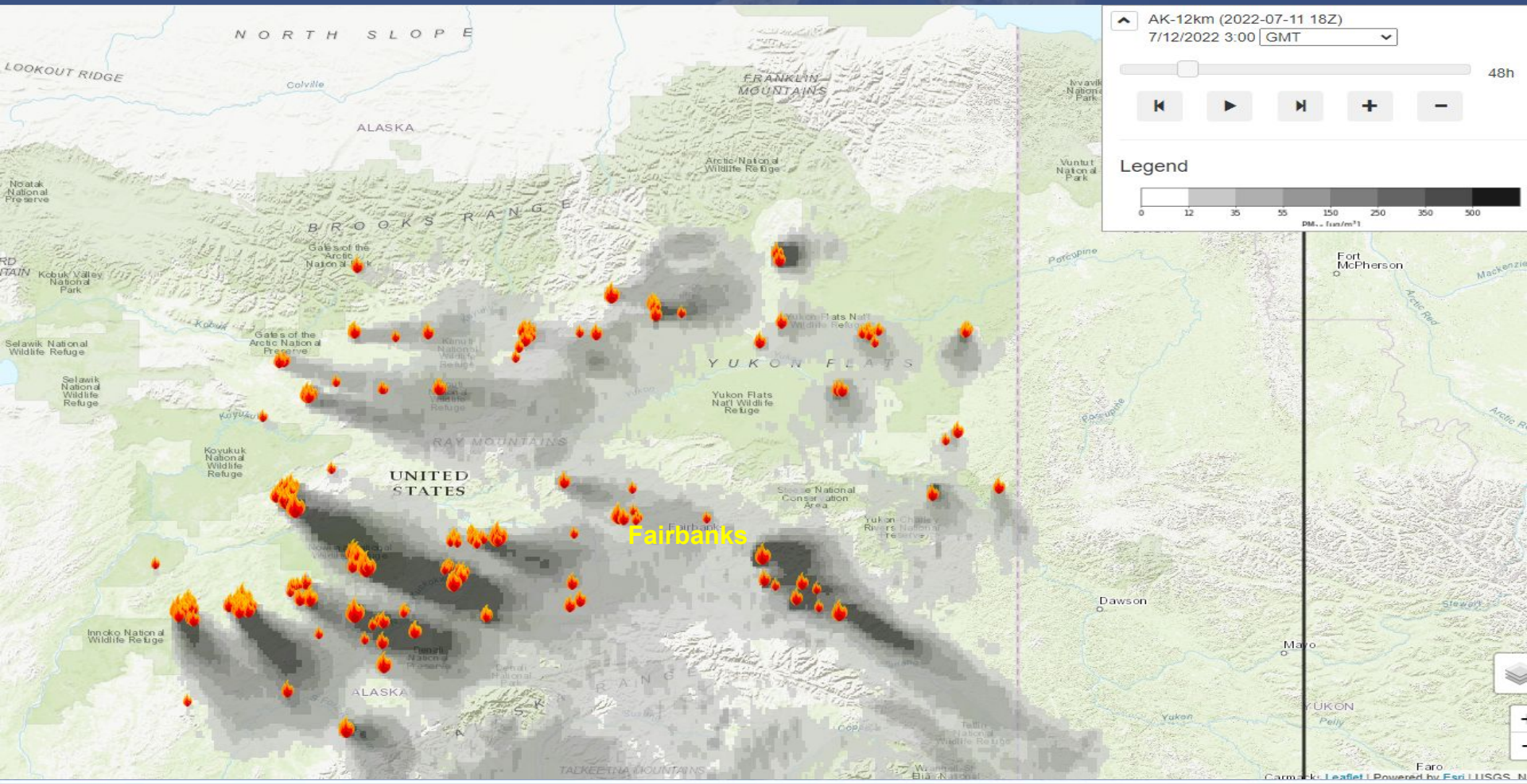


AK-12km (2022-07-11 18Z)
7/12/2022 1:00 GMT

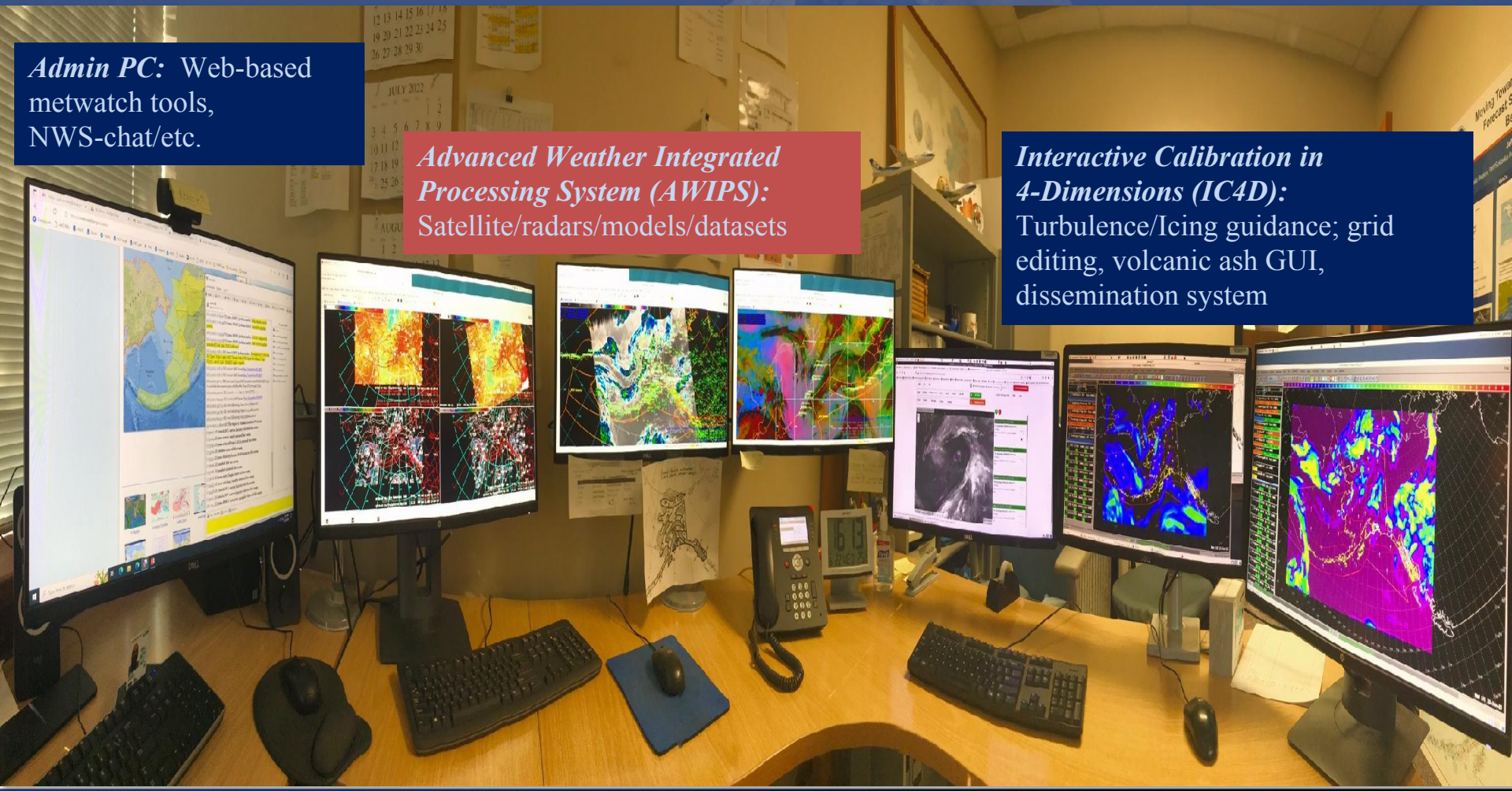
Smoke progs to 48-hrs; but no VIS



Smoke progs to 48-hrs; but no VIS



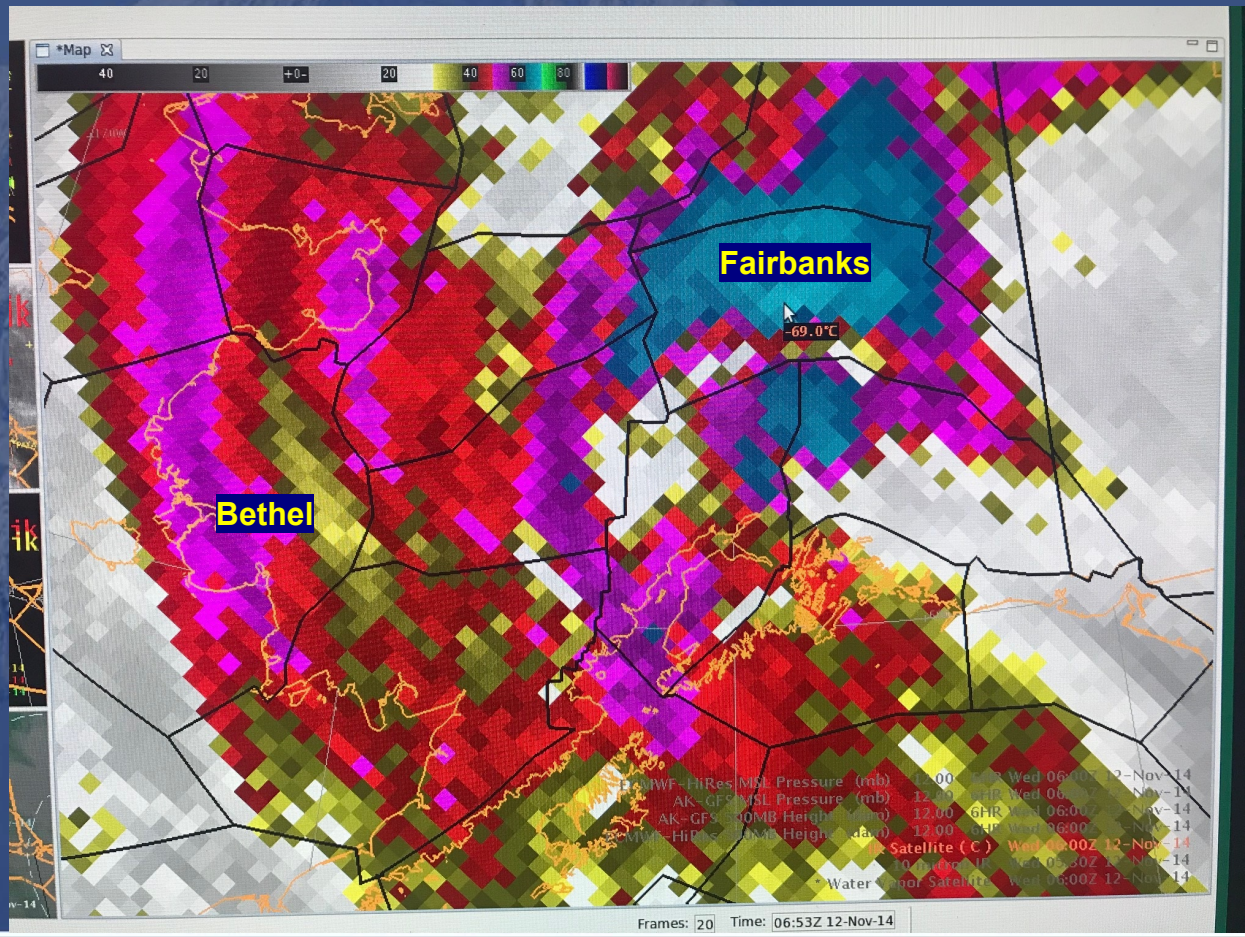
AAWU/VAAC workstation



AWIPS tools- GOES 15

-Legacy satellite imagery

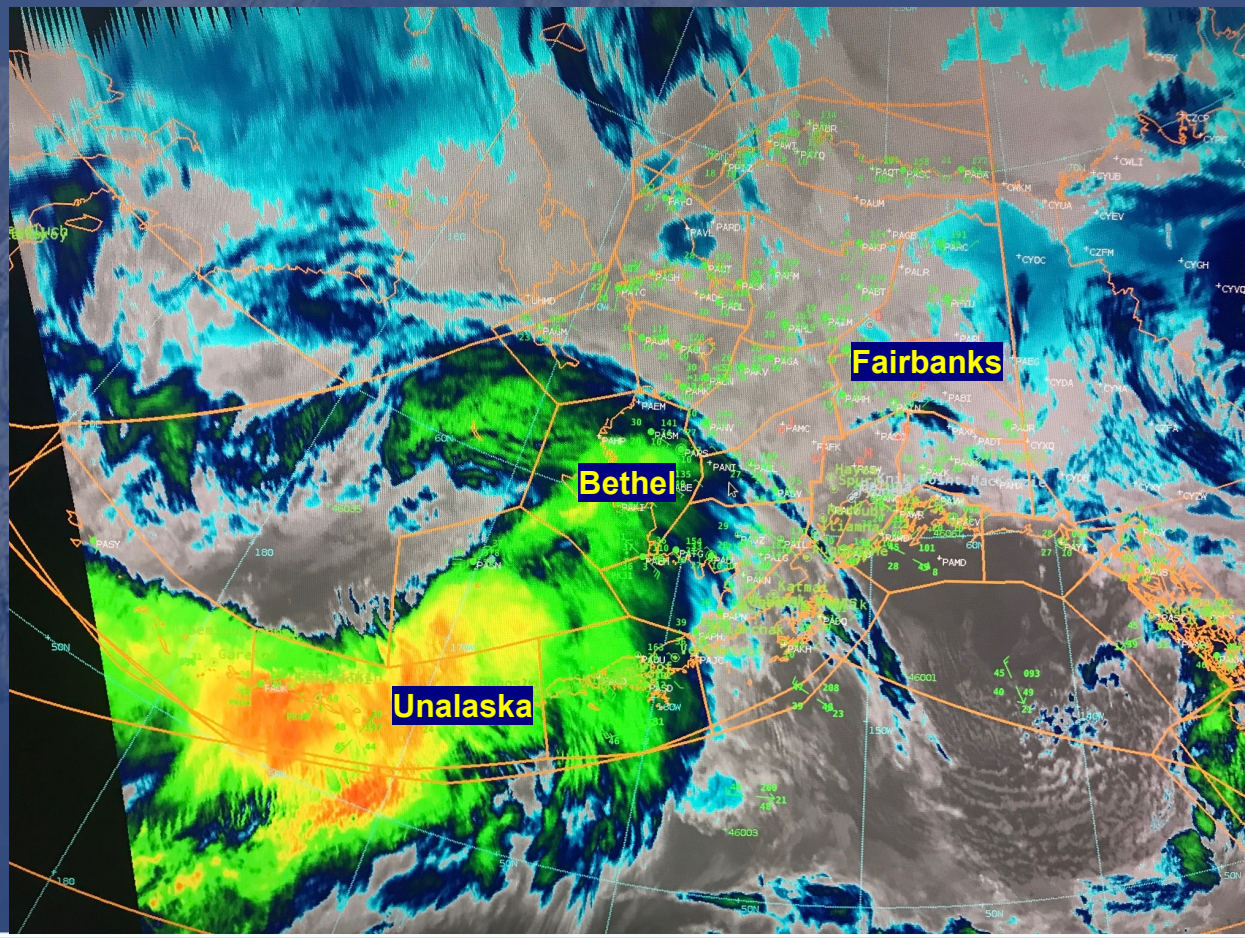
-Low resolution crude imagery, every 15-minutes



AWIPS tools- GOES 17/18

-Much higher resolution

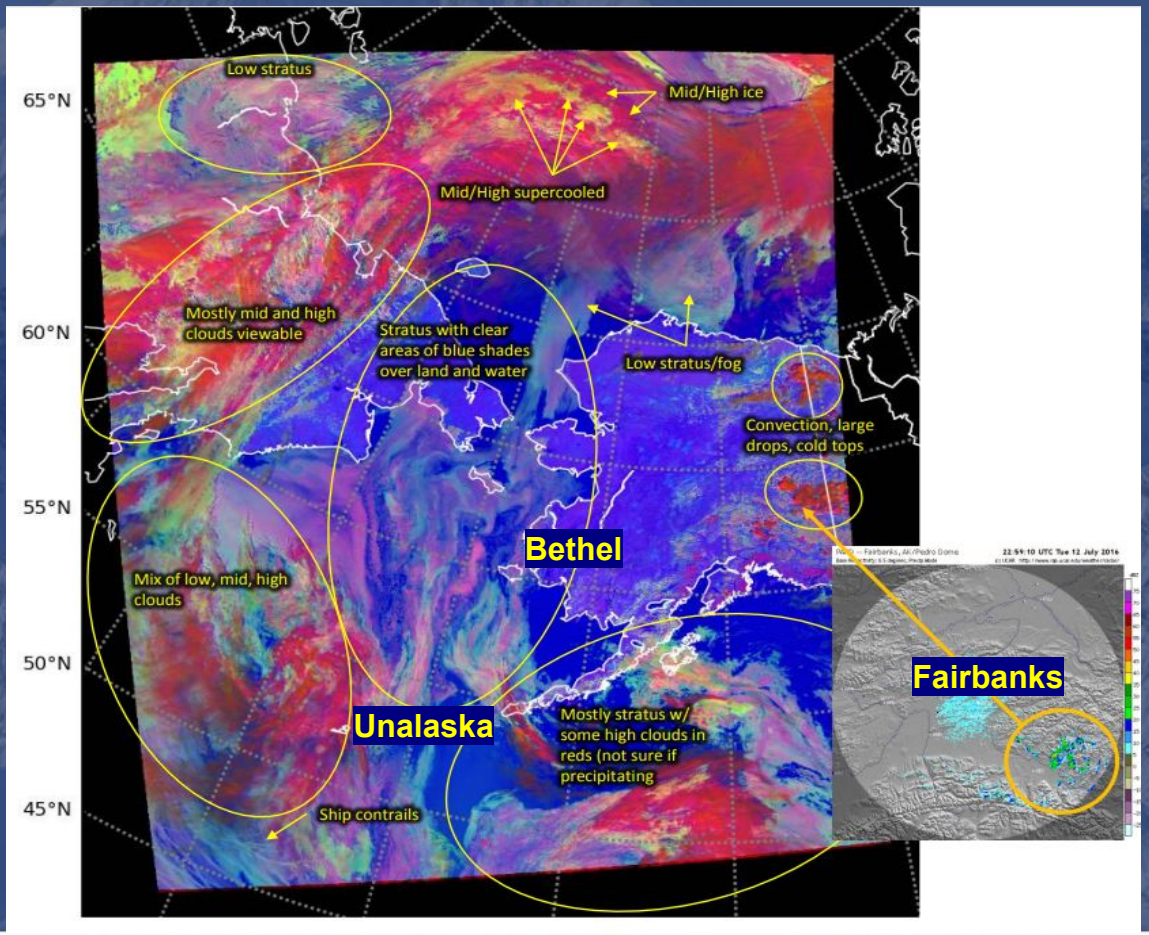
-High resolution imagery every 15-minutes; in super high refresh, **every minute!**



AWIPS tools- GOES 17/18

-RGB bands provide large contrast! (Red/Green/Blue)

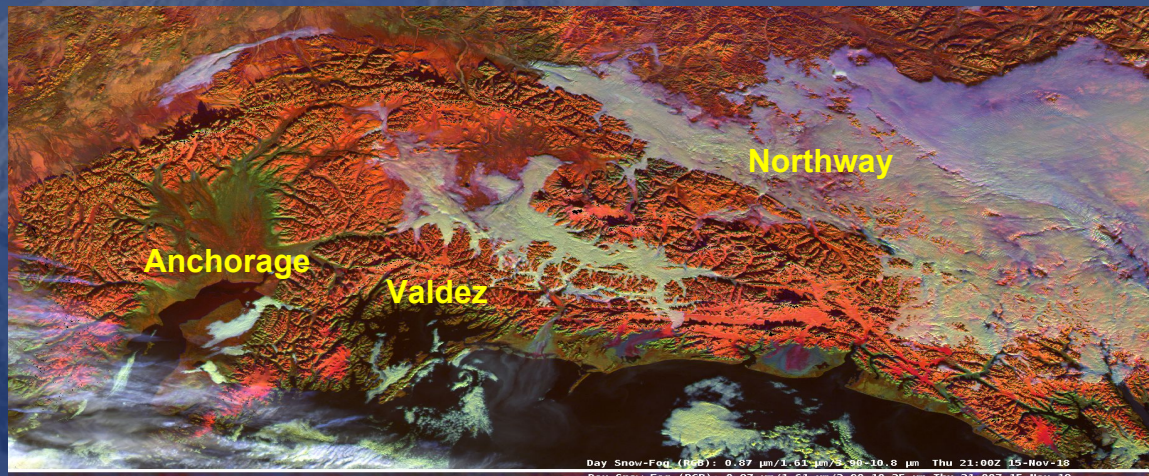
-Image credit to Kevin Fuell, NASA SPoRT

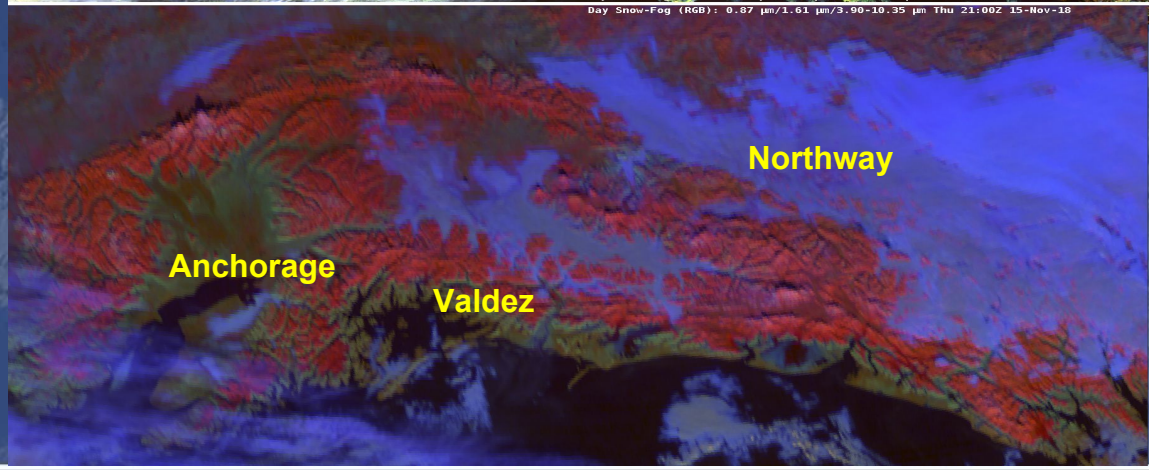


AWIPS tools- GOES 17/18

-Incredible details denoted

-Stratus/fog, even blowing dust/silt!



