SPoRT R2O Paradigm:

bridging the gap between experimental and operational phases

EMILY BERNDT & AARON NAEGER

SHORT-TERM PREDICTION RESEARCH AND TRANSITION CENTER

NASA MARSHALL SPACE FLIGHT CENTER

SPoRT Mission

Mission: Transition unique NASA and NOAA observations and research capabilities to the operational weather community to improve short-term weather forecasts on a regional and local scale

SPoRT prepares the ***community*** of ***end users and mission scientists*** for next generation satellite missions and capabilities through an interactive R2O/O2R paradigm

Current/Future Activities:

Successful partnerships to prepare NWS forecasters for GOES-R and JPSS through use of experimental proxy products

Expanding partnerships to other government agencies and new NASA missions

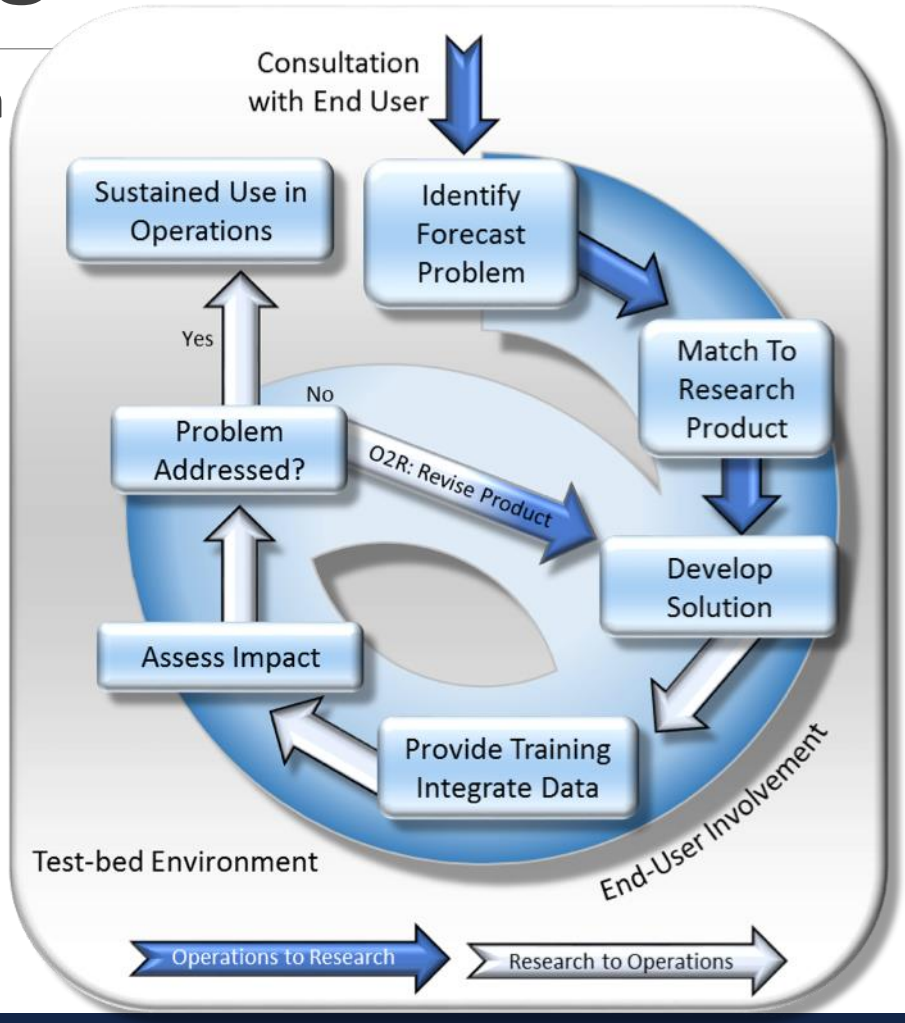
R2O/O2R Paradigm

Bridge the “Valley of Death” through interactive partnership with end users and product or algorithm developers

- Integrate data into user decision support tools
- Create product training
- Conduct product assessments

Concept has been used to successfully transition more than 40 satellite datasets to operational users for nearly 15 years

Other groups in the community have adopted this paradigm



Data Approach

SPoRT provides experimental data to end users by LDM, FTP, and WMS depending on application

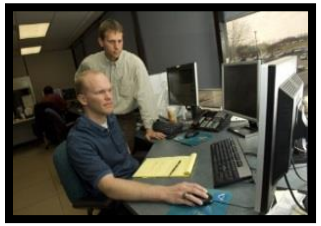
While NASA is not an “operational” data provider, team members strive to provide 24/7 data feeds, knowing that product reliability is key to use by operational forecasters and decision makers

Monitor our product ingest and status for all experimental products going to a customer

Data downlinked from satellite

Data obtained by SPoRT; value-added products generated

Product disseminated to end-user formatted for their decision support system



End-user makes operational decisions using SPoRT products

Training Approach

Targeted, applications based training

Multiple flavors of training are needed to reach all learning styles

- Site visits
- Microlessons
- User-based, interactive modules
- Quick Guides

SPoRT Applications Library

- 1-minute examples
- Short videos
- 21 total cases (and counting)

