NASA OMPS Nadir Science Team Products, Validation and Applications

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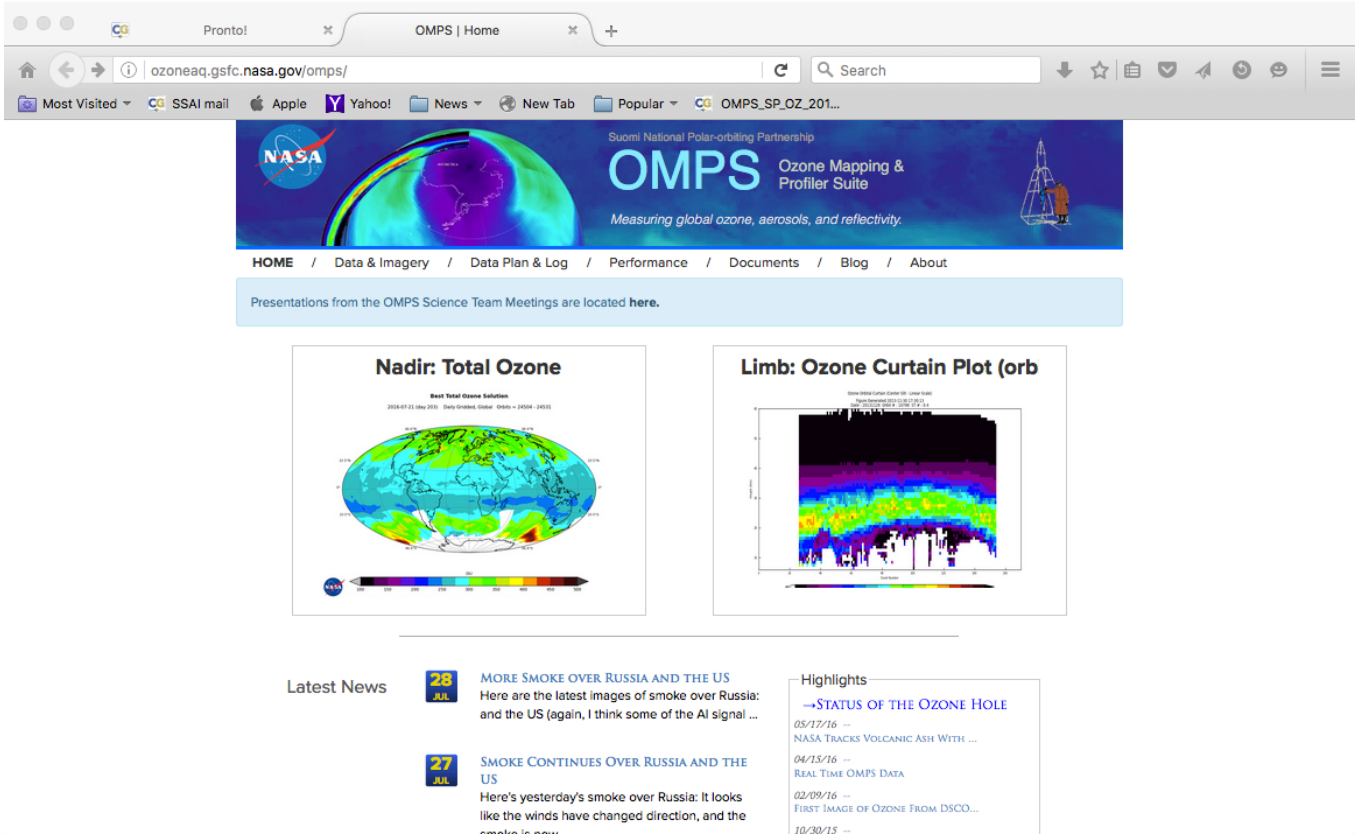
NASA OMPS Science Team / SIPS

Summary

- NASA Science Team and SIPS recently completed reprocessing of OMPS NM and NP data
  - Designated V2
  - Will be first version archived at the GSFC DISC
  - Uses NASA convention - L1A (not RDR), L1B (not SDR), L2 (not EDR), L3
  - Current L2 based on V8 SBUV/2 algorithm for NP, V8.6 algorithm for NM
    - New NM L2 using V9 algorithm planned for next year
- Dataset is currently being validated
  - Will present some initial assessments
- "Forward" processing of V2 dataset currently taking place
  - L3 data (both HDF5 and ASCII format) / images available from
  - http://ozoneaq.gsfc.nasa.gov/omps
    - Special "ozone hole" page will be set up and available
- Near real-time and real-time applications of V2 in development
  - Based on V1 "pathfinders"