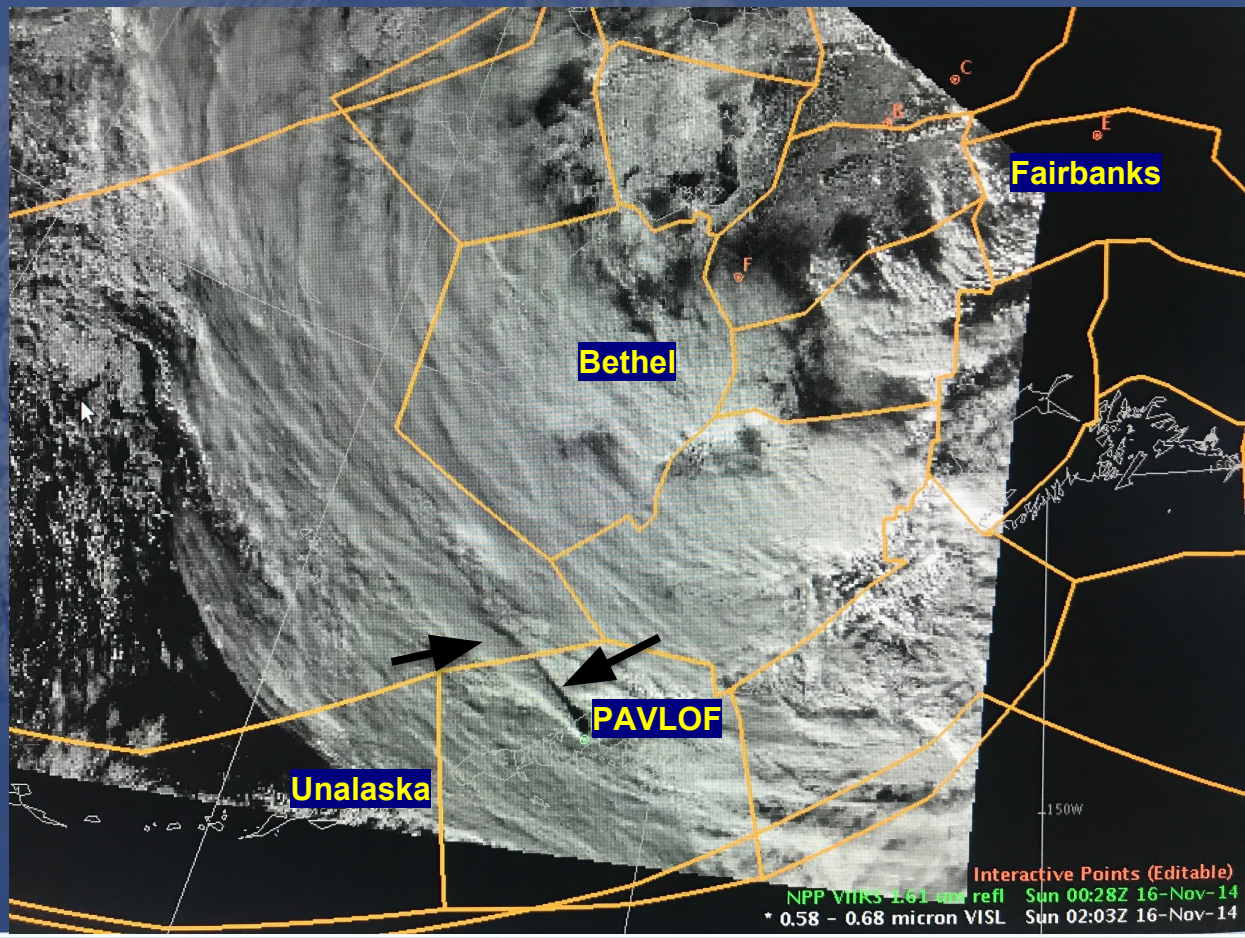


AWIPS tools- POES

-Very high resolution

-Excellent contrast and details

-Volcanic ash plume from Pavlof volcano

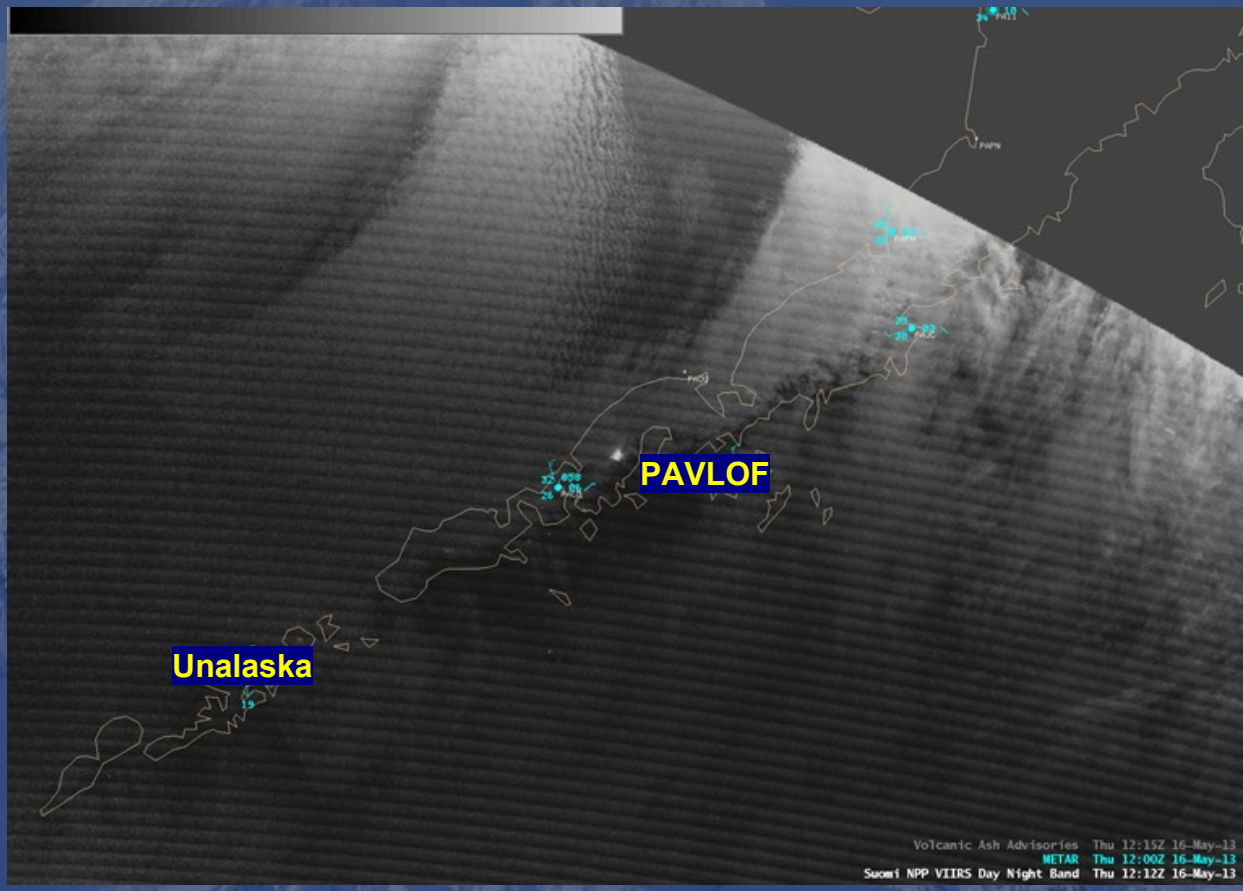


AWIPS tools- POES

-Very high resolution

-Excellent contrast and details

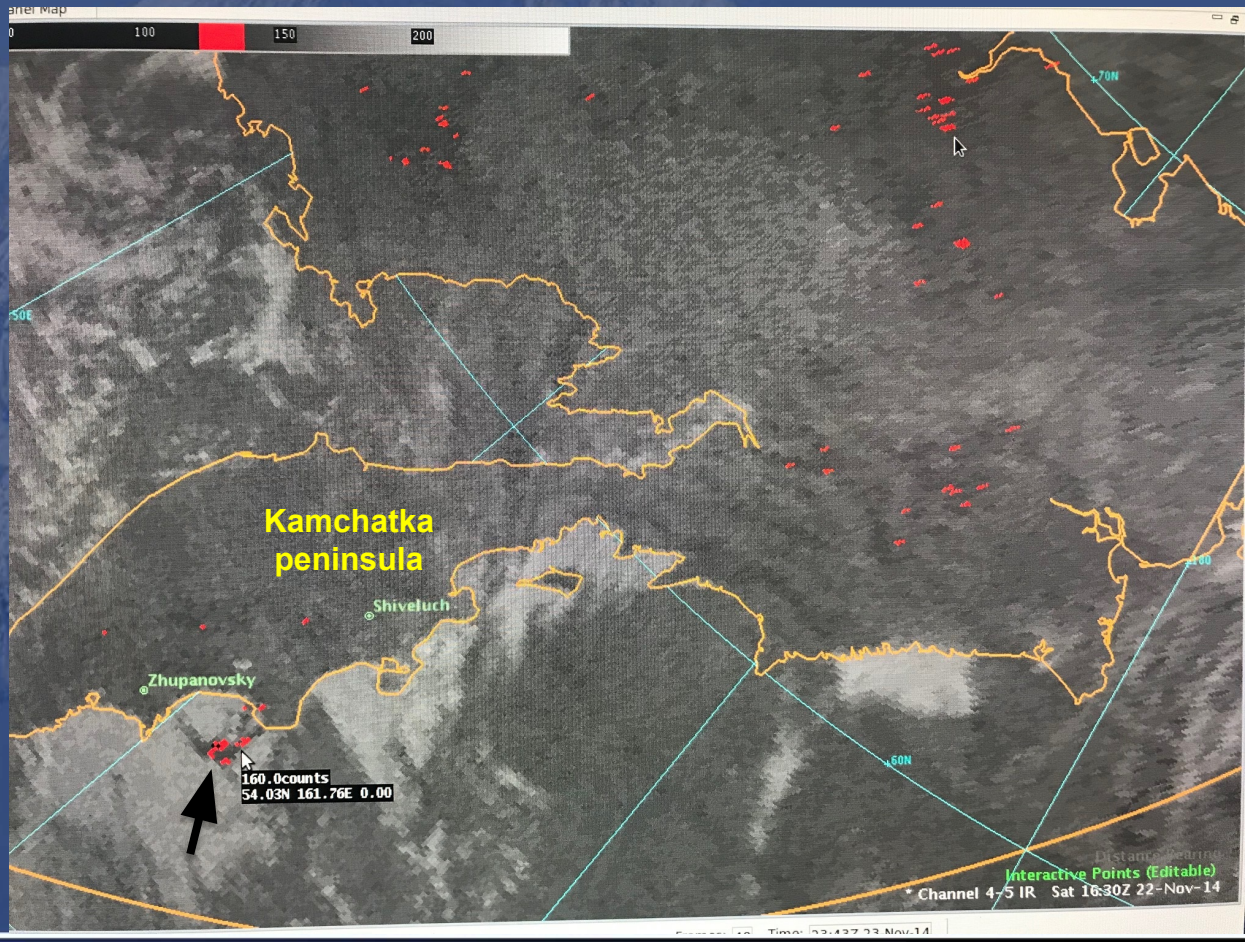
-Volcano hot spotting



AWIPS tools- MT-satellite

-Pre Himawari-8 era

-Very crude imagery; limited contrasts to differentiate clouds from volcanic ash.



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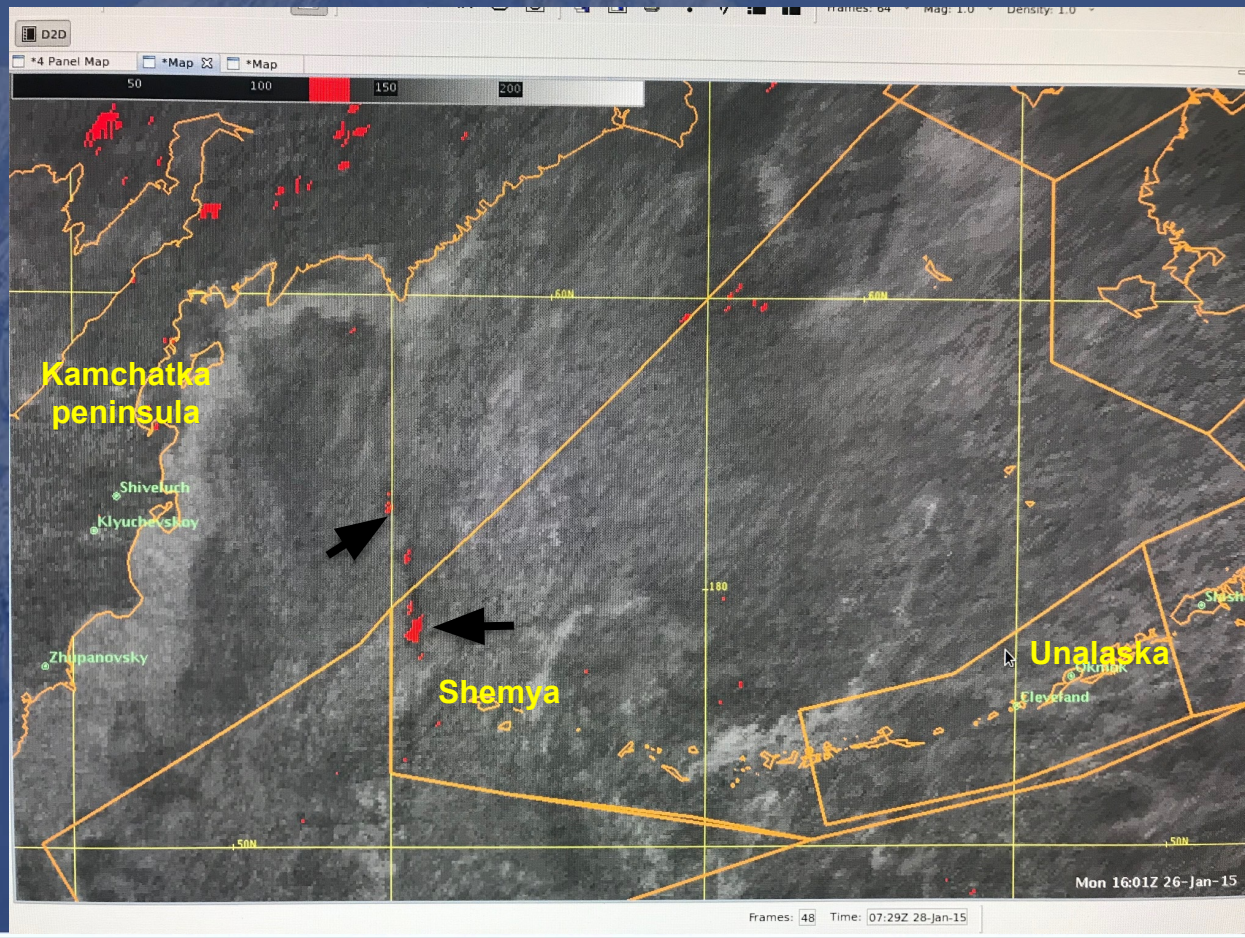
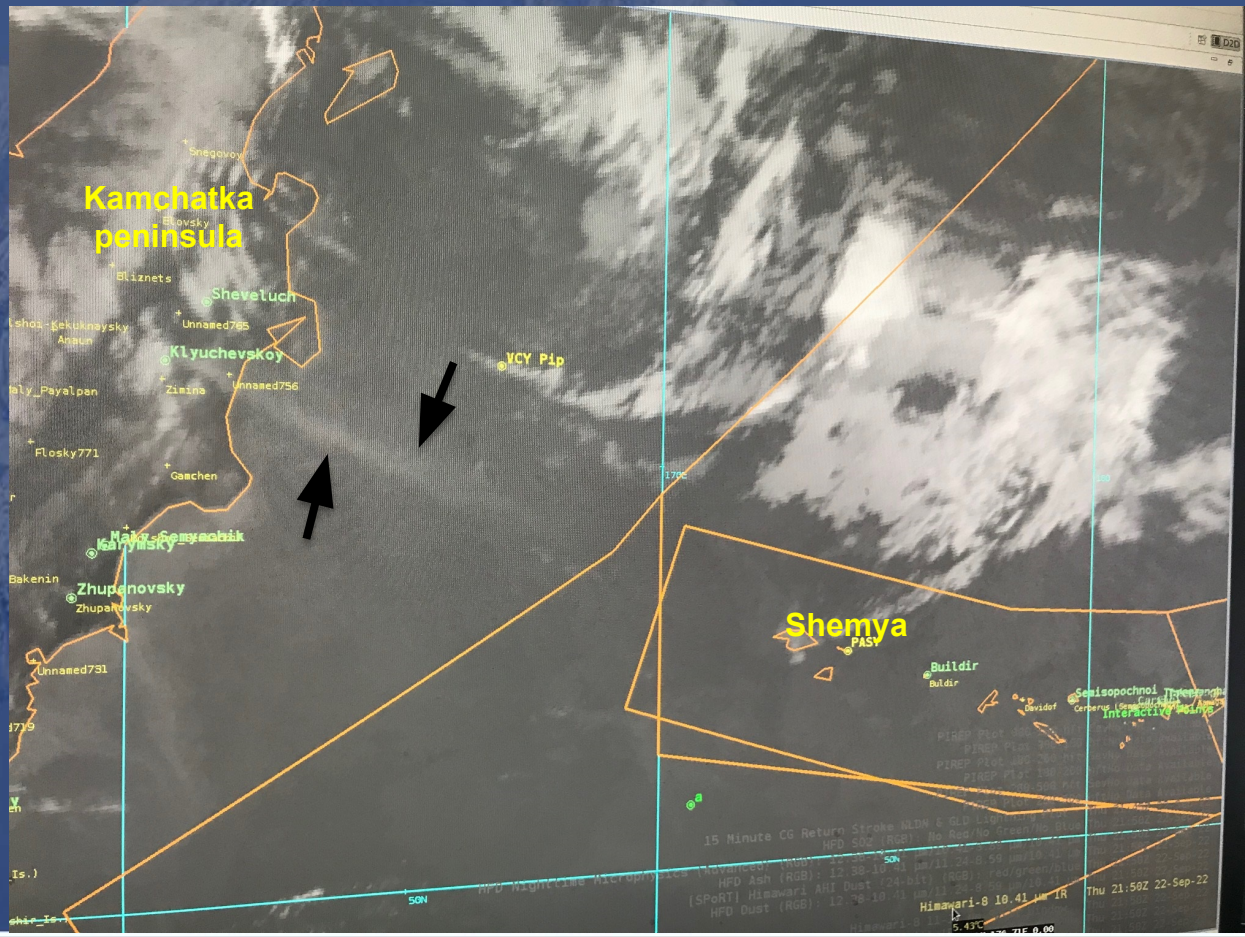


AWIPS tools- Himawari-8 era

-Himawari-8, higher resolution imagery every 10-minutes!