Collaborate with end users for operational/decision maker perspective

Assessment Approach

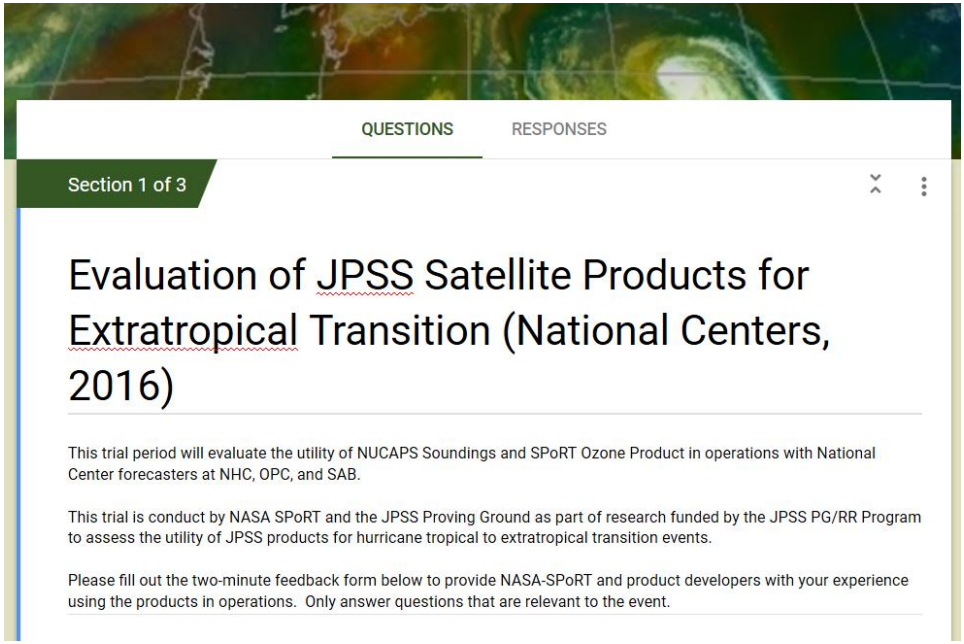
Targeted product assessments with the end user to evaluate utility of product and give feedback to developers

Methods for feedback

- Online form
- Email/phone calls
- Blog

Assessment follow-up

- Wrap-up telecon with participants
- Summarize results in a report for the developers



“Bridging the gap” between experimental and operational

SPoRT prepares the ***community*** of ***end users and mission scientists*** for next generation satellite missions and capabilities through an interactive R2O/O2R paradigm

Keys to successful day 1 readiness include:

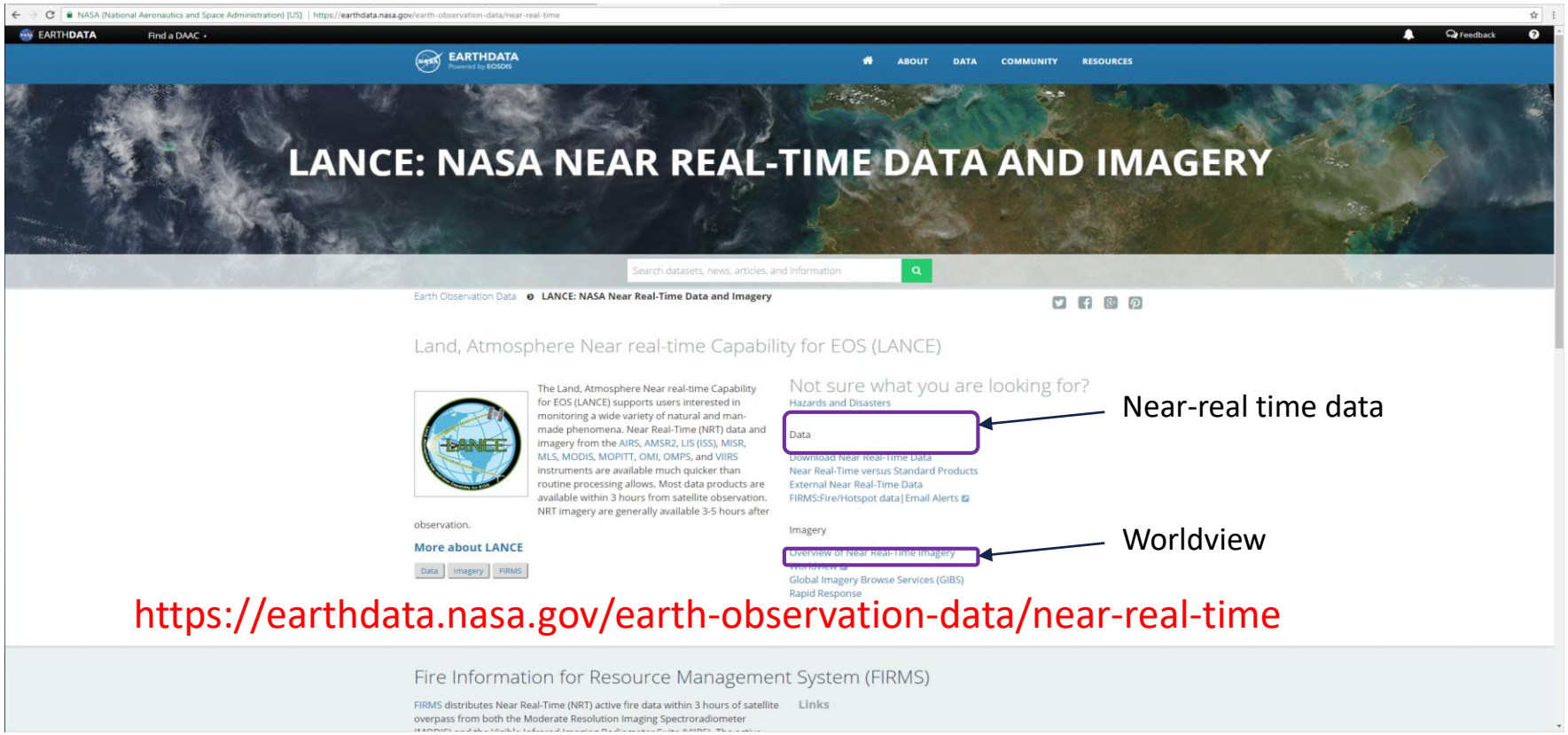
- Data in the end users’ display system
- Targeted training
- Assessments to gather feedback from users for the mission scientists

