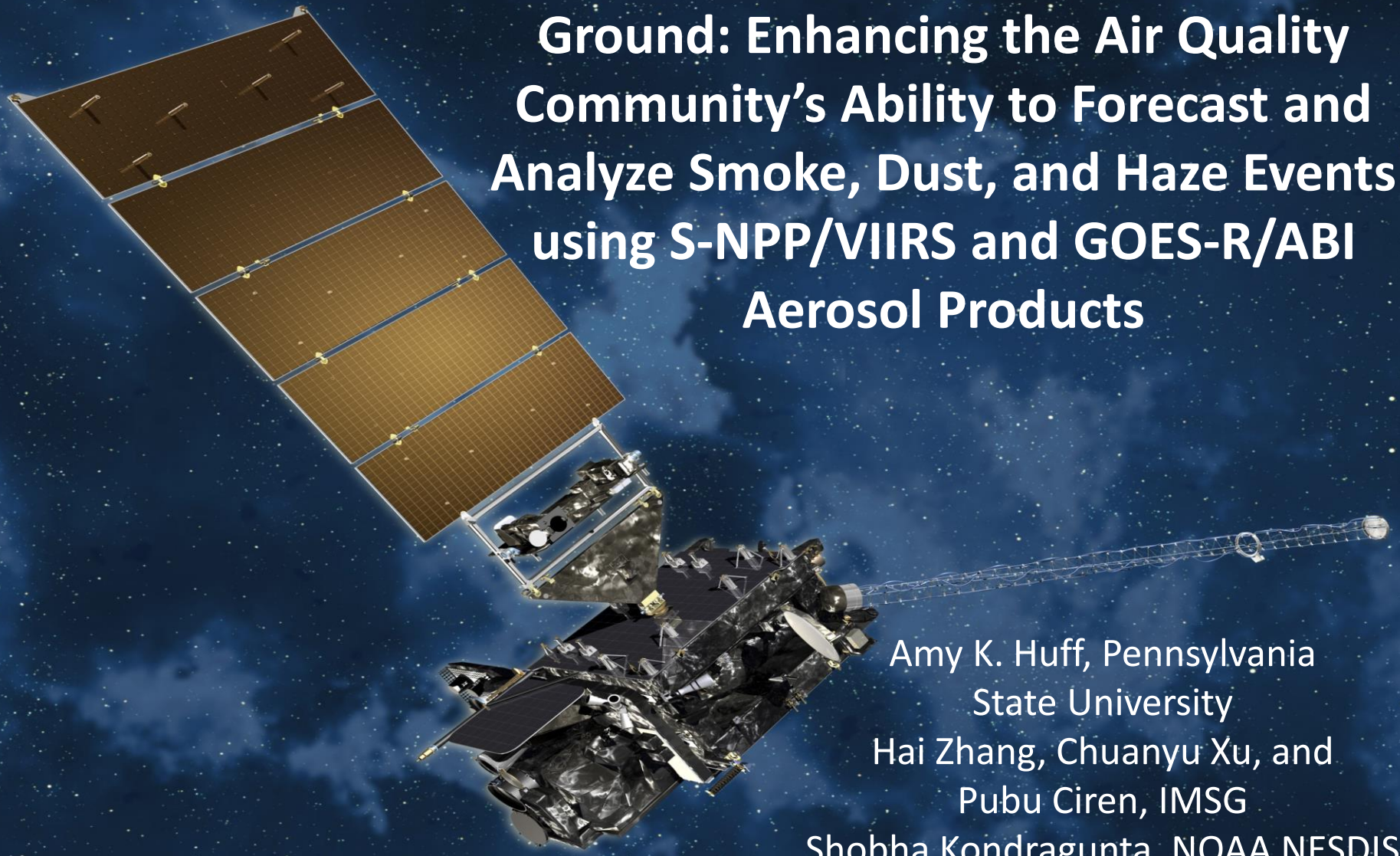
The NOAA Satellite Air Quality Proving Ground: Enhancing the Air Quality Community's Ability to Forecast and Analyze Smoke, Dust, and Haze Events using S-NPP/VIIRS and GOES-R/ABI Aerosol Products



