Recent results from the development and evaluation of active fire products from Suomi NPP VIIRS

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Outline

- The VIIRS active fire product suite and product status
- Evaluation of the input VIIRS Sensor Data Record product
- Validation examples
- Conclusions

VIIRS Heritage: MODIS and AVHRR

VIIRS			MODIS Equivalent			AVHRR-3 Equivalent			OLS Equivalent		
Band	Range (um)	HSR (m)	Band	Range	HSR	Band	Range	HSR	Band	Range	HSR
DNB	0.500 - 0.900								HRD PMT	0.580 - 0.910 0.510 - 0.860	550 2700
M1	0.402 - 0.422	750	8	0.405 - 0.420	1000						
M2	0.436 - 0.454	750	9	0.438 - 0.448	1000						
M3	0.478 - 0.498	750	3 10	0.459 - 0.479 0.483 - 0.493	500 1000						
M4	0.545 - 0.565	750	4 12	0.545 - 0.565 0.546 - 0.556	500 1000						
I1	0.600 - 0.680	375	1	0.620 - 0.670	250	1	0.572 - 0.703	1100			
M5	0.662 - 0.682	750	13 14	0.662 - 0.672 0.673 - 0.683	1000 1000	1	0.572 - 0.703	1100			
M6	0.739 - 0.754	750	15	0.743 - 0.753	1000						
I2	0.846 - 0.885	375	2	0.841 - 0.876	250	2	0.720 - 1.000	1100			
M7	0.846 - 0.885	750	16	0.862 - 0.877	1000	2	0.720 - 1.000	1100			
M8	1.230 - 1.250	750	5	SAME	500						
M9	1.371 - 1.386	750	26	1.360 - 1.390	1000						
I3	1.580 - 1.640	375	6	1.628 - 1.652	500						
M10	1.580 - 1.640	750	6	1.628 - 1.652	500	3a	SAME	1100			
M11	2.225 - 2.275	750	7	2.105 - 2.155	500						
I4	3.550 - 3.930	375	20	3.660 - 3.840	1000	3b	SAME	1100			
M12	3.660 - 3.840	750	20	SAME	1000	3b	3.550 - 3.930	1100			
M13	3.973 - 4.128	750	21 22 23	3.929 - 3.989 3.929 - 3.989 4.020 - 4.080	1000 1000 1000						
M14	8.400 - 8.700	750	29	SAME	1000						
M15	10.263 - 11.263	750	31	10.780 - 11.280	1000	4	10.300 - 11.300	1100			
I5	10.500 - 12.400	375	31 32	10.780 - 11.280 11.770 - 12.270	1000 1000	4 5	10.300 - 11.300 11.500 - 12.500	1100 1100	HRD	10.300 - 12.900	550
M16	11.538 - 12.488	750	32	11.770 - 12.270	1000	5	11.500 - 12.500	1100			

Requirements: L1RD Supplement

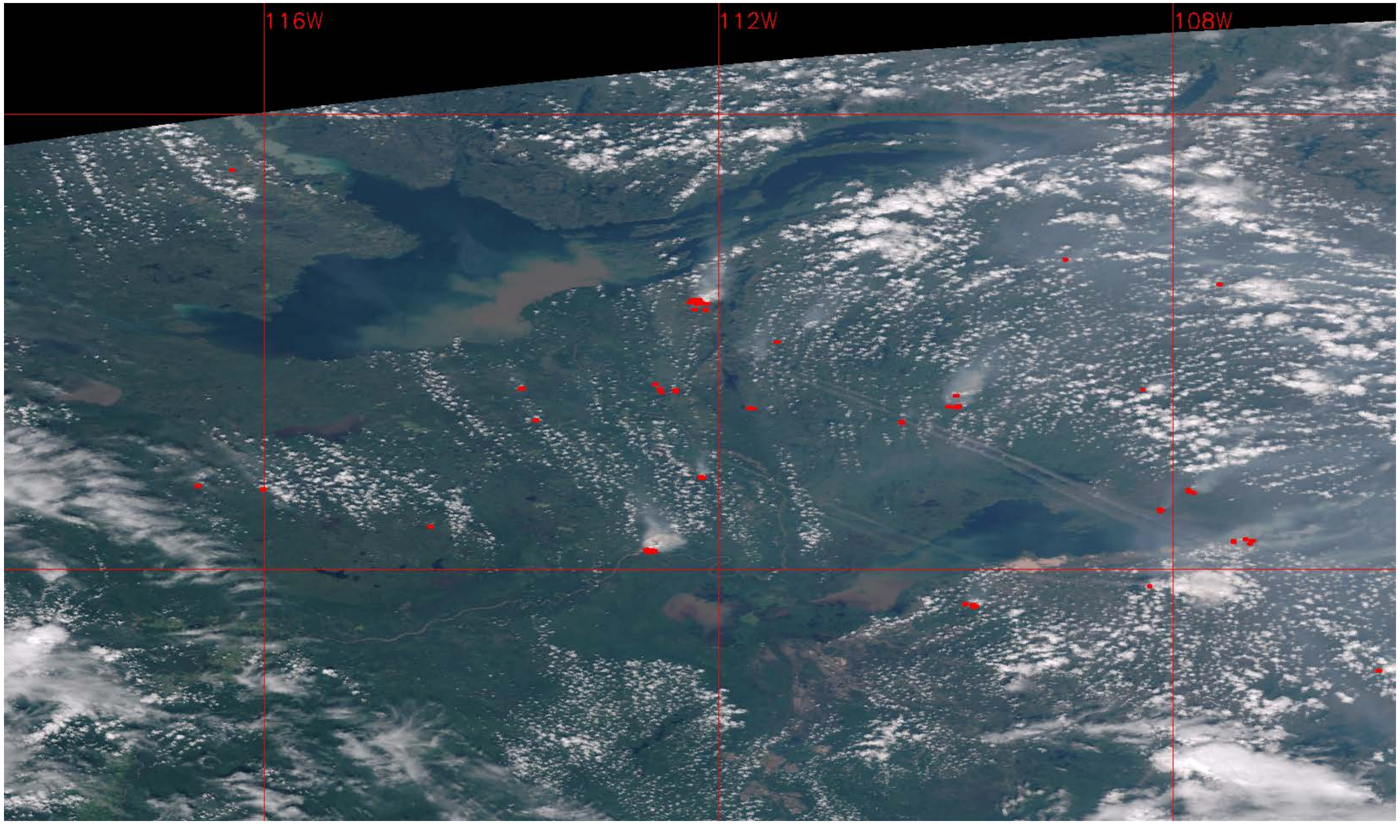
Active Fires		
ATTRIBUTE	**THRESHOLD**	**OBJECTIVE**
a. Horizontal Cell Size		
1. Nadir	0.80 km	0.25 km
2. Worst case	1.6 km	
b. Horizontal Reporting Interval	HCS	
c. Horizontal Coverage	Global	Global
d. Mapping Uncertainty, 3 sigma	1.5 km	0.75 km
e. Measurement Range		
1. Fire Radiative Rower (FRP)	1.0 to 5.0 $(10)^3$ MW	1.0 to 1.0 $(10)^4$ MW
2. Sub-pixel Average Temperature of Active Fire	N/A	N/A
3. Sub-pixel Area of Active Fire	N/A	N/A
f. Measurement Uncertainty		
1. Fire Radiative Rower (FRP)	50%	20%
2. Sub-pixel Average Temperature of Active Fire	N/A	N/A
3. Sub-pixel Area of Active Fire	N/A	N/A
g. Refresh	At least 90% coverage of the globe every 12 hours (monthly average)	N/A