-Better contrast of clouds vs non clouds

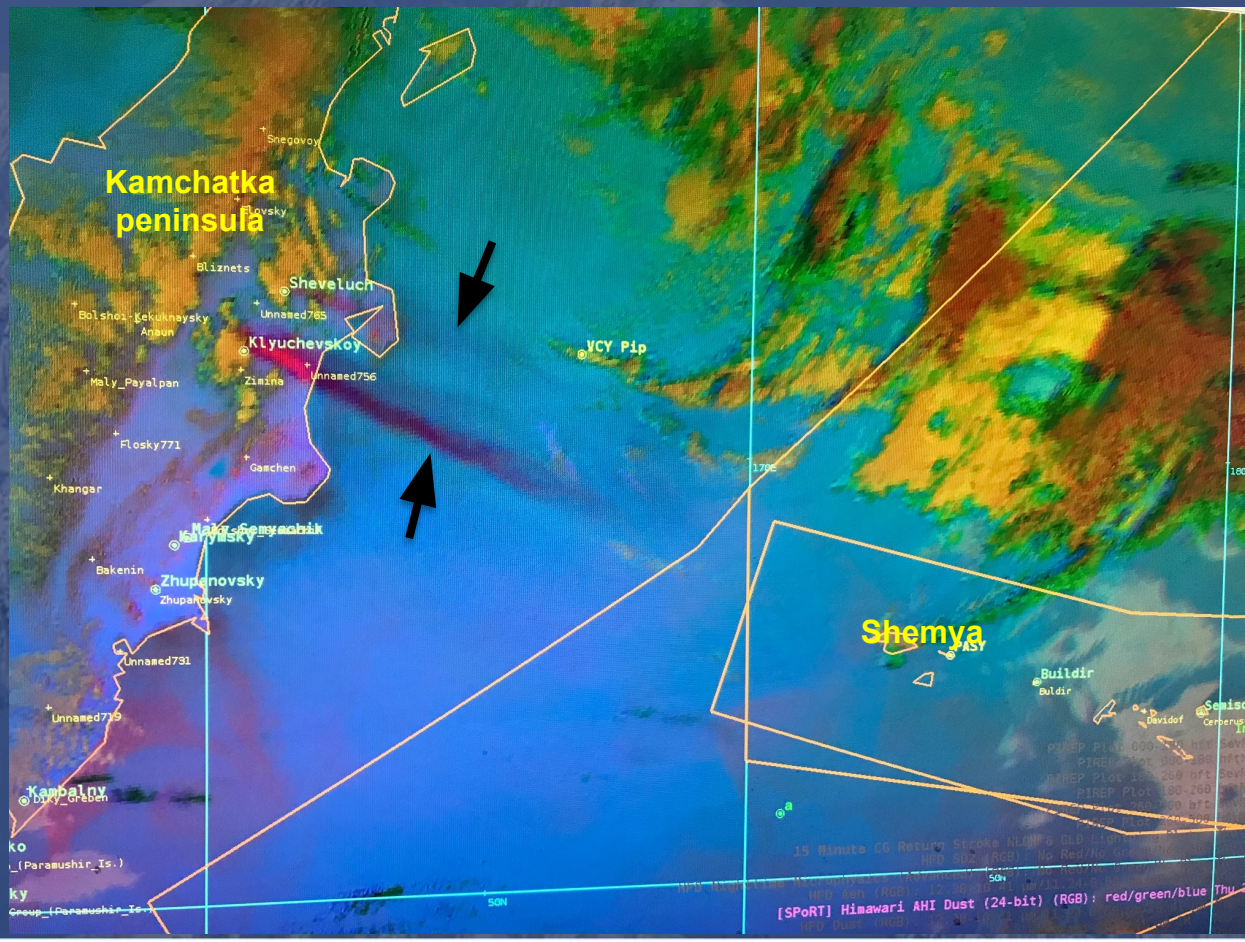


AWIPS tools- Himawari-8 era

-Himawari-8, higher resolution imagery

-RGB (Red/Green/Blue)

-Volcanic ash stands out from meteorological clouds



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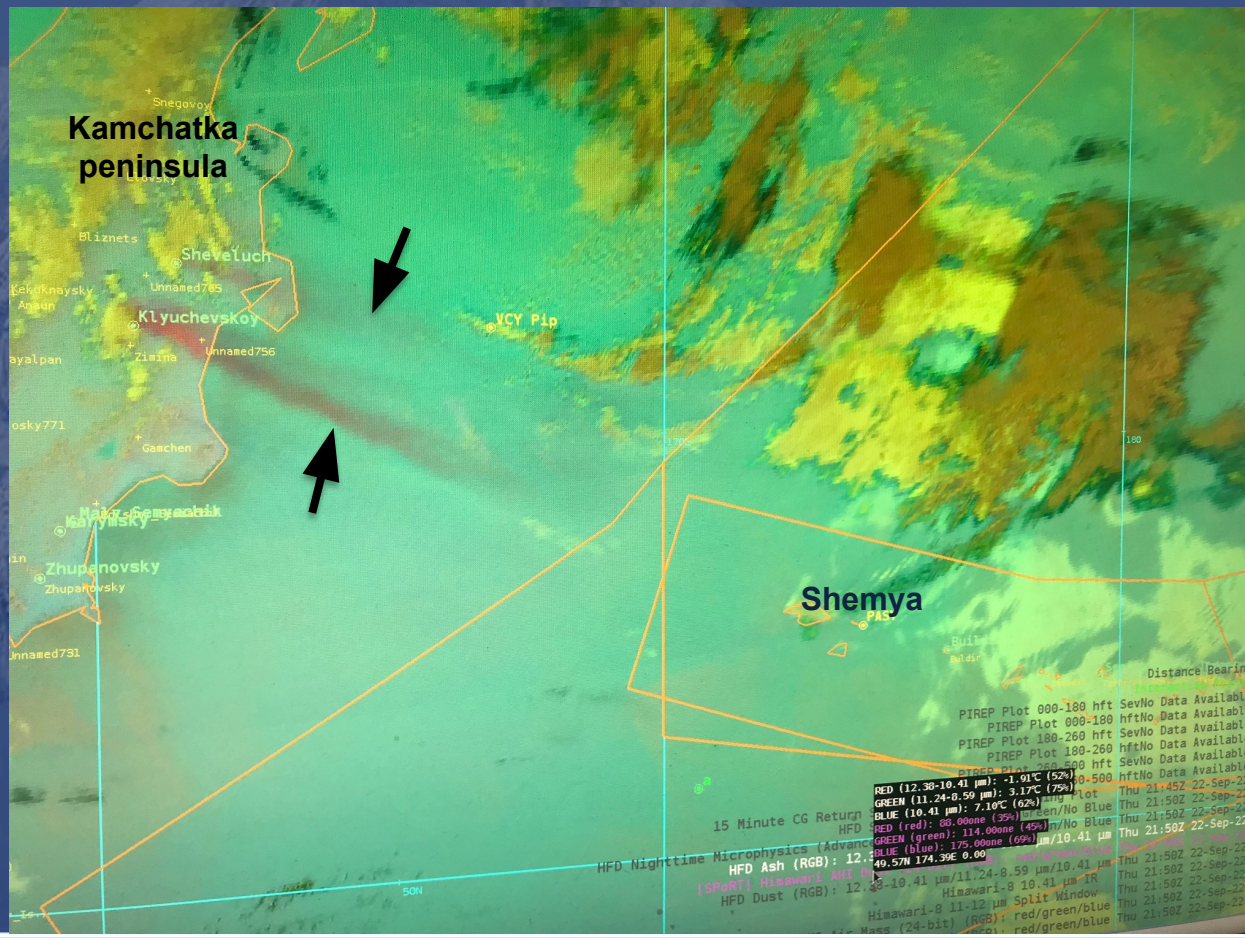
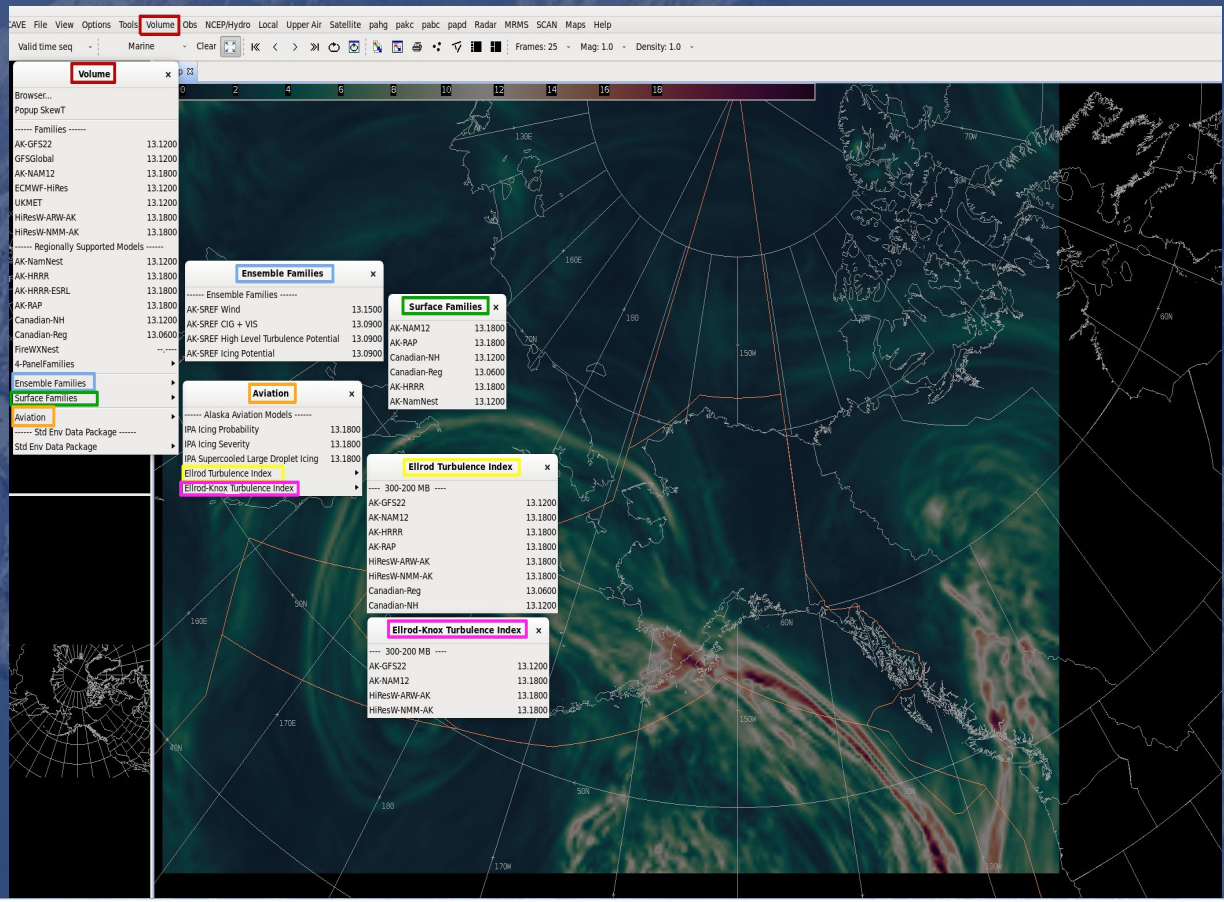