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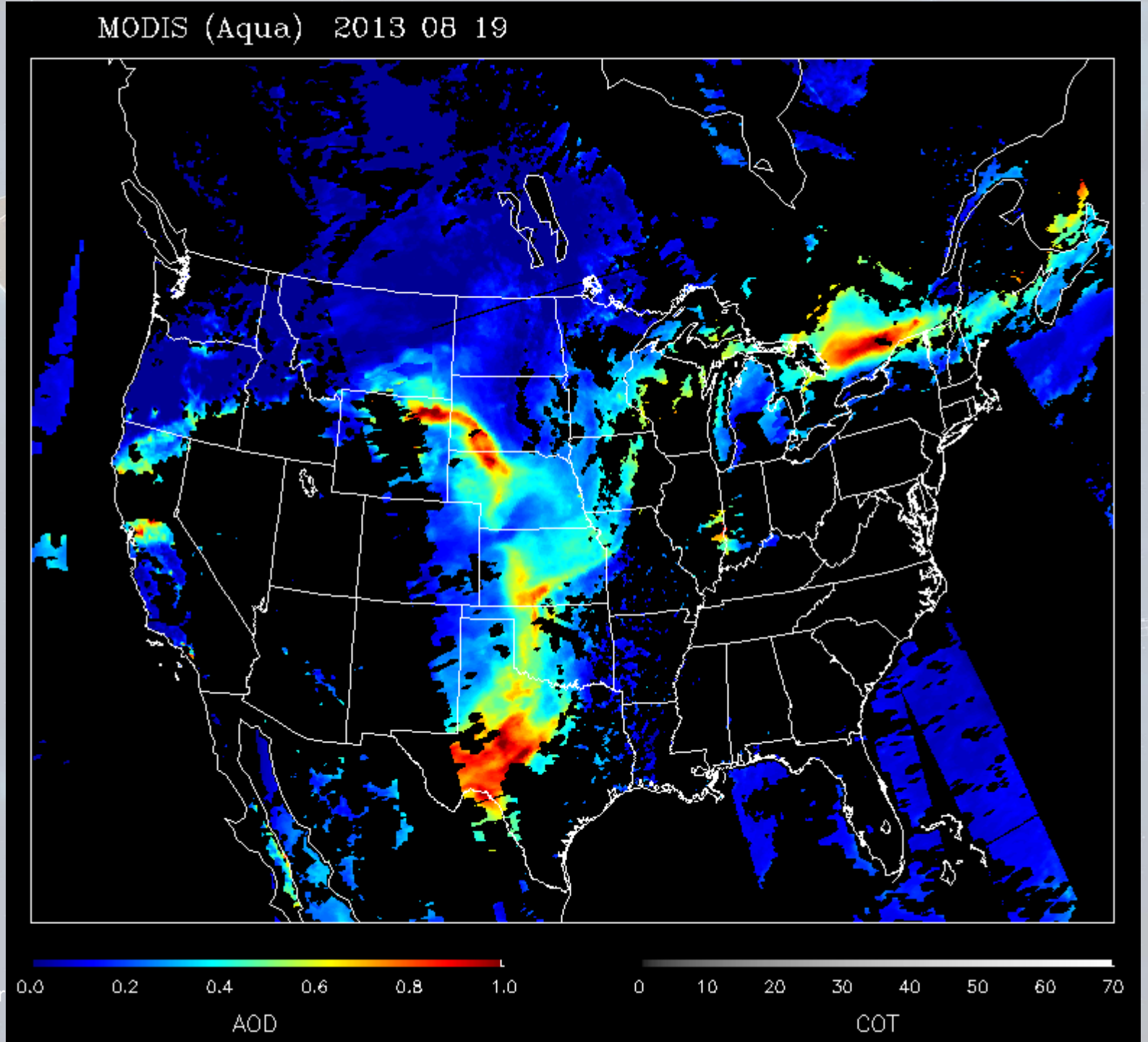
Satellite Aerosol Optical Depth (AOD)