: Not required for S-NPP

Current IDP product was designed to meet heritage NPOESS requirements., which have been baselined according to L1RDS S-NPP Performance Exclusions (Appendix D). Spatially explicit fire mask and fire characterization are "uppers" in the JPSS L1RD for J1 and beyond.

Background of VIIRS NOAA Operational Active Fire Product

- Represents **continuity** with NASA EOS **MODIS** and NOAA POES **AVHRR** fire detection (and also international missions such as (A)ATSR
- VIIRS **design allows for radiometric measurements** to detect and characterize active fires over a wide range of observing and environmental conditions
- Product is expected to be used by **real-time resource and disaster management; air quality monitoring; ecosystem monitoring; climate studies** etc.



NW Canada
07 July 2013
20:14:55-20:20:34 UTC

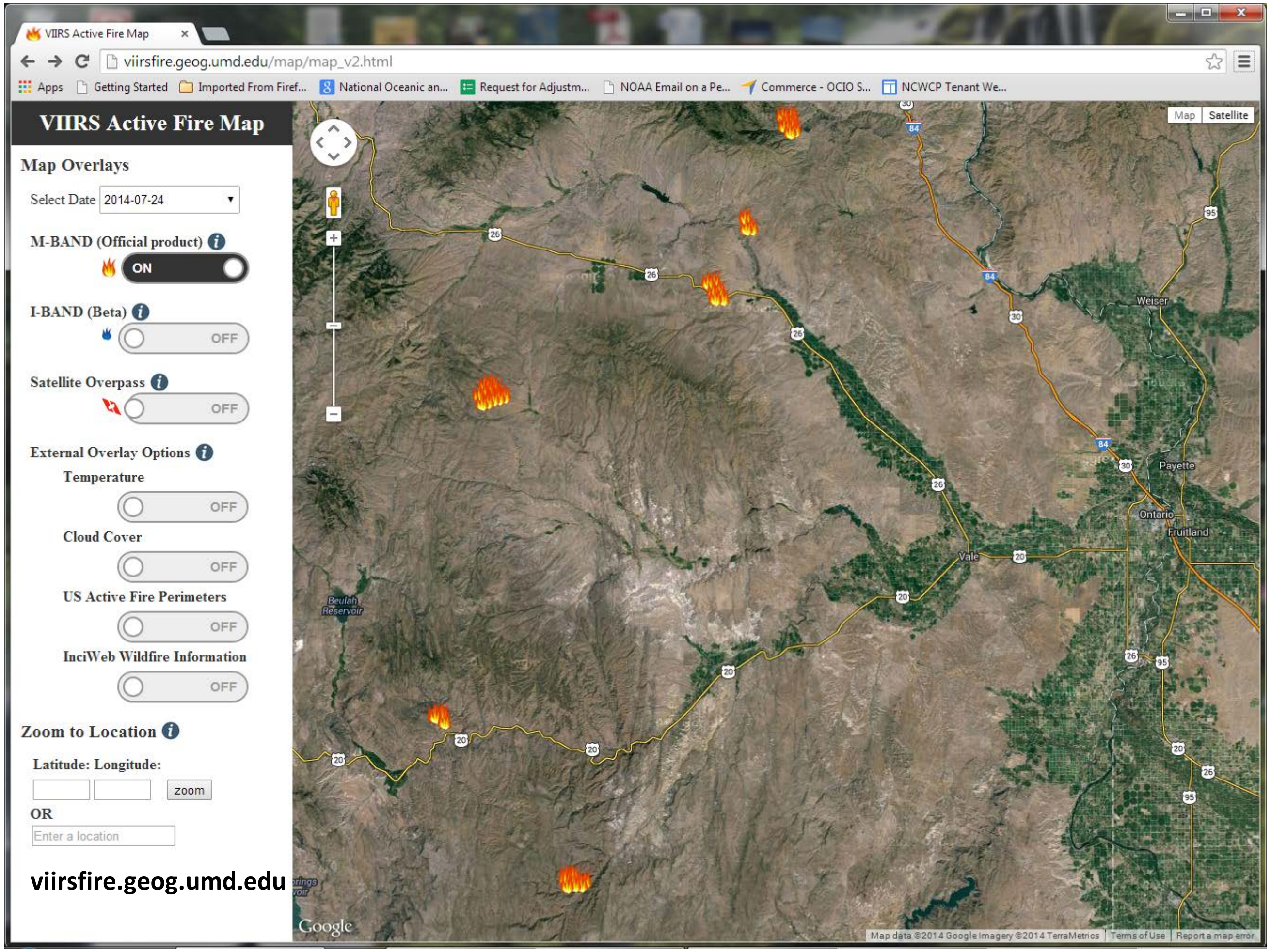
VIIRS Fire Product and User Outreach

- The operational SNPP VIIRS Active Fire product is a sparse array containing **locations of pixels** flagged as "fire" by the detection algorithm

- The science team is developing a suite of improved products, including **fire radiative power to characterize the fire intensity**

- End users are engaged through **Proving Ground and User Readiness efforts**

http://viirsfire.geog.umd.edu/

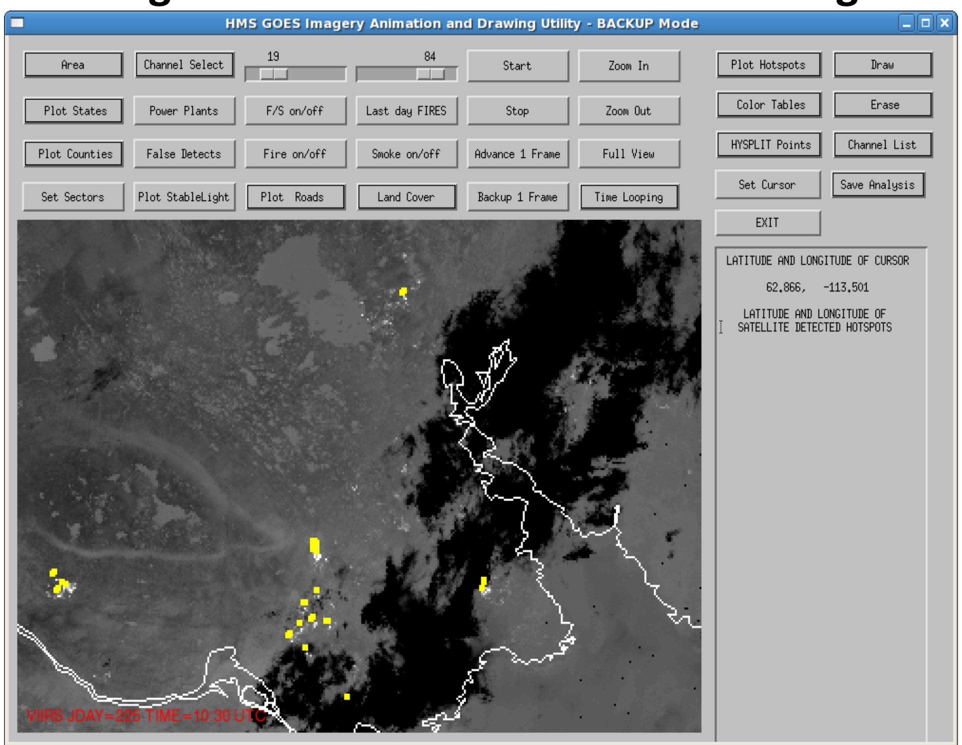


Fire detections from the operational Suomi NPP VIIRS Active Fire product in NW US on July 24, 2014. Data in various user-friendly formats are available from the product evaluation portal at viirsfire.geog.umd.edu .

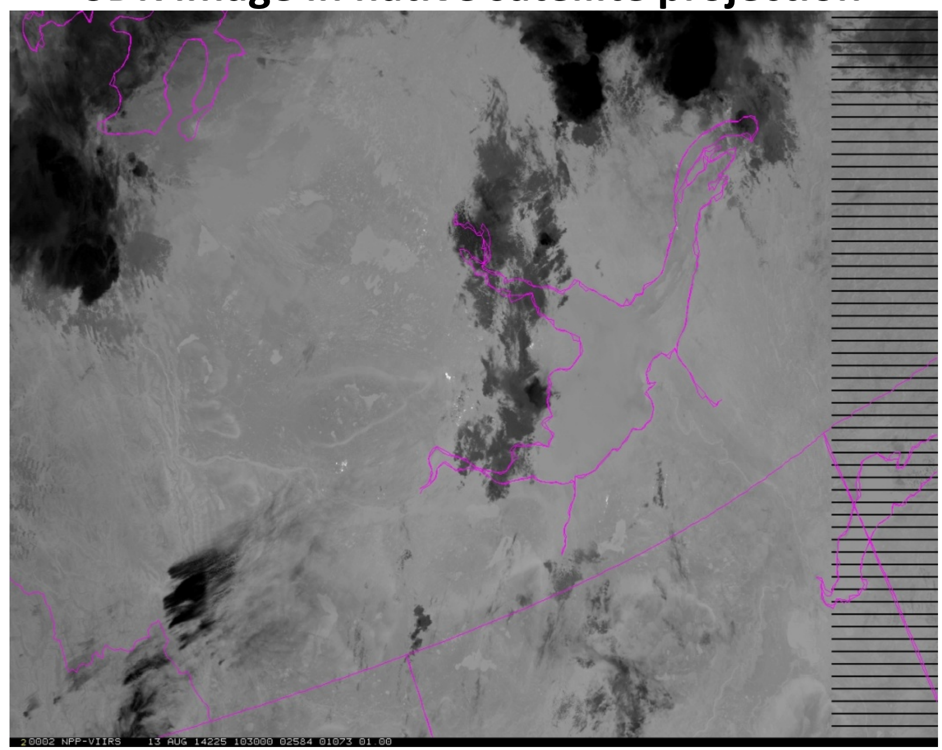
VIIRS Fire in the NOAA Hazard Mapping System (HMS)