Ozone Hole Page at http://ozoneaq.gsfc.nasa.gov/omps



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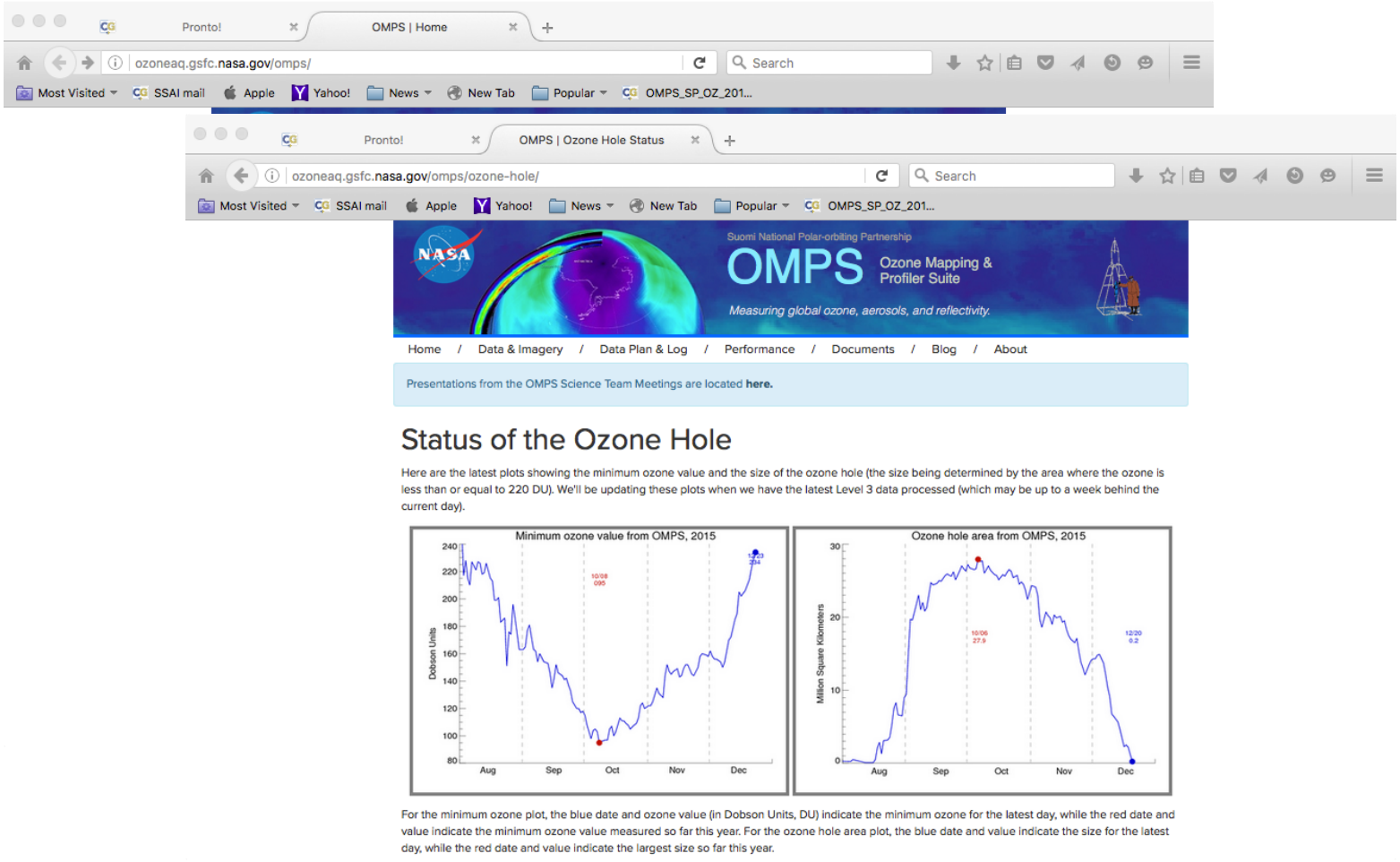

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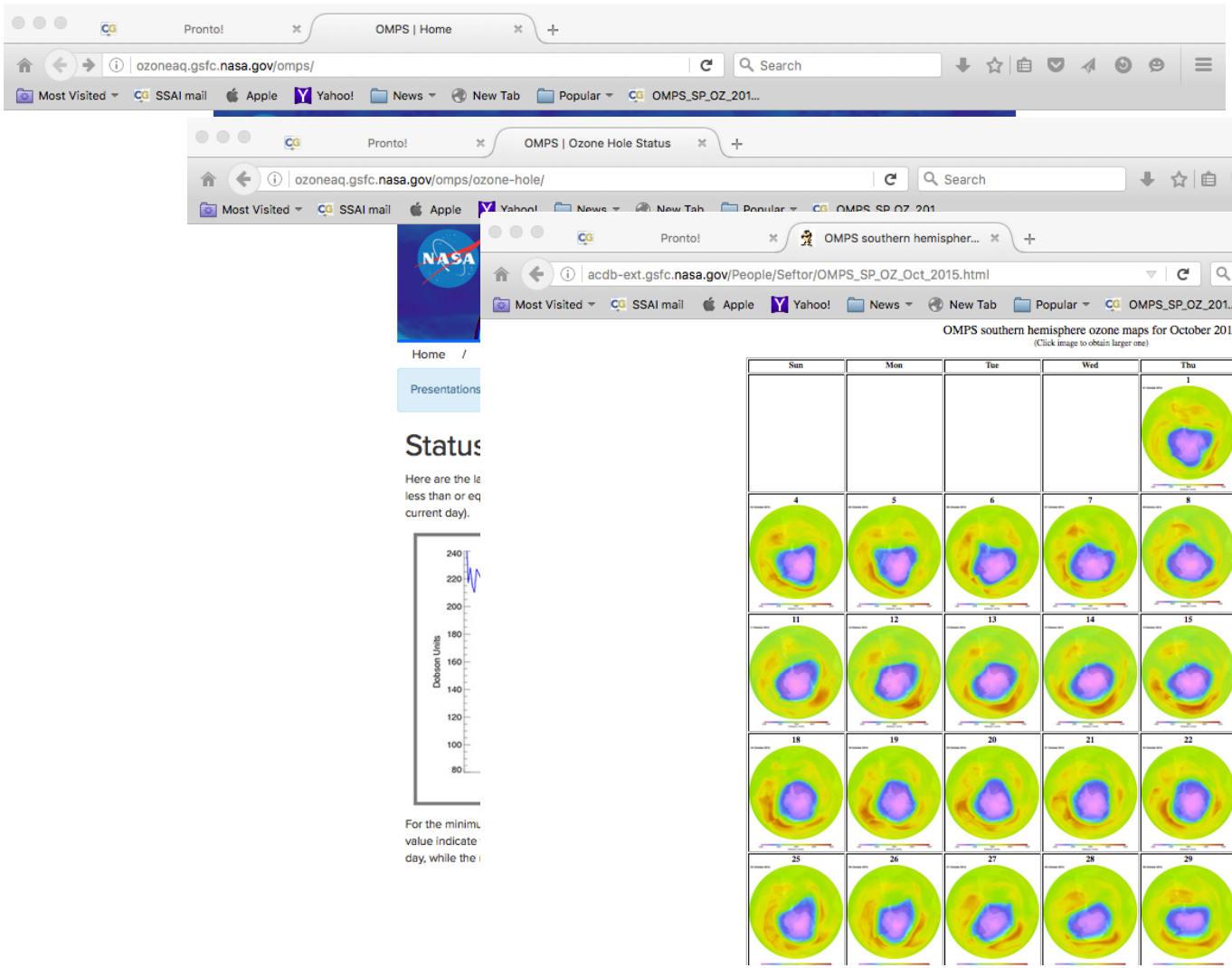
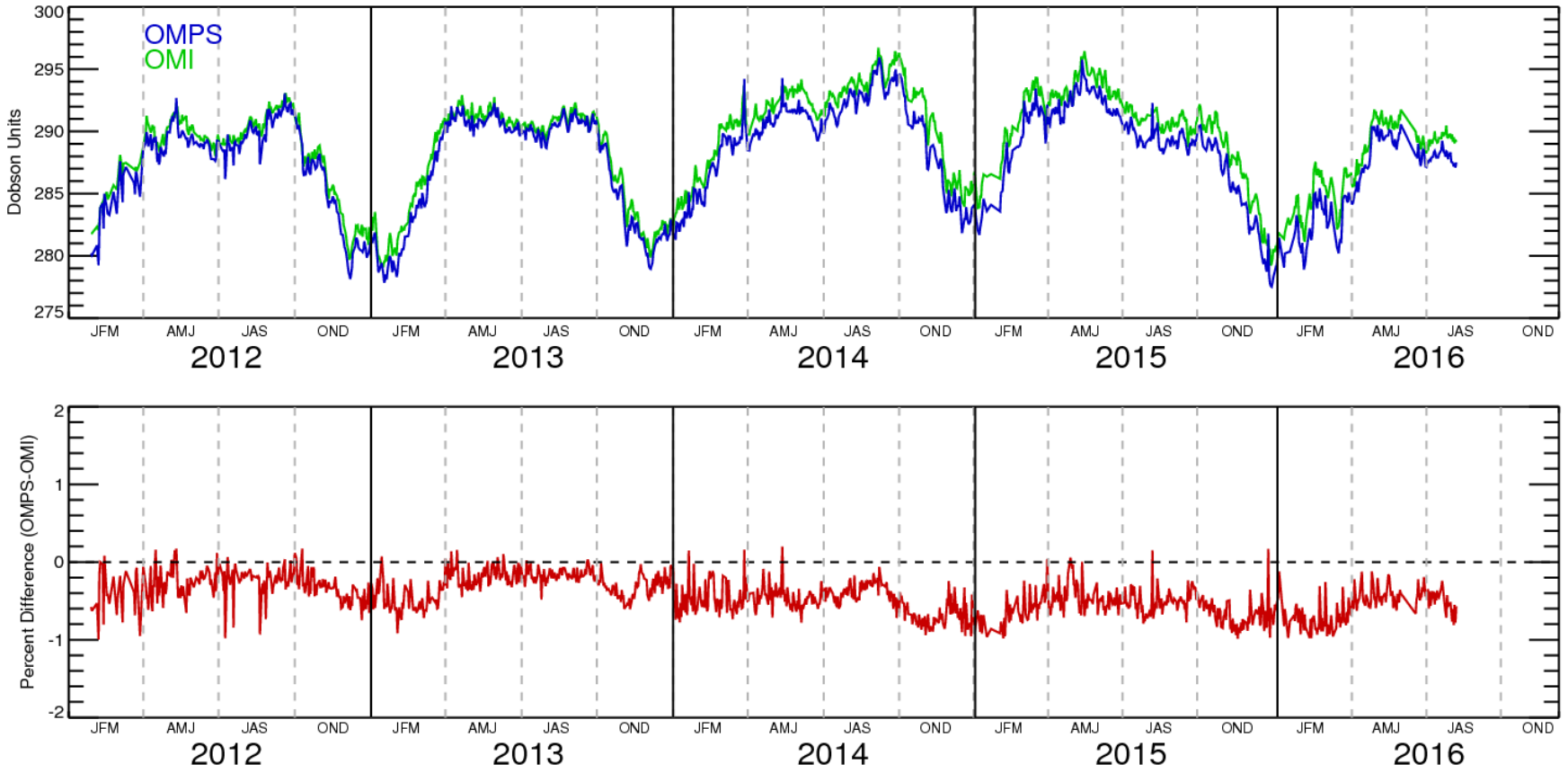


