



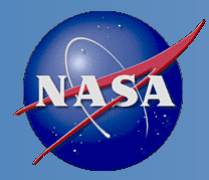
**VIIRS Aerosol EDR  
Validation Stage 1  
May 2014  
ANCILLARY DATA**



# Ancillary Data



- Ancillary data from forecast
  - National Center for Environmental Prediction (NCEP)
    - Precipitable Water,
    - Surface Air Temperature,
    - Surface Wind Speed,
    - Surface Wind Direction,
    - Ozone Concentration,
    - Surface Pressure.
  - When ancillary data are missing VIIRS AOT is not retrieved and the quality flag is set to “Not Produced”

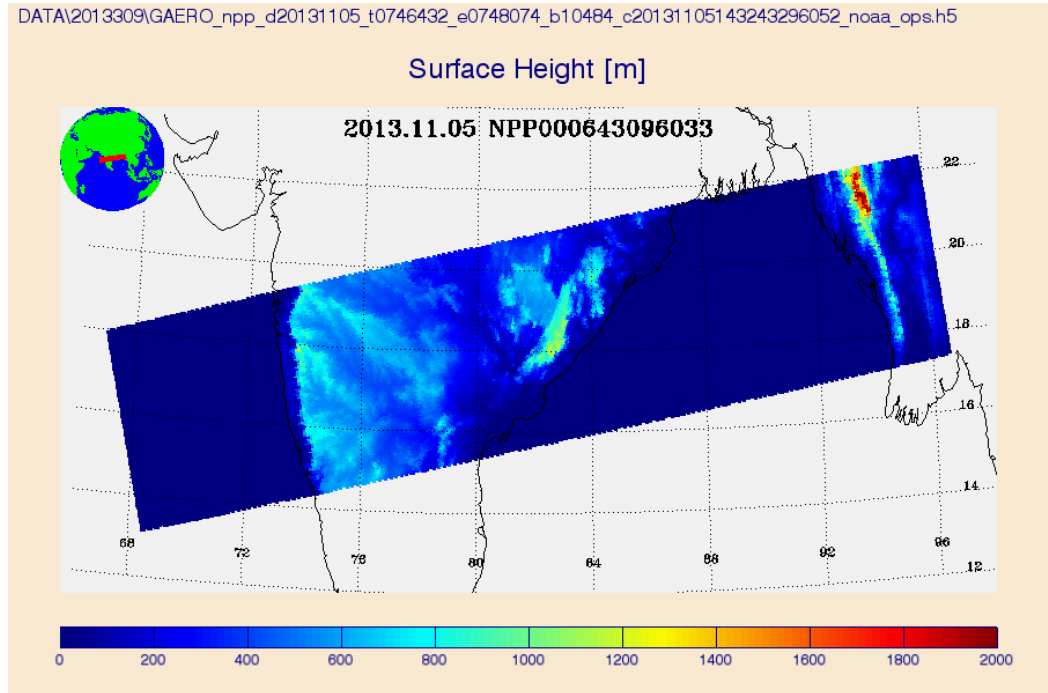


# Ancillary Data



- Ancillary data from forecast (contd.)
  - Navy Aerosol Analysis and Prediction System (NAAPS)
    - Total column AOT at 550 nm (*used only in IP, does not affect EDR*)
- Ancillary data from climatology
  - Monthly aerosol climatology AOT, back up for NAAPS AOT (*used only in IP, does not affect EDR*)