- **VIIRS Active Fire is incorporated** with detected fires from numerous other satellite sources (GOES, POES and MODIS) and undergoes **additional manual quality control** before being merged into a unified daily fire analysis product for North America.
- The AFP also provides an additional **data source as input for initializing the daily National Weather Service Air Quality smoke forecast**.

VIIRS AFP from 13 August 0850Z and 1030Z images over VIIRS M13 SDR 1030Z image



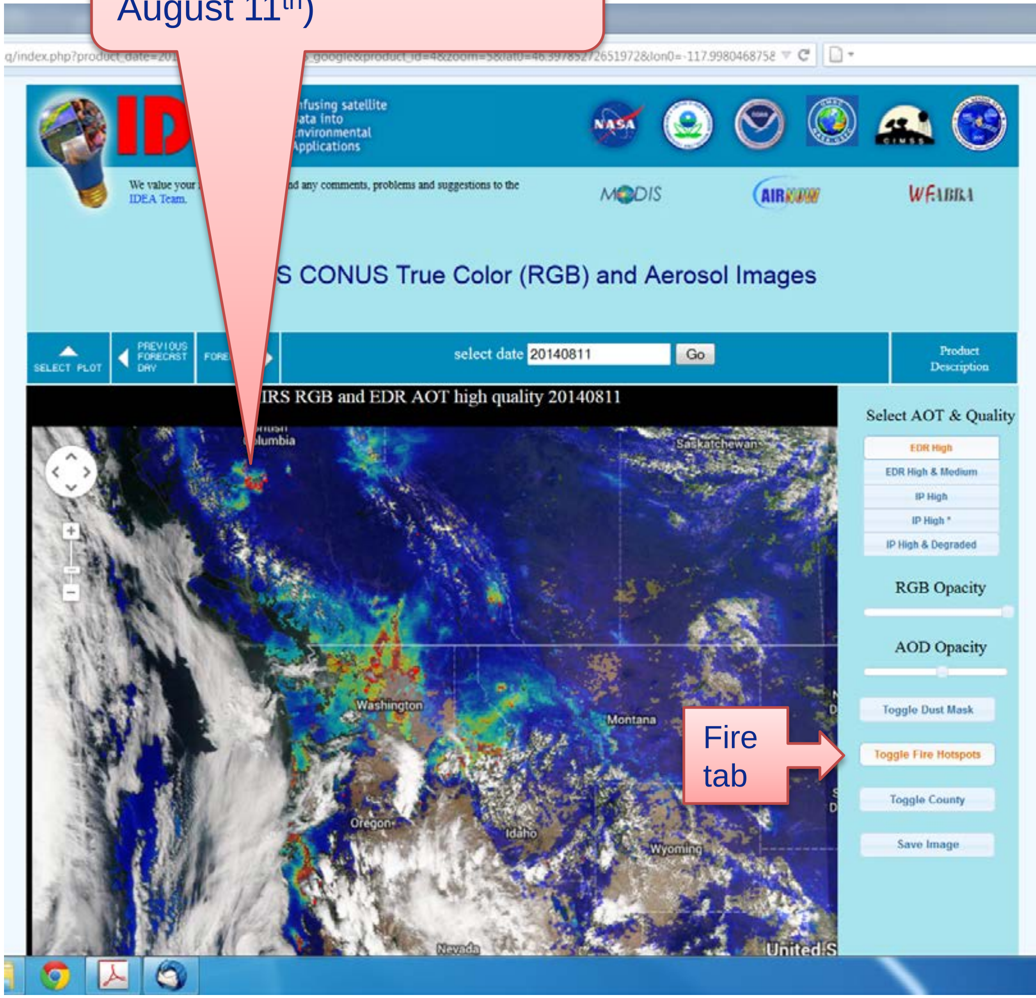
McIDAS display of 13 August 1030Z M13 SDR image in native satellite projection



VIIRS Fire in STAR Smoke Analysis system (IDEA)

- IDEA (Infusing satellite Data into Environmental Applications) system and ASDA (Automated Smoke Detection and tracking Algorithm) have been using **VIIRS hot spots** generated from DB data since March 2013. NDE products will also be used when available operationally.
- GBBEPx (Global Biomass Burning Emissions Product – Extended) will also use the product when **FRP** becomes available along with fire detection
- Air quality forecasters use the IDEA system in their daily forecasting. *This website gets more than one million hits each year.*
- NWS Alaska and Western regions will use ASDA smoke plumes for incident monitoring and containment activities. *Through new fire and smoke initiative*
- GBBEPx using fire detection and FRP will generate emissions that will be used by **NCEP's global aerosol model**

