

Suomi National Polar-orbiting Partnership



VIIRS Active Fire Product: Current Status and Future Plans



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**Presenting*

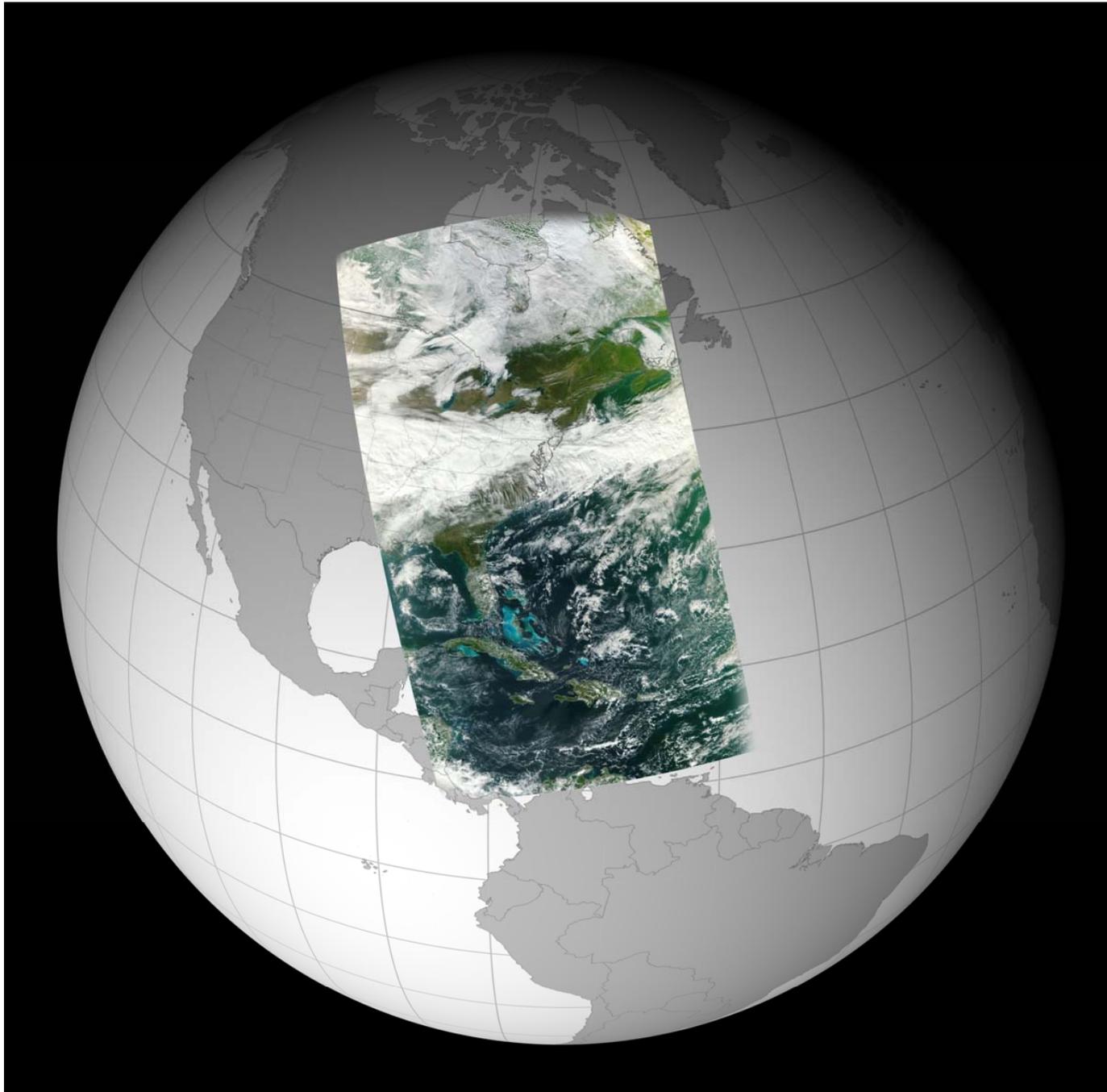
Outline

- Launch and post launch checkout
 - Some minor delays
- Thermal doors open and detections begin
 - Success!
- Evaluation of the AF product
 - MODIS vs. VIIRS
 - I-band fire algorithm
 - Geolocation
- Future plans (C6 for VIIRS)

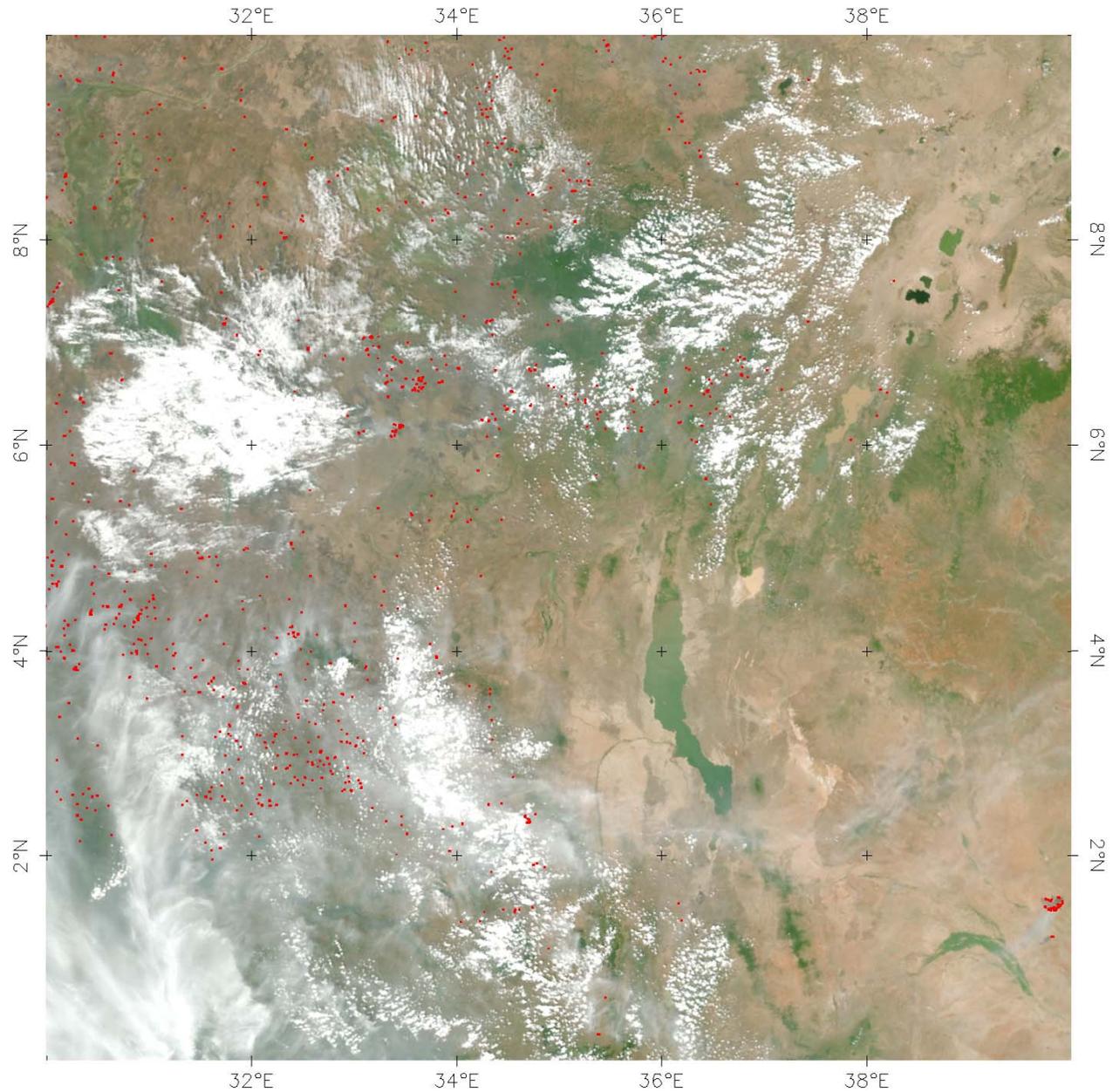
Suomi National Polar-orbiting Partnership Launch

Suomi NPP
spacecraft
launched from
Vandenberg Air
Force Base at
0548 EDT on Oct.
28, 2011.



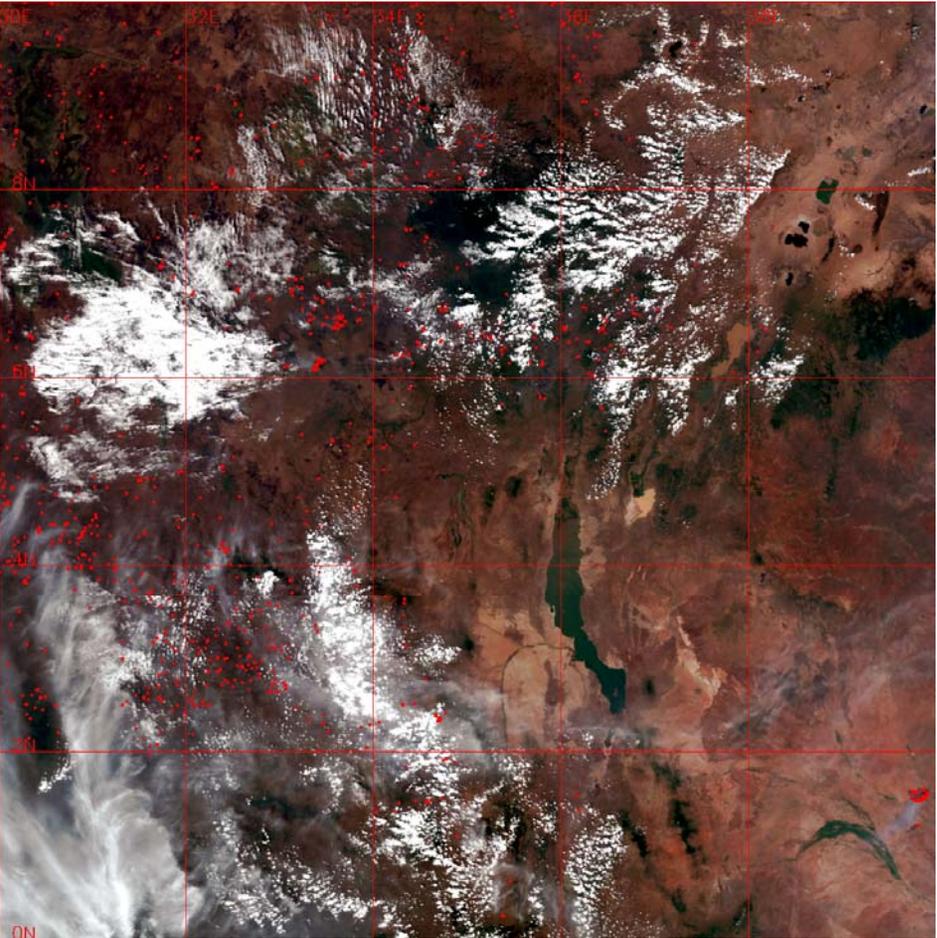
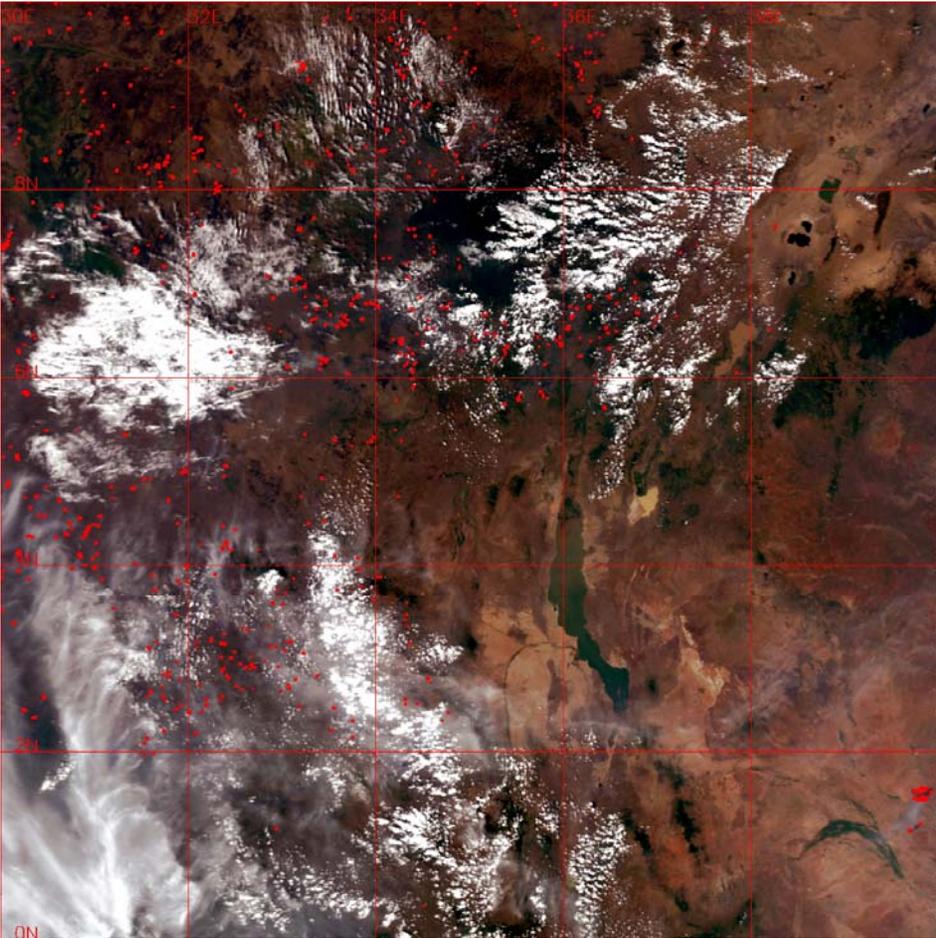