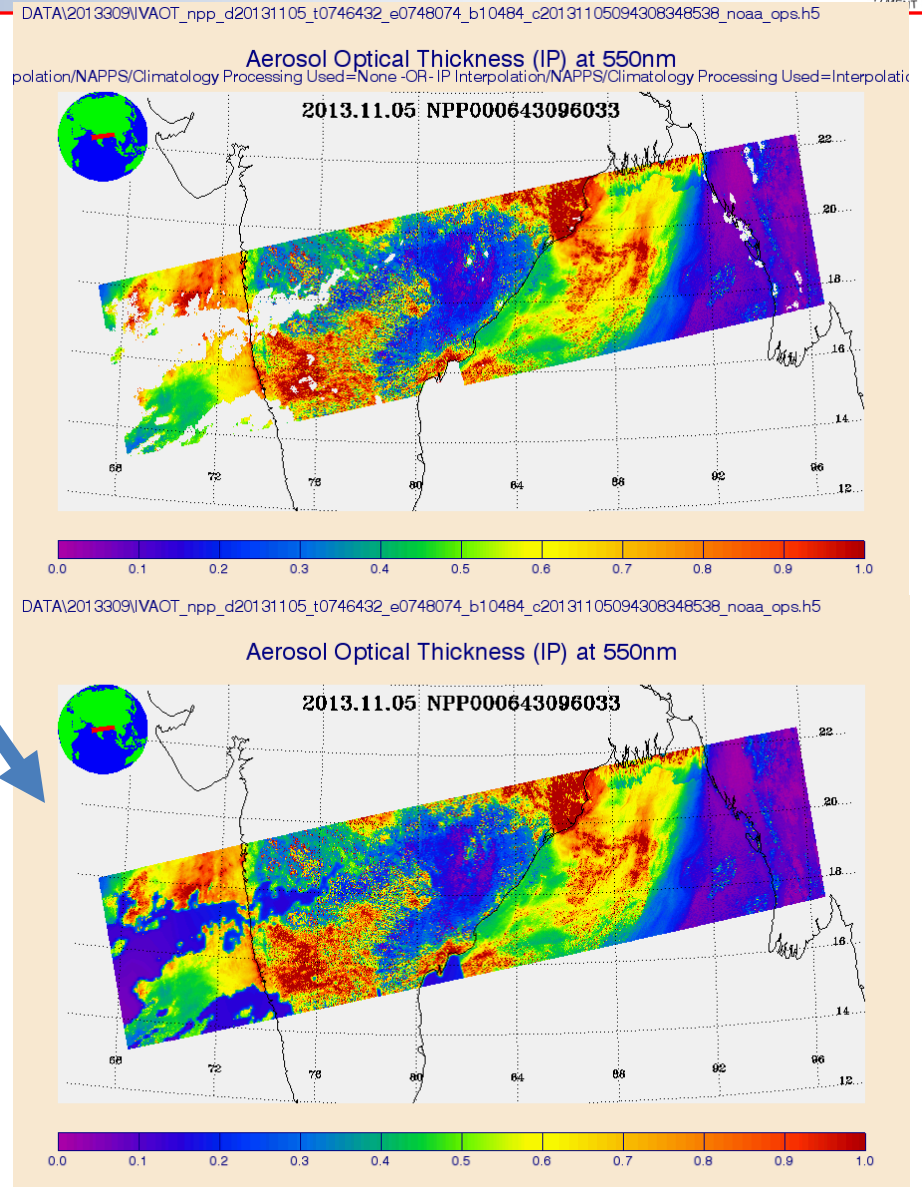
- Moderate resolution terrain height
  - static map
- Surface pressure
  - Adjusted to terrain height
- Used in calculating molecular scattering contribution
- Used in calculation of gas transmission



Example of terrain height in VIIRS Aerosol EDR granule for Nov 5, 2013

# Example of Ancillary Data (2)

- AOT from retrieval and from interpolation of retrieved values. →
- AOT from retrieval, interpolation of retrieved values and from NAAPS. →
- Missing AOT IP (white areas) in top plot are filled in by AOT from NAAPS. (These AOTs do not enter the AOT EDR.)





# **VIIRS Aerosol EDR Validation Stage 1**

**May 2014**

# **SENSOR DATA RECORDS**

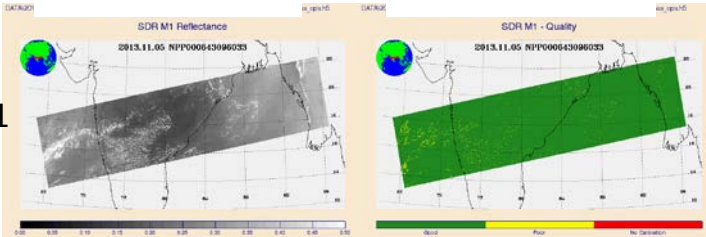
# M-bands used in AOT retrieval

Reflectance

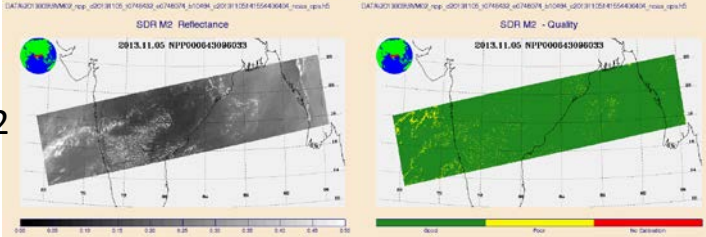
Bad SDR QF

- Over land: M3, M5, M11, M1, M2
  - Over ocean: M7, M5, M6\*, M8, M10, M11
- \*Starting with Mx8.0 (Nov 14, 2013) over ocean retrieval does not use M6 when it is saturated

