

NOAA GOES-R

Air Quality Proving Ground (AQPG)

***Summer 2011 Near Real-Time Testbed
of Proxy ABI Aerosol Products***

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Proving Ground All-Hands Meeting

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Overview of GOES-R AQPG Summer Experiment

- Objectives:
 - Test the generation of GOES-R ABI aerosol products using simulated radiances
 - Distribute the products to users in near real time
 - Obtain feedback from users on the usability of the products
- Proxy aerosol products:
 - AOD, aerosol type, RGB
 - Domain: Southeastern U.S.
 - Streaming hourly images, 12:00 – 23:00 UTC daily, July 12-30, 2011
- Experiment is being conducted during the NASA DISCOVER-AQ field campaign
 - Availability of aerosol vertical profiles and other physical/chemical properties for ABI validation

Simulated ABI Data Creation Process

Hourly outputs of aerosol and met fields from 48-hour WRF-Chem forecast run at 12-km resolution
(<ftp.nsstc.org/outgoing/yes>)

2 min

Re-formatting of CMAQ outputs to prepare for CRTM run

50 min

CRTM Run on STAR computer orbit006l with 12GB memory and 16 CPUs. Code based on FORTRAN, IDL, and shell scripts

6 hrs

GOES-R ABI Synthetic Radiances
(6 bands: 0.47, 0.66, 0.86, 1.36, 1.6, 2.25 μm)

Post-processing of ABI aerosol products using IDL and ImageMagic to generate display imagery files