Pre-launch R2O/O2R activities can provide valuable input to data processers, mission scientists, algorithm developers, and guide baselining of products/capabilities

LANCE/WorldView:

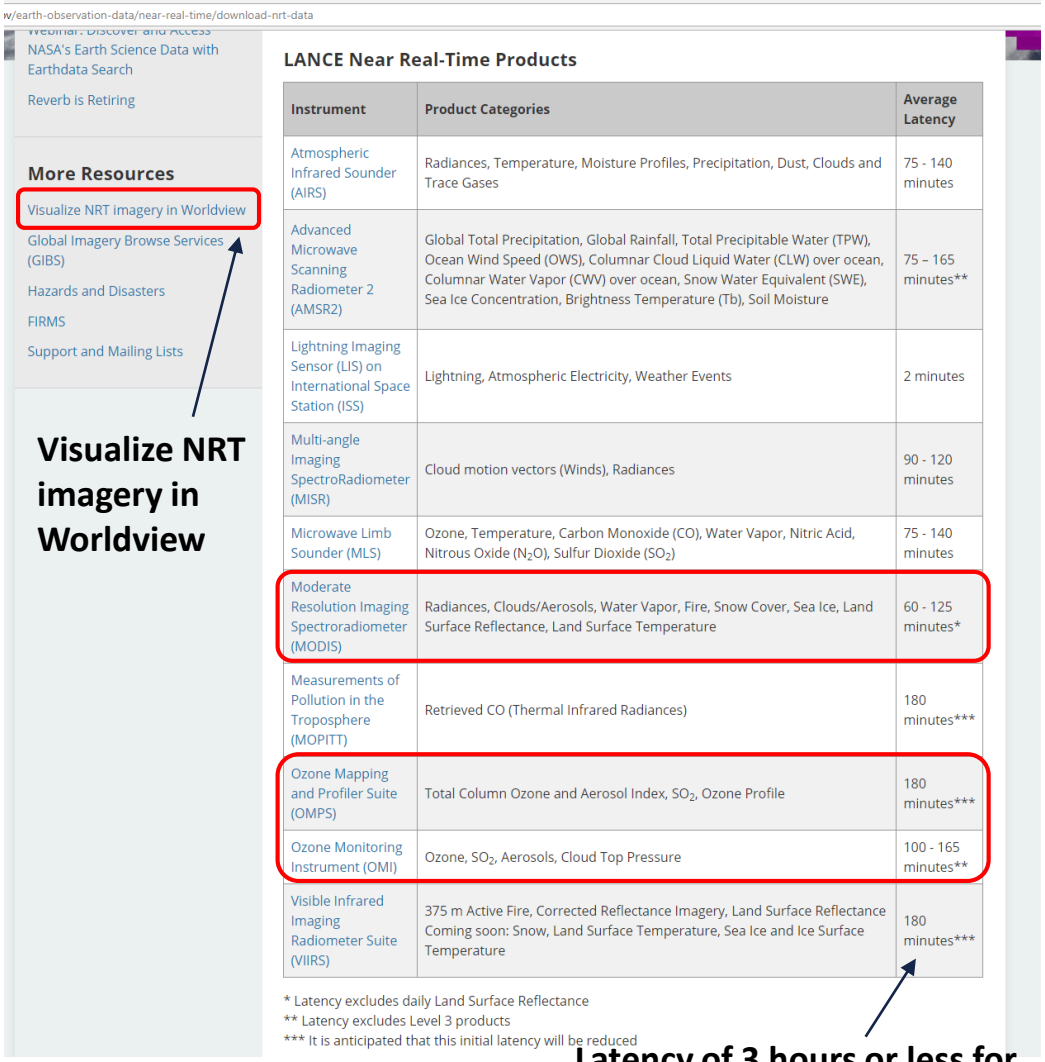
NASA operational capabilities for data delivery, display, and analysis