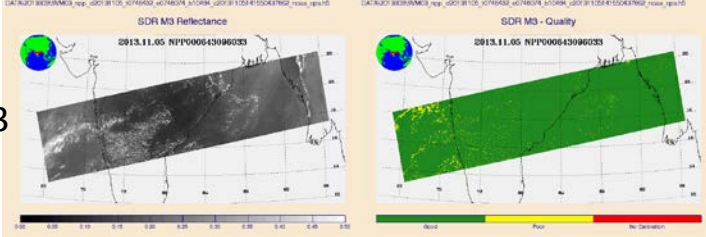
M1



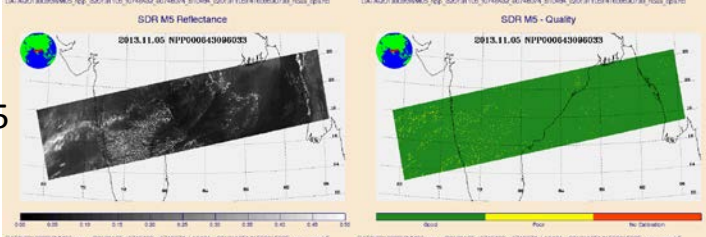
M2



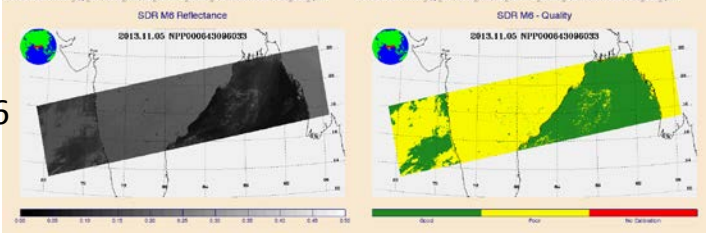
M3



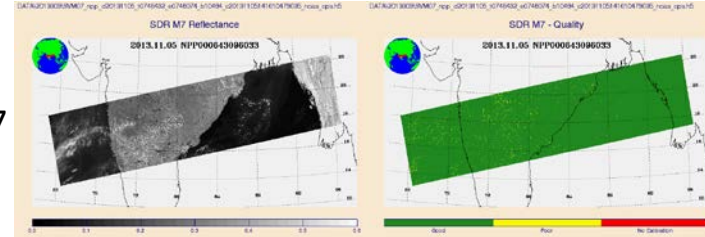
M5



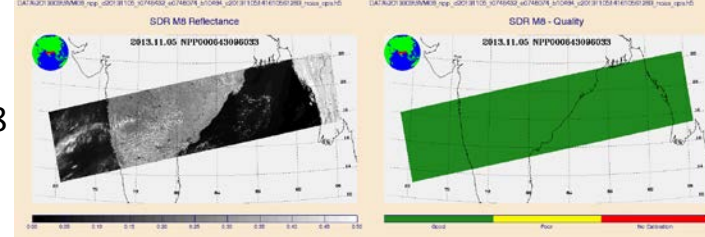
M6



