

# THE NASA-VAAC INITIATIVE

Toward improved dialogue between research and operational activities for aviation safety after volcanic eruptions

Jean-Paul Vernier(1,2), N. Krotkov(3), N. Eckstein(4), A. Naeger(5), D. Bensimon(6), R. Kahn(3), J. Tackett(2), G. Taha(3)

1. National Institute of Aerospace, USA

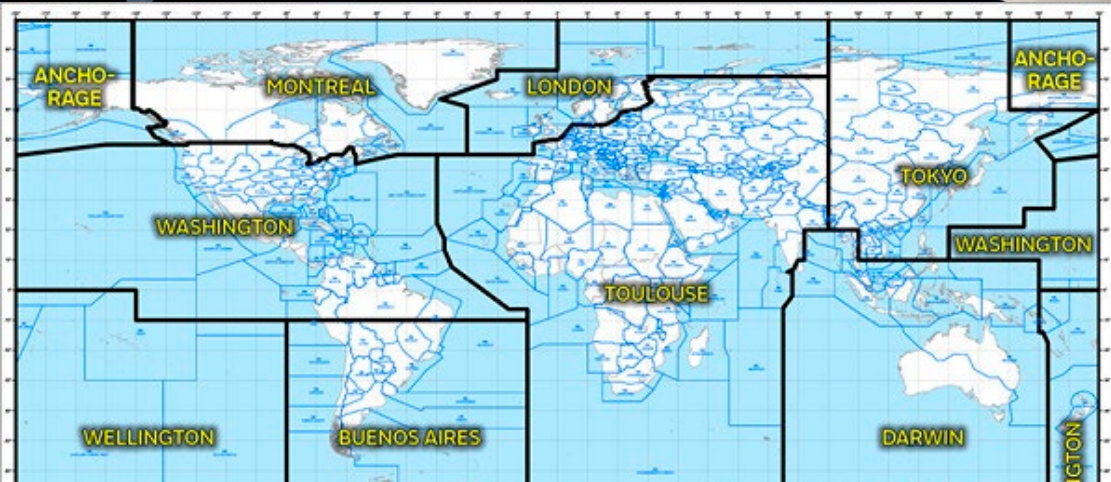
2. NASA Langley Research Center, USA

3. NASA Goddard Space Flight Center, USA

4. NOAA, National Weather Service, USA

5. University of Alabama, USA

6. Meteorological Service Canada, Canada



## VOLCANIC ASH : A THREAT FOR AVIATION

- Volcanic ash can damage aircraft engines and represent a threat for aviation/ Volcanic sulfate can also pose AQ problems in cabins.
- Icelandic eruption in 2011 costed 1.7 b\$ for US aviation industry
- 9 Volcanic Ash Advisory Centers worldwide monitor the presence of volcanic ash to warn aviation

**NASA engagement with the VAACs to enhance use of satellite data to monitor volcanic ash**

# THE NASA-VAAC INITIATIVE

## Objectives :

- Improve dialogue between NASA satellite teams and the VAACs
- Enhance use of satellite data to monitor volcanic ash
- Receive feedback from the VAACs to design future generations of satellite observations

## Initiatives:

- Bi-annual workshop between NASA and the VAACs
- 3 workshops took place since 2022
- Well attended by the VAACs
- Example of the recent Shiveluch eruption

ICAO



# NASA-VAAC WORKSHOP STATISTICS

## VAAC involvement (6/9)

- **Buenos Aires**
- **Anchorage**
- **Montreal**
- **Tokyo**
- **Wellington**
- **Darwin**