NASA LANCE



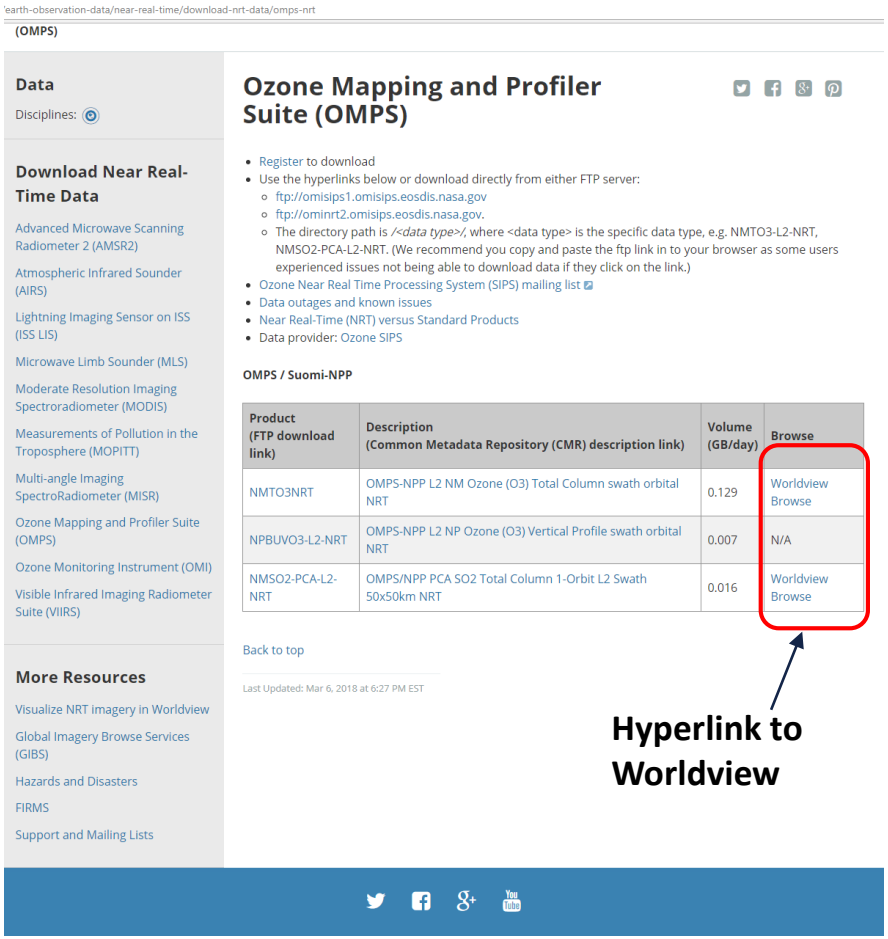
- The Land, Atmosphere Near real-time Capability for EOS (LANCE) provides data from AIRS, AMSR2, LIS (ISS), MISR, MLS, MODIS, MOPITT, OMI, and VIIRS instruments within 3 hours of satellite overpass
- Near-real time data meets application needs such as numerical weather prediction, **forecasting and monitoring natural hazards**, ecological/invasive species, disaster relief, and **air quality**

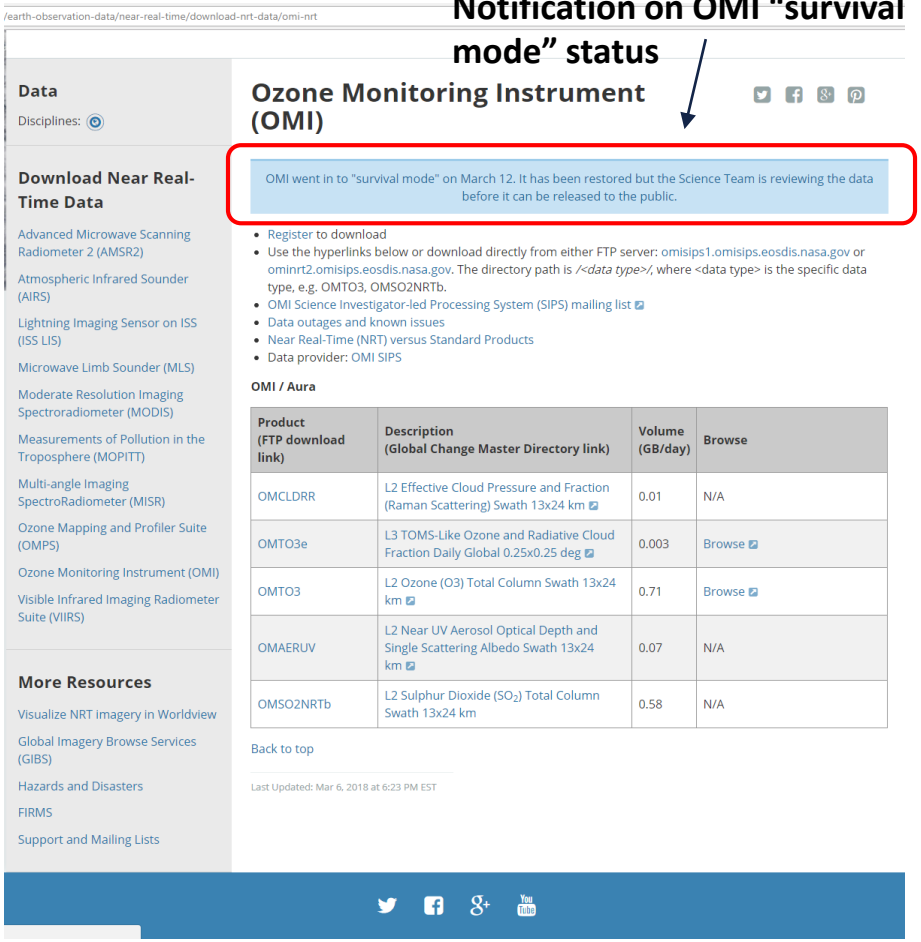
NRT Products



- The instruments and NRT products are listed and average latency is provided
- MODIS aerosol products have average latencies of 2 hours or less
- Air quality instruments (OMPS and OMI) have higher latencies approaching 3 hours
- Can we achieve average latencies of 2 hours or less for TEMPO L1 and L2 products?
- Links to additional details and NRT products by clicking on specific instrument
- Link to visualize NRT imagery in Worldview