- AOD indicates areas of high particulate matter in the atmosphere associated with smoke plumes, haze, and blowing dust
- Air quality forecasters, modelers, analysts use AOD for retrospective and near real-time applications
- Current AOD observations from geostationary (GOES) and polar-orbiting (Terra, Aqua) satellites
  - GASP: high refresh rate; 4 km resolution
  - MODIS AOD: high accuracy; 10 km and 3 km resolution
- Imagery is available via NOAA IDEA website http://www.star.nesdis.noaa.gov/smcd/spb/aq/


MODIS (Aqua) 2013 08 19
0.0
0.2
0.4
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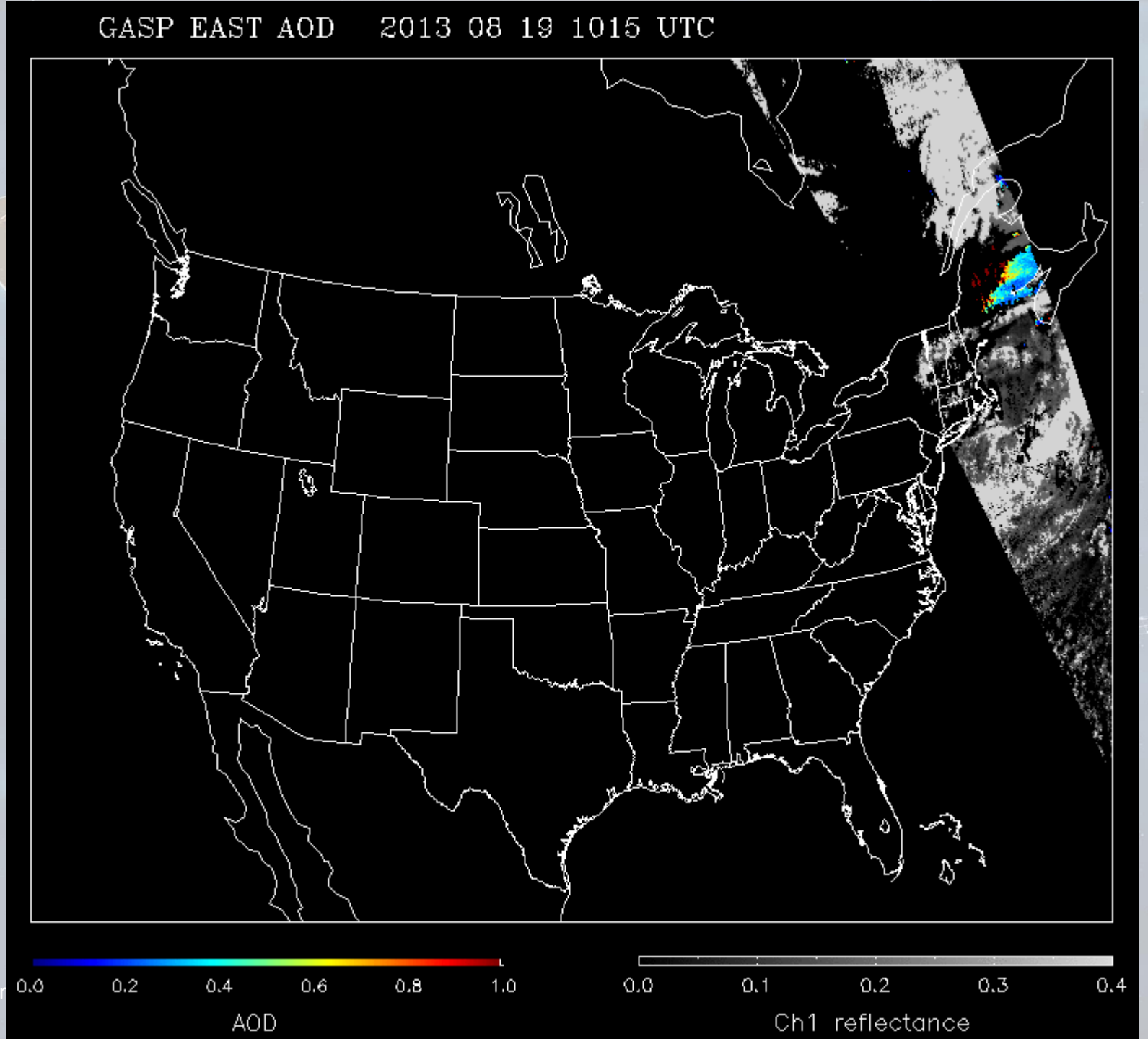
1.0
AOD
0
10
20
30
40
50
60
70
COT