## US Participation in addition to NASA

- NOAA, USGS

## NASA Mission Personnel/Subject Matter Experts

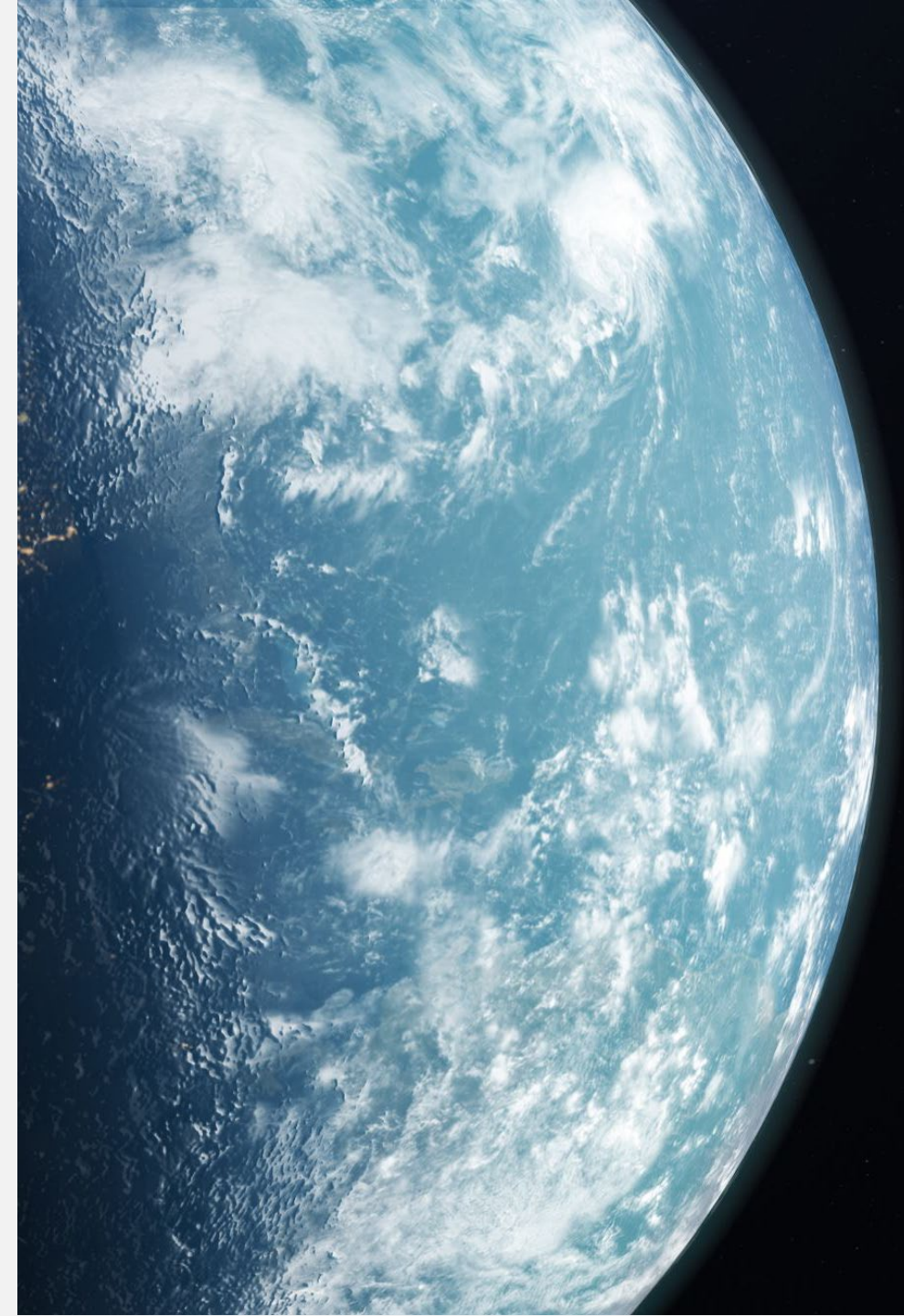
- Launched mission, TEMPO, CALIPSO, MISR, MODIS, OMPS
- Future mission AOS, PACE, MAIA

# TIMELINE



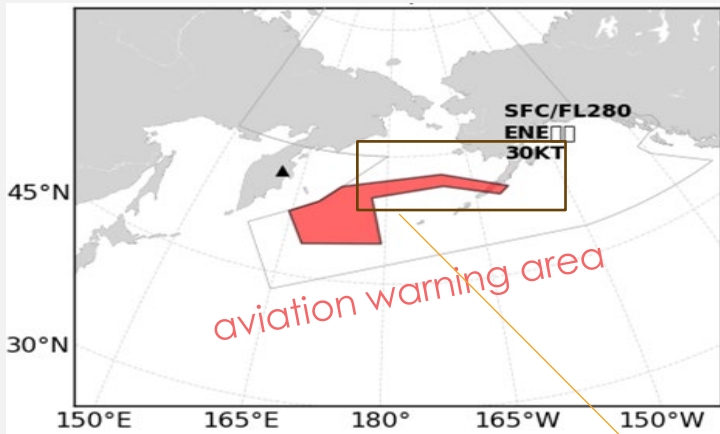
## TOPICS COVERED

- Volcanic ash and sulfate clouds observed with NASA Satellites: pros and cons
- How to shape future NASA missions according to end-user's needs ?
- What types of products are most useful ? How to disseminate the information ?
- Do the VAACs need training to use new satellite products ?
- Feedback from existing NASA-funded projects