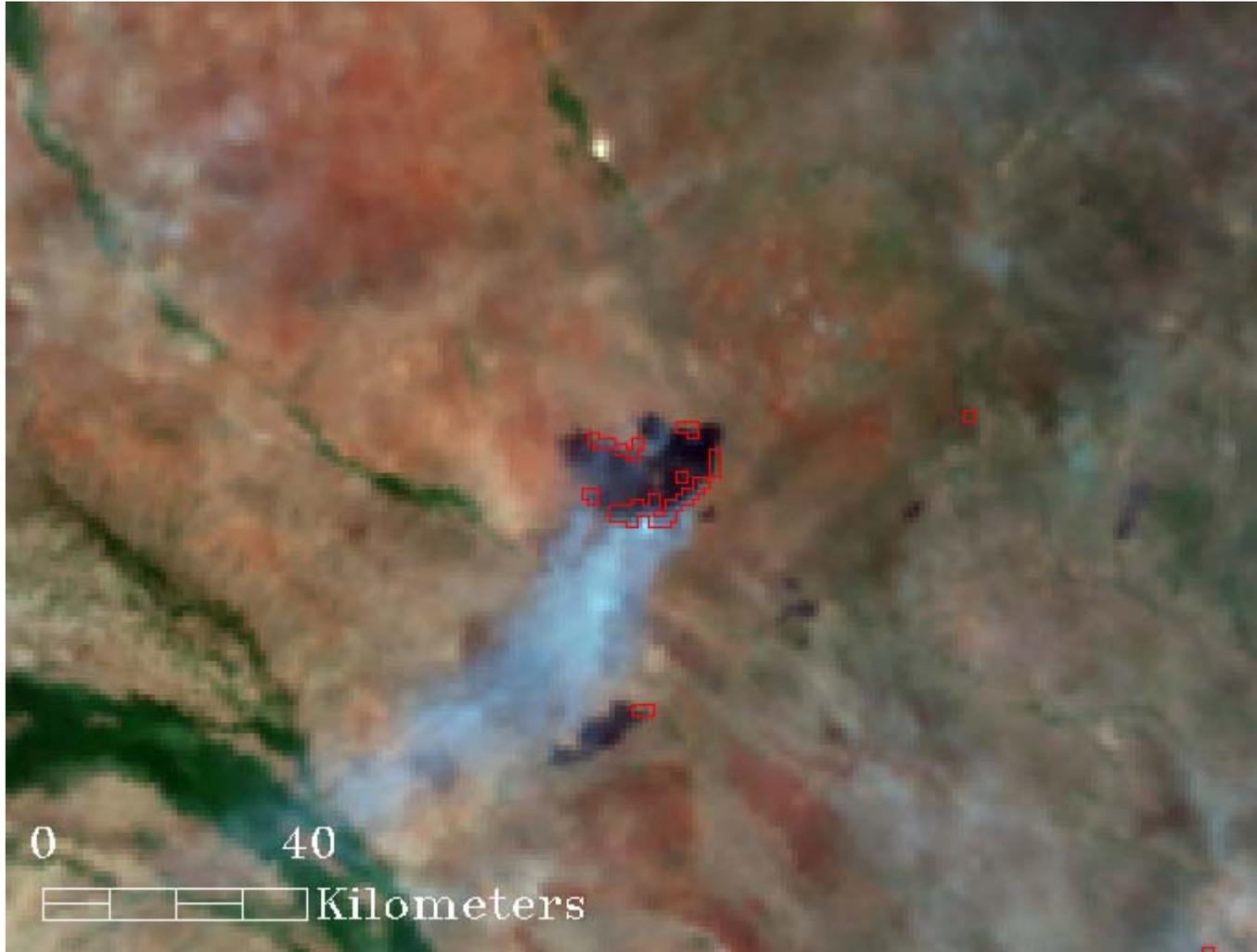
Thermal doors
opened
January 18th
and first fire
detection
images
produced the
following day



MODIS fires on January 19th, 2012
over central Africa

VIIRS fires on January 19th, 2012
over central Africa

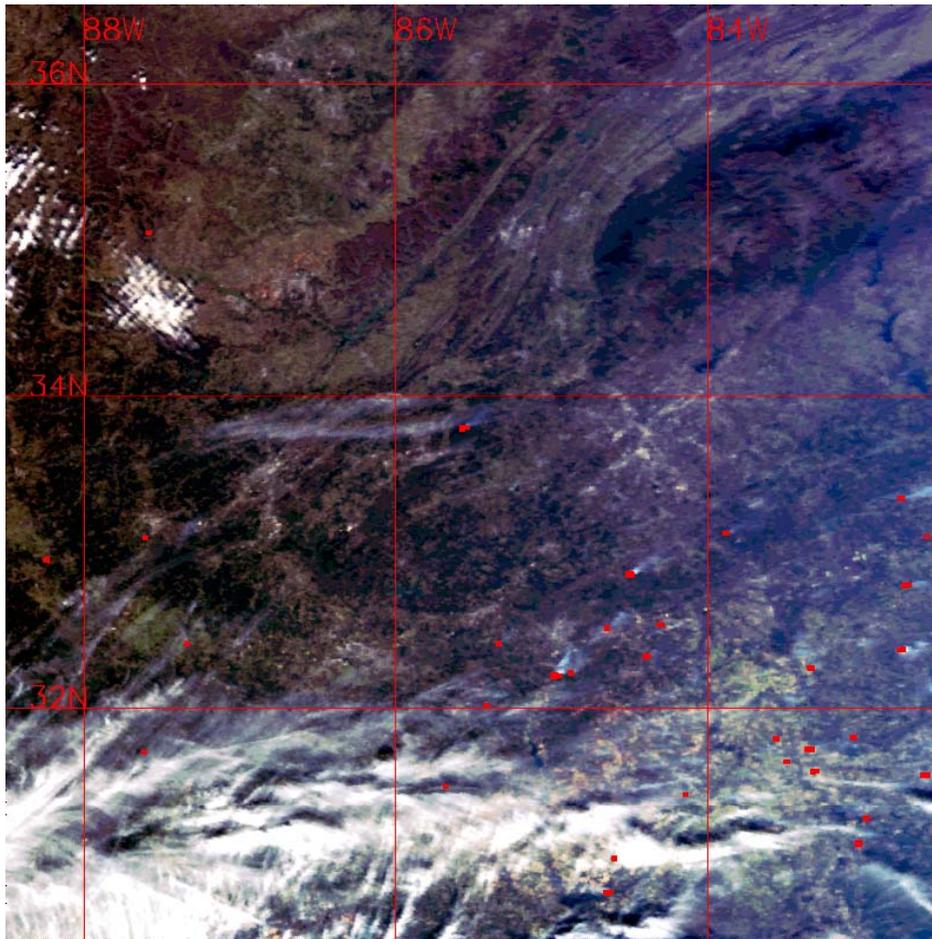




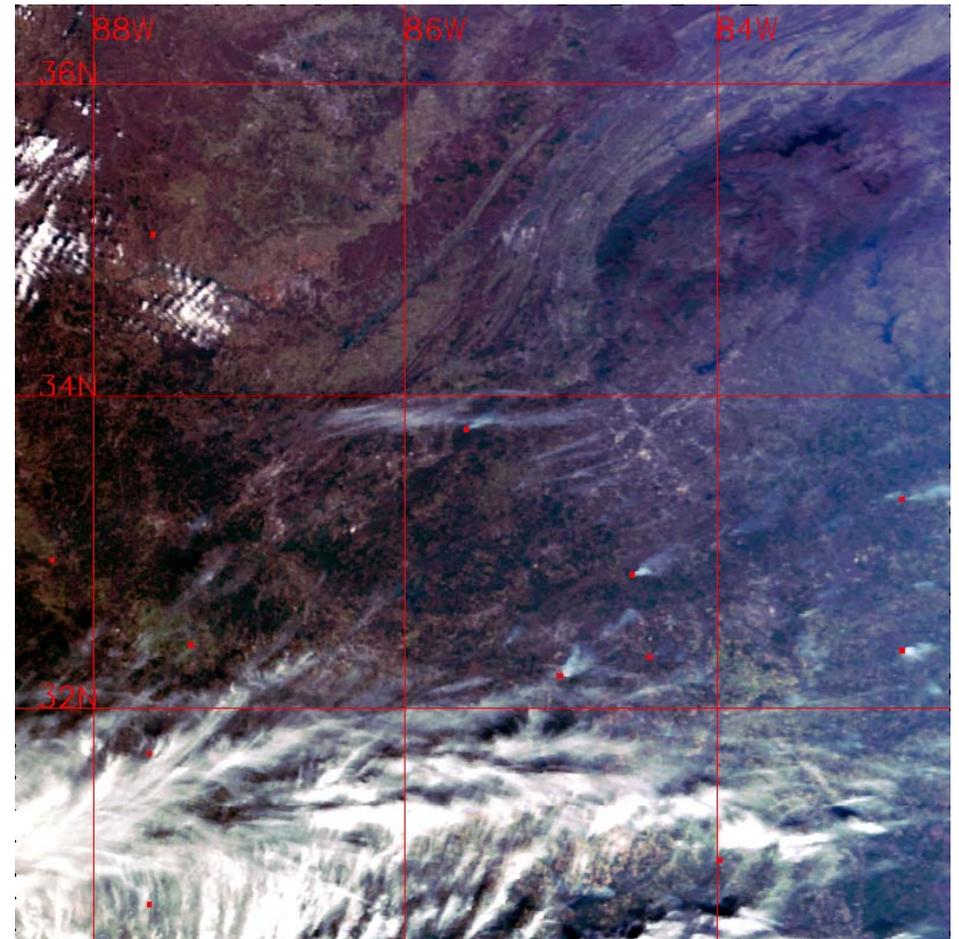
Ground observed fires

- USFS implemented a number of Rx fires at the Talladega National Forest (AL)
- Approximately 1000 acres were burned 1/30
- Two VIIRS overpasses of the area
 - The first one around 1748-1758 UTC did not produce a detection for the Rx fire (*in the M-band*)
 - The second at 1926-1936 UTC did.
- MODIS had one overpass of the area (at a lower scan angle) also with confirmed fire detection.

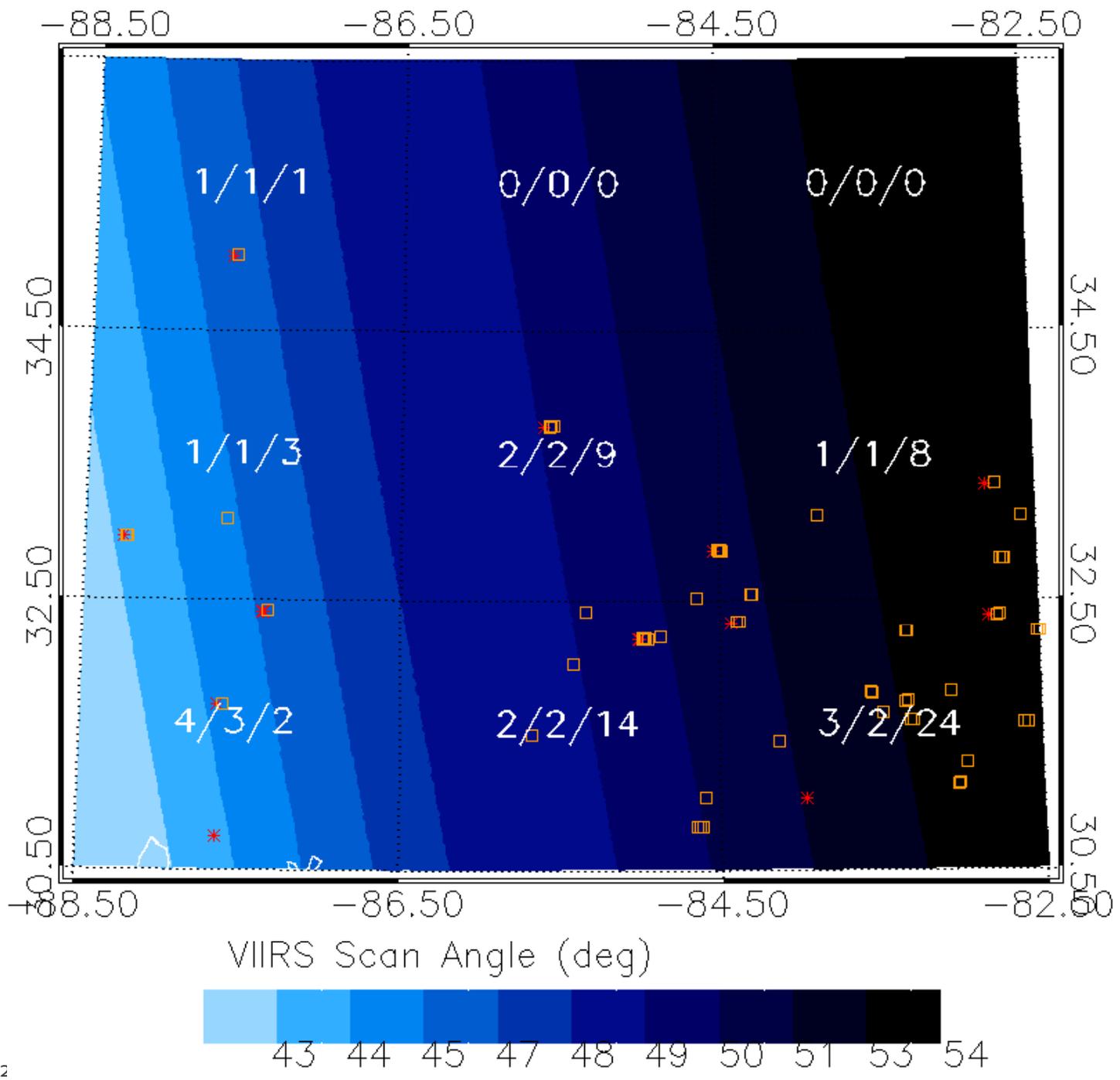
MODIS fire detections



VIIRS fire detections



January 30th, 2012 over Talladega Rx (1926-1936UTC)