AWIPS tools- Turbulence

-Probability and severity of turbulence, Ellrod-Knox index

-Cross check with balloon soundings and PIREPs

-First guess



AAWU/VAAC workstation

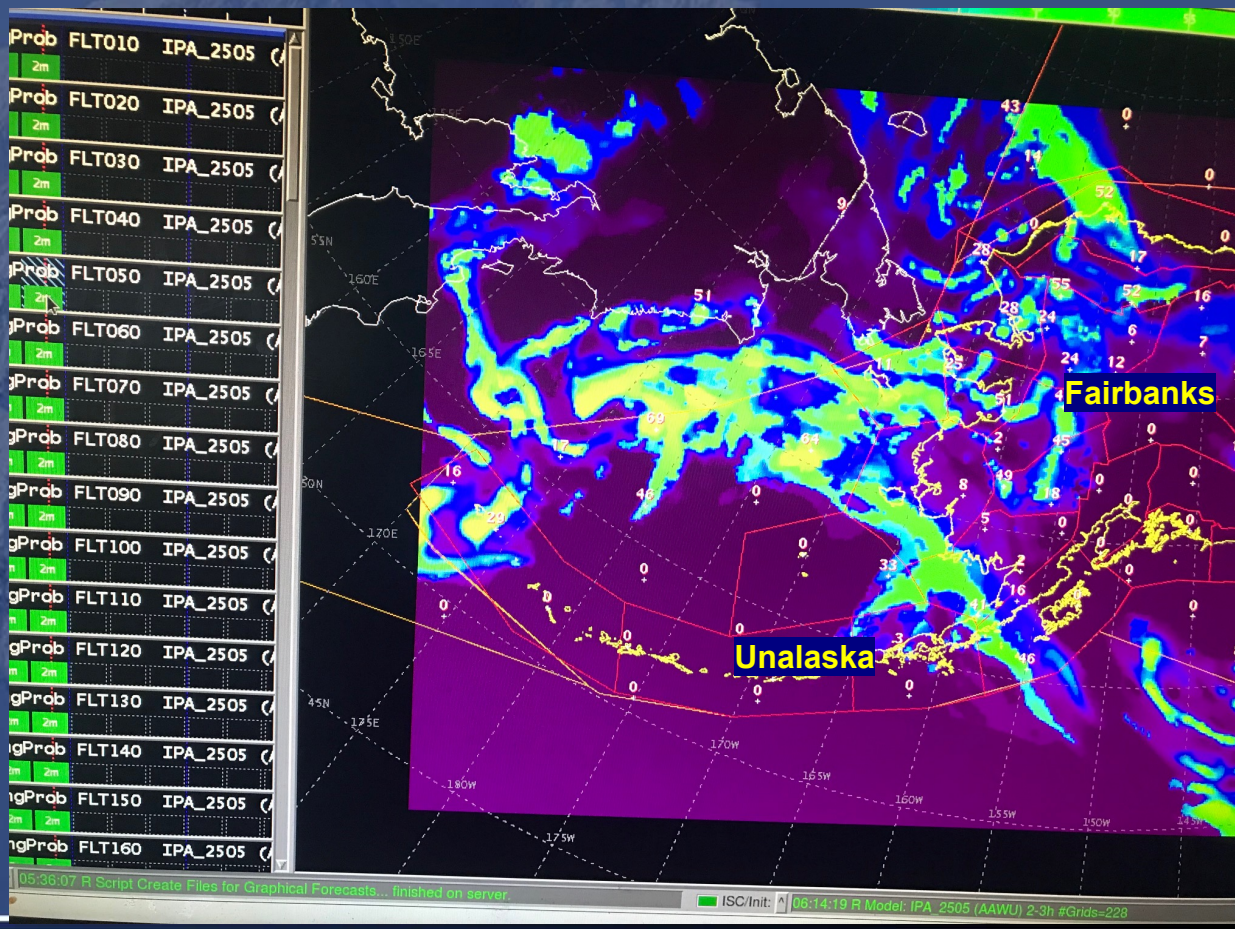
IC4D tools- IPA

-Icing Product for Alaska (IPA), based on Rapid Refresh model (RAP)