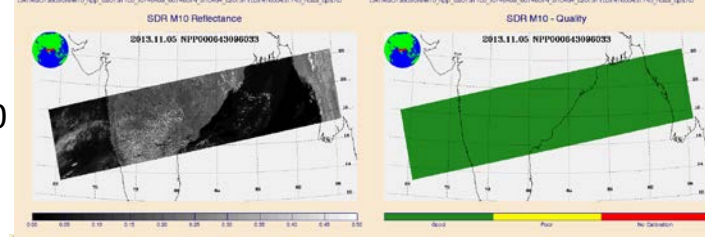
M7



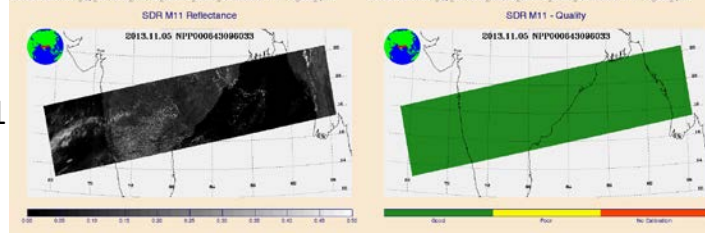
M8



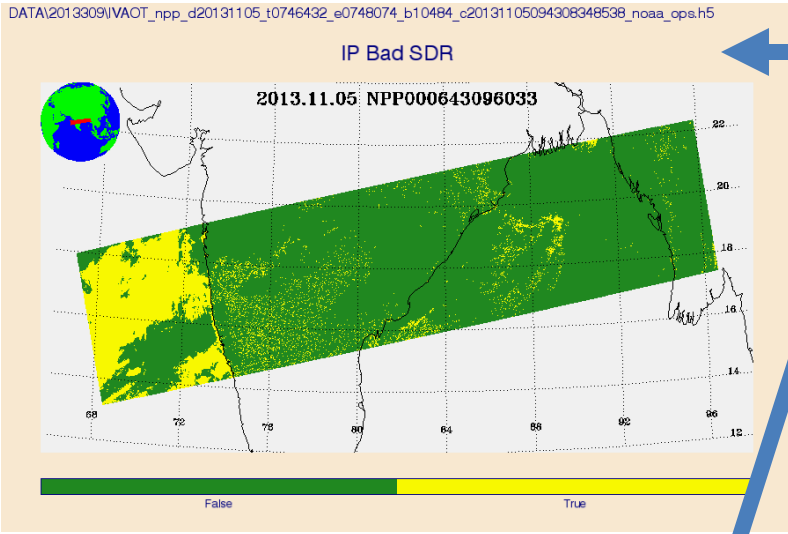
M10



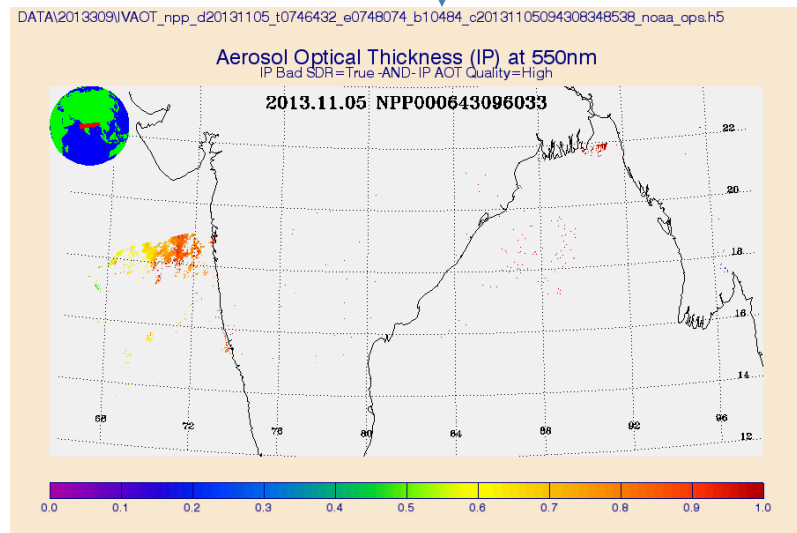
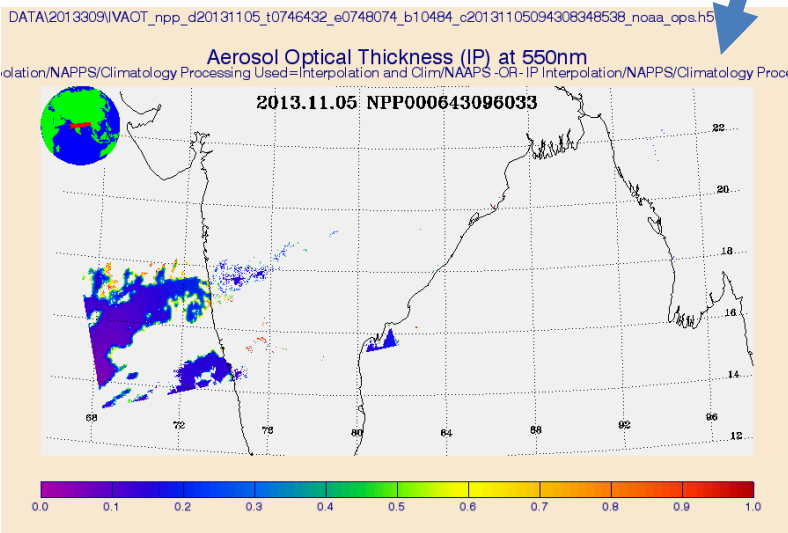
M11