Fires burning (image from August 11th)



http://www.star.nesdis.noaa.gov/smcd/spb/aq/

VIIRS active fire product development

NOAA: real-time NOAA operational applications

- Operational M-band product generated by IDPS (Interface Data Processing Segment)
- Part of integrated processing chain
- Low latency
- Detections only
- Locations only (no fire mask)

VIIRS Fire Team

Algorithm updates

Upstream processing updates

NASA: science, long-term continuity + added value NRT

- Experimental M-band MODIS continuity product at Land PEATE (Product Evaluation and Test Element)
- Detections, Fire Mask and Fire Radiative Power, CMG
- Spatially explicit fire mask
- Spatial and temporal aggregates – heritage deliver systems (RR, FIRMS)
- Experimental I-band product

NOAA Proving Ground
NASA Applied Science

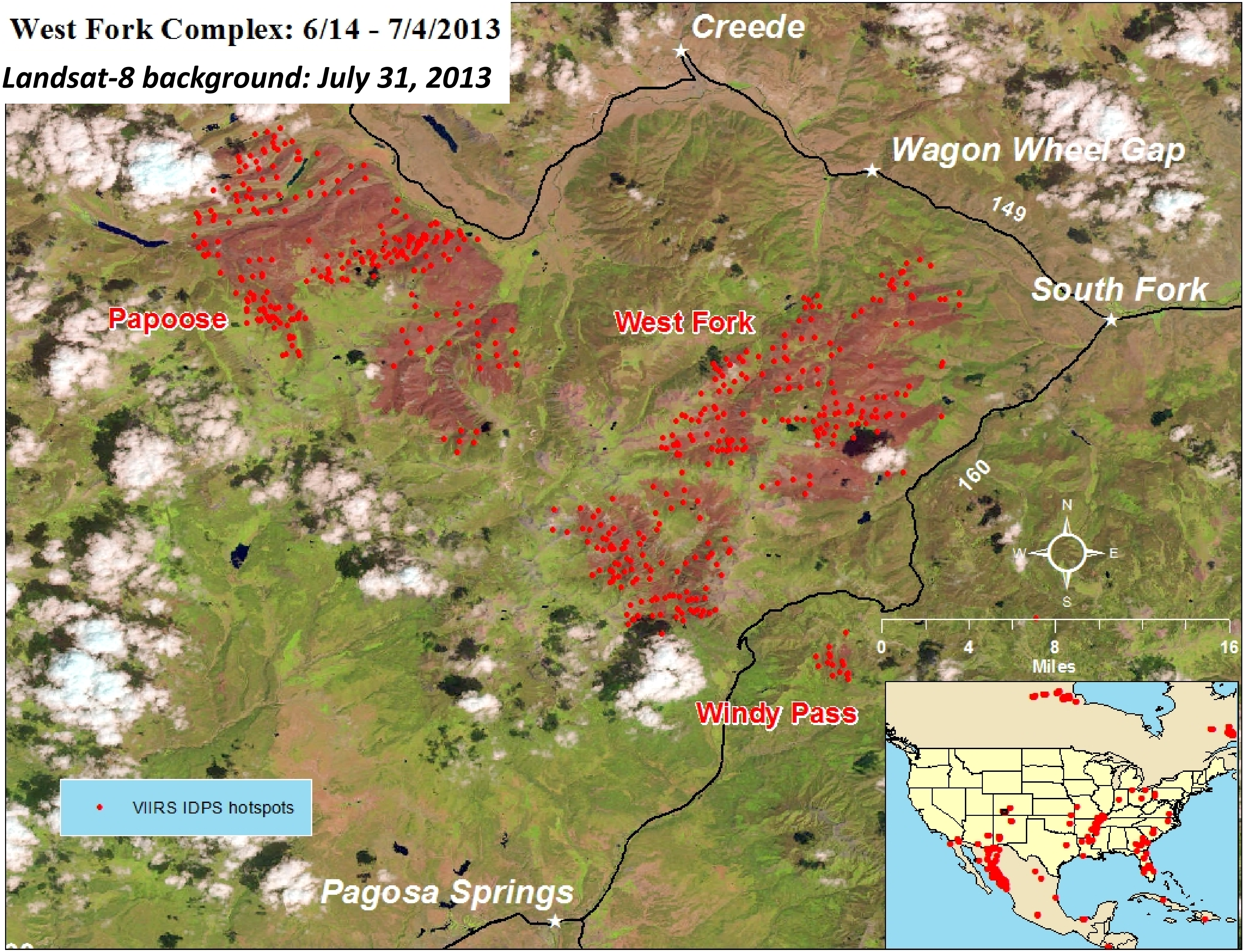
algorithm synchronization, end user feedback