-Probability of icing out to 18-hrs

-Cross check with satellite and balloon soundings

-First guess



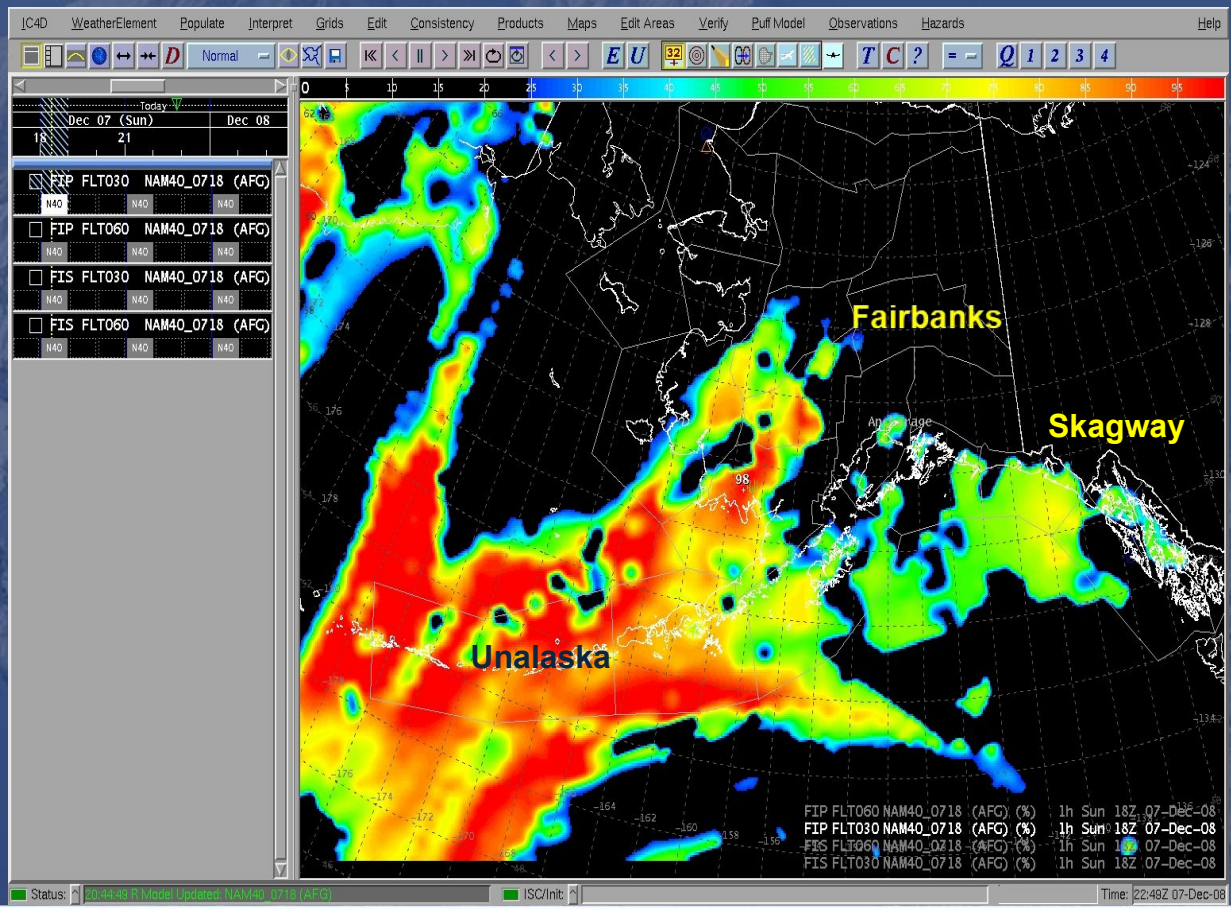
IC4D tools- FIP

-Forecast Icing Potential (FIP); developed by UCAR and funded by FAA

-Probability/threat of icing out to 36-hrs

-Cross check satellite and balloon soundings

-First guess



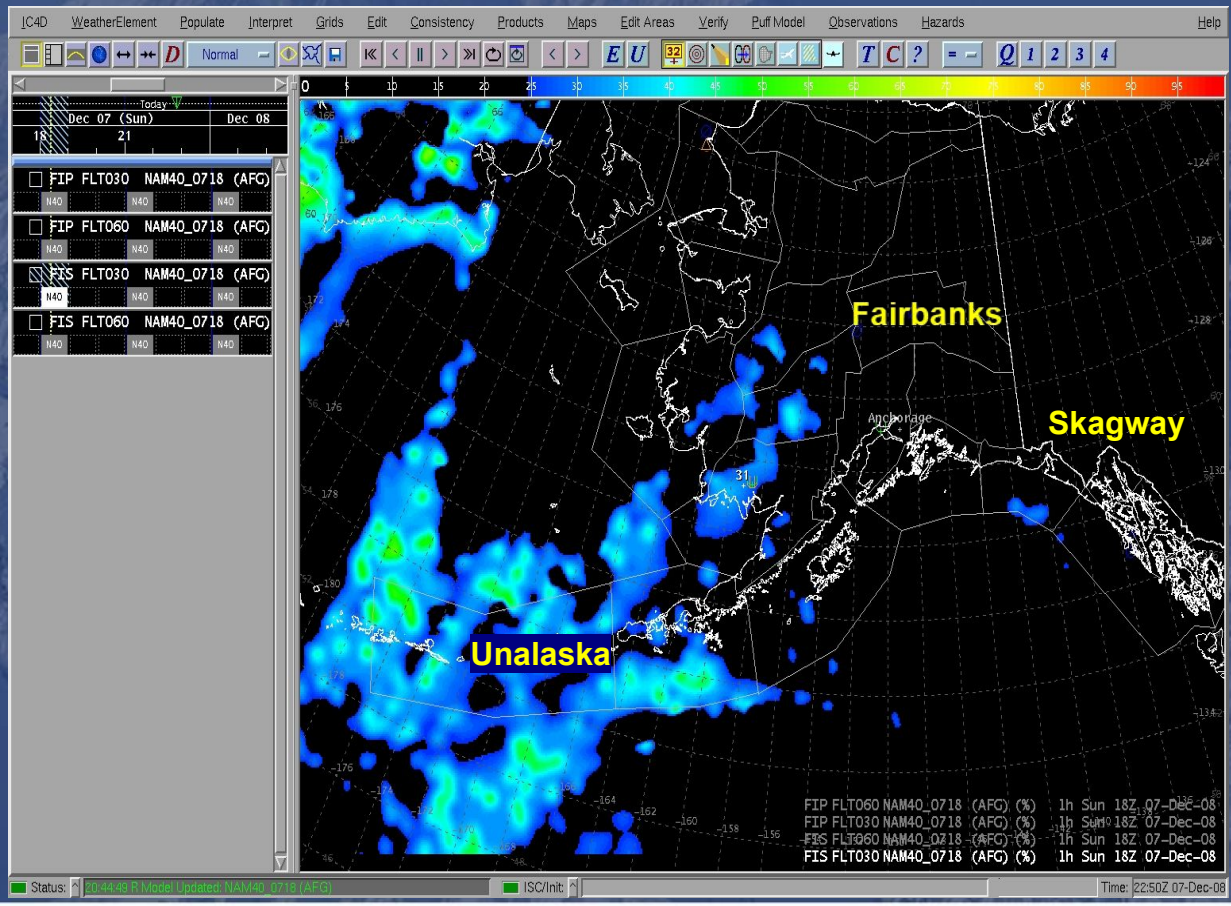
IC4D tools- FIS

-Forecast Icing Severity (FIS); developed by UCAR and funded by FAA

-Intensity of icing prog out to 36-hrs

-Cross check with PIREPs

-First guess

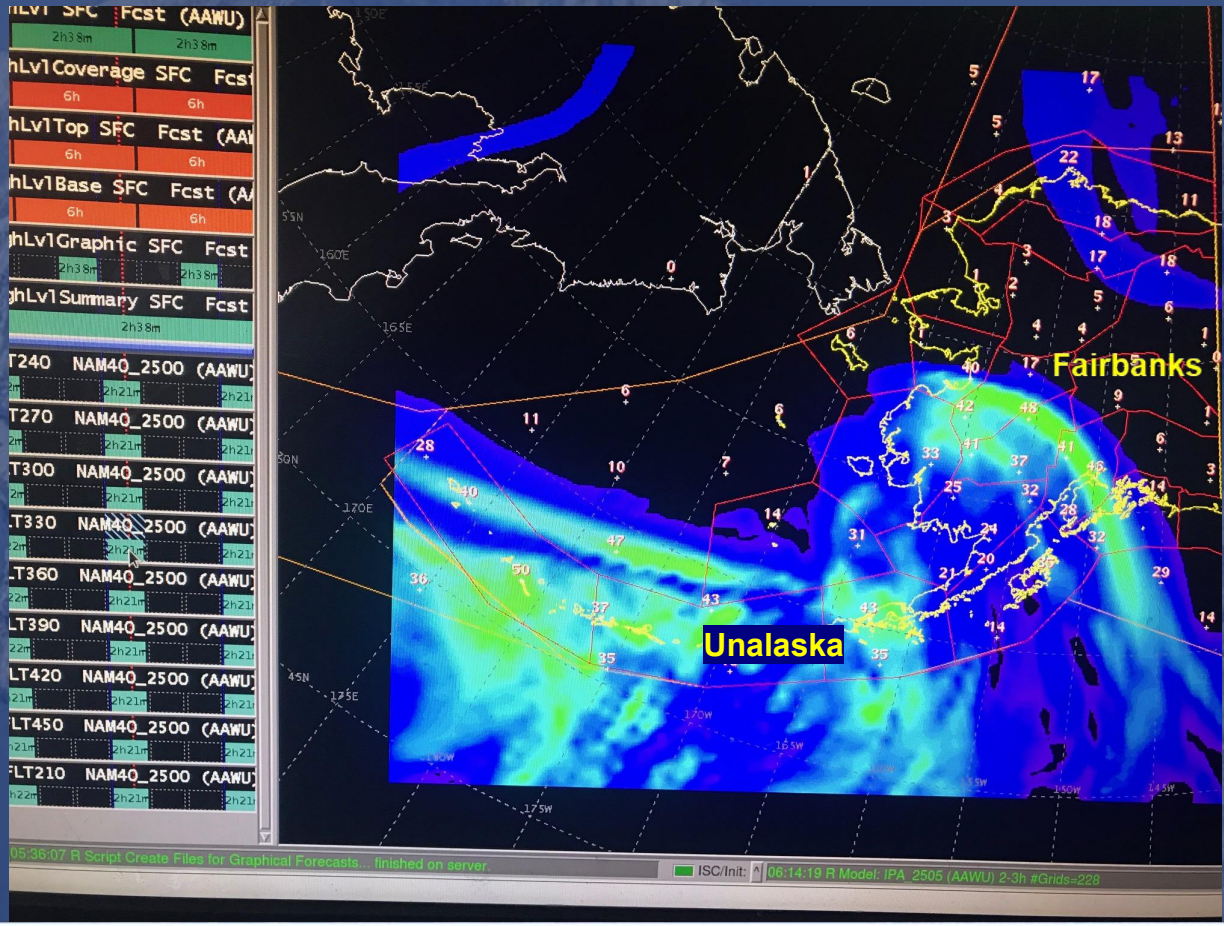


IC4D tools- Turbulence

-Graphical Turbulence Guidance (GTG) out to 24-hrs

-Set of weighted algorithms to ascertain threat of Moderate or greater intensity turbulence

-Cross check satellite/PIREPs

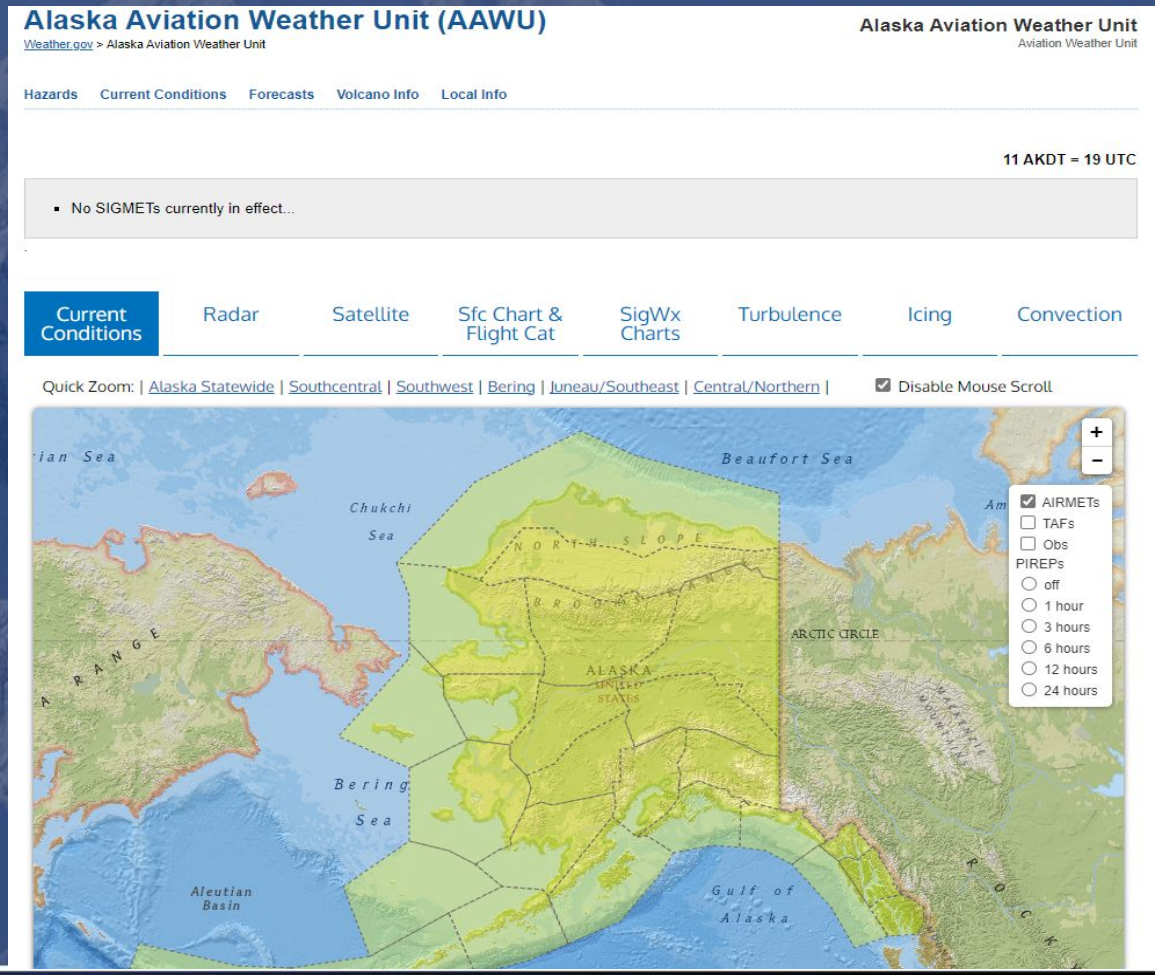


AAWU web presence

-One stop shop for a host of aviation variables

-Hazard graphics