36 min

Simulated ABI aerosol products

ABI AOD algorithm run on orbit006l for daytime scenes

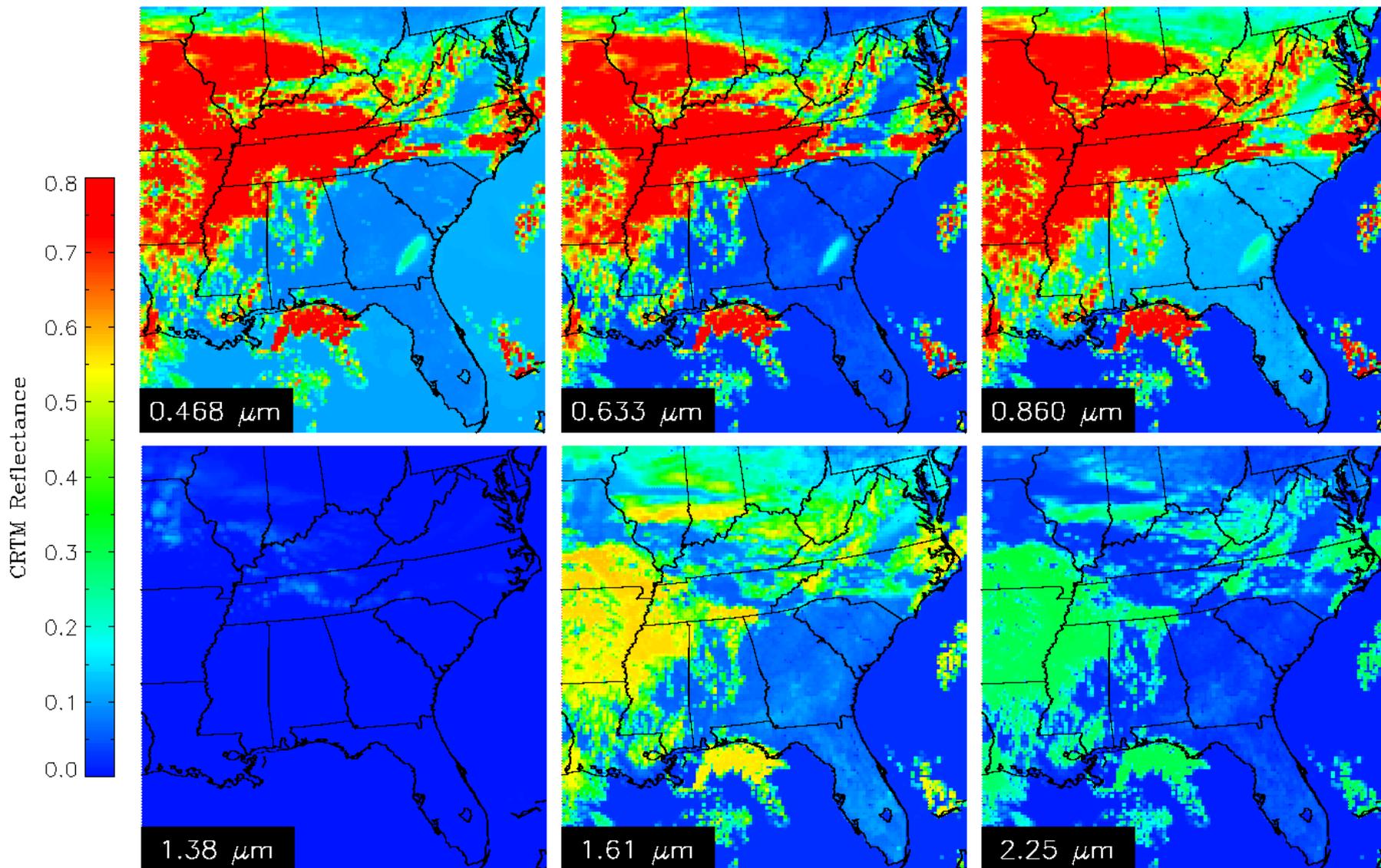
1 min

ABI aerosol imagery

30 min

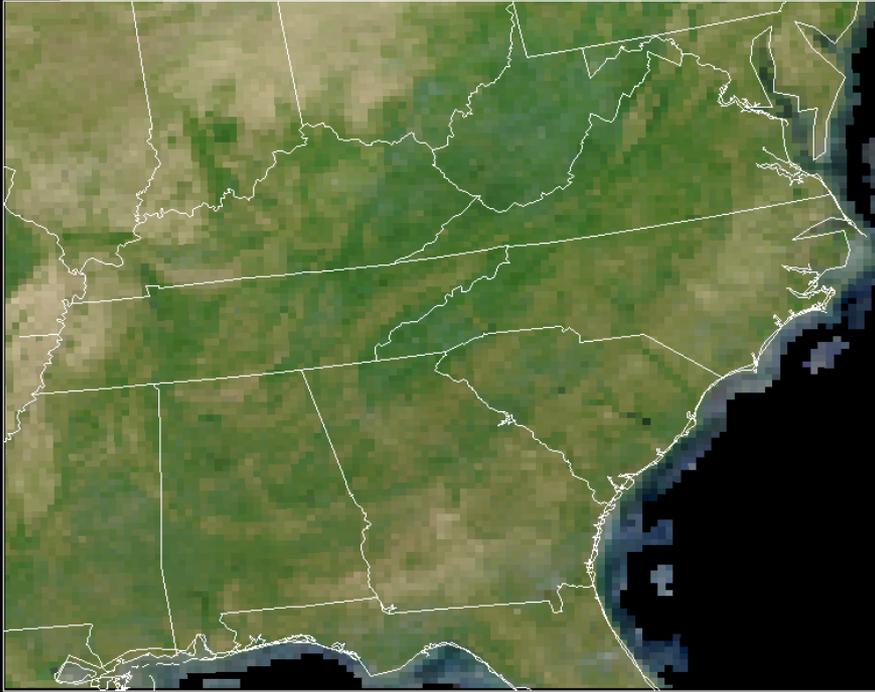
Web display:
<http://www.star.nesdis.noaa.gov/smcd/spb/aq/aqpg/>