DIRECT READOUT

- **Can run IDPS, NASA or locally developed code**
- **Stand-alone**

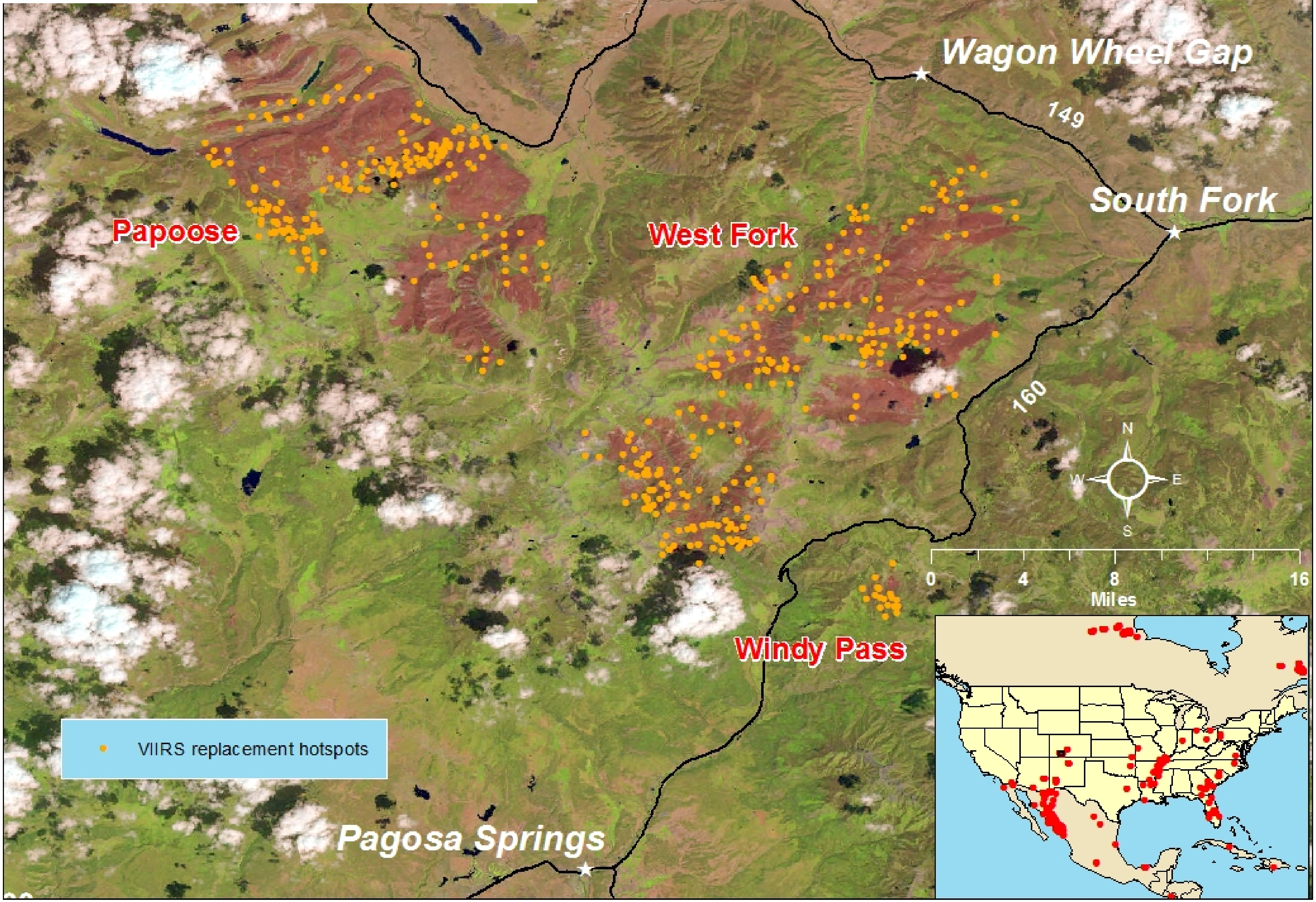
West Fork Complex: 6/14 - 7/4/2013

Landsat-8 background: July 31, 2013



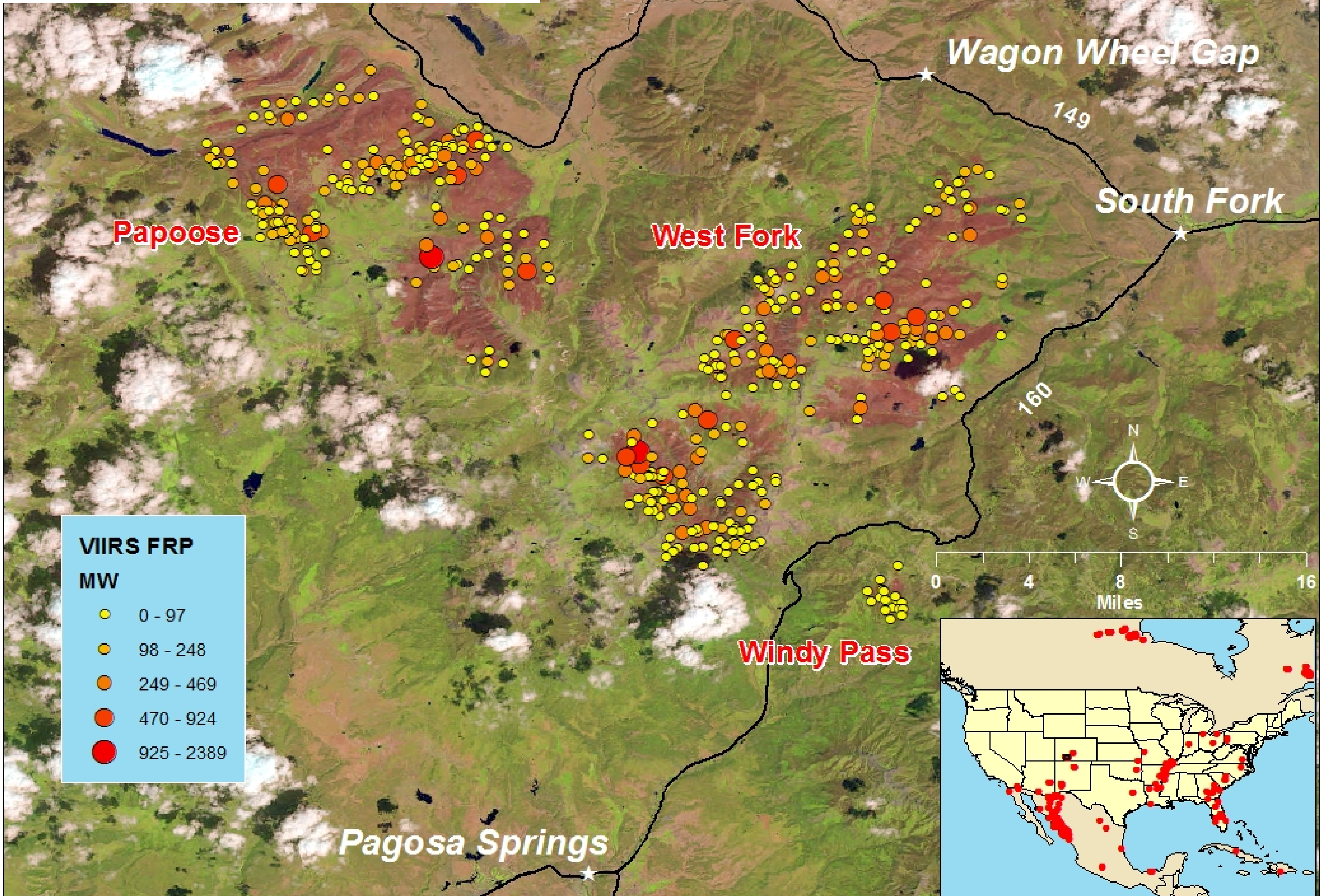
West Fork Complex: 6/14 - 7/4/2013

Landsat-8 background: July 31, 2013