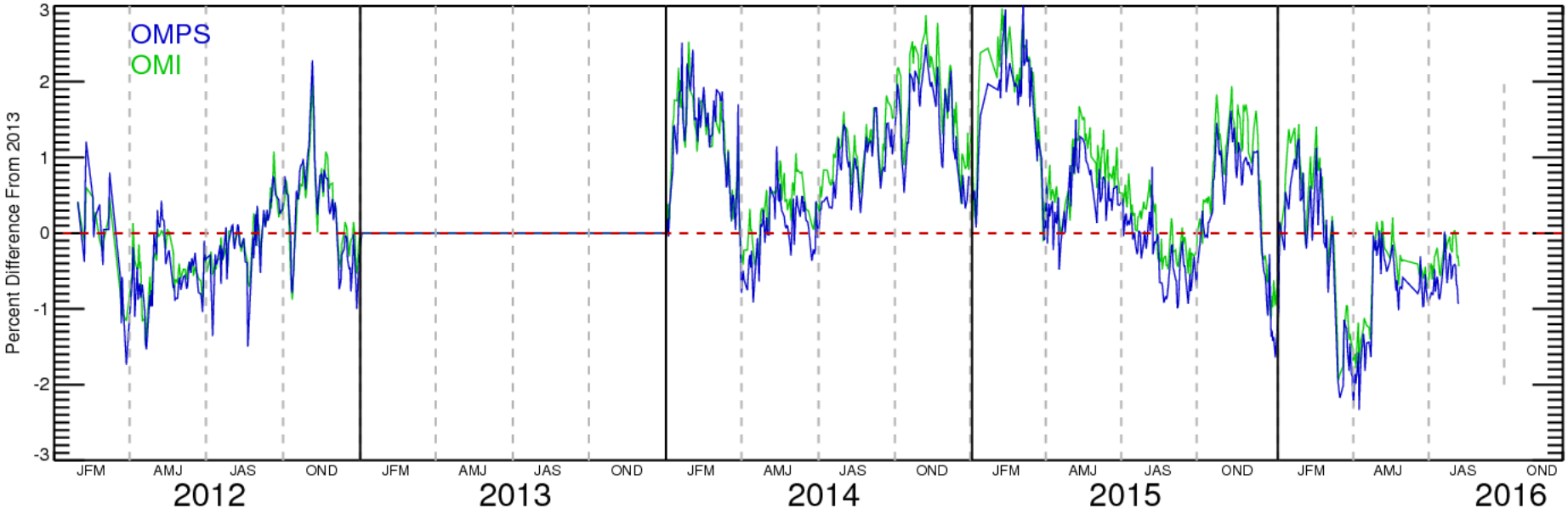
Comparison of OMPS to OMI total ozone

OMI / OMPS / Difference

(Average total ozone from -60 to 60 degrees latitude)