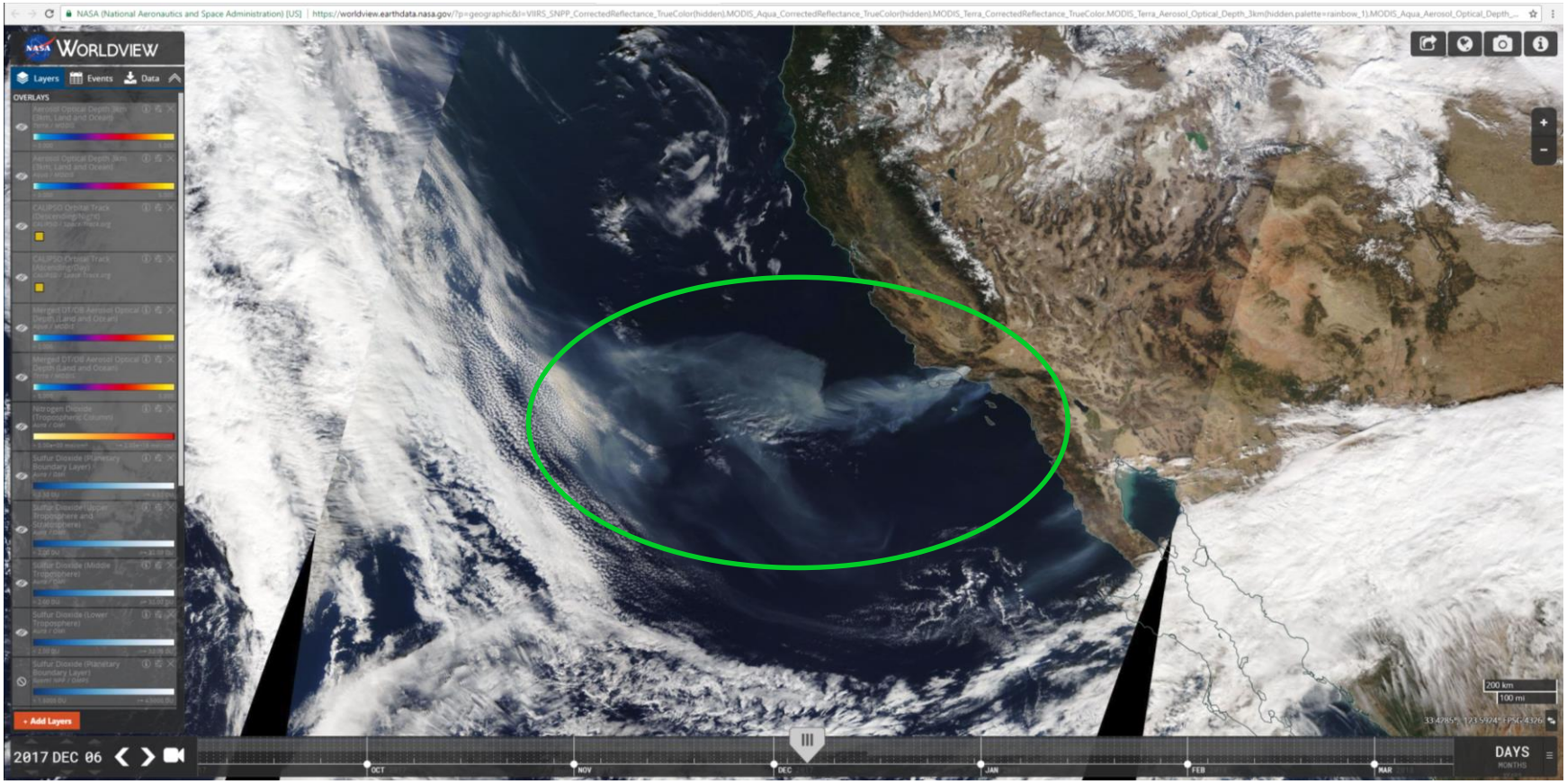
OMPS and OMI





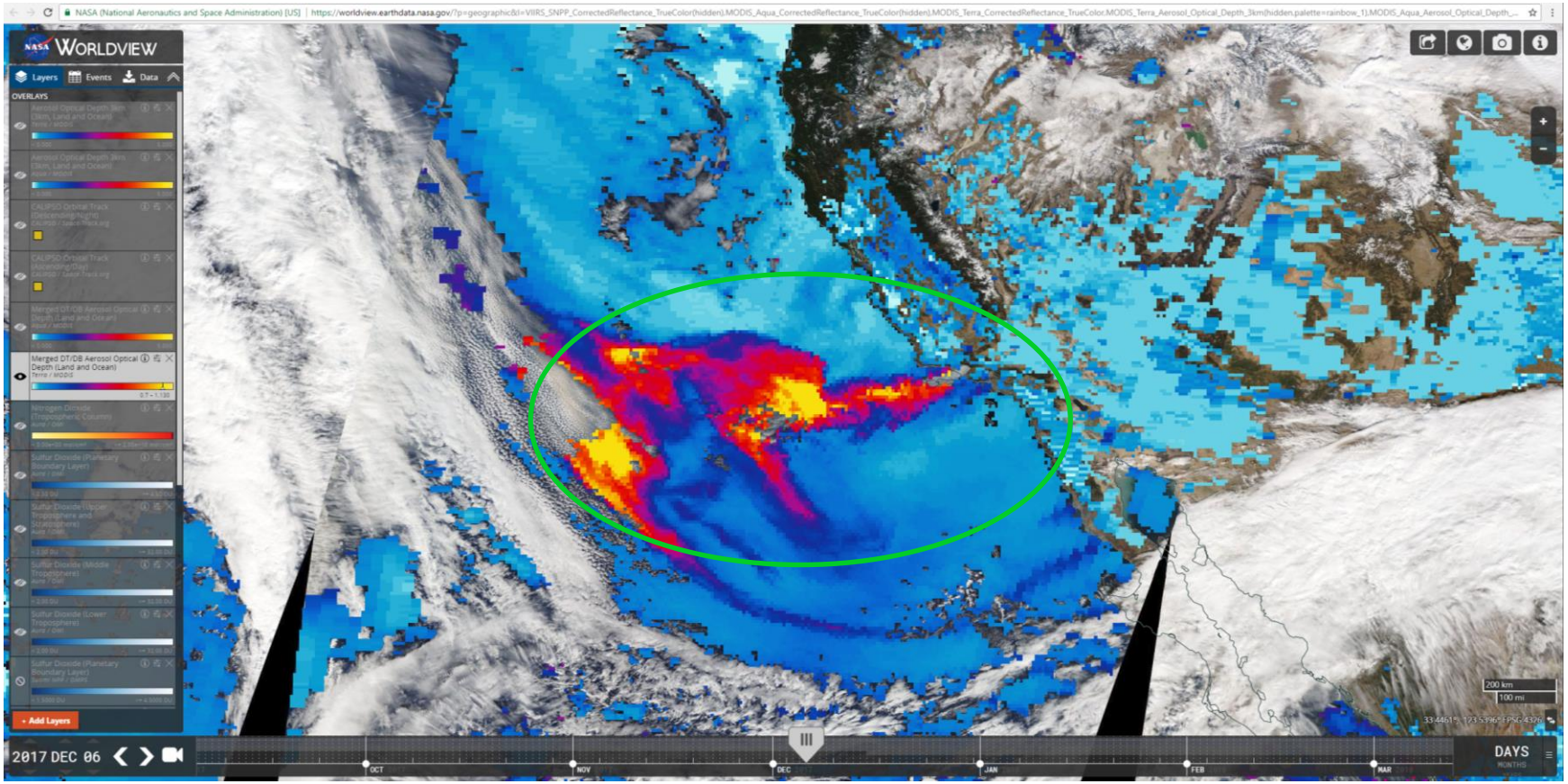
- Hyperlinks to download NRT OMPS and OMI data products
- Provides product descriptions and notifications on instrument and data issues