Reflectance (12 km) – March 25, 2011 1900 UTC



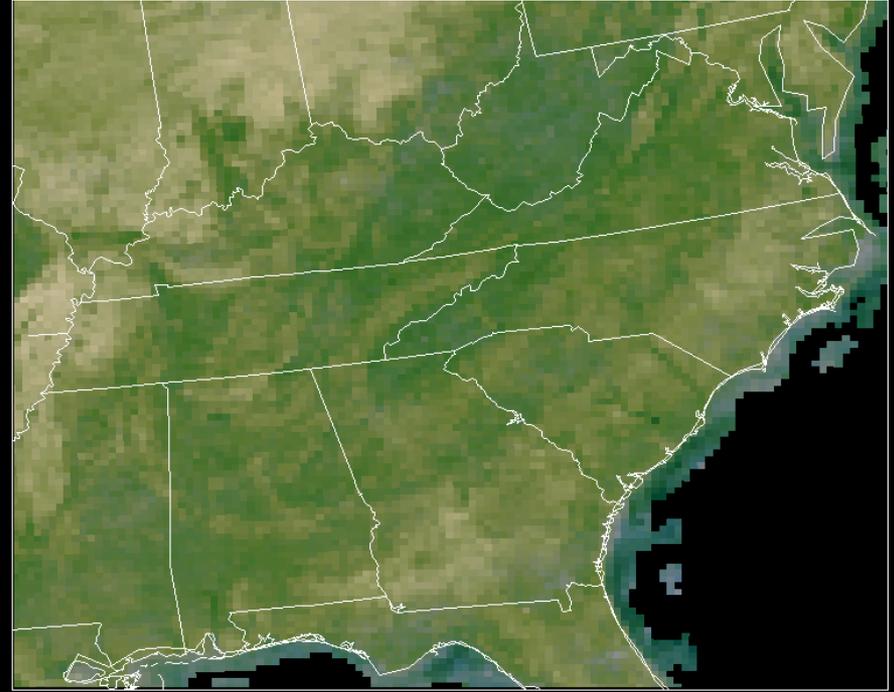
Generation of RGB Images for AQPG

2011/03/25 1800 UTC surface reflectance



MODIS RGB land surface

2011/03/25 1800 UTC surface reflectance