M13 & I4

M13

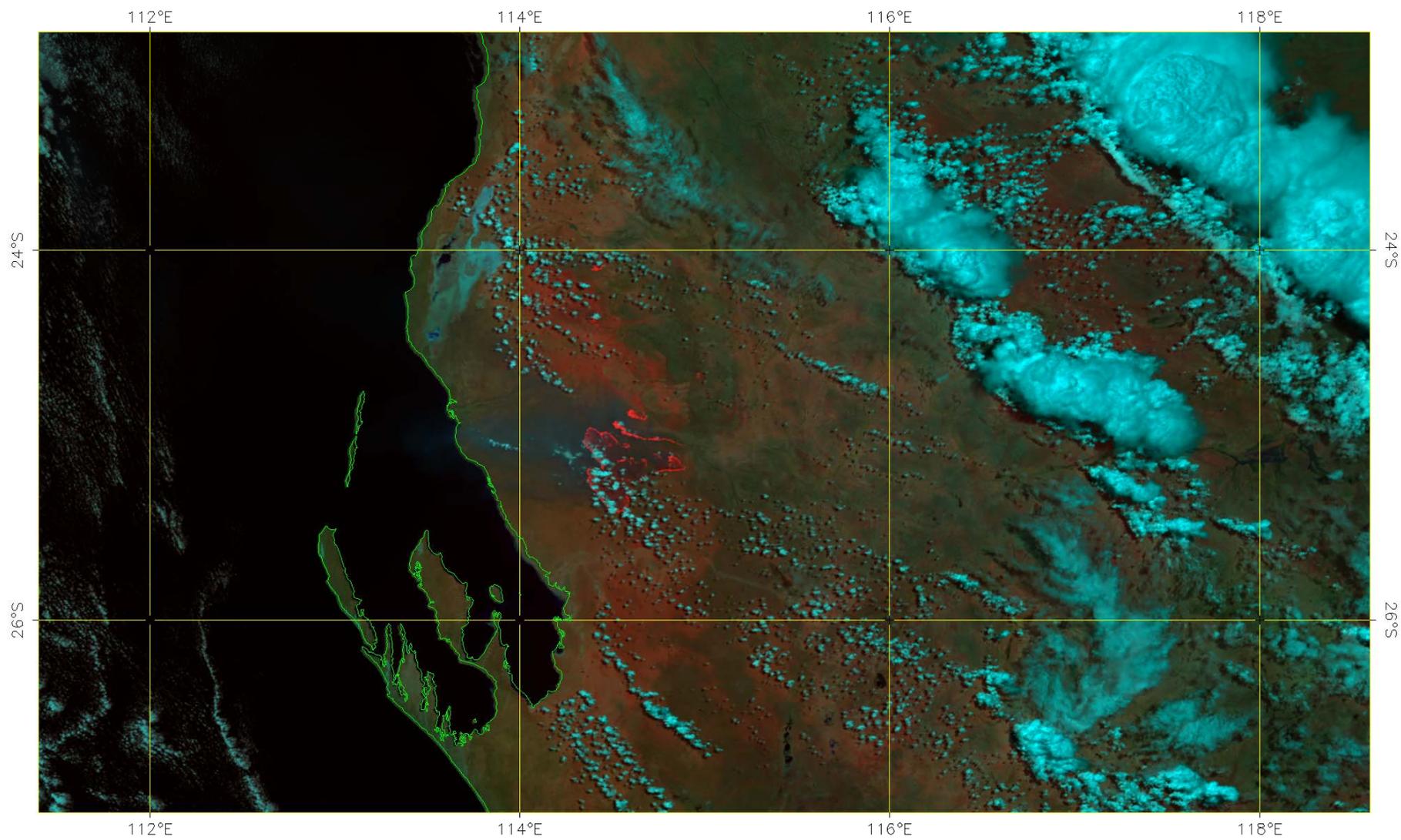
- Center Wavelength:
 - 4.050 μm
- HRI (km) at nadir:
 - 0.742 x 0.259
- Aggregated
 - 0.742 x 0.777
- Spec Tmax (K):
 - LG 343 / HG 634
- Tested Tmax:
 - HG max 20-25K+ above spec (654-659)

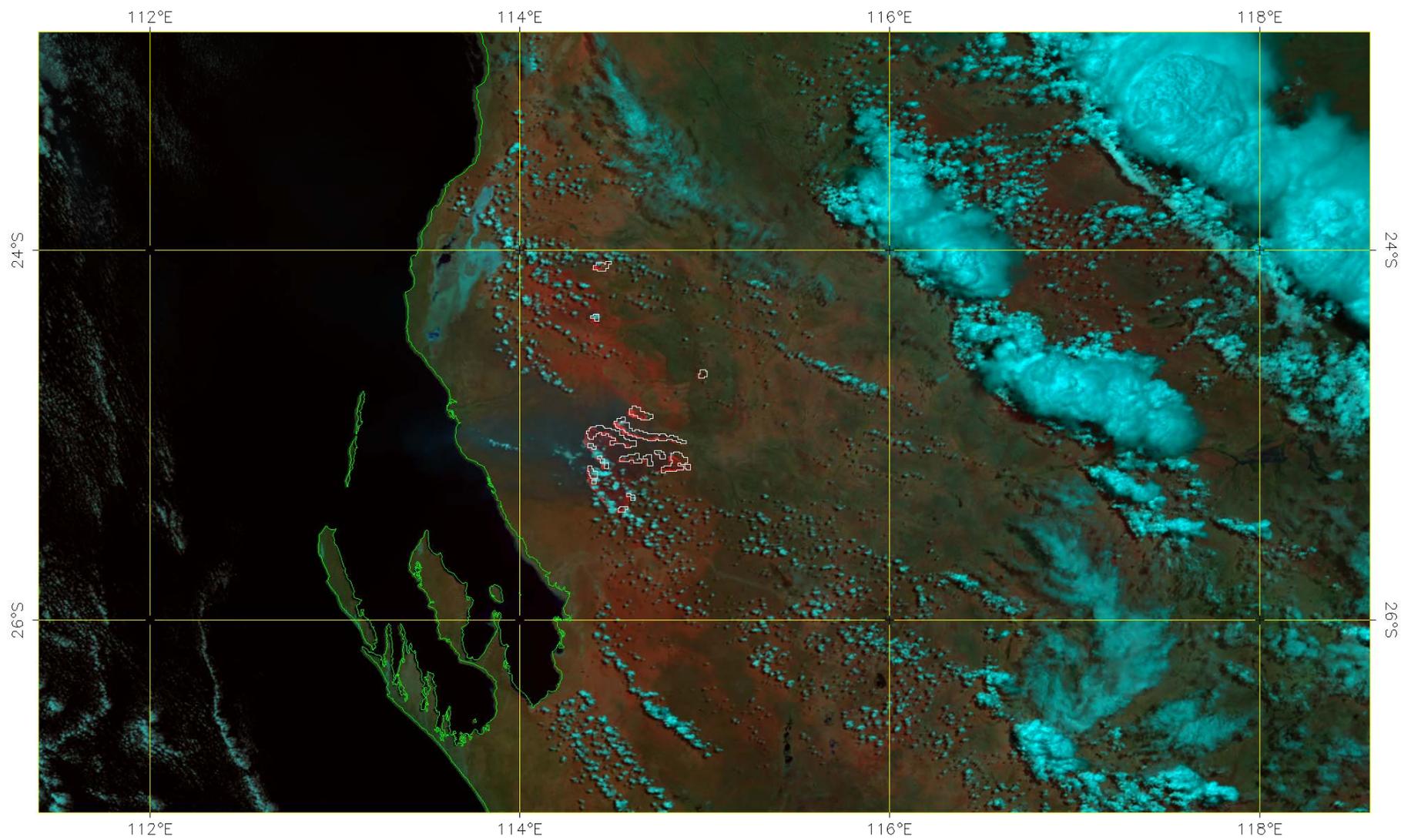
I4

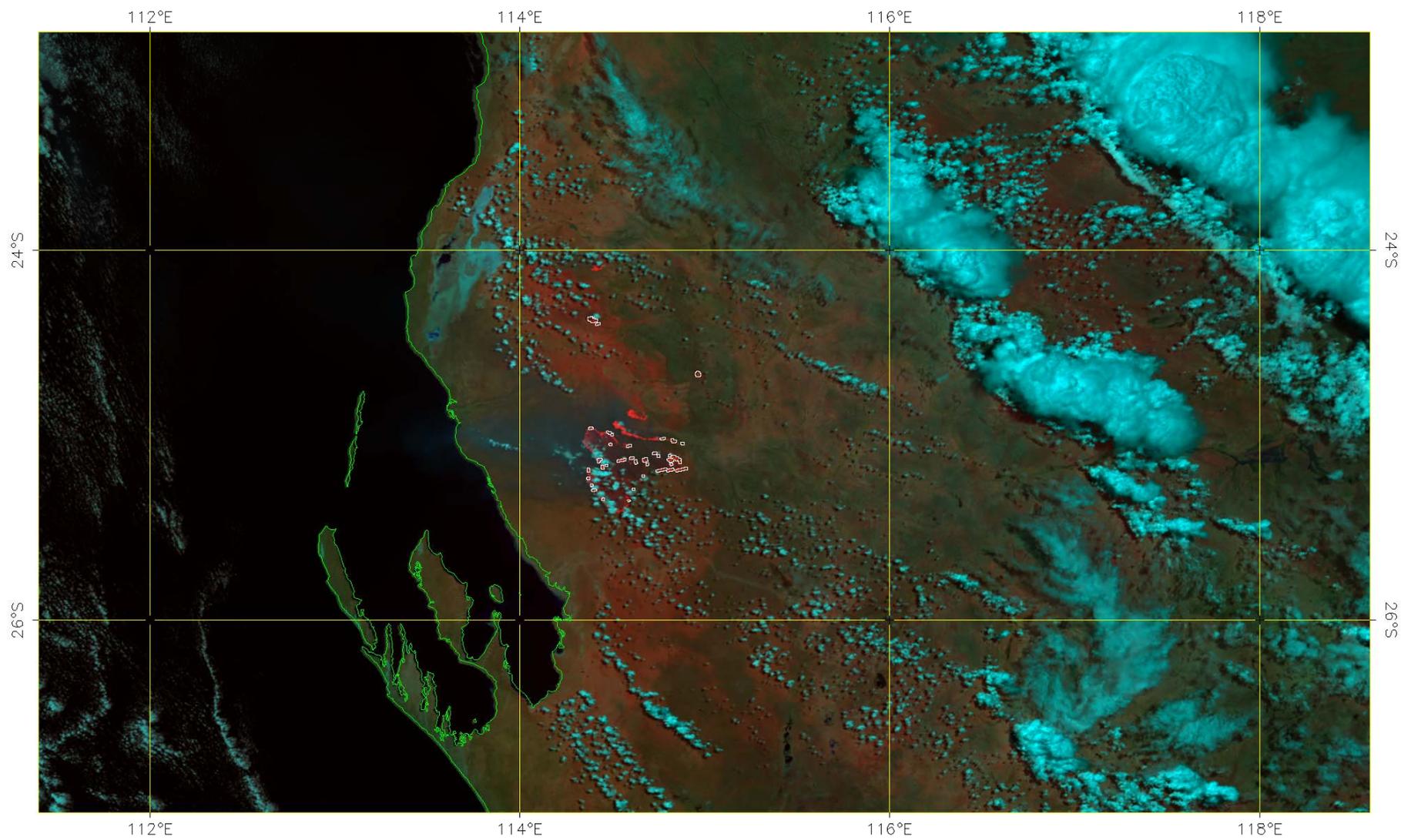
- Center Wavelength:
 - 3.740 μm (Atmospheric attenuation?)
- HRI (km) at nadir:
 - 0.371 x 0.128
- Aggregated
 - 0.371 x 0.384
- Spec Tmax (K):
 - 353
- Tested Tmax:
 - Only 3-5 K above spec (356-358)
 - Saturation problems?