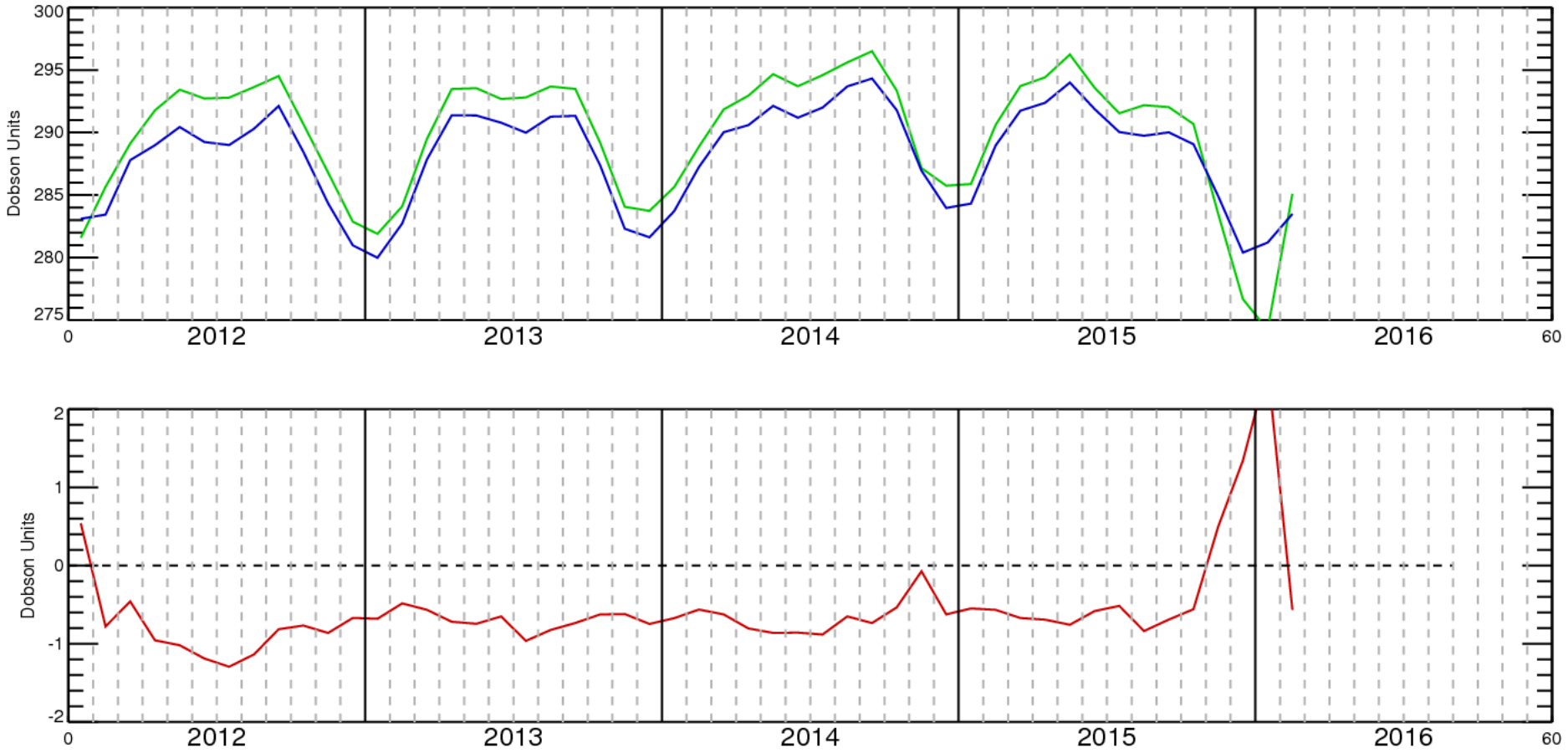


Comparisons of OMPS/OMI total ozone to 2013



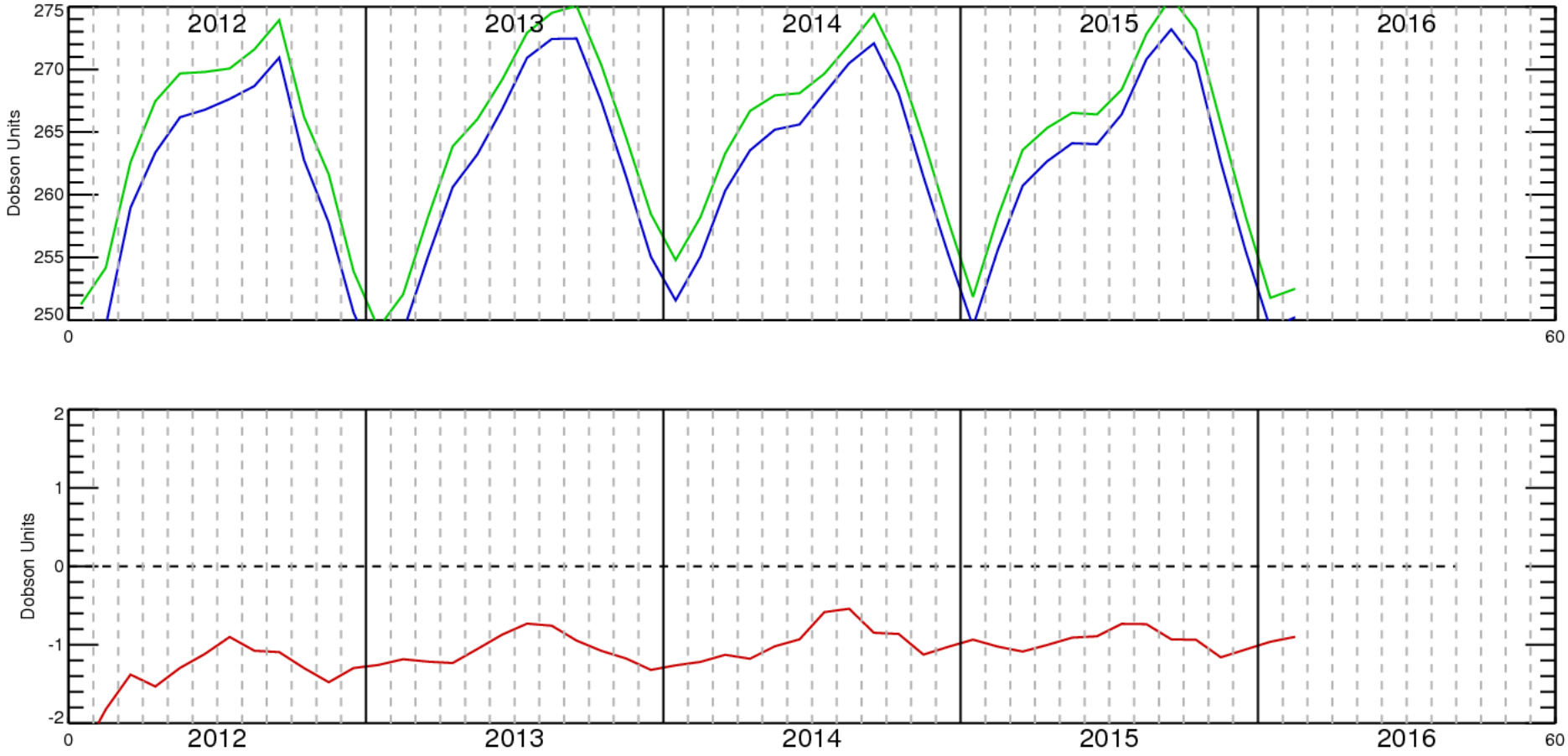
Comparisons of OMPS to NASA's MOD (Merged Ozone Dataset – 60S to 60N)