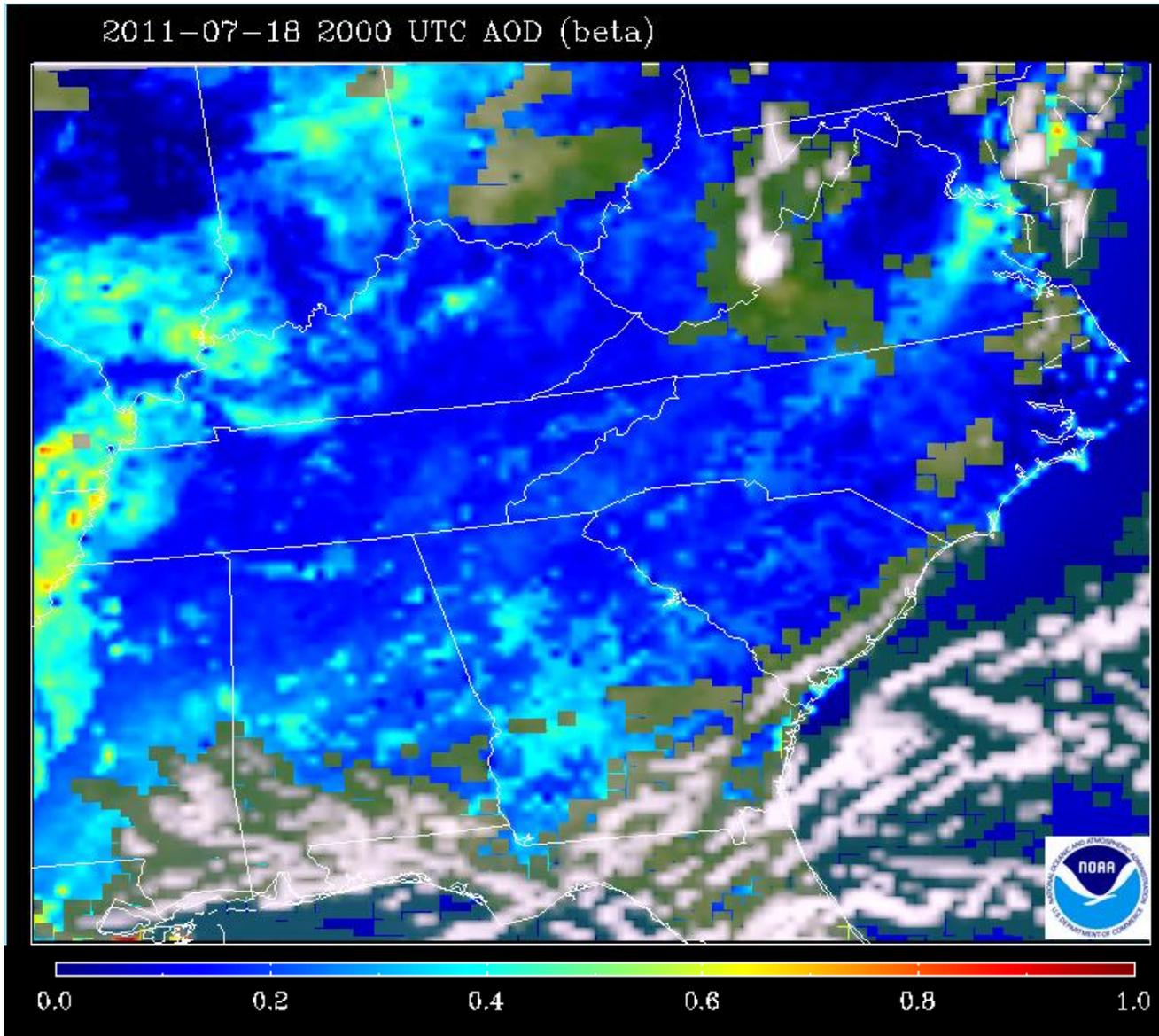
False color land surface

Red = MODIS red

Green = $0.69 * \text{red} + 0.04$

Blue = MODIS blue

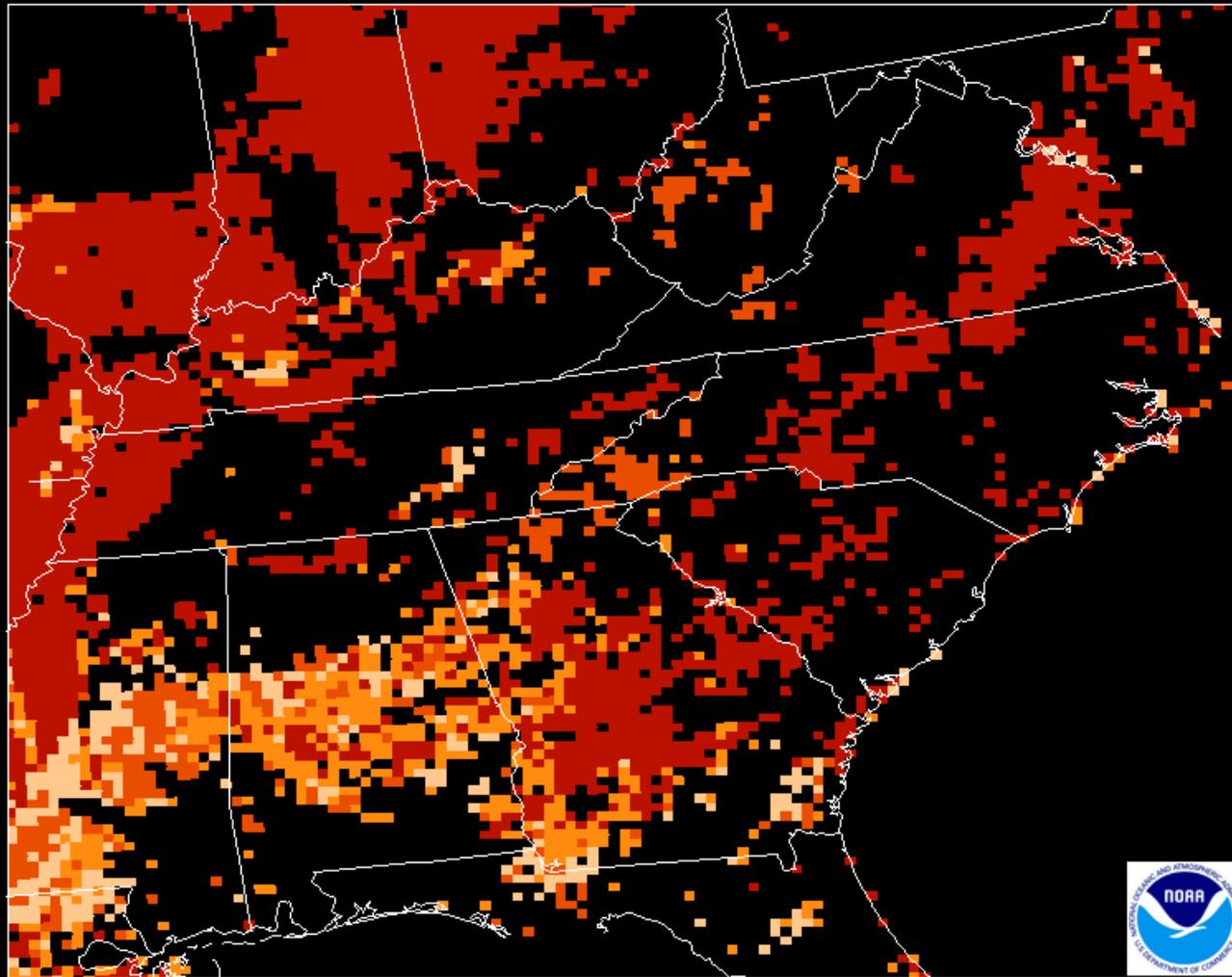
Proxy Aerosol Optical Depth (AOD)



- AOD indicates areas of high particulate concentrations in atmosphere
- Clouds block “measurement” of AOD
- 12 km spatial resolution interpolated to 2 km
- 1 hr temporal resolution

Proxy Aerosol Type

2011-07-18 2000 UTC Aerosol Type (beta)