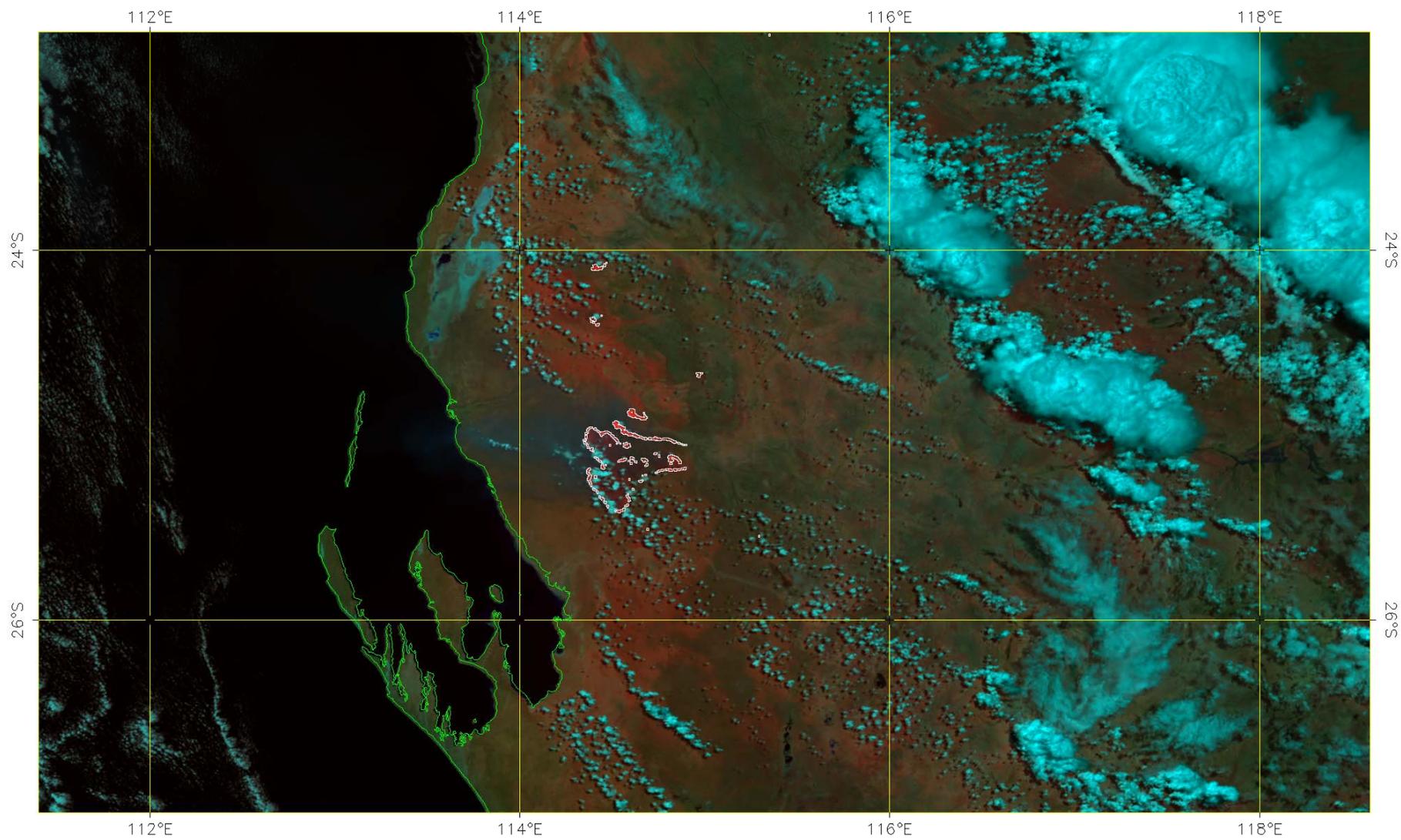
I-band fire detections

- VIIRS I-bands
 - 4 (MIR; 3.55 – 3.93 μm)
 - 5 (TIR; 10.05 – 12.4 μm)
 - (VIS) to screen for clouds
- Although saturation was a concern, and does occur, the data is behaving normally and folded pixel values as a result of saturation are reported as a static 208k.









■ I4



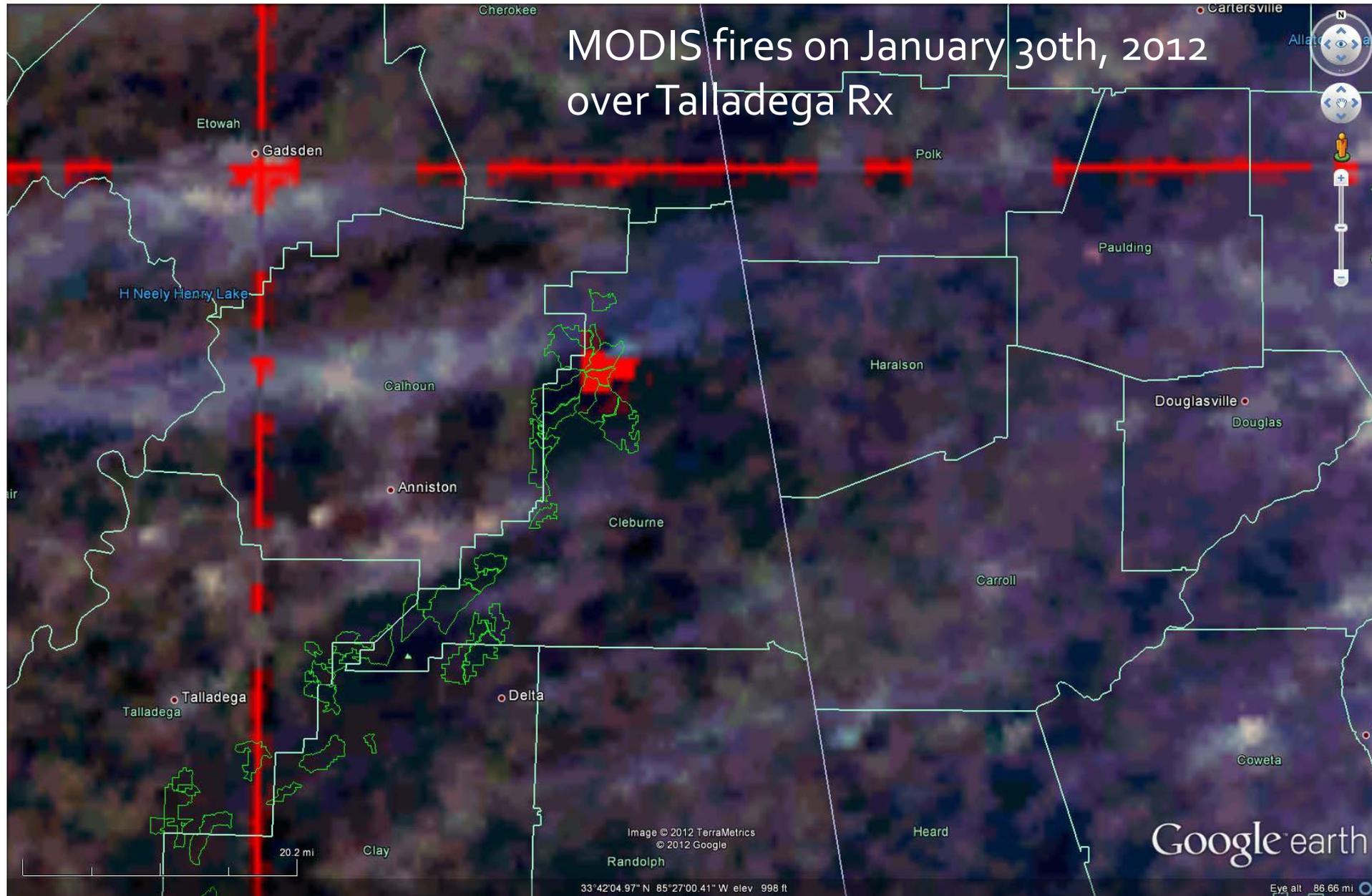
■ M13

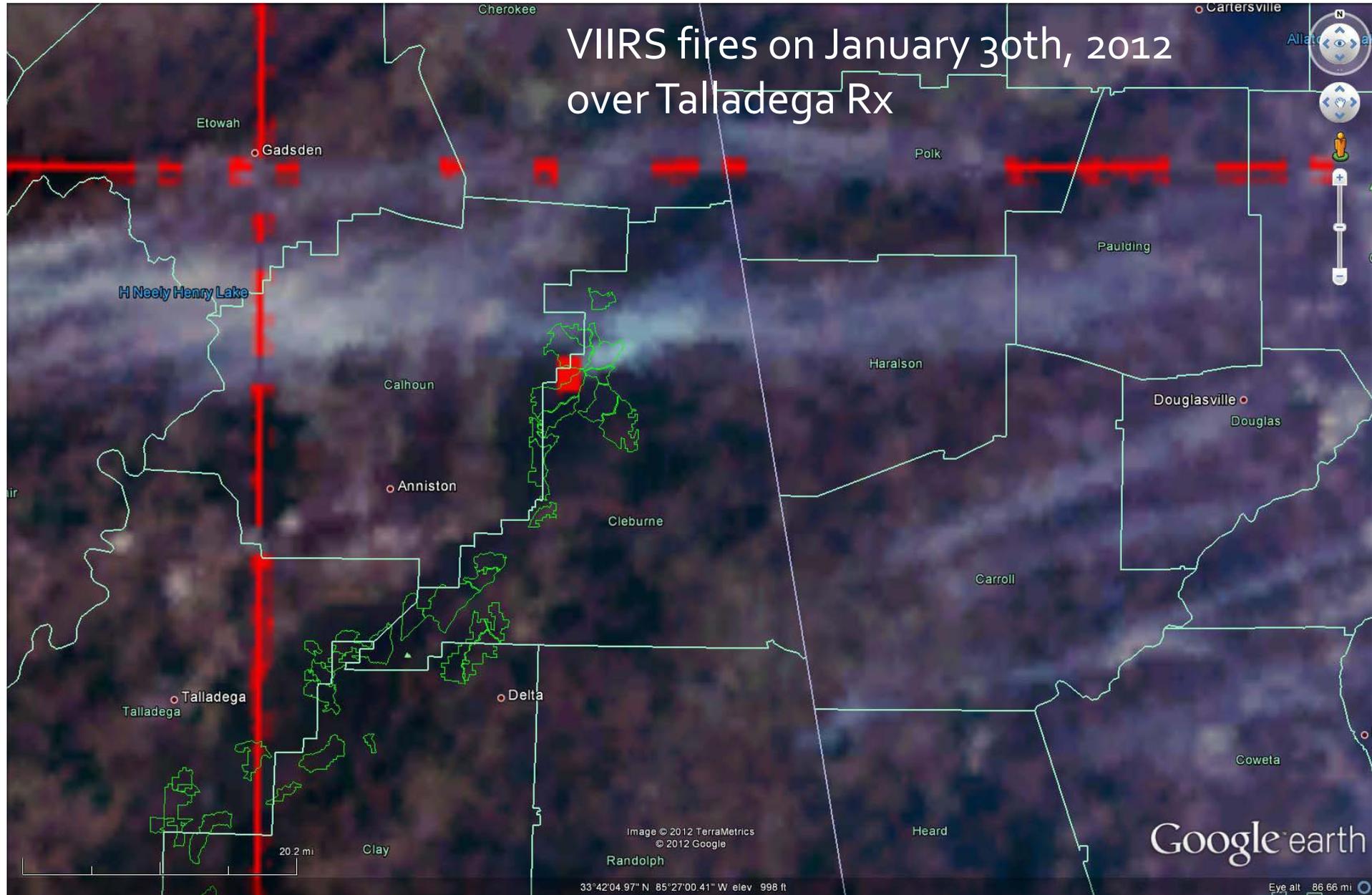


I-band fire detections

- The I-band active fire algorithm could be implemented as a stand-alone product and/or could also become part of a hybrid product.
- Quality flags may be added to the aggregated pixels with the follow-on sensor, indicating when one or more pixels used in the aggregation saturate.
- This could open the door to FRP estimation for aggregated pixels (I-band and M-band) where no saturation has occurred (i.e. un-flagged).