MOD is a monthly-mean zonal and gridded average products constructed by merging individual SBUV/SBUV/2 (total and profile ozone) data sets



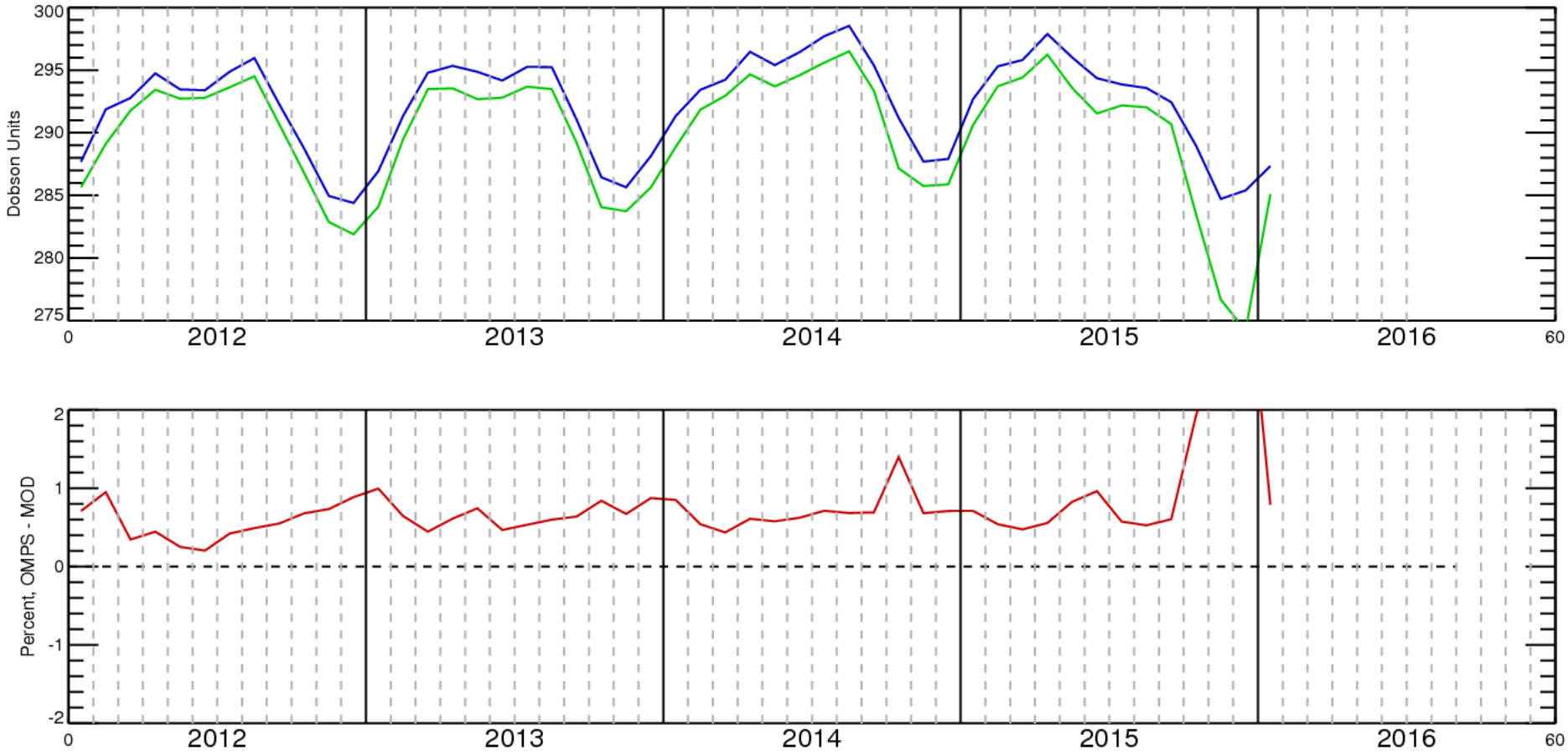
Comparisons of OMPS to NASA's MOD (Merged Ozone Dataset – 30S to 30 N)

MOD is a monthly-mean zonal and gridded average products constructed by merging individual SBUV/SBUV/2 (total and profile ozone) data sets



Comparisons of OMPS NP to MOD (Merged Ozone Dataset – 60S to 60N)