-Alphanumeric products (TAFs/SIGMETs/etc)



Area Forecasts

-Legacy product; low bandwith 'rip and read' forecast for general aviation and Flight Service Stations

-Issuance times: 4:15am/12:15pm/8:15pm

-Valid for 12-hrs from issuance time

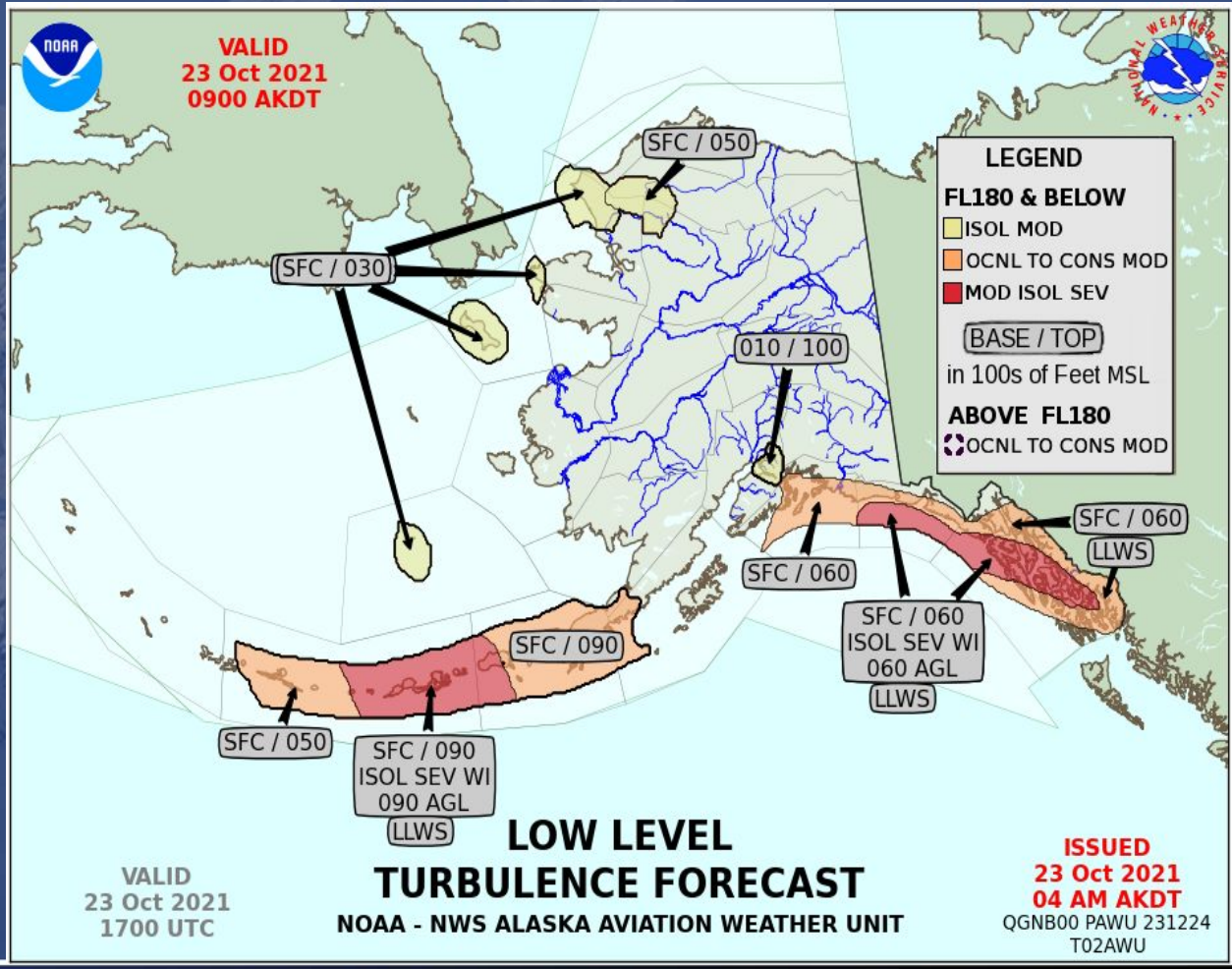
```
KODIAK IS AE...VALID UNTIL 120900

...CLOUDS/WX...

***AIRMET IFR***PAKH SW OCNL CIGS BLW 010. NC...

***AIRMET MT OBSC***MTS OBSC IN CLDS/PCPN. NC...

OTRW SCT009 OVC020 TOP 120 W/DECR LYRS ABV TO FL200. OCNL VIS 5SM -RA.

OTLK VALID 120900-121500...SW KODIAK ISLAND IFR CIG SHRA. ELSW MVFR CIG

SHRA.

...TURB...

NIL SIG.

...ICE AND FZLVL...

SW PADQ ISOL MOD ICEIC 040-120.

AFT 00Z N PADQ ISOL MOD ICEIC 040-100.

FZLVL 015.
```

Low-level turbulence (below FL180)

-OCNL MOD = AIRMET
-OCNL SEV = SIGMET

-Issuance times:
4:30am/12:30pm/8:30pm

-Valid for 12-hrs from issuance time

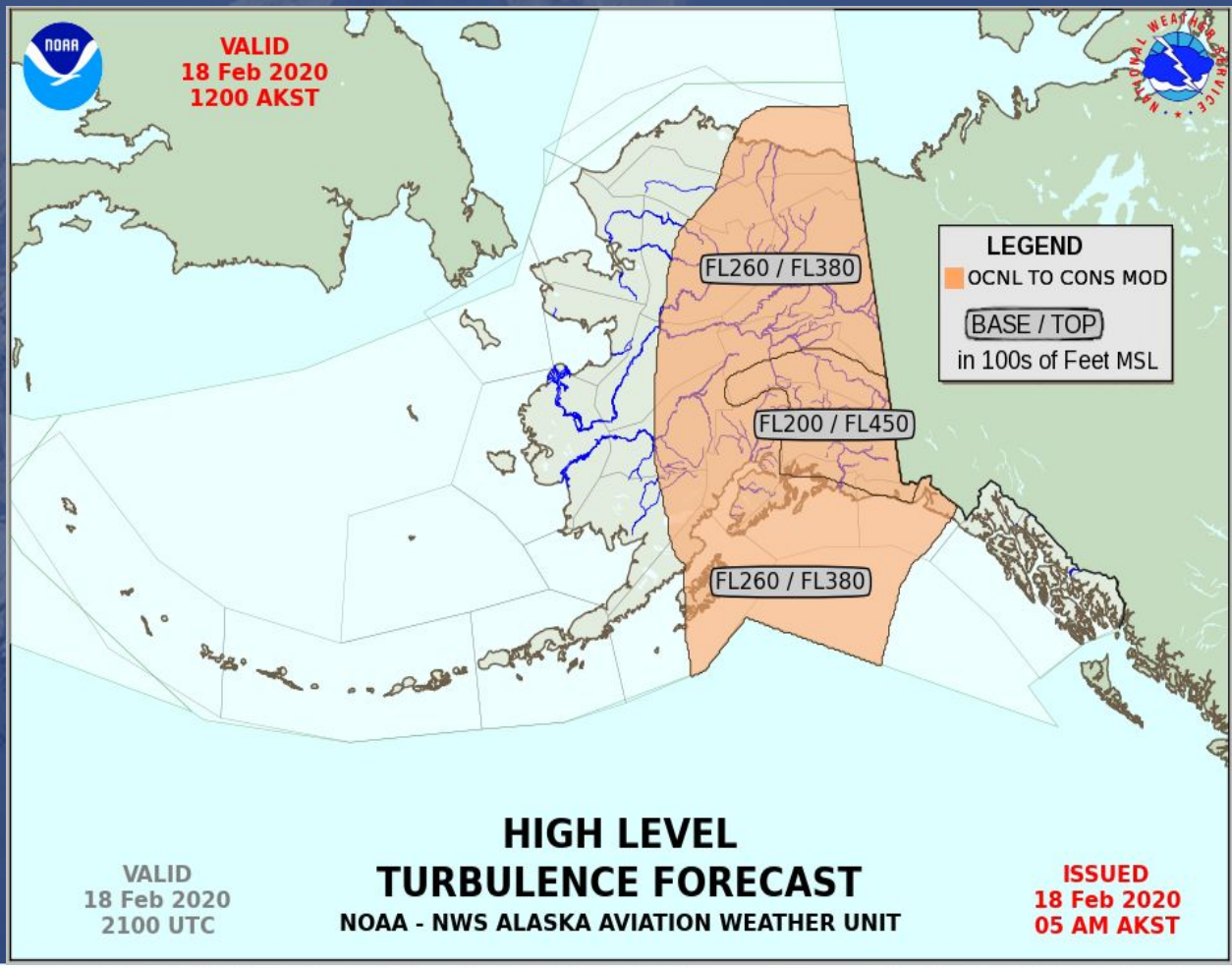


High-level turbulence (FL180-450)