- Hyperlinks to Worldview

NASA Worldview – 2017 Dec Fire/Smoke



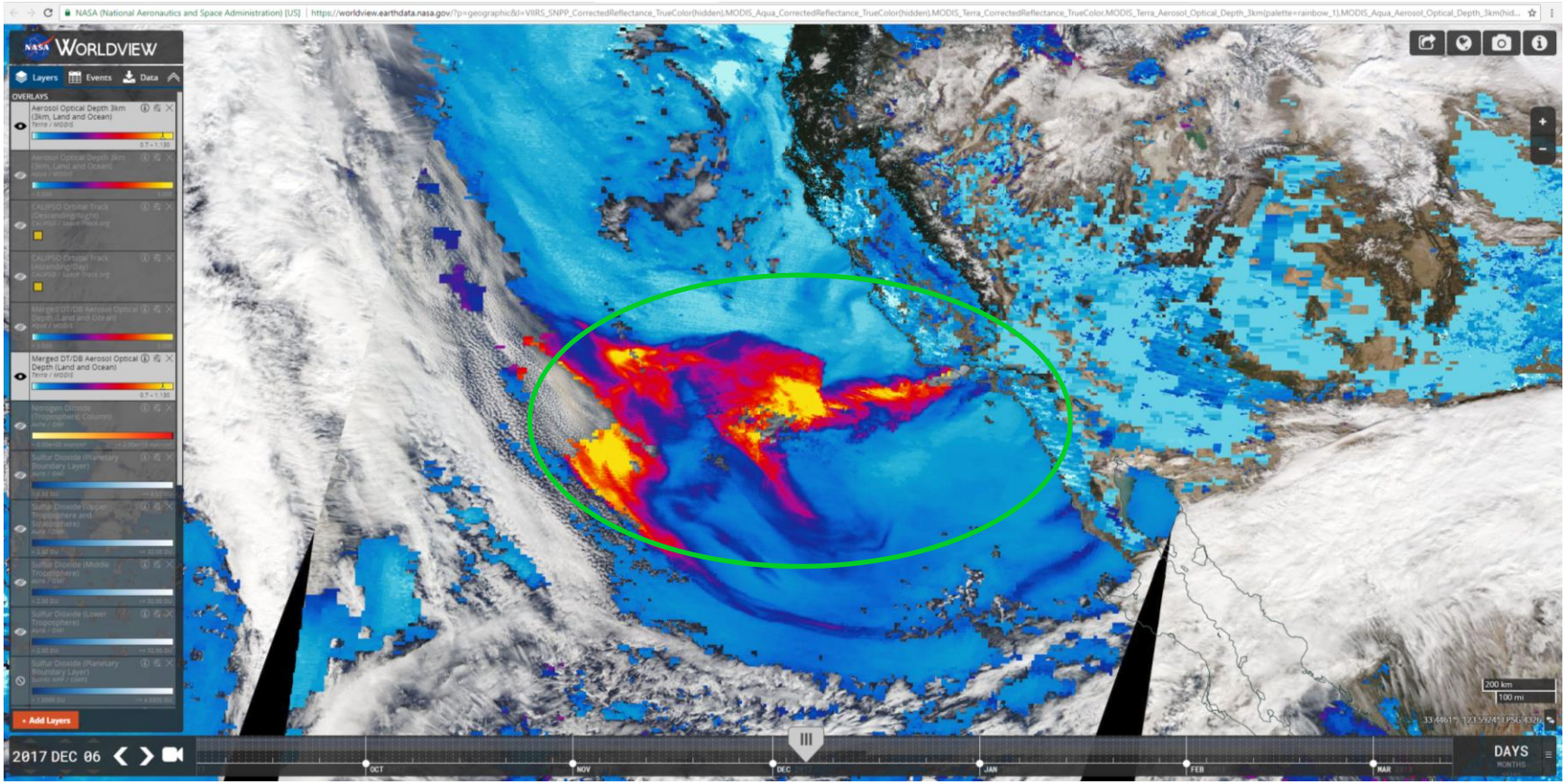
- MODIS Aqua True Color Red-Green-Blue imagery (generated from L1B product) depict approximate fire location and smoke plume