# Over Ocean Retrieval



- AOT IP bad SDR quality flag indicates more extensive area with bad SDR pixels due to out of range M6 reflectances over ocean.
- AOT IP for pixels with “bad SDR” QF are filled in with interpolation and/or forecasted (NAAPS) AOT
- Some pixels with “bad SDR” QF can still have “high” quality AOT







# **VIIRS Aerosol EDR Validation Stage 1**

**May 2014**

# **AOT & APSP EDR QUALITY FLAGS**



# AOT & APSP EDR QF

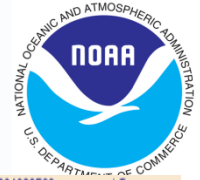


- There are 17 quality flags (QF) for AOT and APSP EDR
- Examples are shown in next two slides
- QFs were examined and some inconsistencies were found. DRs were submitted to fix them in Mx8.5. (see DR slides)

QF1	QF2	QF3
AOT Quality	Cloud Contamination	Low sun, degraded
APSP Quality	Cloud adjacent to cell	Low sun, excluded
Land, Ocean, or Not Produced	Cirrus Contamination	Bright surface (land)/Shallow or Turbid Water (ocean)
AOT out of Spec Range	Bad SDR	Low AOT, APSP Excluded
APSP out of Spec Range	Sunglint	
	Cloud Shadow	
	Snow/Ice	
	Fire	

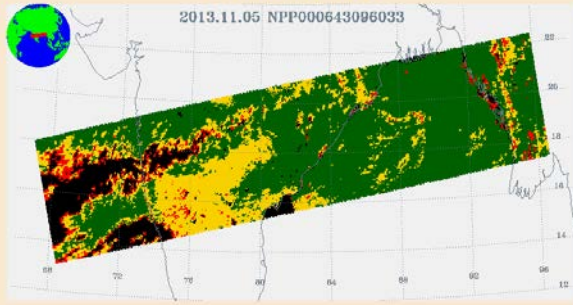


# AOT & APSP EDR QF Examples



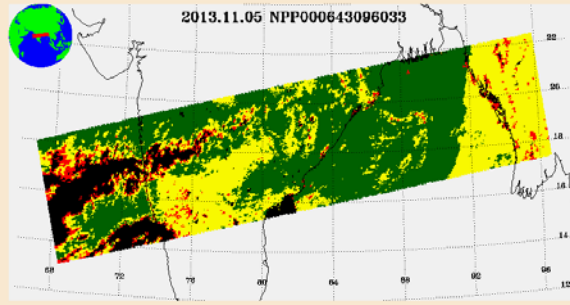
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AOT Product Quality



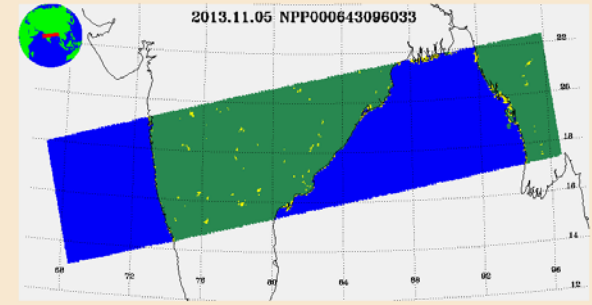
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### Angstrom Exponent Product Quality



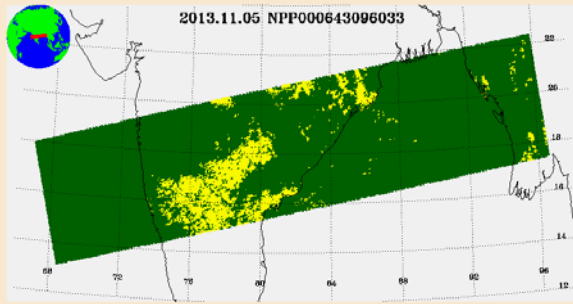
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AeroEDR - Land/Ocean