-OCNL MOD = AIRMET
-OCNL SEV = SIGMET

-Issuance times:
4:30am/12:30pm/8:30pm

-Valid for 12-hrs from issuance time

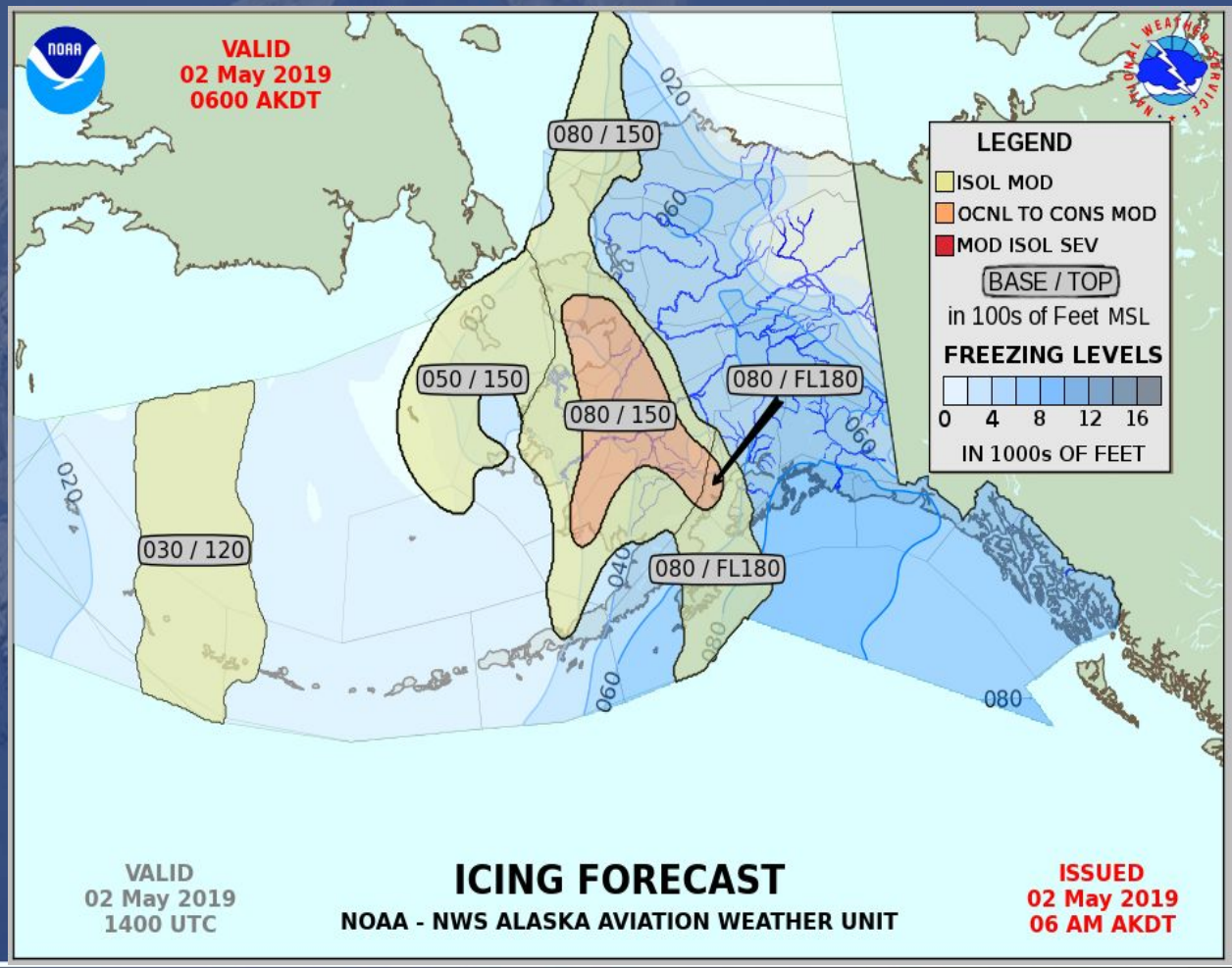


Icing

-OCNL MOD = AIRMET
-OCNL SEV = SIGMET

-Issuance times:
4:30am/12:30pm/8:30pm

-Valid for 12-hrs from issuance time

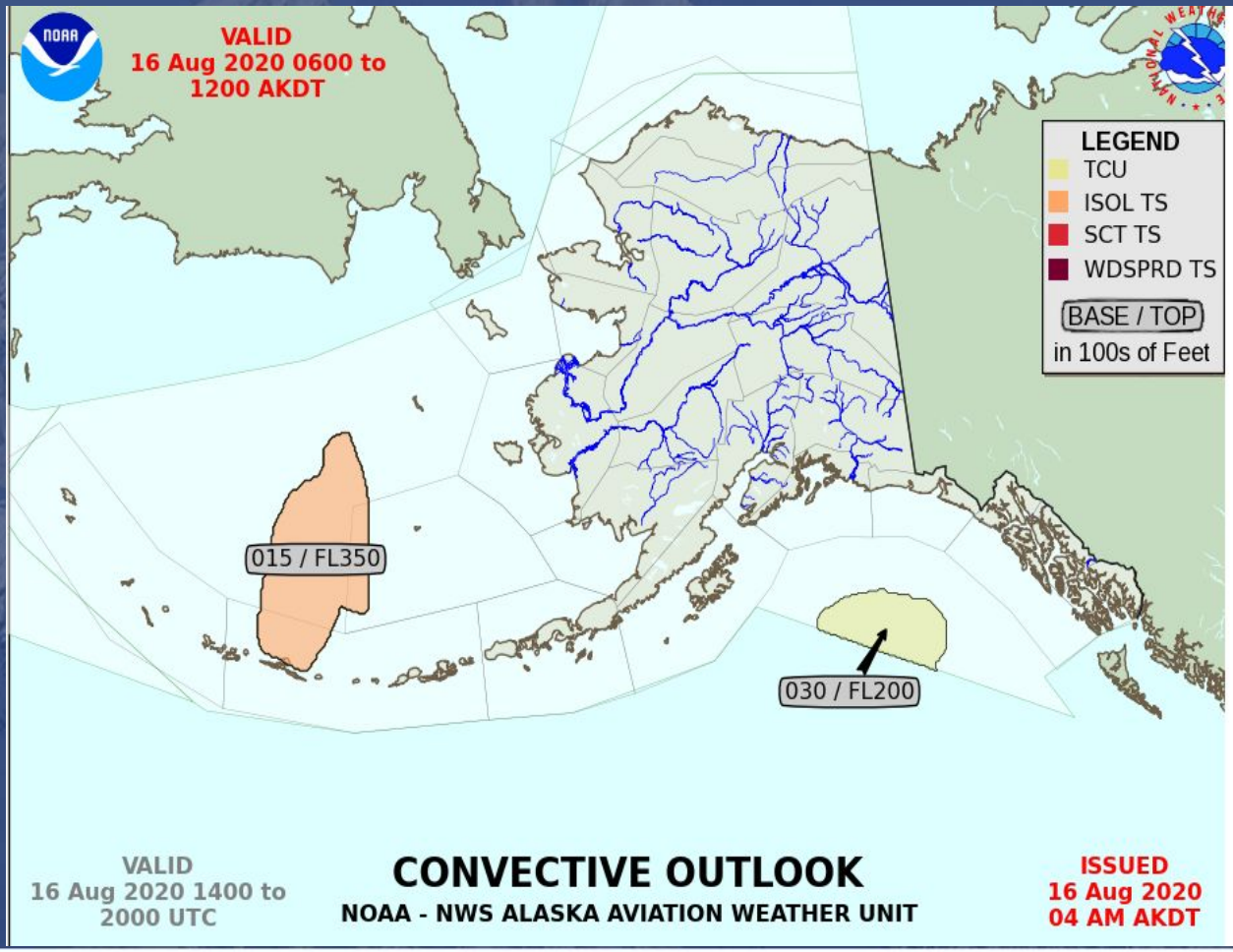


Convection (Produced May-Sep)

-TCU (Towering CU)
-ISOL TS (CB)
-SCT-WDSPRD TS (CBs)