NASA Worldview – 2017 Dec Fire/Smoke



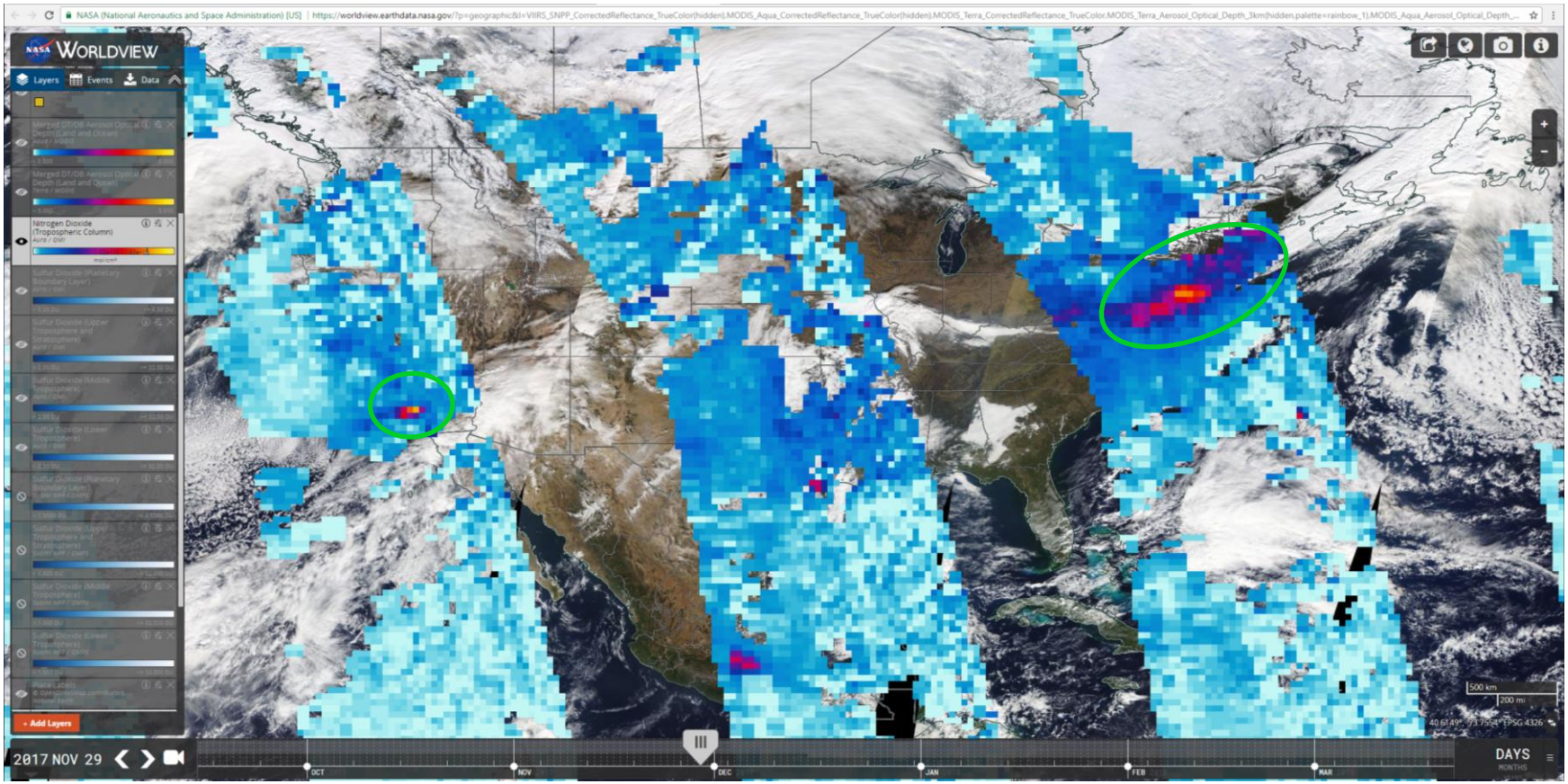
- MODIS L2 10 km AOD product shows AOD exceeding 1 in portions of plume