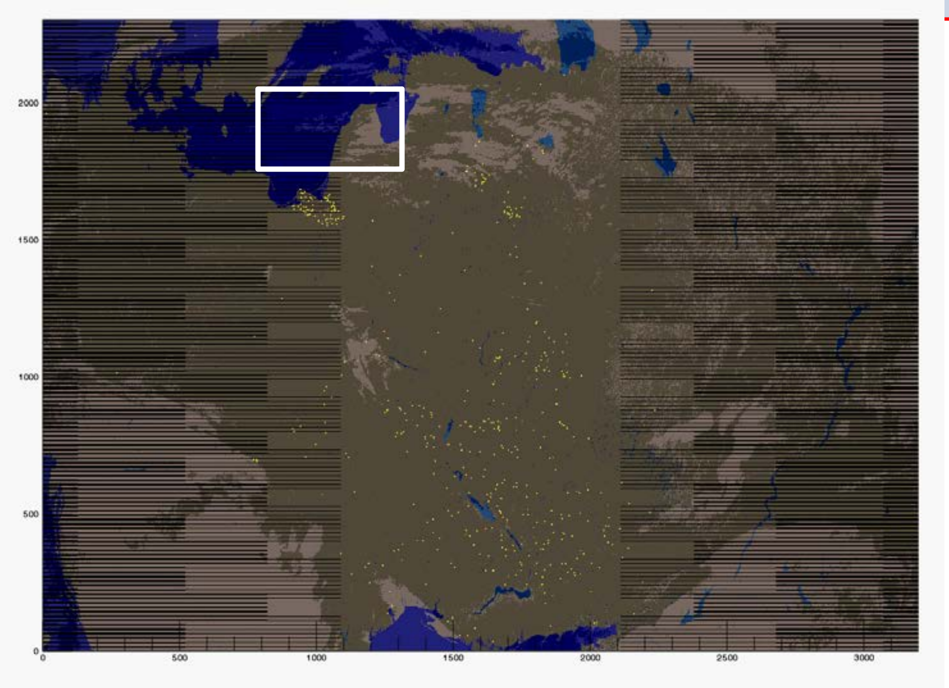


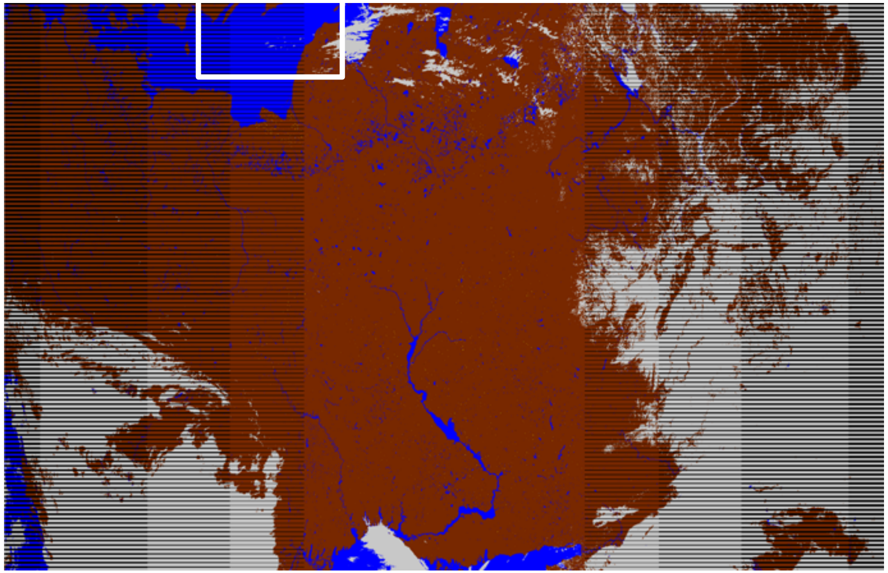
West Fork Complex: 6/14 - 7/4/2013

Landsat-8 background: July 31, 2013



IDPS vs. JPSS "replacement" code





March 10, 2014 10:36-10:40

IDPS operational run
Unpacked from HDF5:
AVAFO* (AF EDR)
IICMO* (CM IP)
Plotted with IDL from binaries:
VIIRS-AF-EDR
VIIRS-CM-IP