Total Ozone = Sum of Ozone Profile



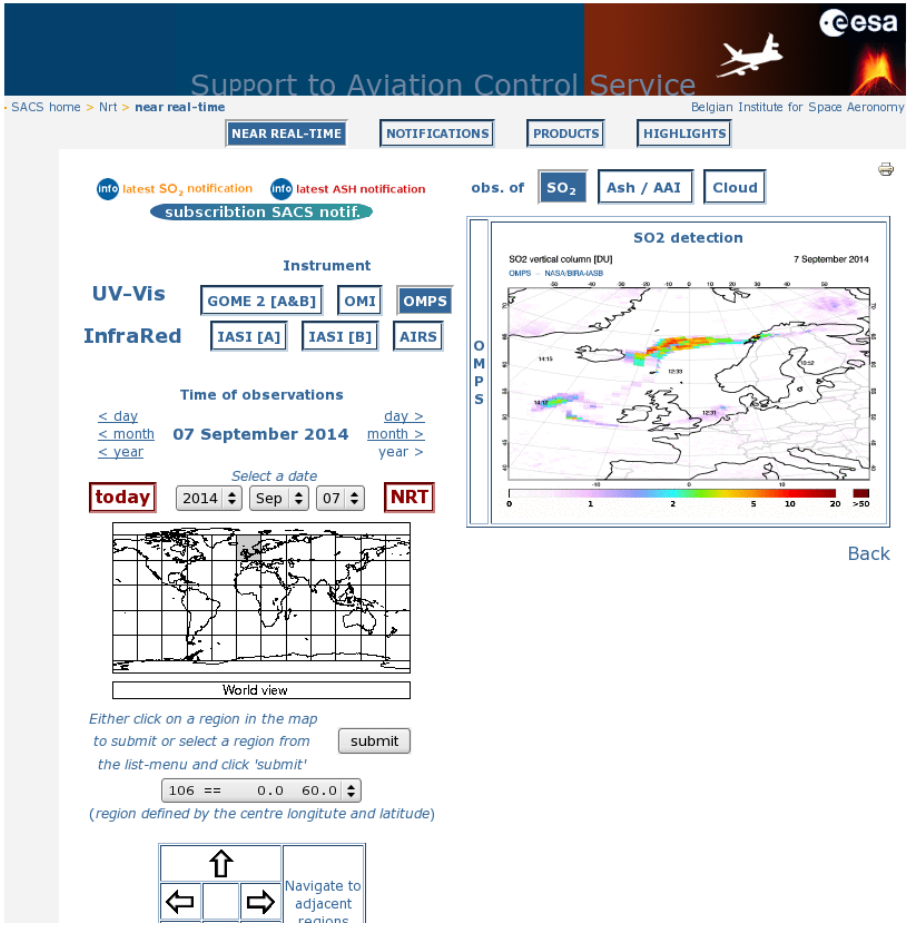
Near Real-Time OMPS data

- The OMPS Science Team and SIPS are working on incorporating the following products in the Land, Atmosphere Near real-time Capability for EOS (LANCE) system by the end of this year
  - SO_2
    - Monitoring of volcanic eruptions
    - Mapping of volcanic ash clouds hazardous to aviation
  - Aerosol Index
    - Monitoring of volcanic eruptions
    - Mapping of volcanic ash clouds hazardous to aviation
    - Dust / Smoke monitoring and forecast
  - Ozone
    - "Identification of stratospheric air intrusions leading to rapid cyclogenisis and hurricane force winds"
    - Mapping of high ozone areas for aircraft to avoid
      - Can adversely affect crew/passenger health
- Access through LANCE will facilitate their availability and use through
  - Worldview (https://worldview.earthdata.nasa.gov/)
  - GIBS (Global Image Browse Services)
  - Access via ftp (need to register with urs.earthdata.nasa.gov)

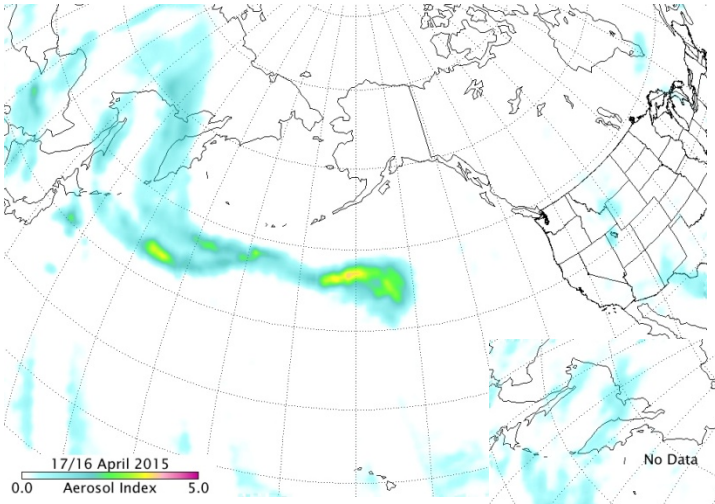
Volcanic Eruption Monitoring

OMPS currently supports the ESA's Support to Aviation Control Service (SACS)
With near-real time SO_2 and AI data

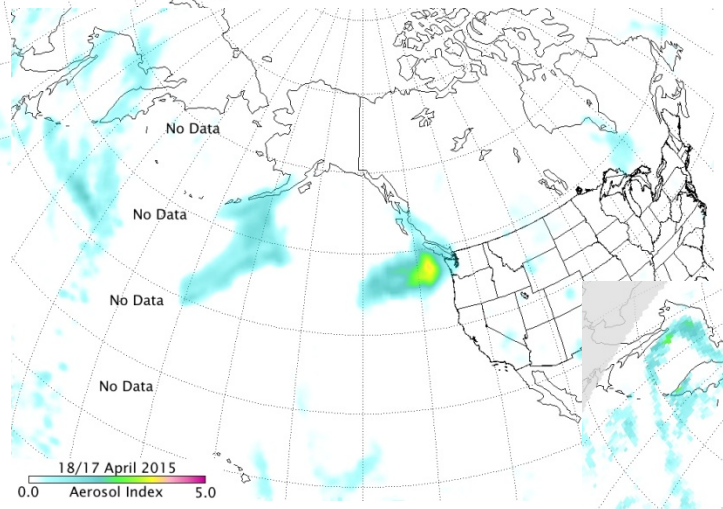
Example from last year showing eruption of Bardarbunga / Holuhraun