GASP EAST AOD 2013 08 19 1015 UTC
0.0 0.2 0.4 0.6 0.8 1.0
AOD
0.0 0.1 0.2 0.3 0.4
Ch1 reflectance

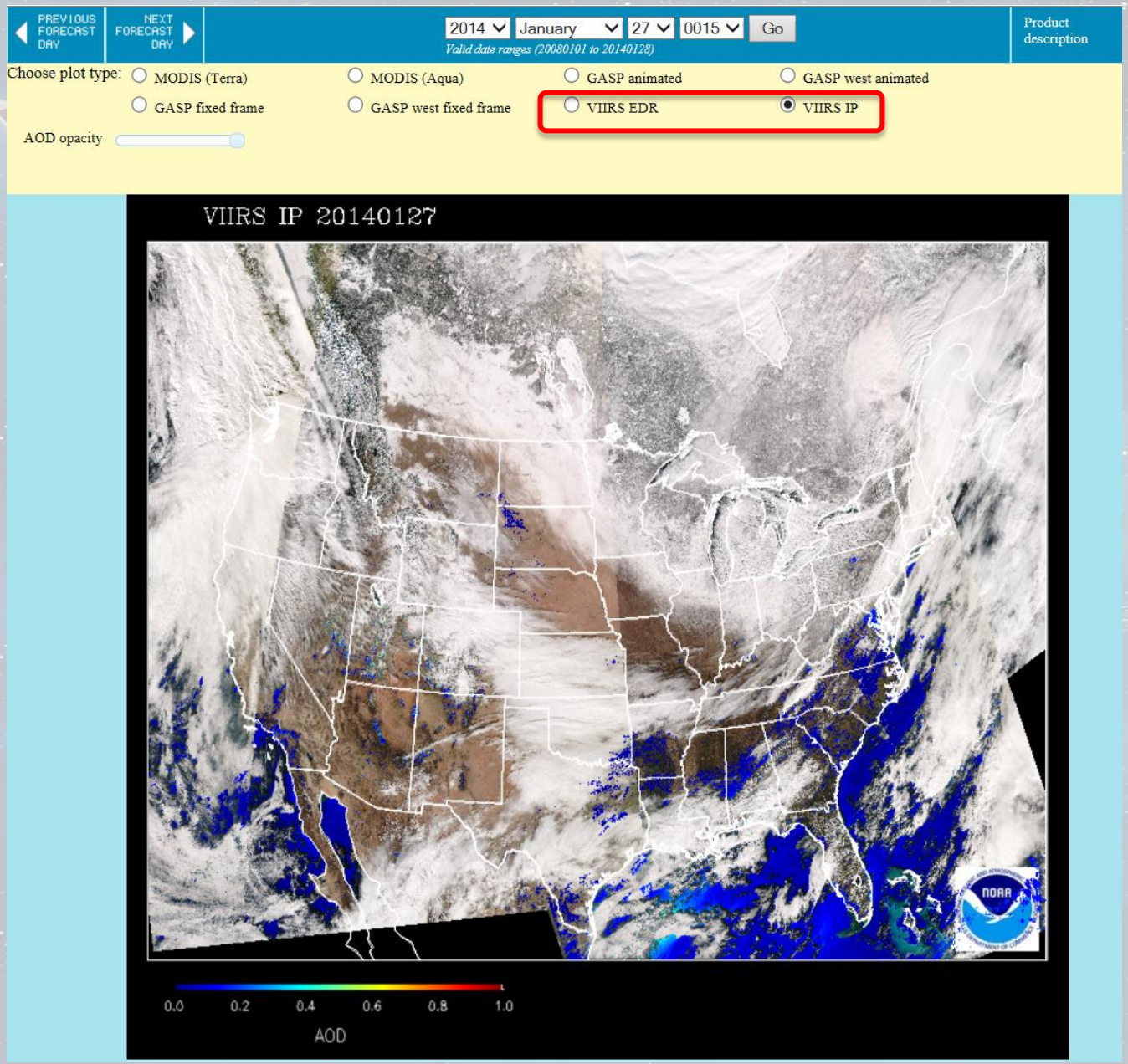
New and Improved AOD Products

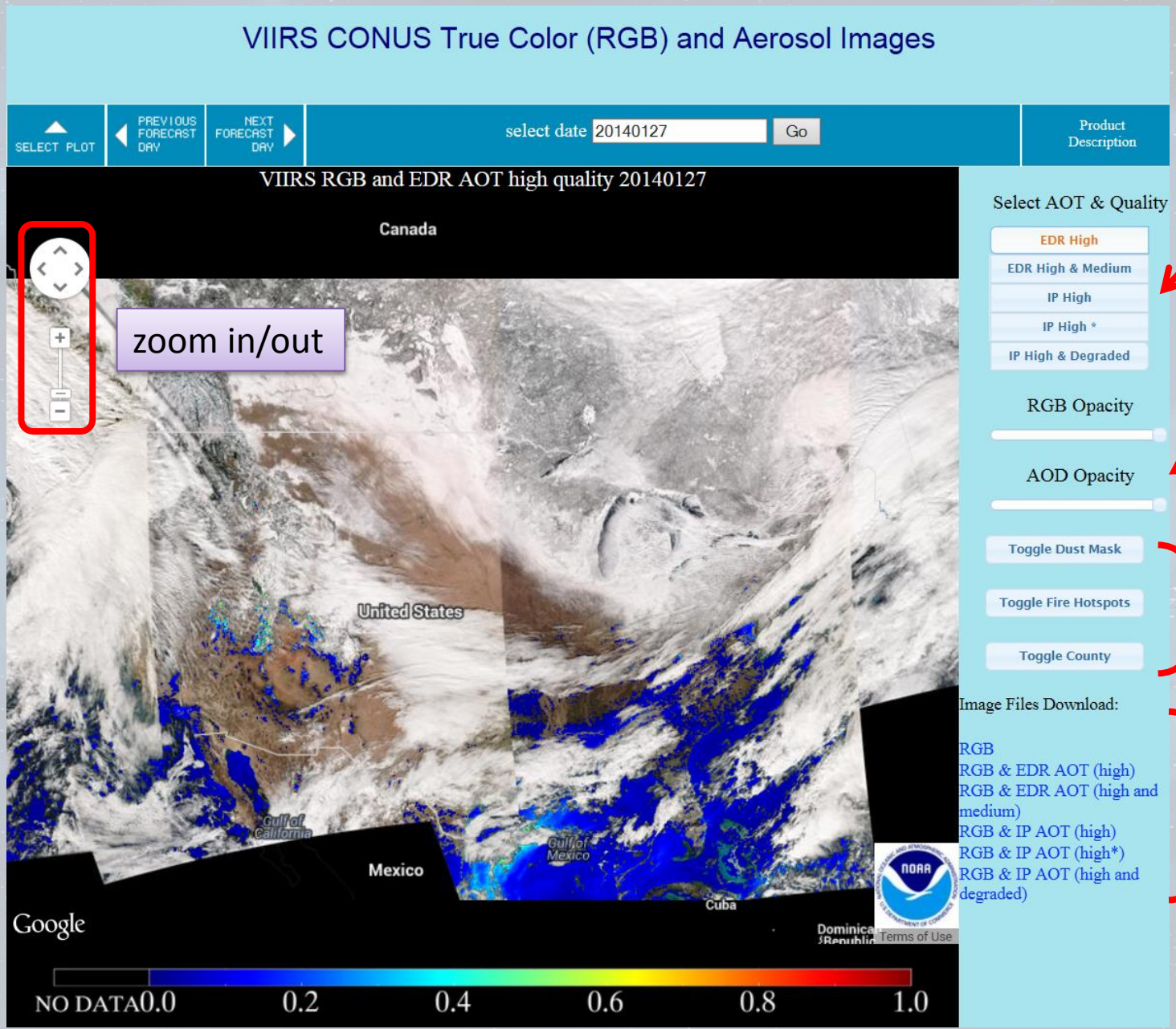
1. Visible Infrared Imaging Radiometer Suite (VIIRS) on Suomi-NPP satellite was launched on Oct 28,2011
   - Polar-orbiting satellite, afternoon overpass, similar to Aqua (~1:30 PM local time)
   - 2 AOD products:
     - Intermediate Product (IP), 750 m resolution
     - Environmental Data Record (EDR), 6 km resolution
2. Advanced Baseline Imager (ABI) on GOES-R satellite will be launched in early 2016
   - Geostationary satellite, next generation of GOES
     - AOD with “best of both worlds” (high refresh rate of current GASP and high accuracy of MODIS/VIIRS AOD)