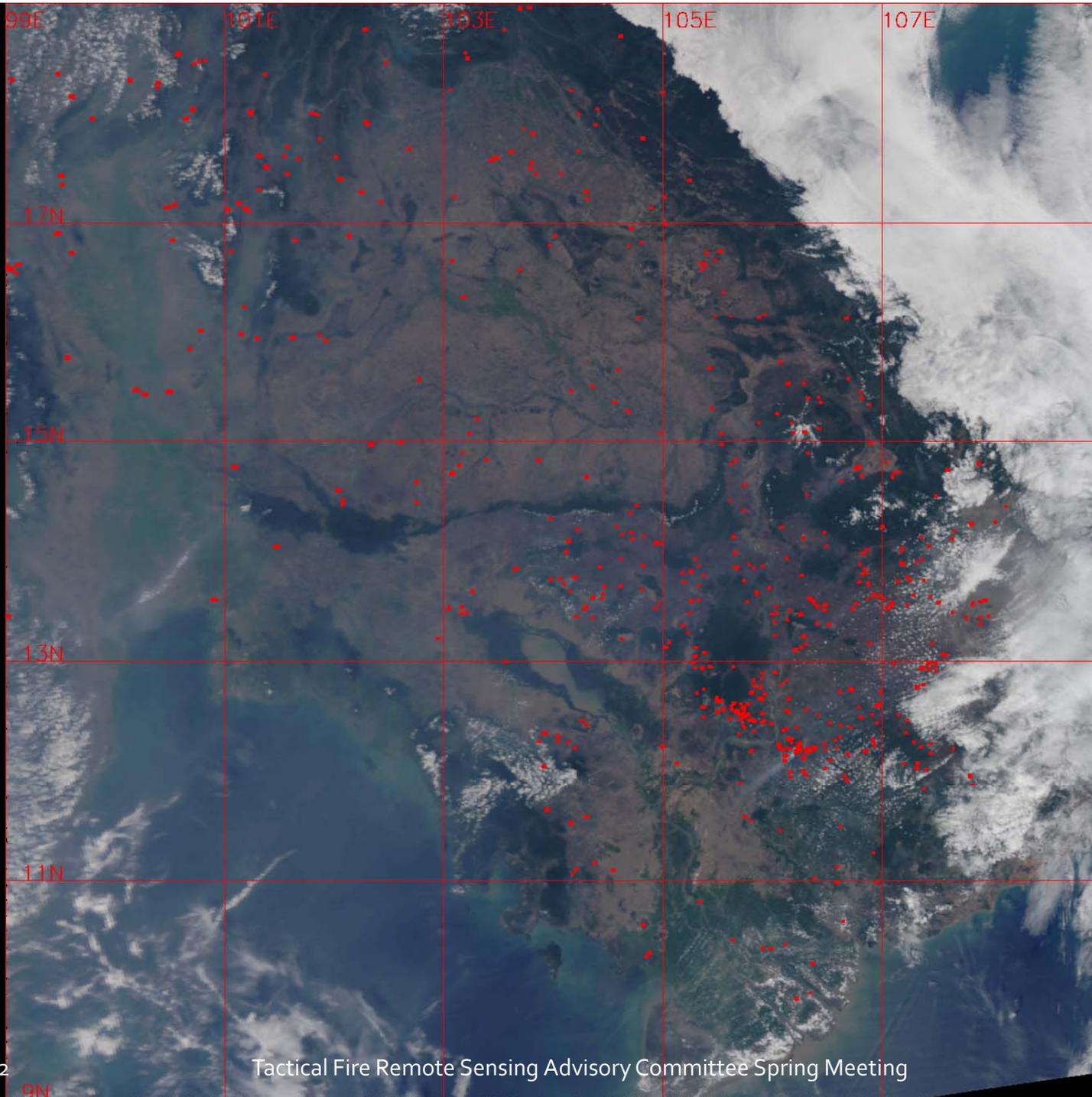
Geolocation





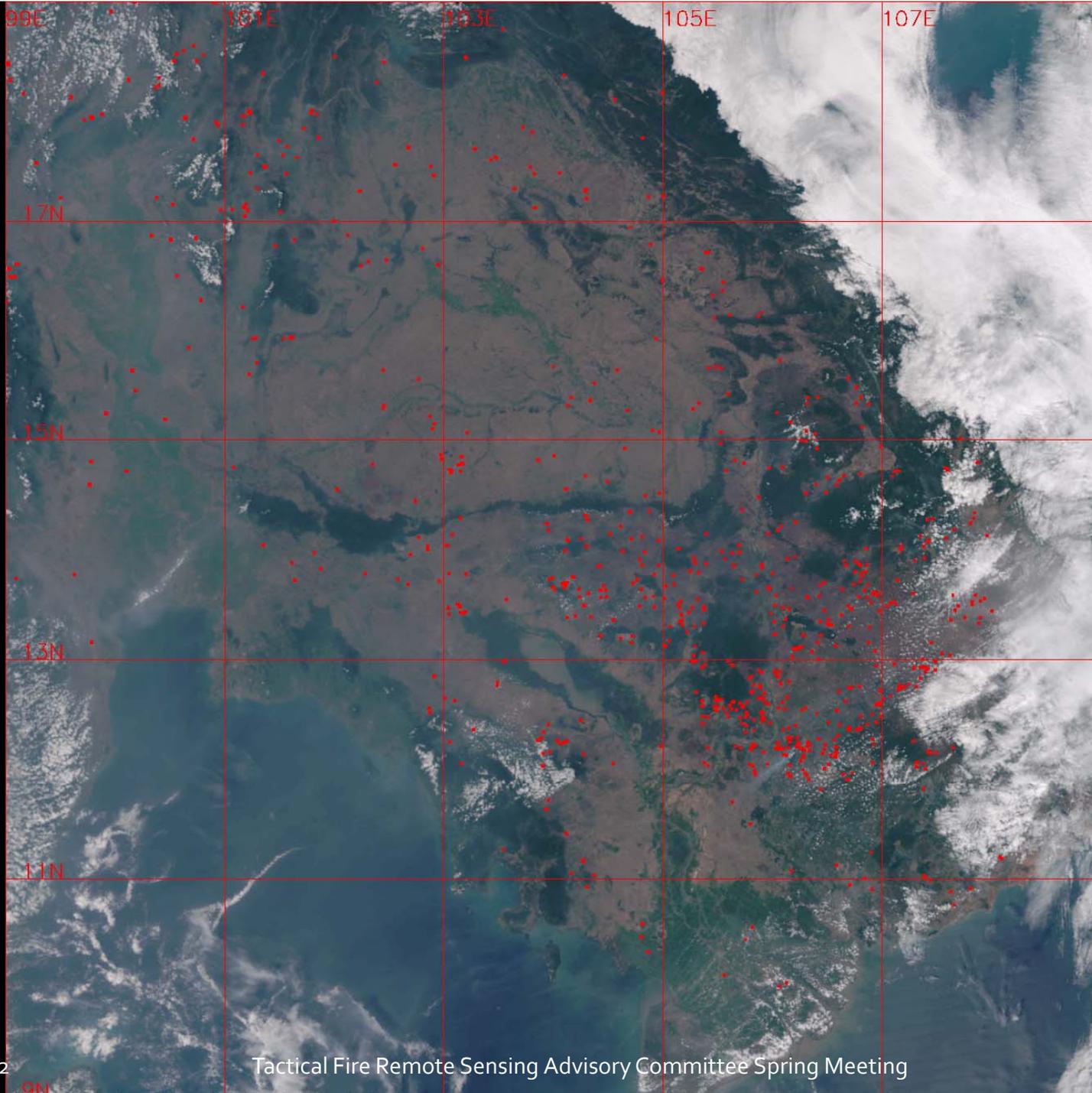
Aqua
MODIS

Cambodia
20 Feb '12
06:15UTC



NPP
VIIRS

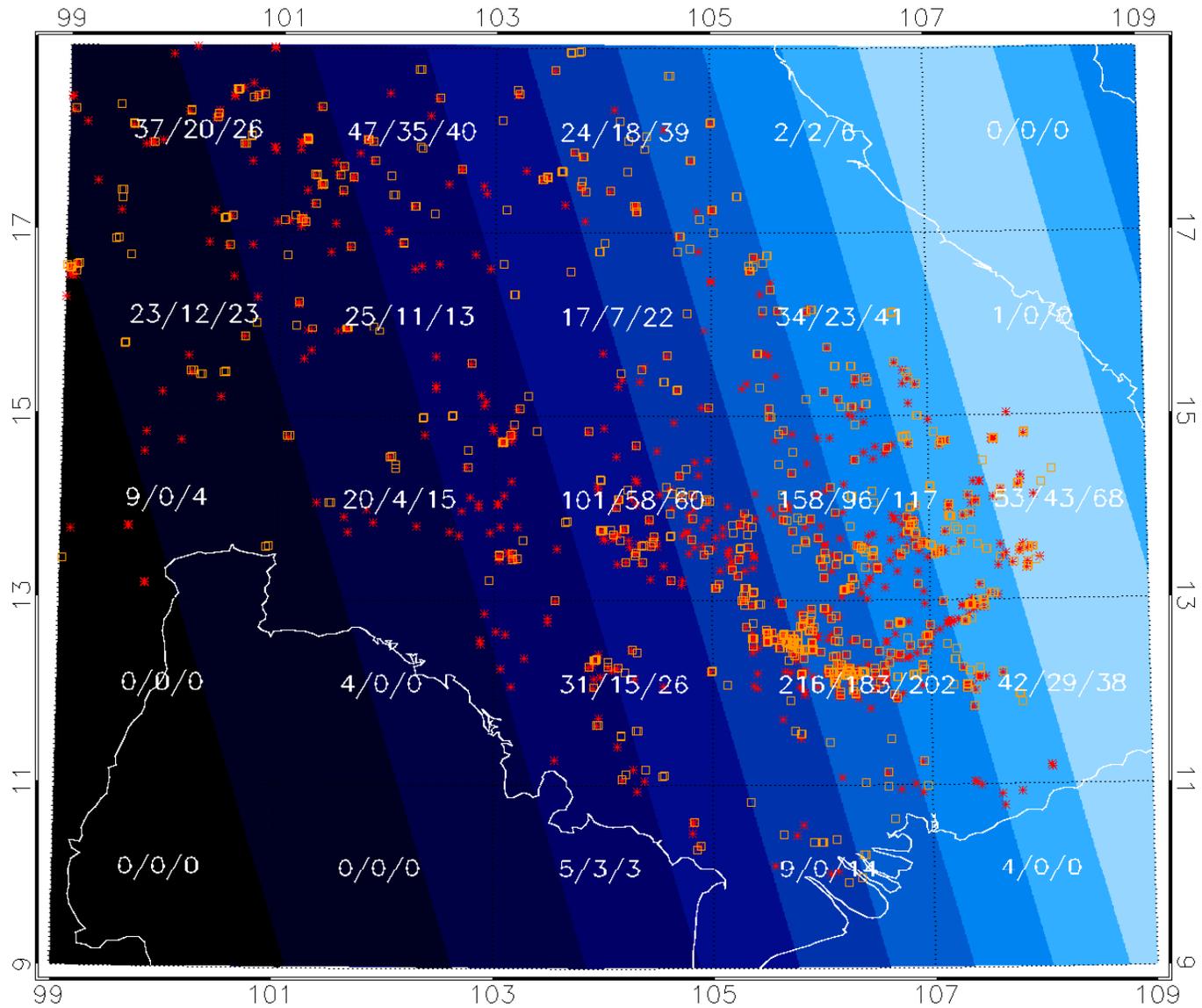
Cambodia
20 Feb '12
0604UTC



MYD14
VIIRS

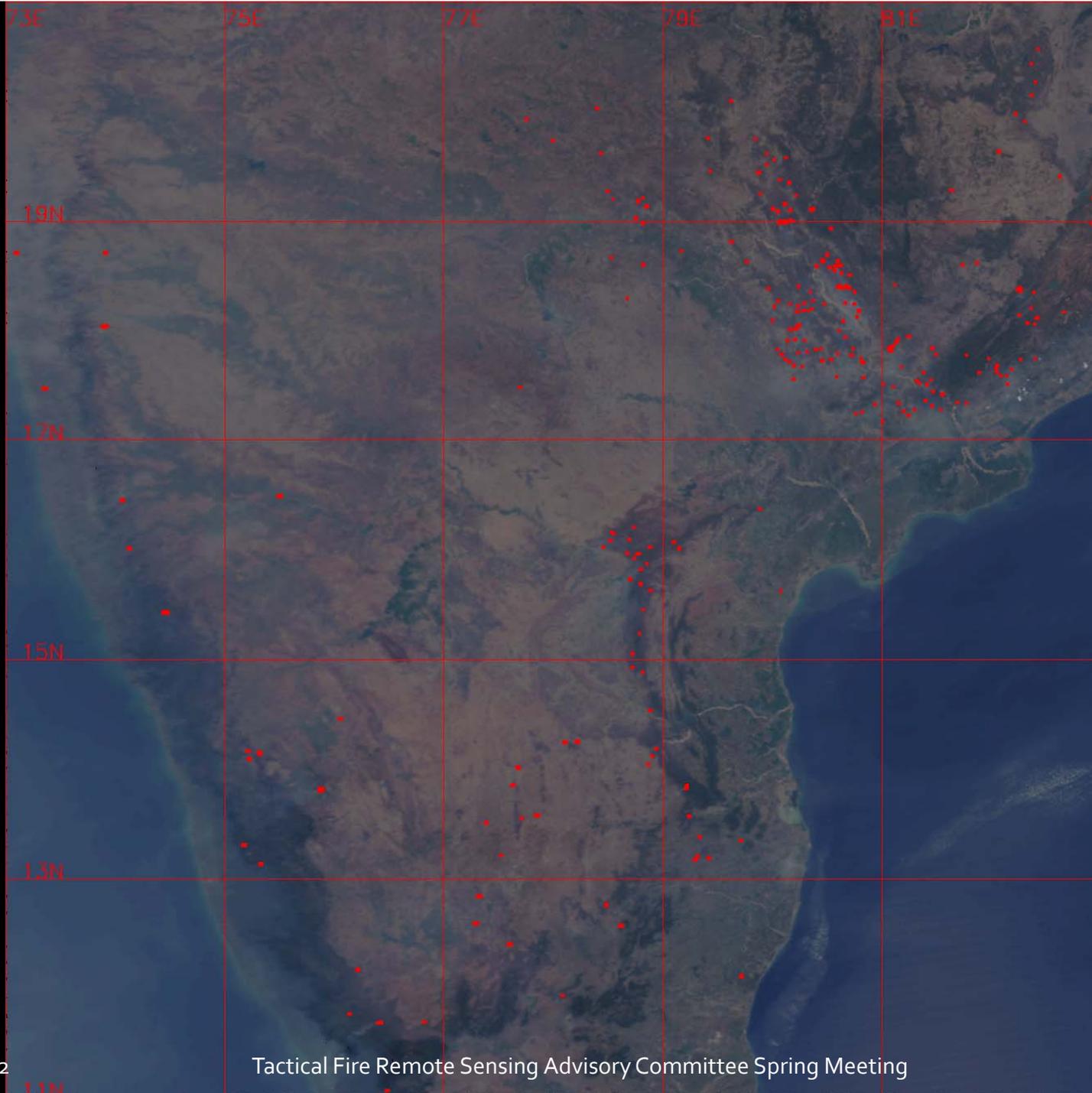
Cambodia
20 Feb '12
~0604UTC

MYD: 757
VIIRS: 836



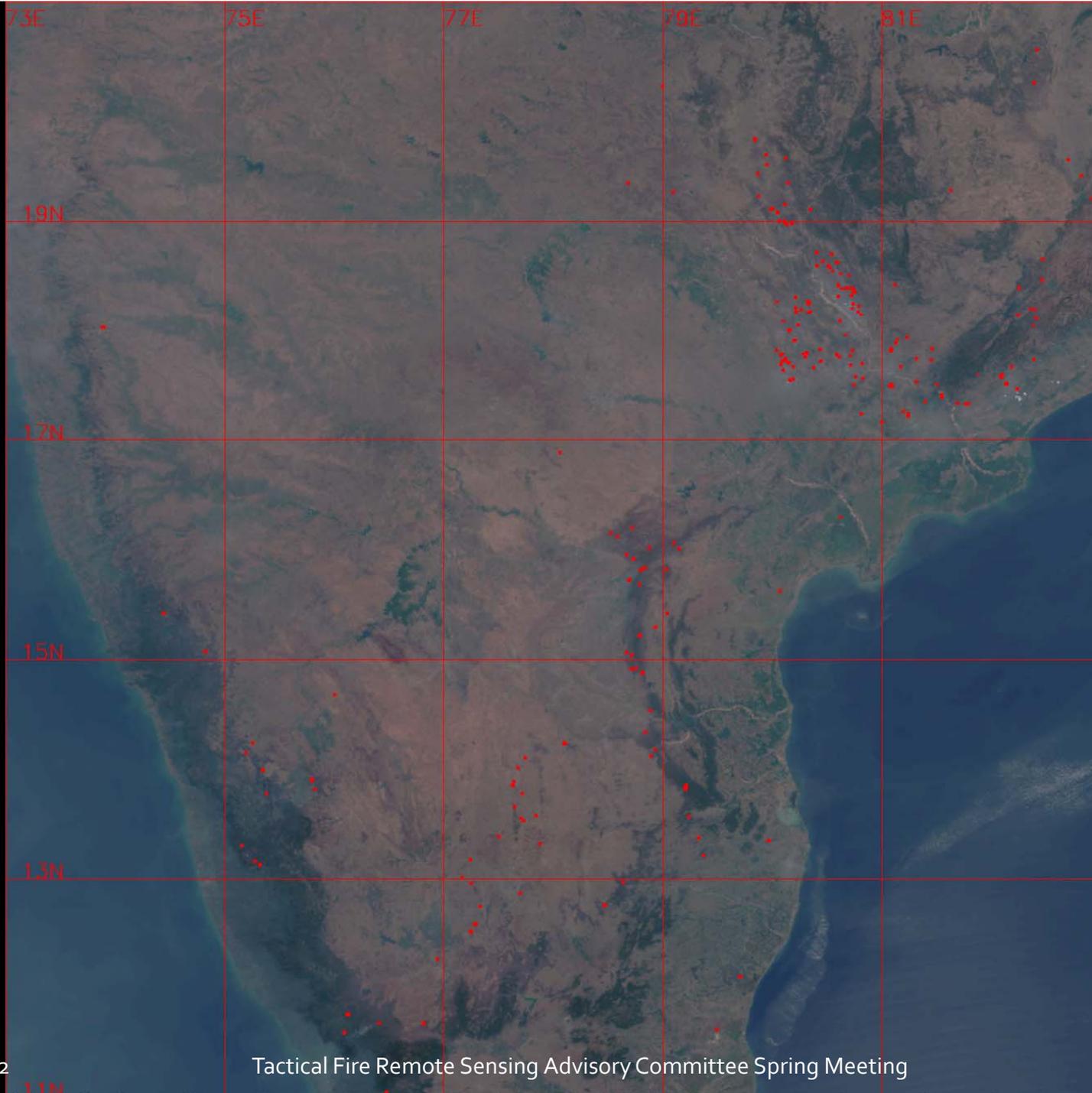
Aqua
MODIS

India
20 Feb '12
0755UTC



NPP
VIIRS

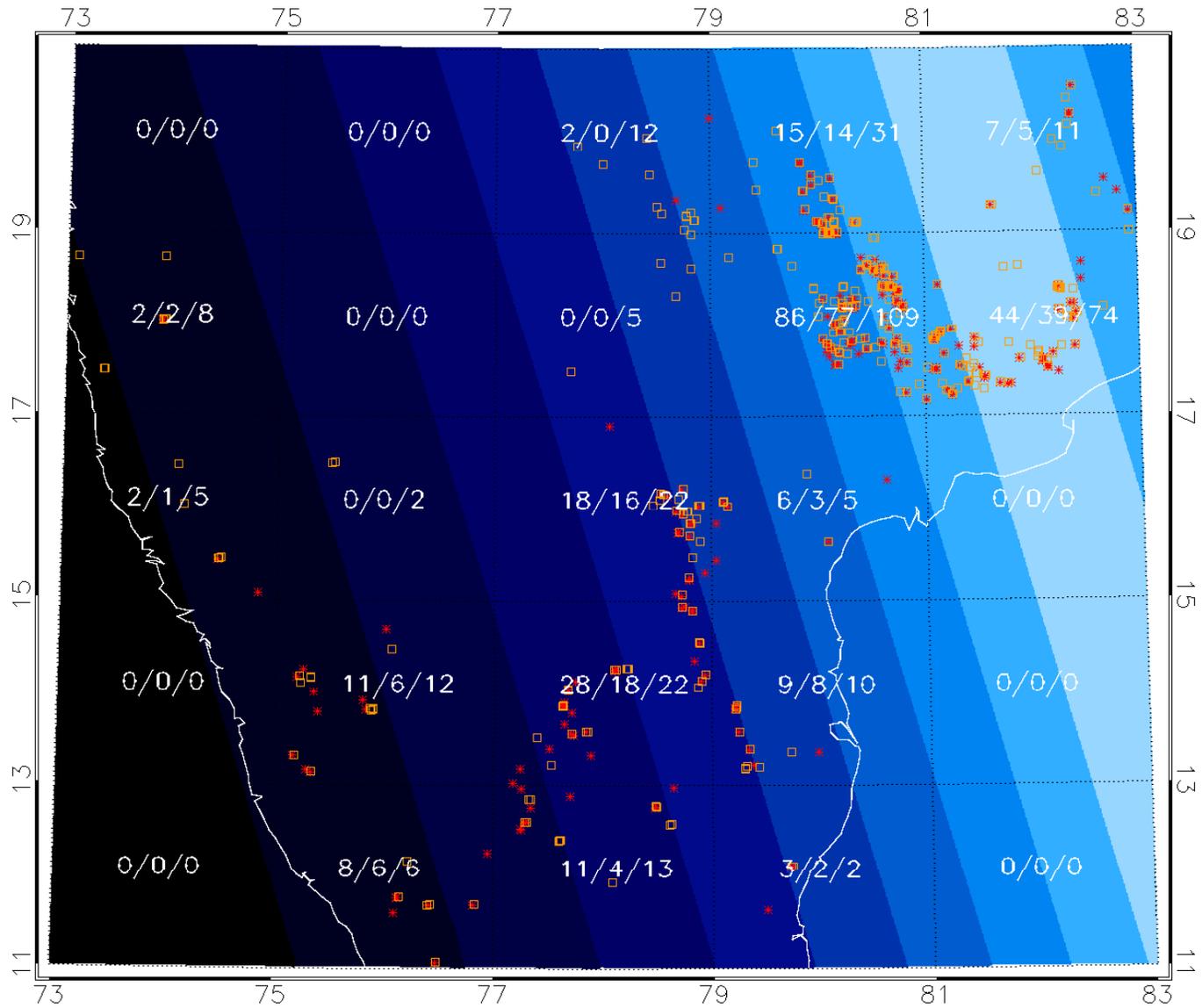
India
20 Feb '12
0745UTC



MYD14
VIIRS

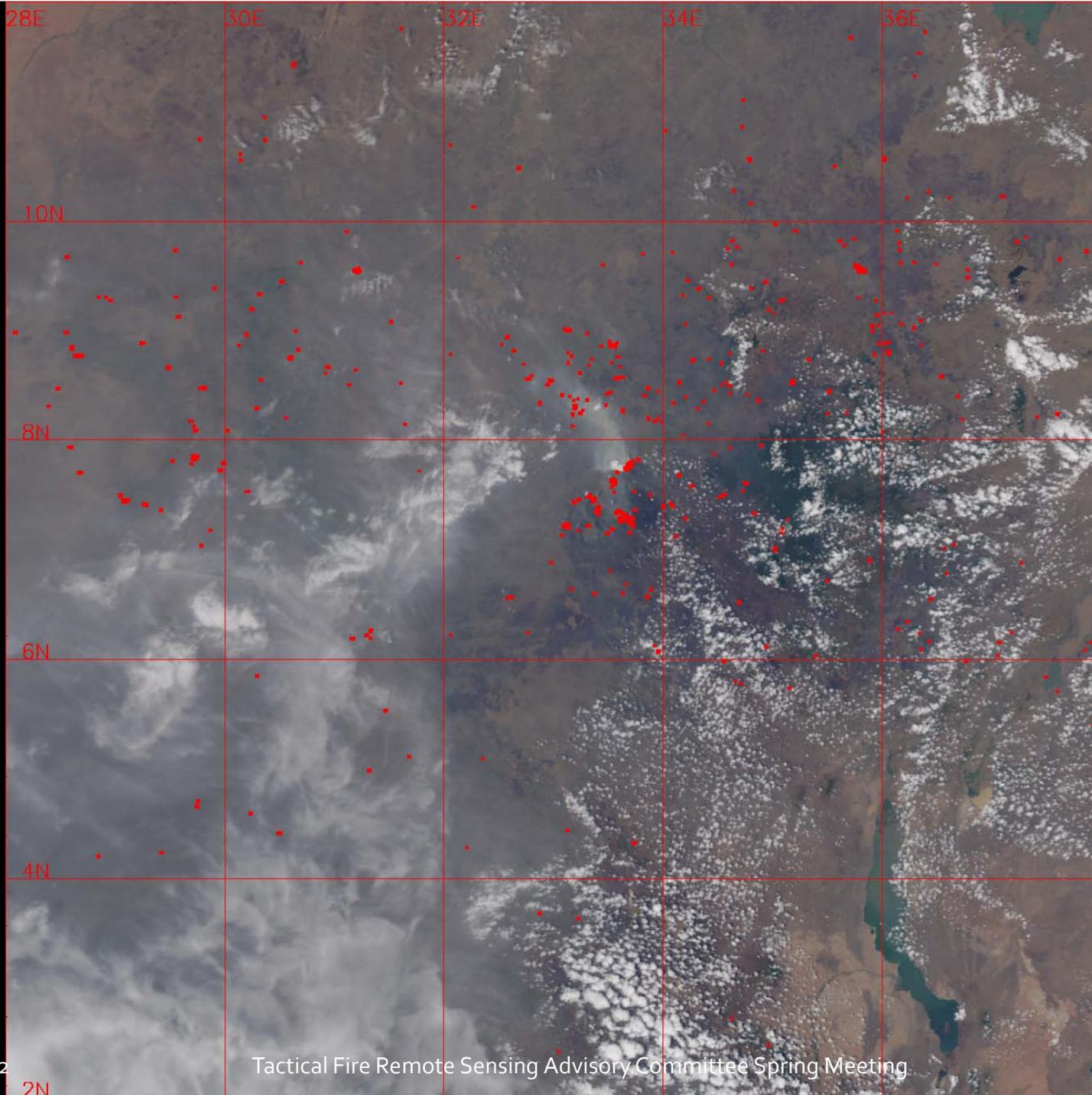
India
20 Feb '12
~0745UTC

MYD: 349
VIIRS: 252



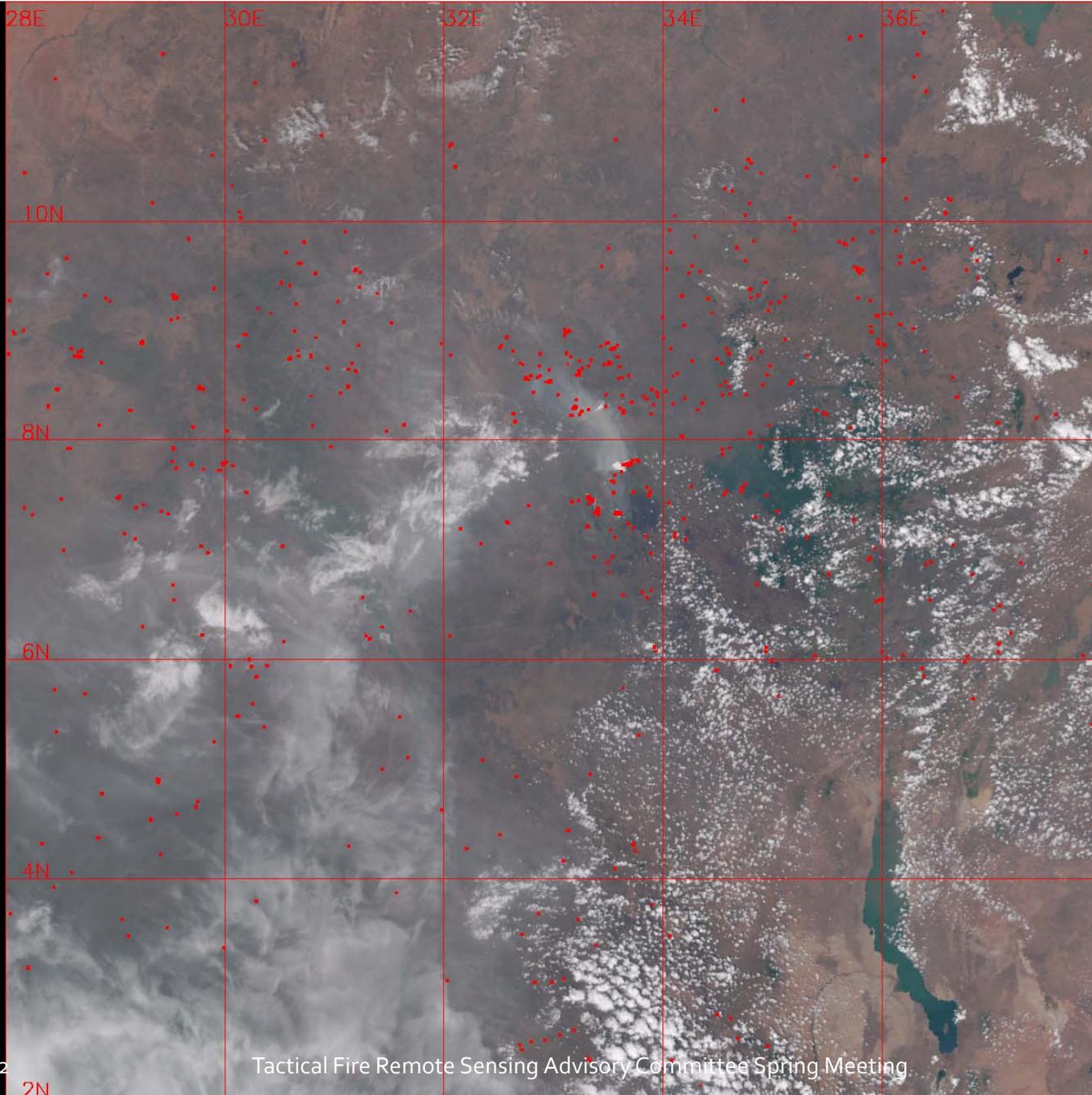
Aqua
MODIS

Africa
20 Feb '12
1110 UTC



NPP
VIIRS

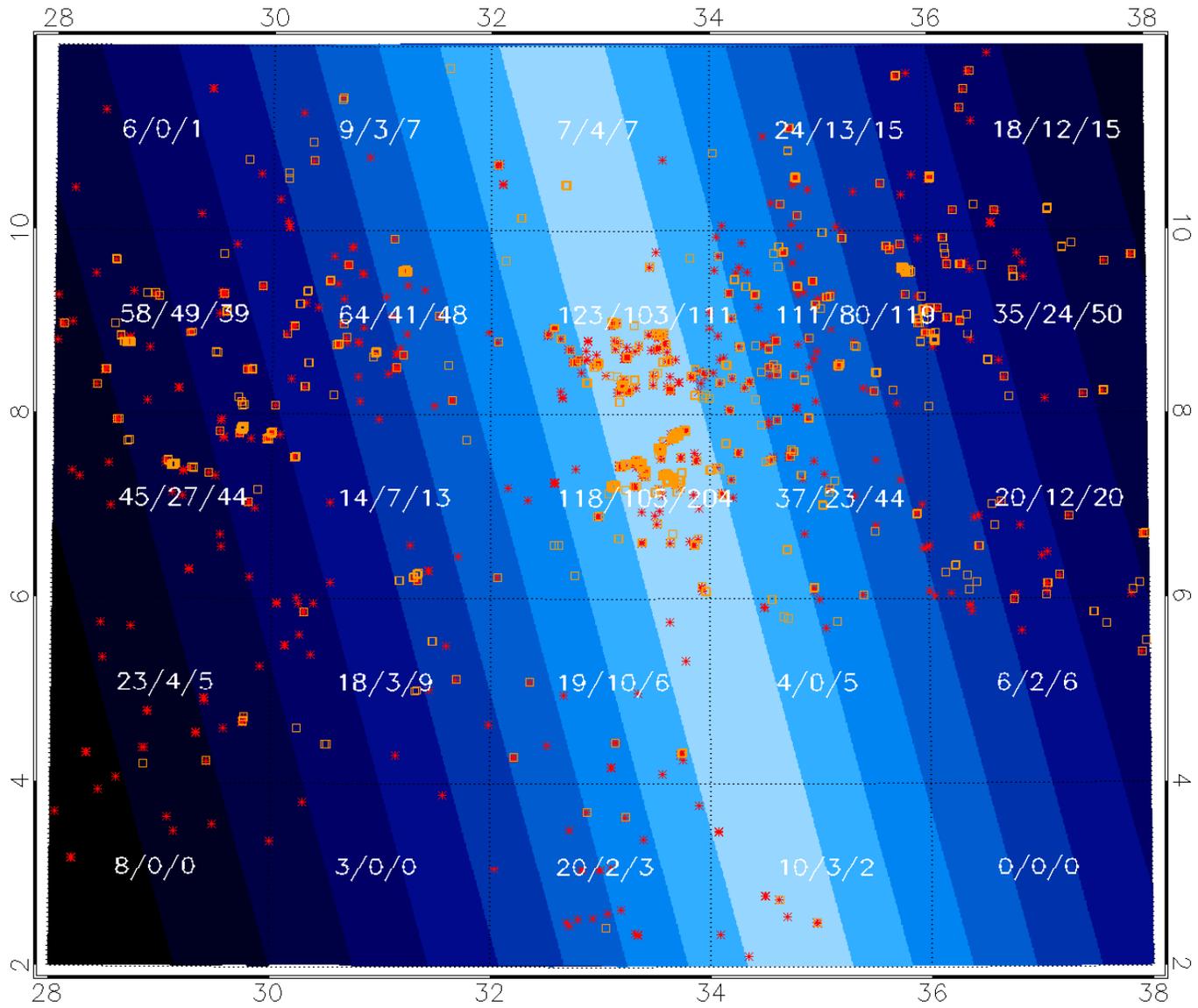