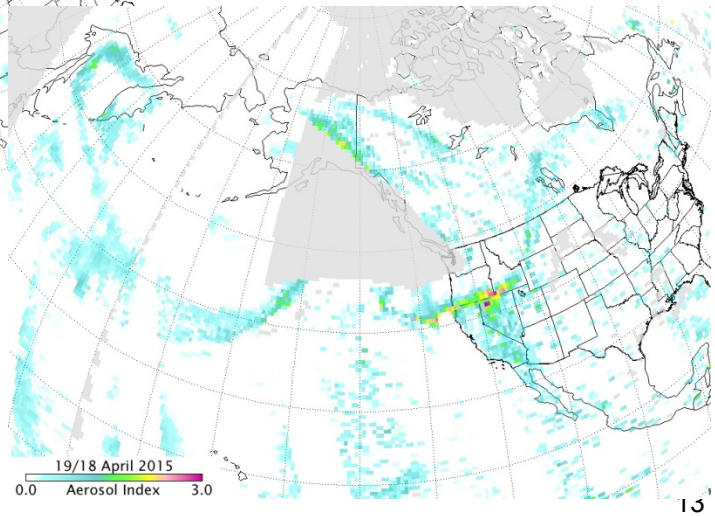


Smoke / Dust Monitoring



The HMS (Hazard Mapping Service) group of NOAA's Satellite Analysis Branch wants a near real-time OMPS AI product to map and forecast both smoke and dust events

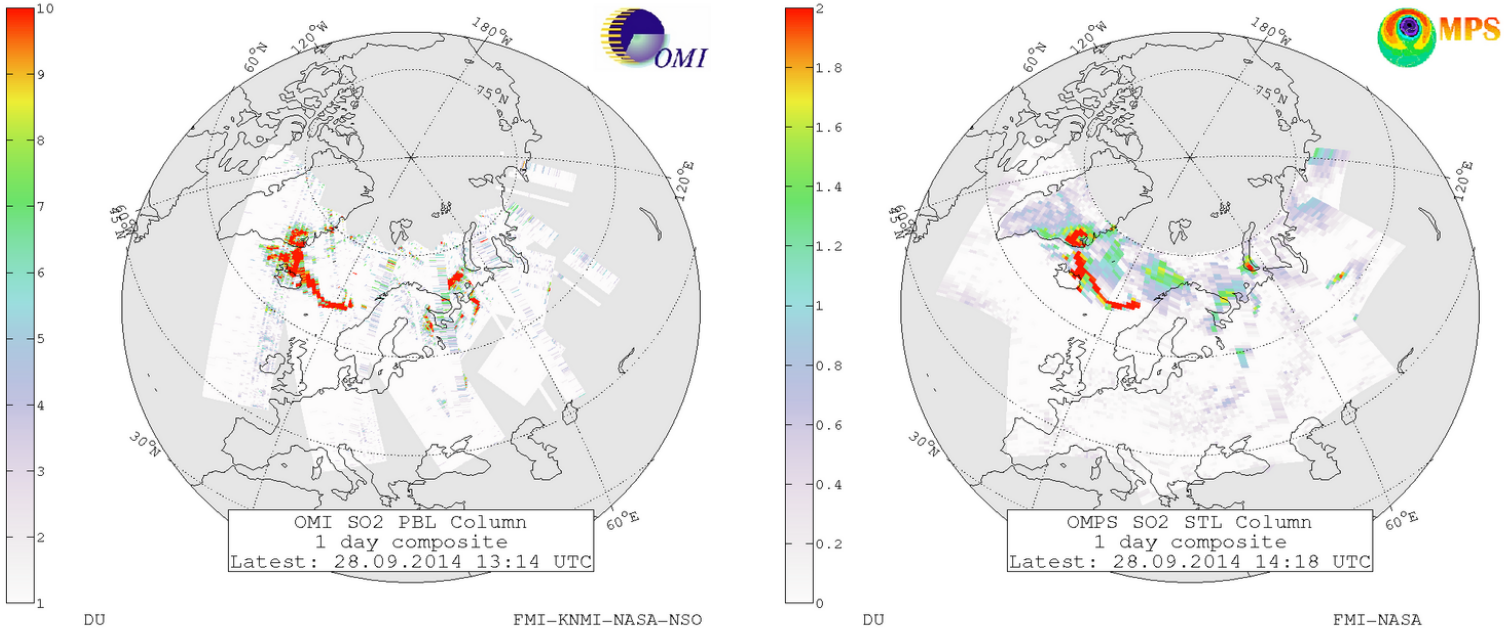




Smoke from Siberian fires travelled across the Pacific to North America this week

Real-Time Suomi NPP OMPS Data Processing Being Performed

- S-NPP OMPS Science Team and GSFC DRL incorporated OMPS processing package to provide real-time OMPS data similar to OMI
  - Package uses NASA's algorithms, provides continuity with OMI
  - FMI, GINA (and ESA's SACS) provide warning to VAACs, pilots, airlines, etc