Satellite Air Quality Proving Ground (AQPG)

- NOAA AQPG provides training and outreach to the air quality satellite user community on new aerosol products from S-NPP/VIIRS and GOES-R/ABI
  - Training workshops at conferences (e.g., NAQC)
  - Training videos on YouTube (http://youtu.be/k17IYMCcHvY and http://www.youtube.com/watch?v=vuoDpVafZAA)
  - Annual AQPG meetings for user community
  - Article in *EM*, A&WMA's magazine for environmental managers
- Advisory Group of 40 air quality forecasters and analysts from federal, state, and local agencies
  - Receiving hands-on training on aerosol products
  - Providing feedback to NOAA on VIIRS and ABI aerosol product development

VIIRS AOD is Available on IDEA





zoom in/out

select EDR or IP and quality flags

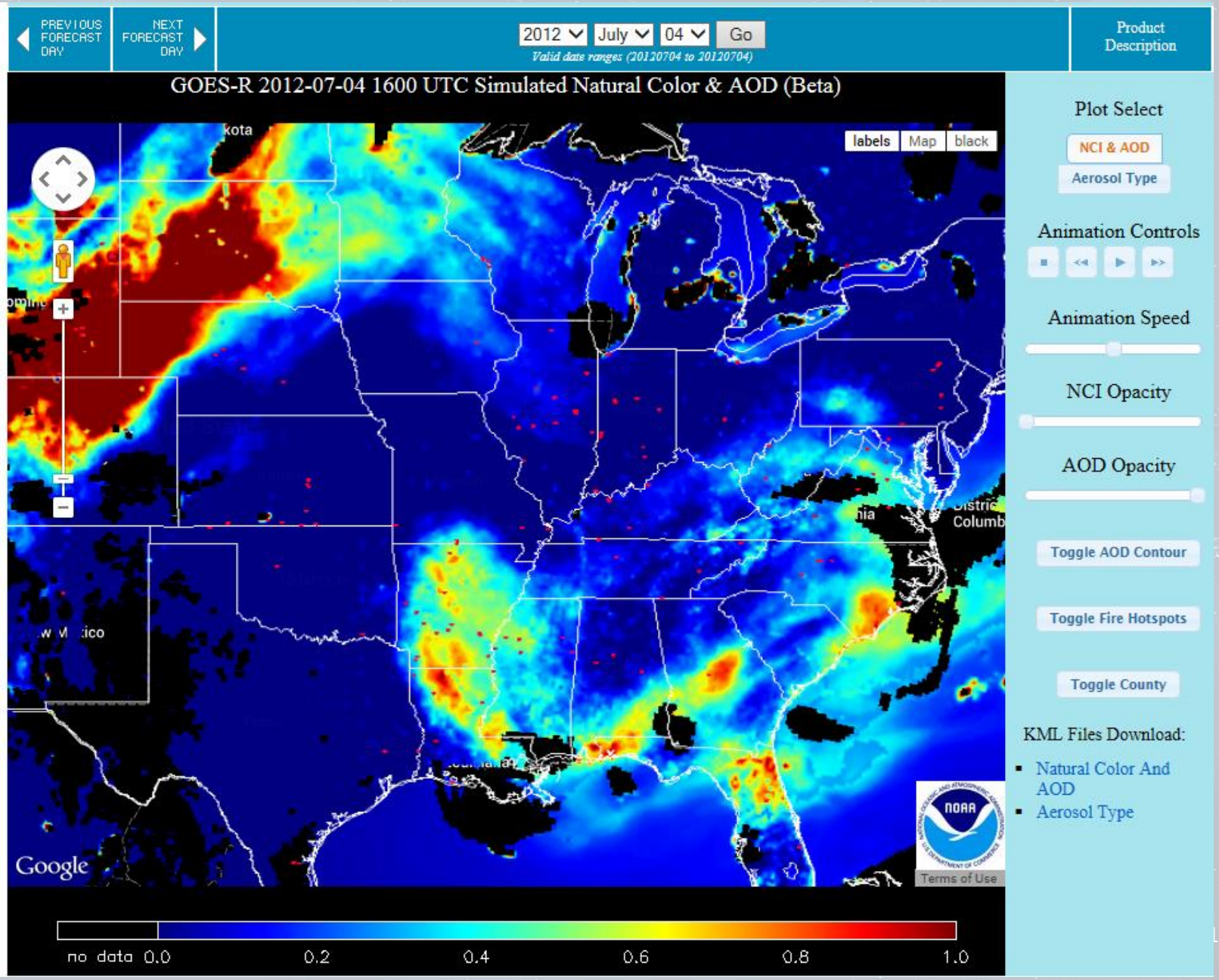
change opacity

visualization options

download imagery

ABI Simulated Aerosol Products

- AQPG is generating *simulated* ABI aerosol imagery before GOES-R launches so users can:
  - Envision what actual ABI aerosol imagery will look like
  - Anticipate how ABI aerosol products will fit into their forecasting and analysis duties
- Basic steps include:
  1. WRF-Chem model output (12 km resolution)