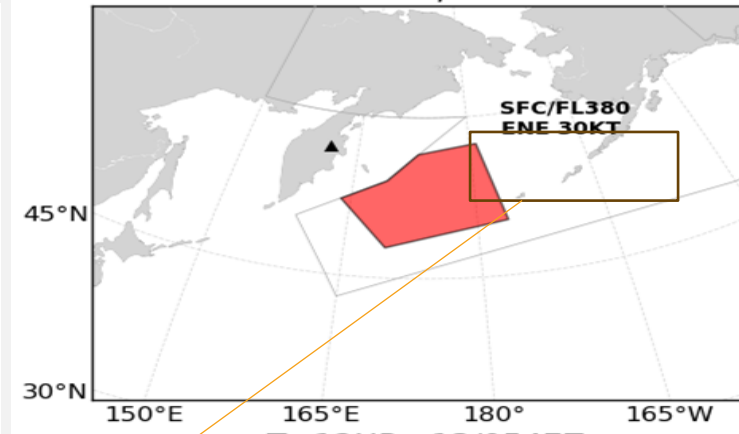


# NASA DAY-NIGHT MONITORING OF VOLCANIC SO<sub>2</sub> AND ASH FOR AVIATION (PI: NICK KROTKOV GSFC)

Eruption of Shiveluch volcano on April 11, 2023



1200Z 12 April 2023

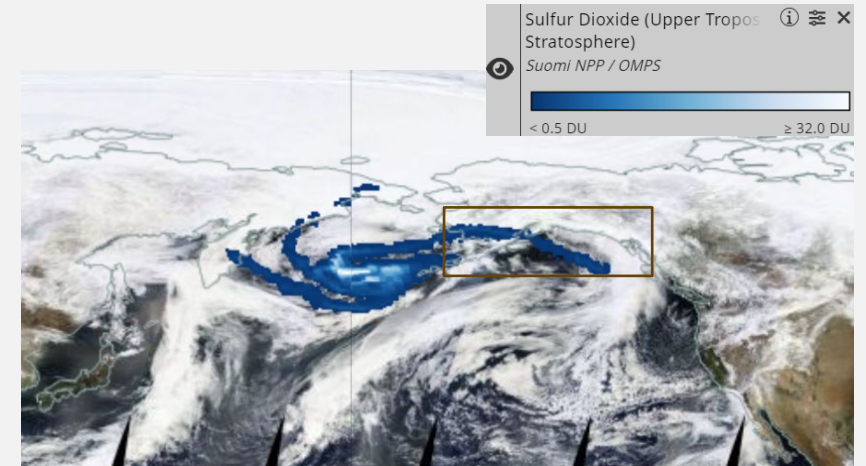


1747Z 12 April 2023

Area removed by the VAACs using SO<sub>2</sub> information from VIIRS

“Using the GOES ash RGB with both VIIRS SO<sub>2</sub> and ash index products proved useful in the analysis and provided confidence in the RGB analysis of an SO<sub>2</sub> filament extending eastward over the Bering. This area was removed from the warning area before 18Z.”

- Nate Eckstein, Anchorage VAAC



OMPS 12 April 2023 NASA worldview

- VAACs used NASA data to refine their ash advisories during the Shiveluch eruption
- Presence of SO<sub>2</sub> and absence of ash led the Anchorage VAAC to remove areas from ash warnings.



FEEDBACK  
AND  
FUTURE  
PLANS

Post-workshop survey distributed on a regular basis to gain feedback regarding meeting structure, topics covered, and suggestions for future workshops

Will change meeting frequency or length depending on needs



# CONCLUSIONS



The NASA-VAAC workshop initiative was created during COVID to improve dialogue between NASA missions and the VAACs



Virtual environment makes it possible to keep a format with regular but short meetings (bi-annual)



Attendance usually from 6 of 9 VAACs, with the major satellite missions represented, indicates the value of this effort



Increased structure and formalized tasks could be a way to move forward