Africa
20 Feb '12
1105 UTC



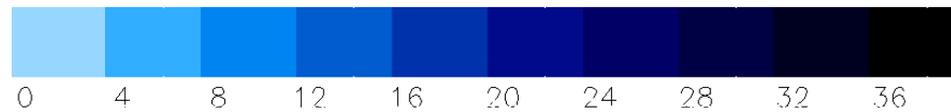
MYD14
VIIRS

Africa
20 Feb '12
~1105 UTC

MYD: 773
VIIRS: 800



VIIRS Scan Angle (deg)



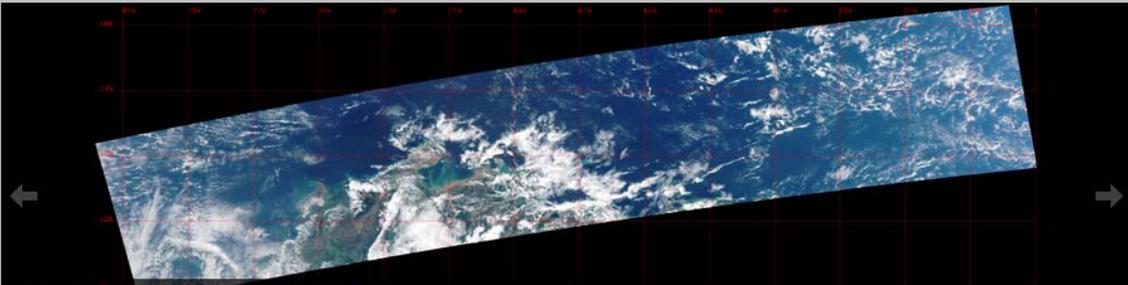
VIIRS AF Website

(<http://viirsfire.geog.umd.edu/>)

VIIRS Active Fire

JPSS
Joint Polar Satellite System
NPP- Land Product Evaluation and Testing Element
VIIRS Land Product Quality Assessment

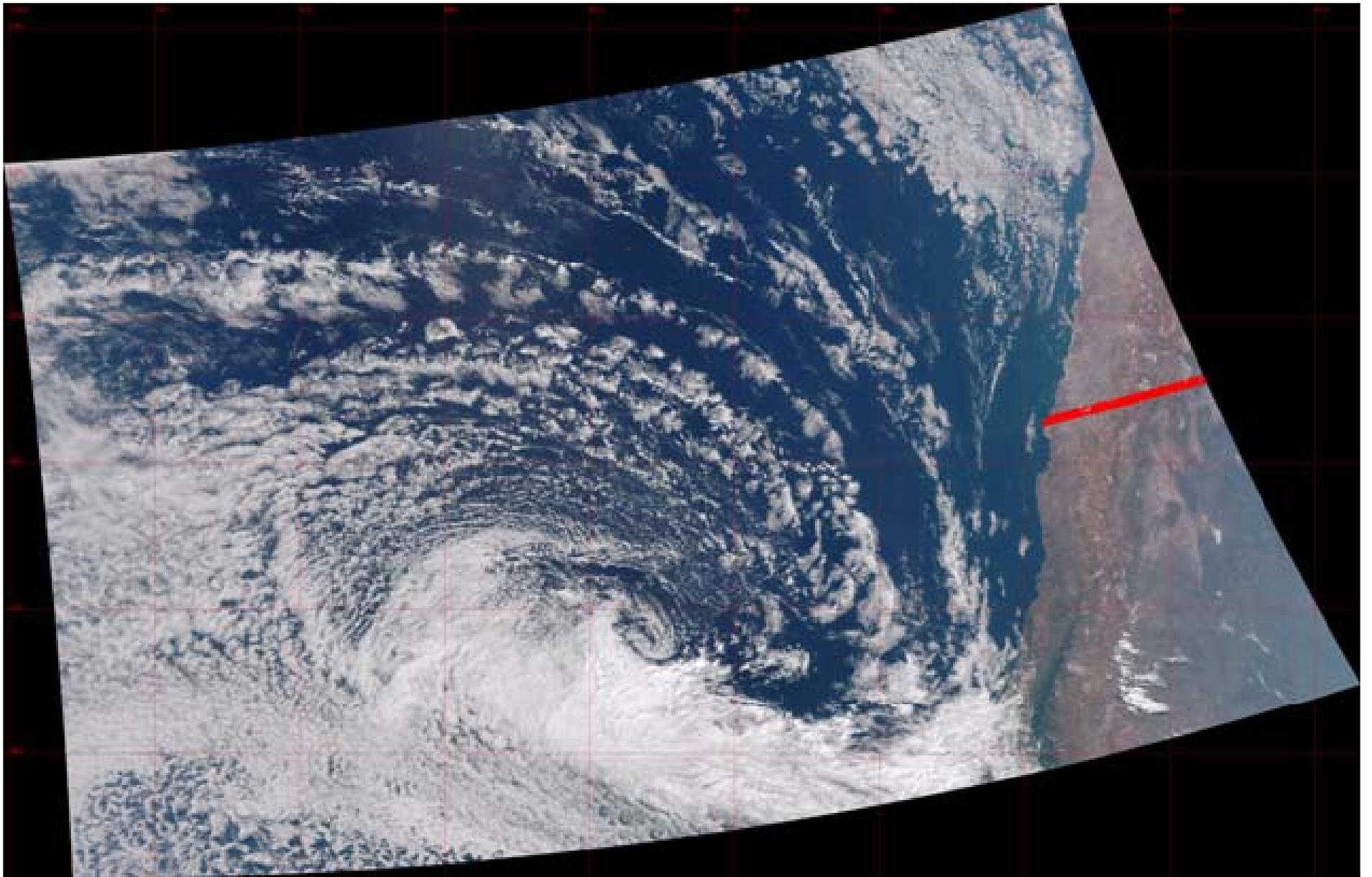
Home	Early light fire detections	Links
Active Fire Team	The VIIRS was launched aboard the Suomi National Polar-orbiting Partnership (NPP) satellite on October 28th, 2011 and on January 18th, 2012 cooler doors for the thermal sensor were opened. Within hours data were being retrieved and fire detections produced. The 84 second swath quicklooks presented here highlight recent fire detections superimposed on corrected reflectance RGB images (bands 5, 4, 3). VIIRS data are still preliminary and will continue to undergo testing and calibration over the coming weeks before being released for public use.	JPSS VIIRS University of Maryland NOAA NOAA-STAR USFS RSAC LOGIN
Ivan Csiszar Wilfrid Schroeder Louis Giglio Evan Ellicott Chris Justice Krishna Vadrevu		



South America fires: January 30th, 2012
The following quicklook shows a VIIRS swath (84 seconds) with fires (highlighted in red) scattered along the north coast of South America in Venezuela and Colombia.