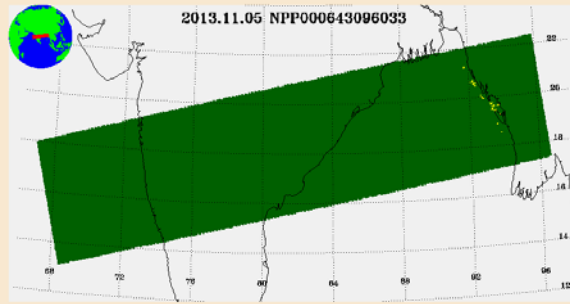
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AOT Out of Range Flag



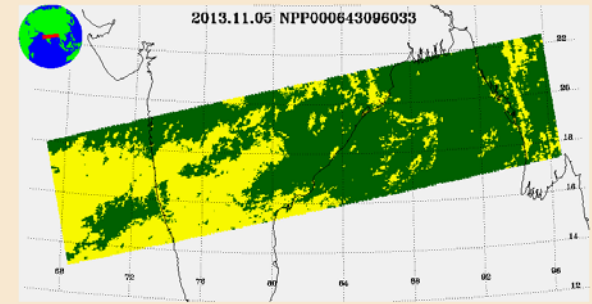
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### Angstrom Exponent Out of Range Flag



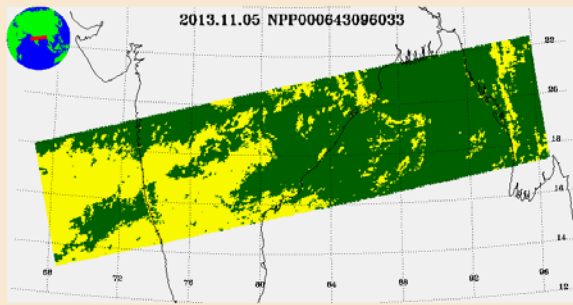
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AeroEDR - Cloud Contamination Flag



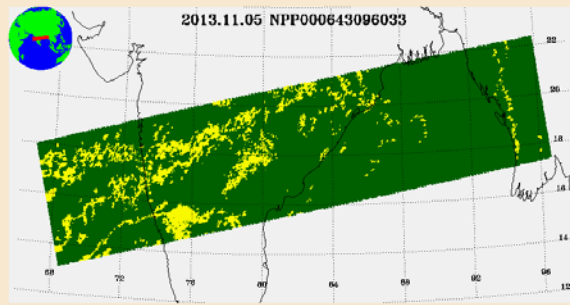
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AeroEDR - Cloud Adjacent Flag



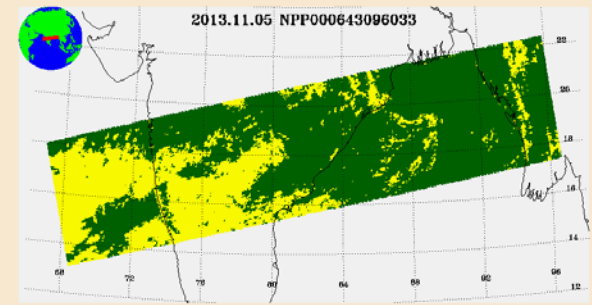
DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

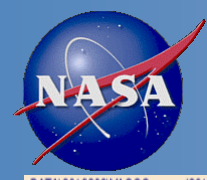
### AeroEDR - Cirrus Contamination Flag



DATA\2013309\VAOOO\_npp\_d20131105\_10746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_cps.h5