NASA Worldview – 2017 Dec Fire/Smoke



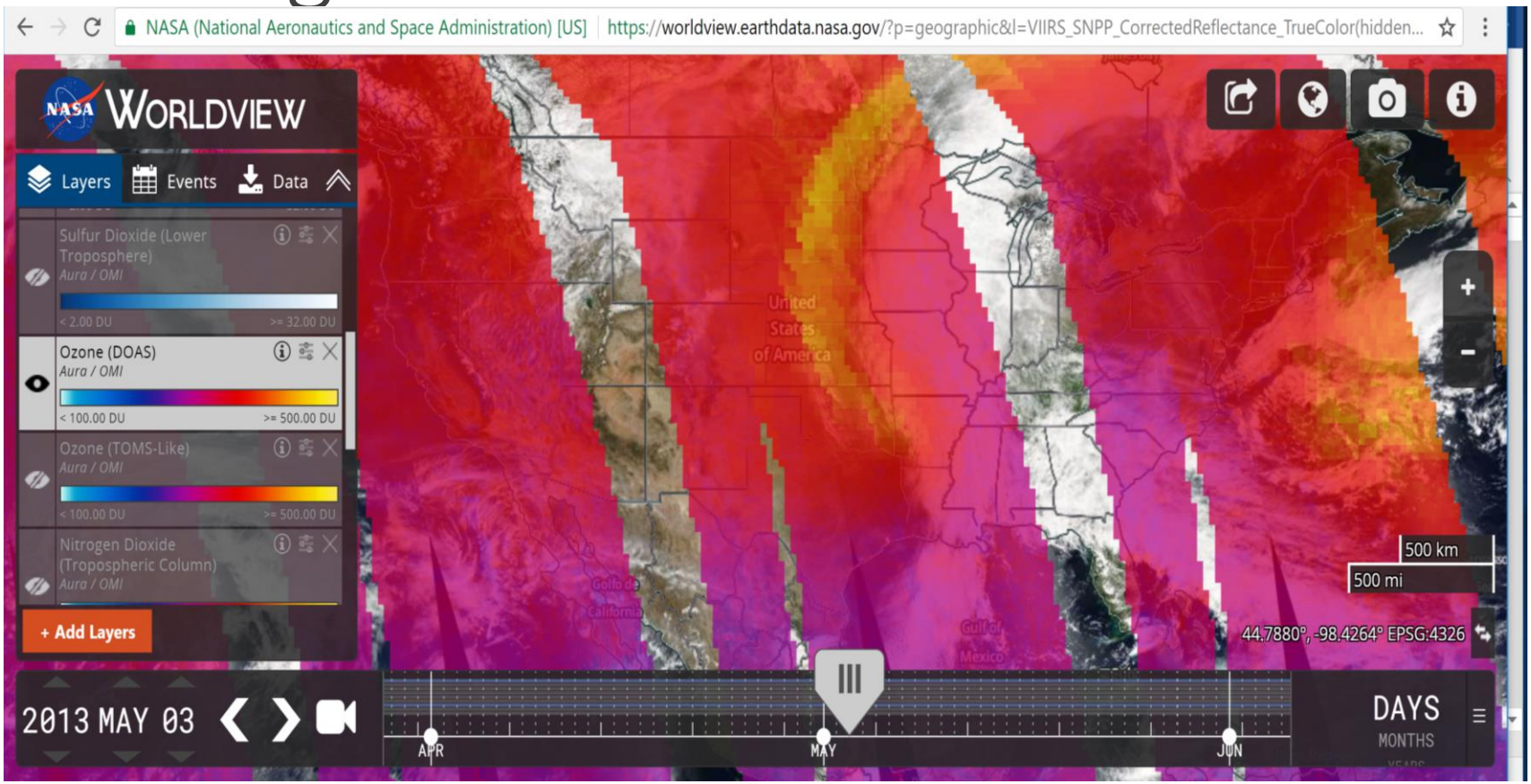
- MODIS L2 3 km AOD product resolves finer features within smoke plume, which highlights potential for high resolution TEMPO products

NASA Worldview – 2017 Nov High Emissions over U.S.



- OMI NO_2 tropospheric columns shows possible locally high emissions over southern California, along with a regional event over northeast U.S.

NASA Worldview – 2013 May High Ozone over Central U.S



- OMI L2 product shows high ozone over central U.S. identified as a stratospheric intrusion
- Unusually high ozone was observed at surface during this event

NASA LANCE/Worldview

- NASA LANCE and Worldview provide an excellent framework for distributing and displaying future NRT TEMPO L1 and L2 products
- Operational and research user communities would greatly benefit from providing TEMPO data products in LANCE and Worldview