Going forward

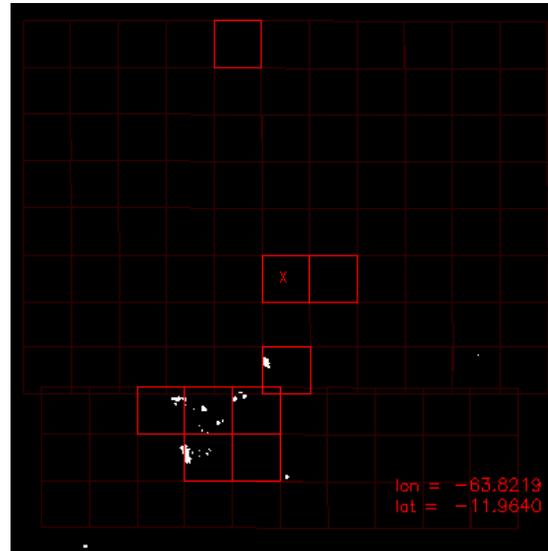
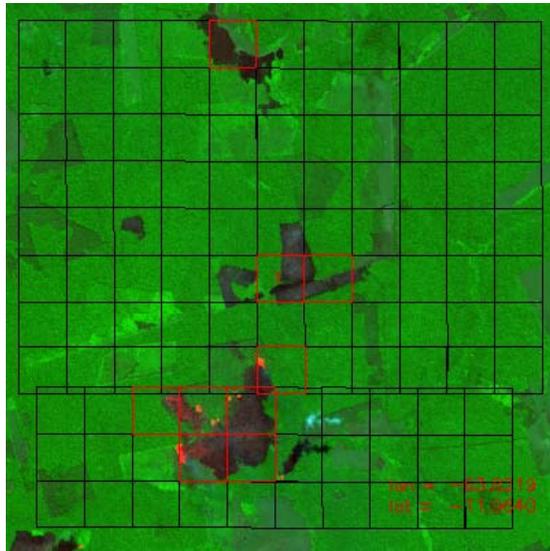
- Implement MODIS C6 code, adapted for VIIRS, to begin testing and evaluation
- Continue assessment of VIIRS AF product using MODIS, airborne (AMS? MASTER?) and ground-based observations (e.g. Rx campaigns).
- Develop and assess fire detection and characterization via M-band / I-band hybridization or stand-alone products.



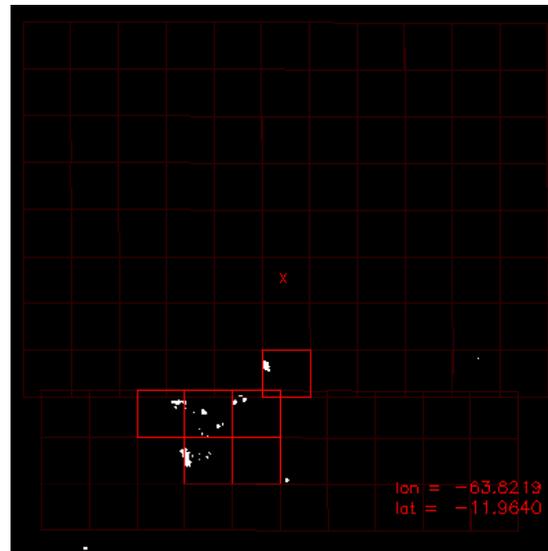
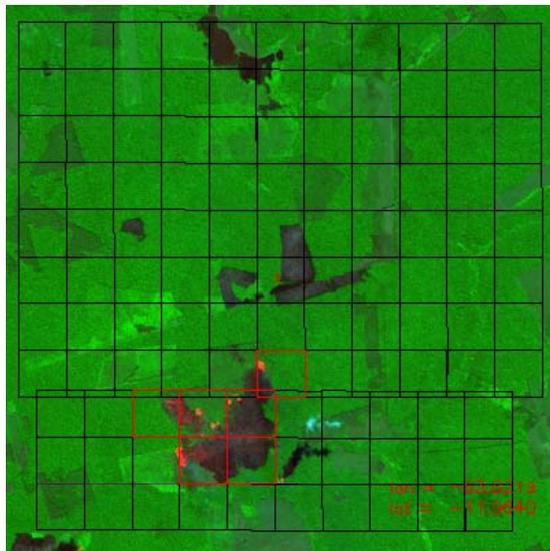
MODIS C6 Algorithm improvements

- Reduce false alarms in Amazon caused by small forest clearings
- Processing to extend to oceans and other large water bodies
 - Detect off-shore gas flaring
- Dynamically adjust potential fire thresholds
 - Detect smaller and/or cooler fires
- Improved cloud mask
- Improved detection confidence estimate
- Updated FRP retrieval

MODIS Collection 5

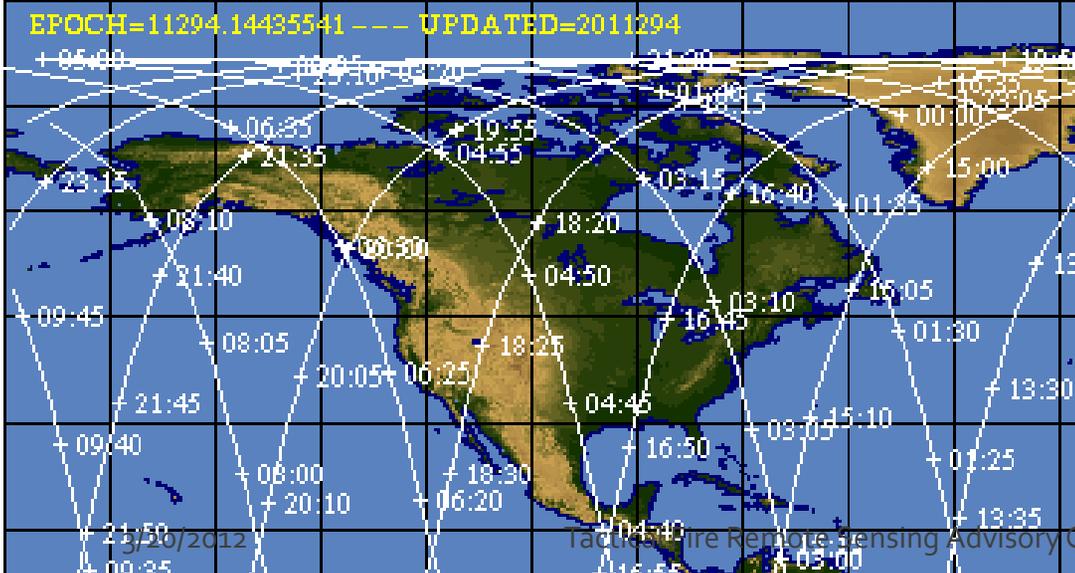
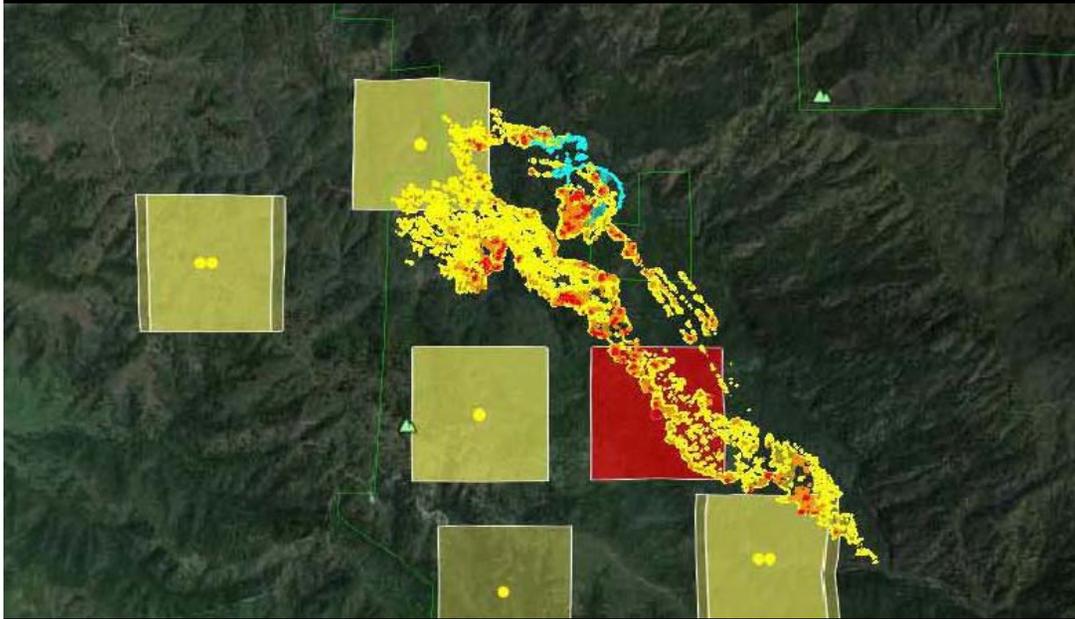


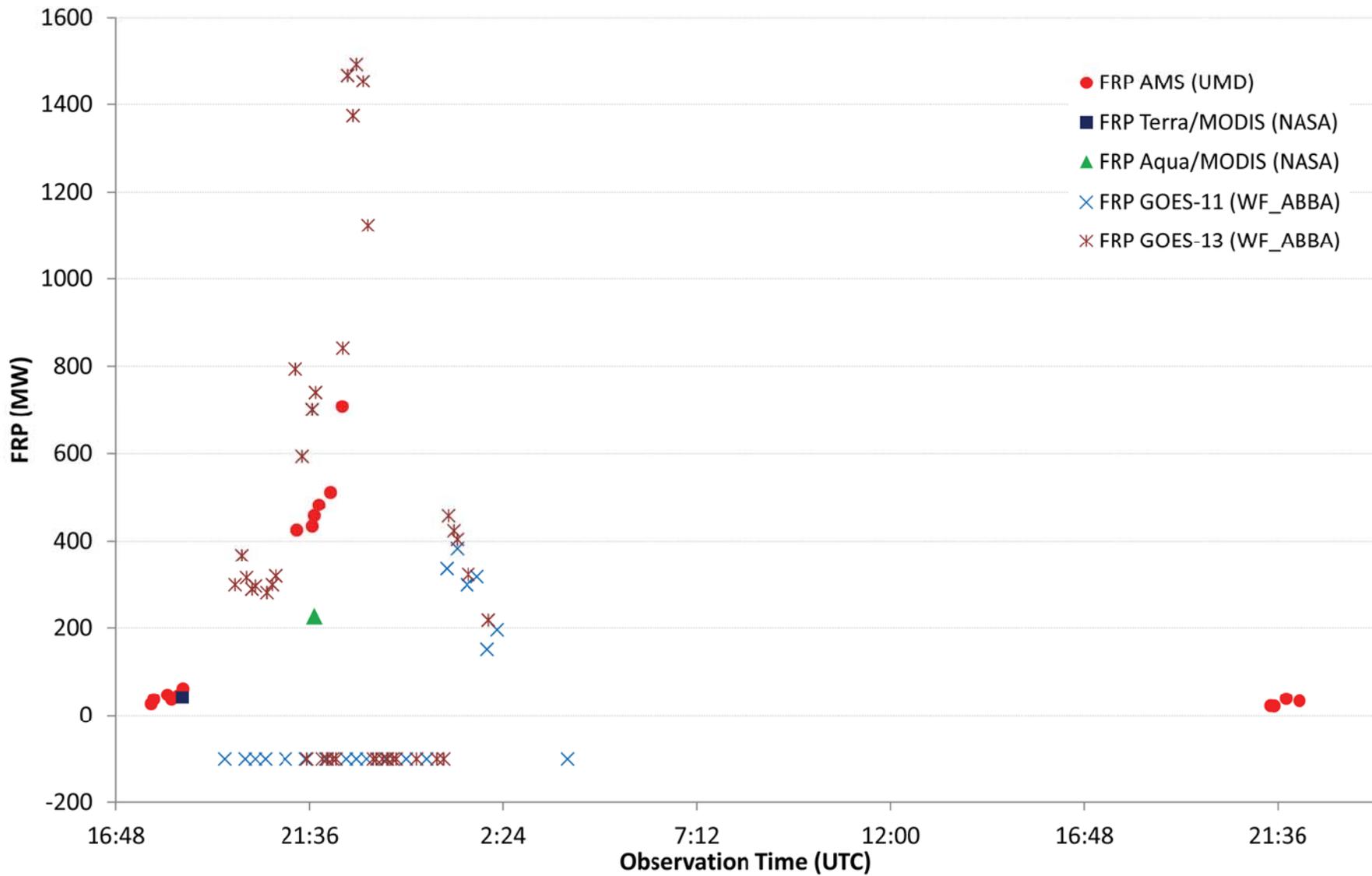
MODIS Collection 6



True fire detections and false alarms from Terra MODIS over a small-scale cleared area in the Amazon on August 27, 2001, as detected by the MODIS Collection 5 and 6 algorithms. The MODIS Collection 6 algorithm removed the false alarms.

Henry Coe campaign





Suomi National Polar-orbiting Partnership



**Thank You
Questions?**