  2. CRTM run to generate ABI synthetic radiances (6 bands)
  3. ABI AOD algorithm run to create simulated ABI AOD
  4. Post-processing and posting of imagery to web
- Near real-time streaming testbed July 12-30, 2011
  - AOD imagery available every hour
  - Advisory Group members provided feedback via email


PREVIOUS FORECAST DAY
NEXT FORECAST DAY
2012
July
04
Go
Valid date ranges (20120704 to 20120704)
Product Description
GOES-R 2012-07-04 1600 UTC Simulated Natural Color & AOD (Beta)
labels
Map
black
Plot Select
NCI & AOD
Aerosol Type
Animation Controls
Animation Speed
NCI Opacity
AOD Opacity
Toggle AOD Contour
Toggle Fire Hotspots
Toggle County
KML Files Download:
Natural Color And AOD
Aerosol Type
Google
Terms of Use
no data
0.0
0.2
0.4
0.6
0.8
1.0

Upcoming AQPG Activities

- Next near real-time streaming testbed of simulated ABI aerosol products in July/Aug 2014; feedback is welcome
- 2-3 training/informational webinars in 2014 to keep Advisory Group members updated on product development
- Submitting journal article in next 2-3 months on the process for generating simulated ABI aerosol products
- 2014 annual AQPG meeting in Oct/Nov

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- AQPG Advisory Group Members