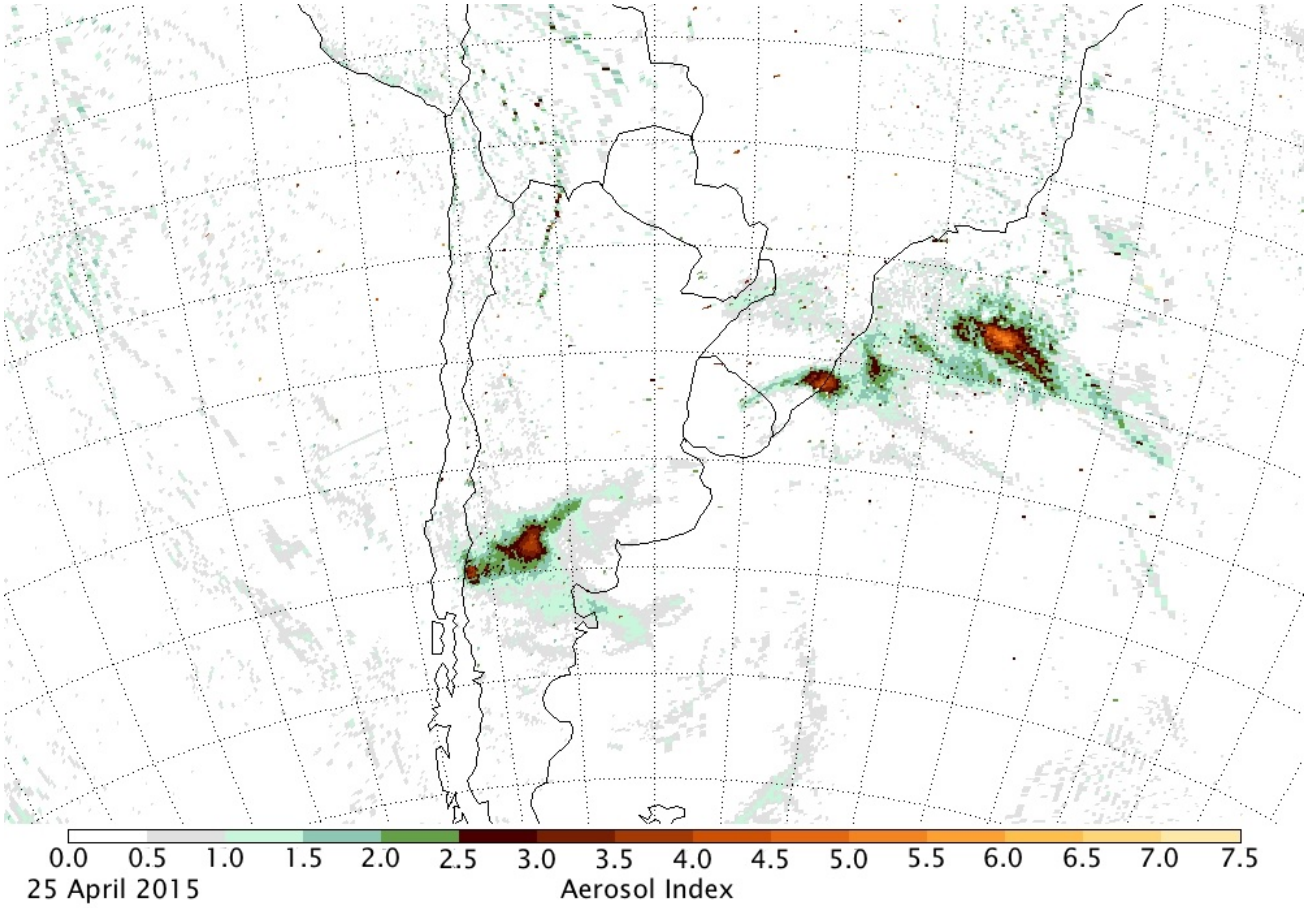


FMI monitoring of Bardarbunga / Holuhraun eruption (from http://sampo.fmi.fi)

Real-Time Data Processing from Suomi NPP OMPS Useful Globally

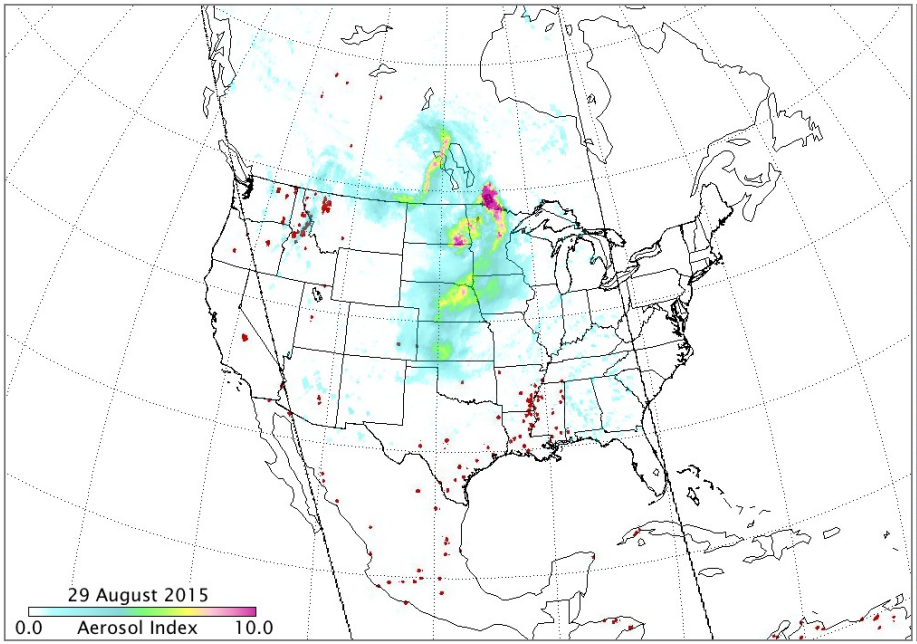
- As part of IPOPP, OMPS SO_2 and Aerosol Index information will be available to the entire DB community

Volcanic Ash from the eruption of Calbuco
25 April 2015
OMPS Aerosol Index
(High resolution mode)

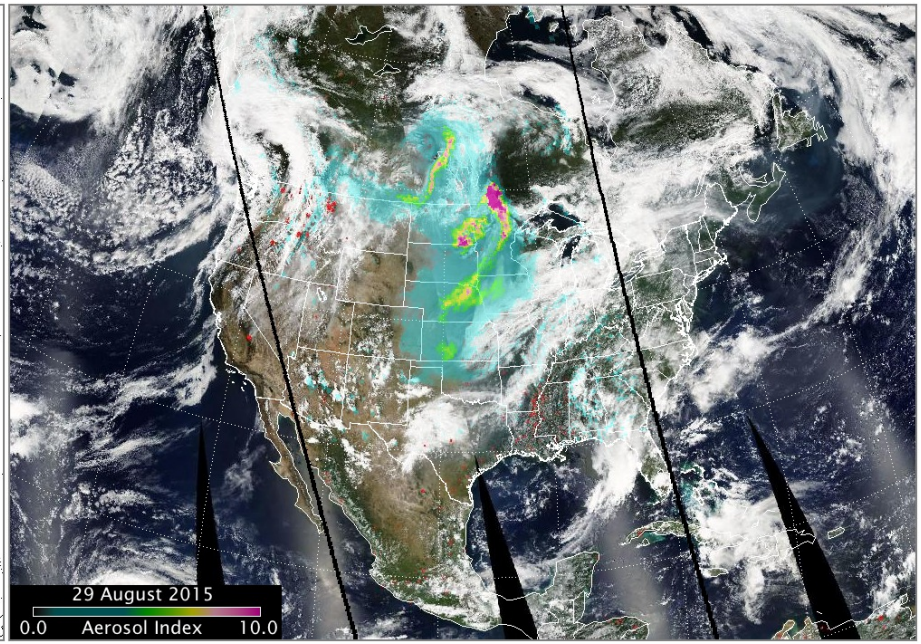


OMPS Real-Time Aerosol Index Data Also Useful for Other Purposes

- Real-time processing of OMPS data may also provide valuable information on smoke and dust transport, air quality forecasts, validation/verification of PyroCb events



OMPS Aerosol Index over MODIS hotpot



OMPS Aerosol Index over MODIS RGB

For more examples, see http://ozoneaq.gsfc.nasa.gov/omps/blog