### AeroEDR - Bad SDR Flag



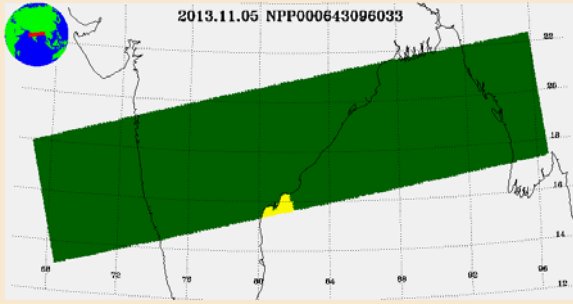


# AOT & APSP EDR QF Examples



DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

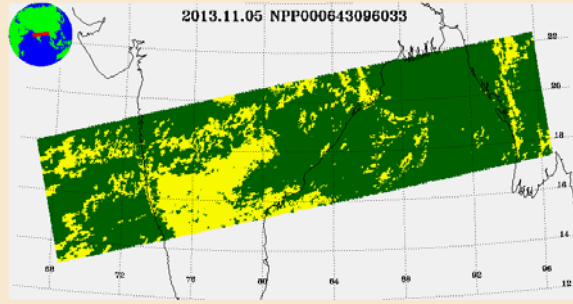
### AeroEDR - Sun Glint Flag



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

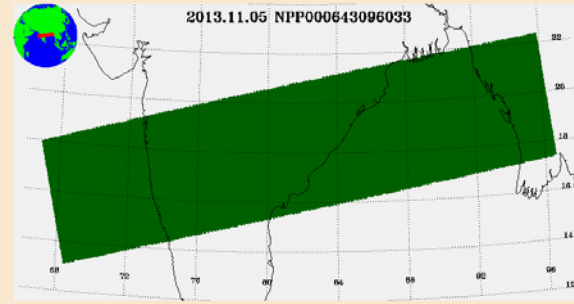
### AeroEDR - Cloud Shadow Flag



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

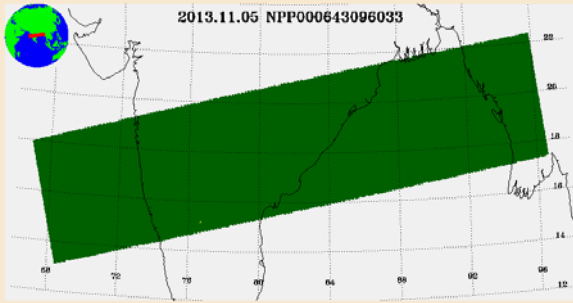
### AeroEDR - Snow/Ice Flag



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

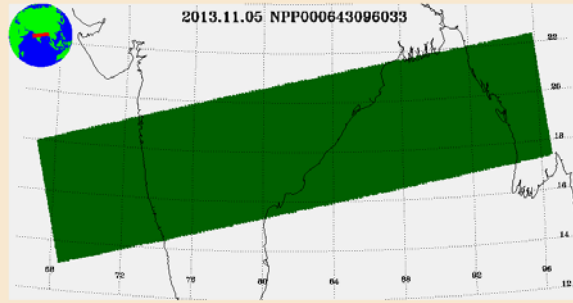
### AeroEDR - Fire Flag



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

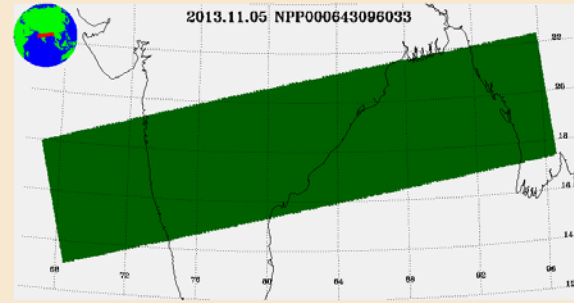
### AeroEDR - Low Sun (65<SZA<=80)



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

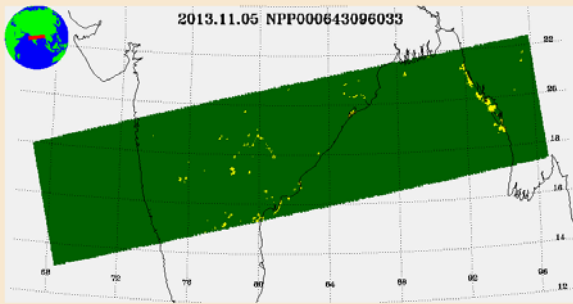
### AeroEDR - Low Sun (SZA>80)



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

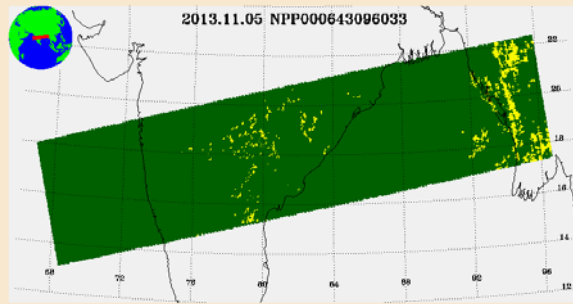
### AeroEDR - Bright Land Surface or Turbid Water



False True

DATA\2013309\VAOOO\_npp\_d20131105\_t0746432\_e0748074\_b10484\_c20131105141304029562\_noaa\_ops.h5

### AeroEDR - Excluded Angstrom Exponent (AOT550<0.15)



False True