-Issuance time: 4:30am

-Valid for 24-hrs from issuance time

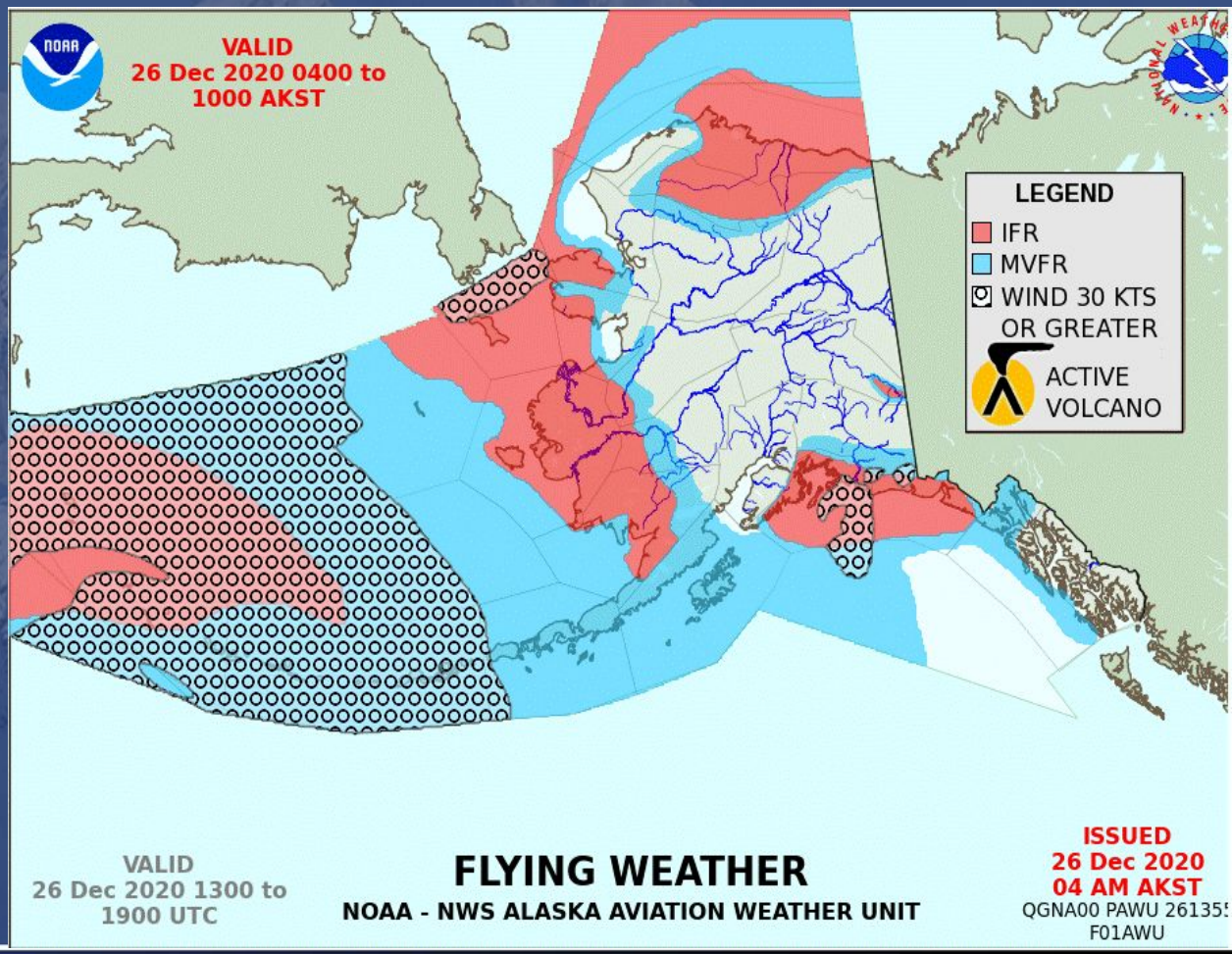


Flight category charts

-VFR
-MVFR
-IFR
-Sustained 30kt winds

-Issuance time: 4:30am/12:30pm/8:30pm

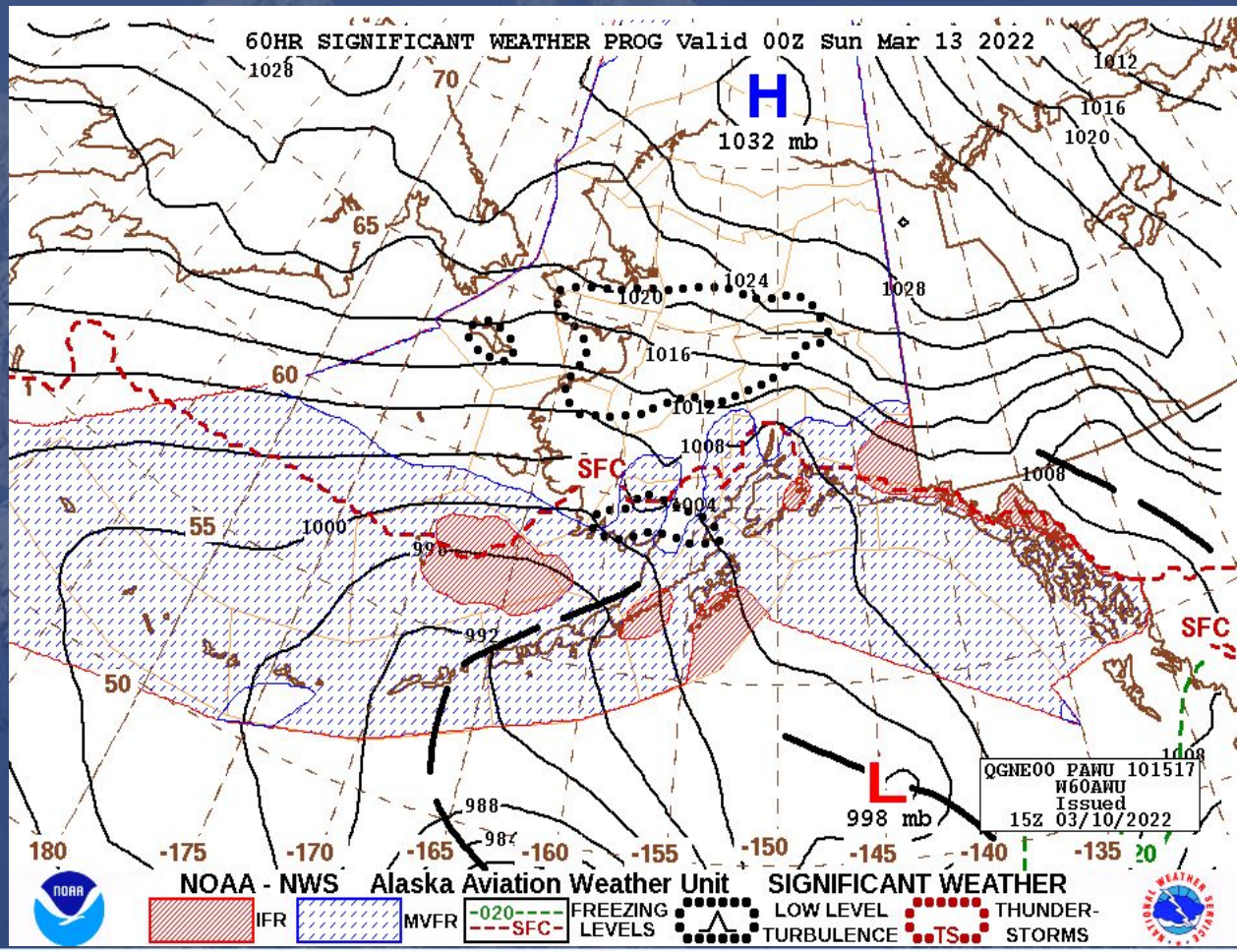
-Valid for 12-hrs from issuance time



24-60-hr Sig Wx charts

-Surface weather features
-Freezing levels
-Flight category outlook
-AIRMET turb threat
-TS potential

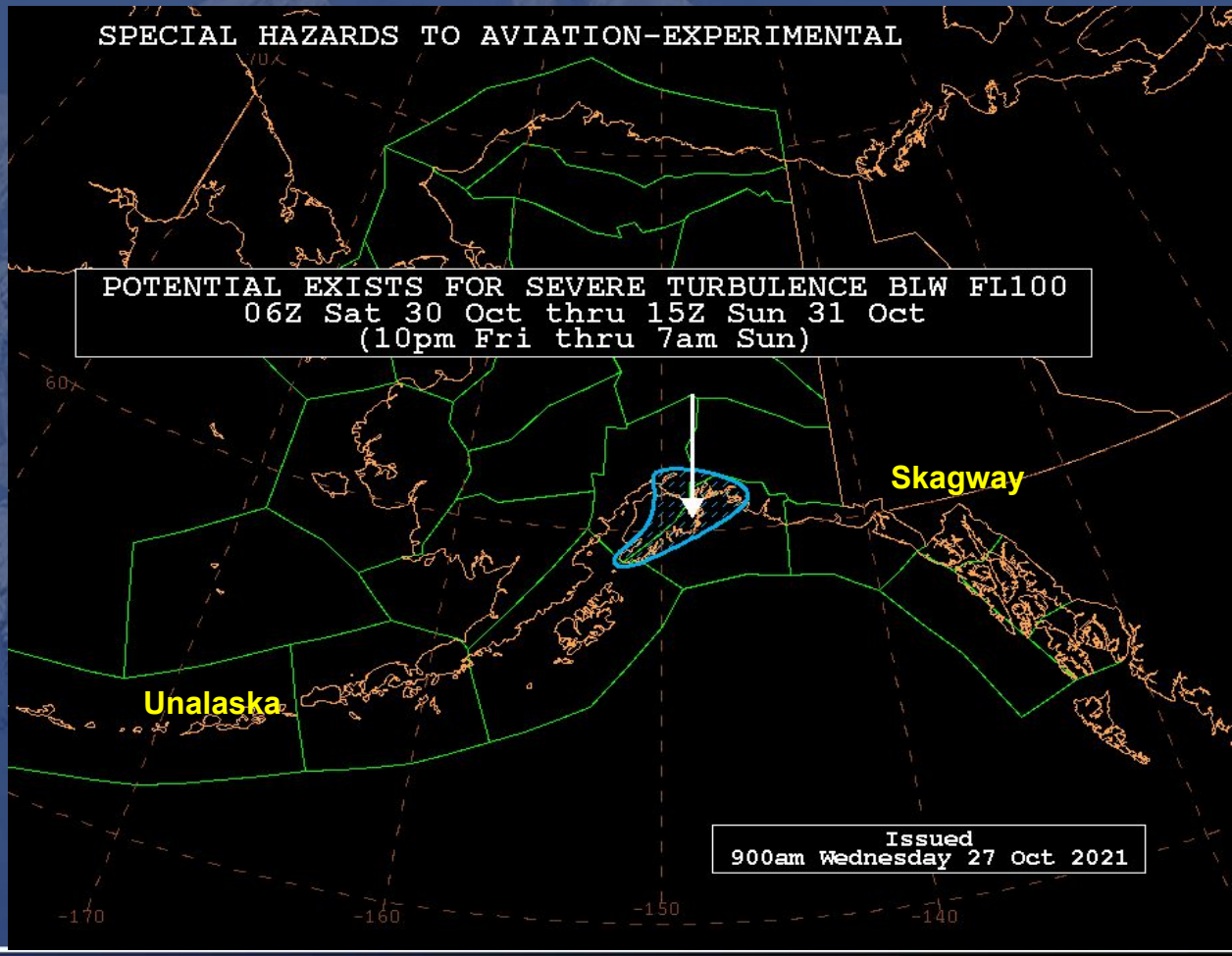
-Issuance times:
By 6am/9pm (trying to standardize 6am and 6pm)



Special hazard to aviation chart

-SEV TURB threat
-SEV ICE potential
-Altimeter settings 31” Hg or greater

-Issuance time:
Target 36-60-hrs in advance

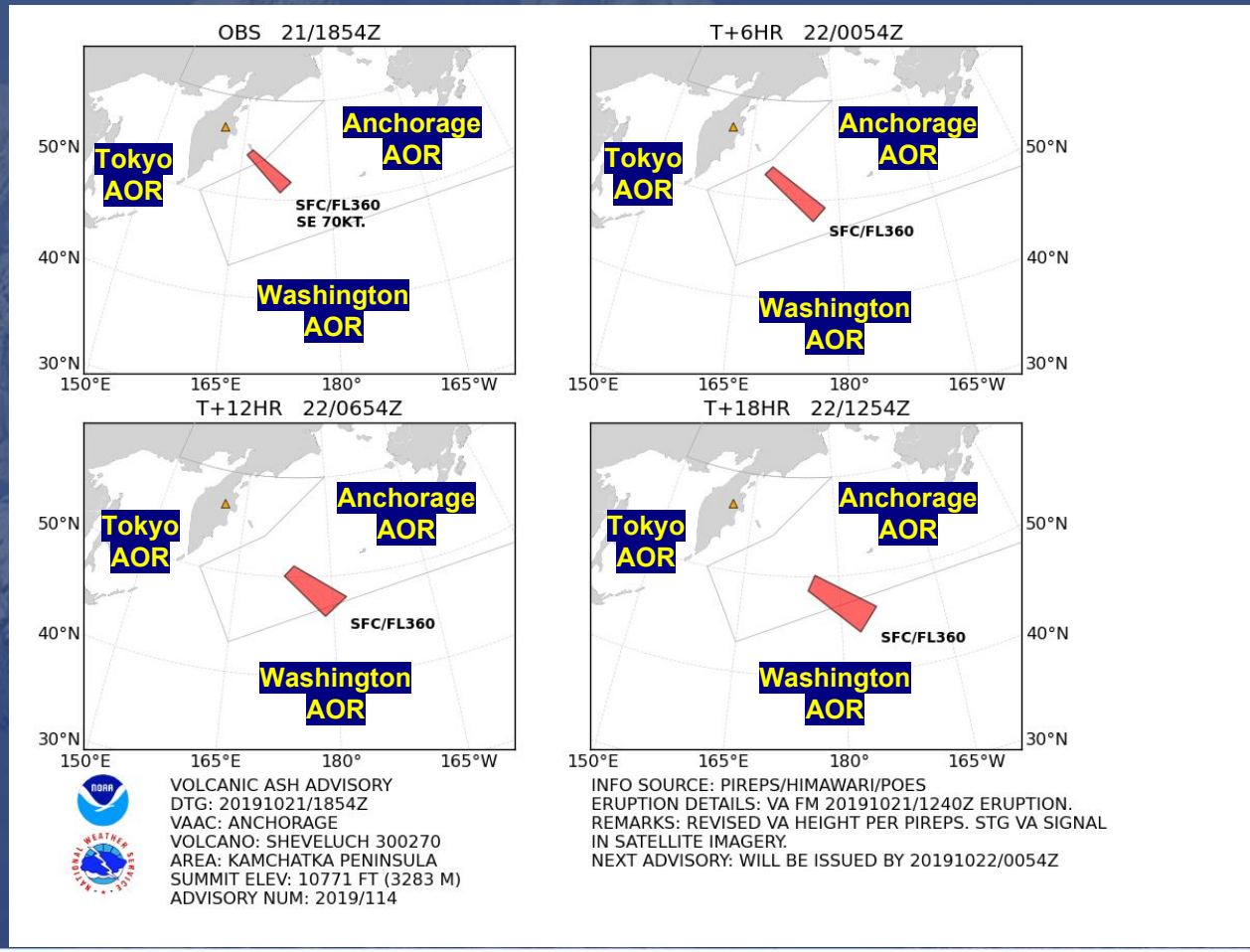


Volcanic ash graphics

-Graphical depiction of VA

-Coordination with international VAACs

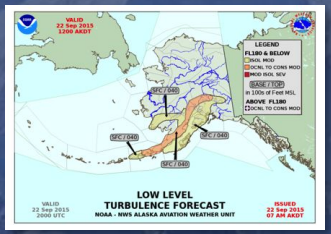
-E-mail notifications to core partners

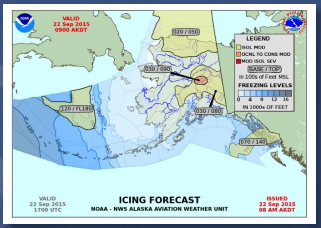


AAWU & VAAC Division of Duties

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 Advisories/Graphics

Summary

-Two offices in one; Meteorological Watch Office and Volcanic Ash Advisory Center responsibilities being done simultaneously

-Loads of information (much of it high resolution!) to assimilate to make decisions; web-based, AWIPS and IC4D tools utilized

-We are an accessible office; direct phone lines to our meteorologists, and presence in NWS-chat for those with appropriate credentials

Links/resources

-AAWU website: https://weather.gov/aawu
-USFS smoke model: https://tools.airfire.org/websky/v2/#status
-MOG turb tool: http://cimss.ssec.wisc.edu/turbulence/Alaska
-NWS chat: http://nwschat.weather.gov
-FAA webcams: https://weathercams.faa.gov/

Thank you! Questions?

weather.gov/aawu -- Alaska Aviation weather products

weather.gov/vaac -- Volcanic Ash products

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