DUST

GENERIC

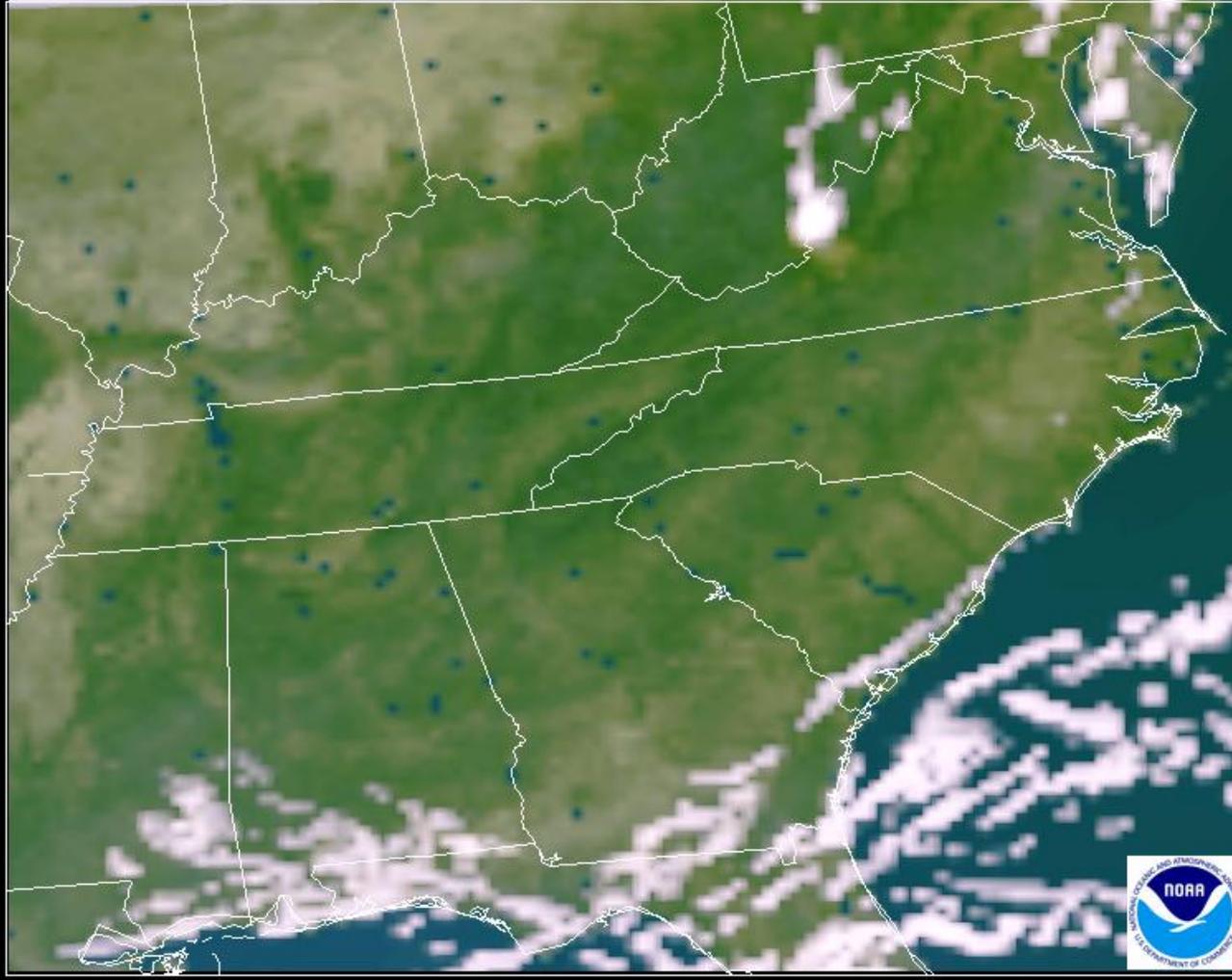
URBAN

SMOKE

- New product - not available with current GOES imager
- Qualitative
- AOD radiances scaled to 4 aerosol types
- Useful for distinguishing between smoke and dust but can be noisy

Proxy True Color (RGB)

2011-07-18 2000 UTC (beta)



- Simple MODIS reflectance-based RGB estimate
- For AQPG summer experiment only
- AQPG may use the CIRA/SPORT RGB product as input for next NRT testbed in Winter/Spring 2012

Feedback from User Community

- Selected members of [AQPG Advisory Group](#) providing feedback on streaming NRT proxy images:
 - Bill Ryan, forecaster for Philadelphia, PA
 - Howard Schmidt, analyst/modeler for EPA Region 3
 - Dan Salkovitz, forecaster for state of Virginia
 - Mike Goldstein, forecaster for Memphis/Shelby Counties, TN
 - Geoffrey Healan, forecaster for state of Alabama
- Focusing on **process** of receiving streaming images of dynamic, high accuracy, high temporal resolution (once per hour) aerosol imagery
 - Different from current satellite products (e.g., 2 static MODIS AOD images per day or lower spatial resolution GASP loops)