The JPSS 1 "replacement" code has been delivered NOAA STAR Algorithm Implementation Team (AIT) for integration into NOAA operations. A CDR is scheduled for October 2014.

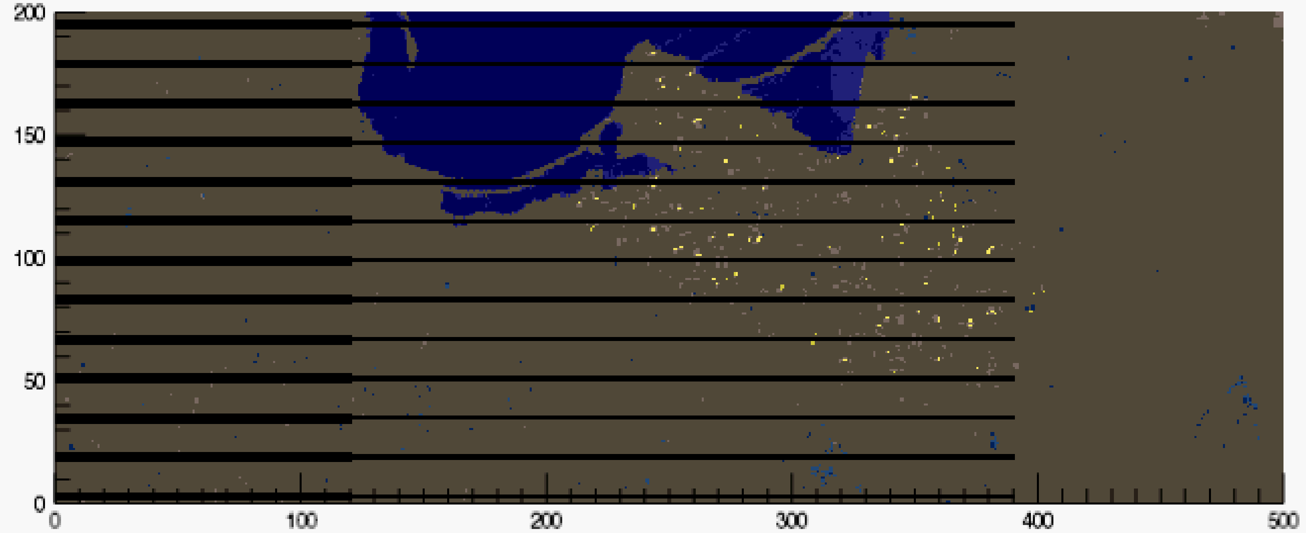
Output from replacement code
Plotted with hdfview from HDF4
"fire mask" field

See next slide for comparison of fire pixels

IDPS vs. JPSS “replacement” code

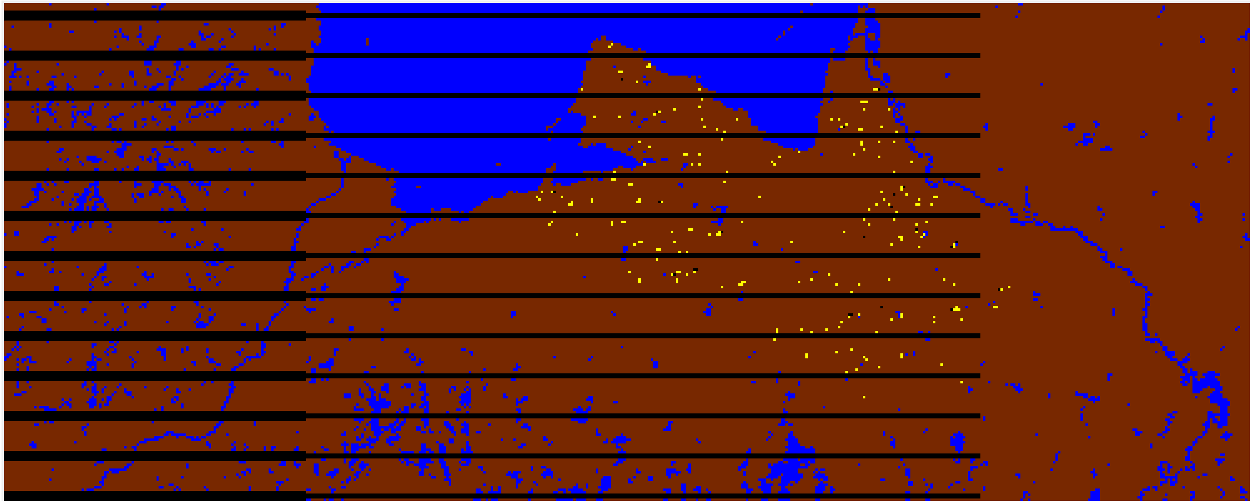
IDPS

March 10, 2014 10:36-10:40

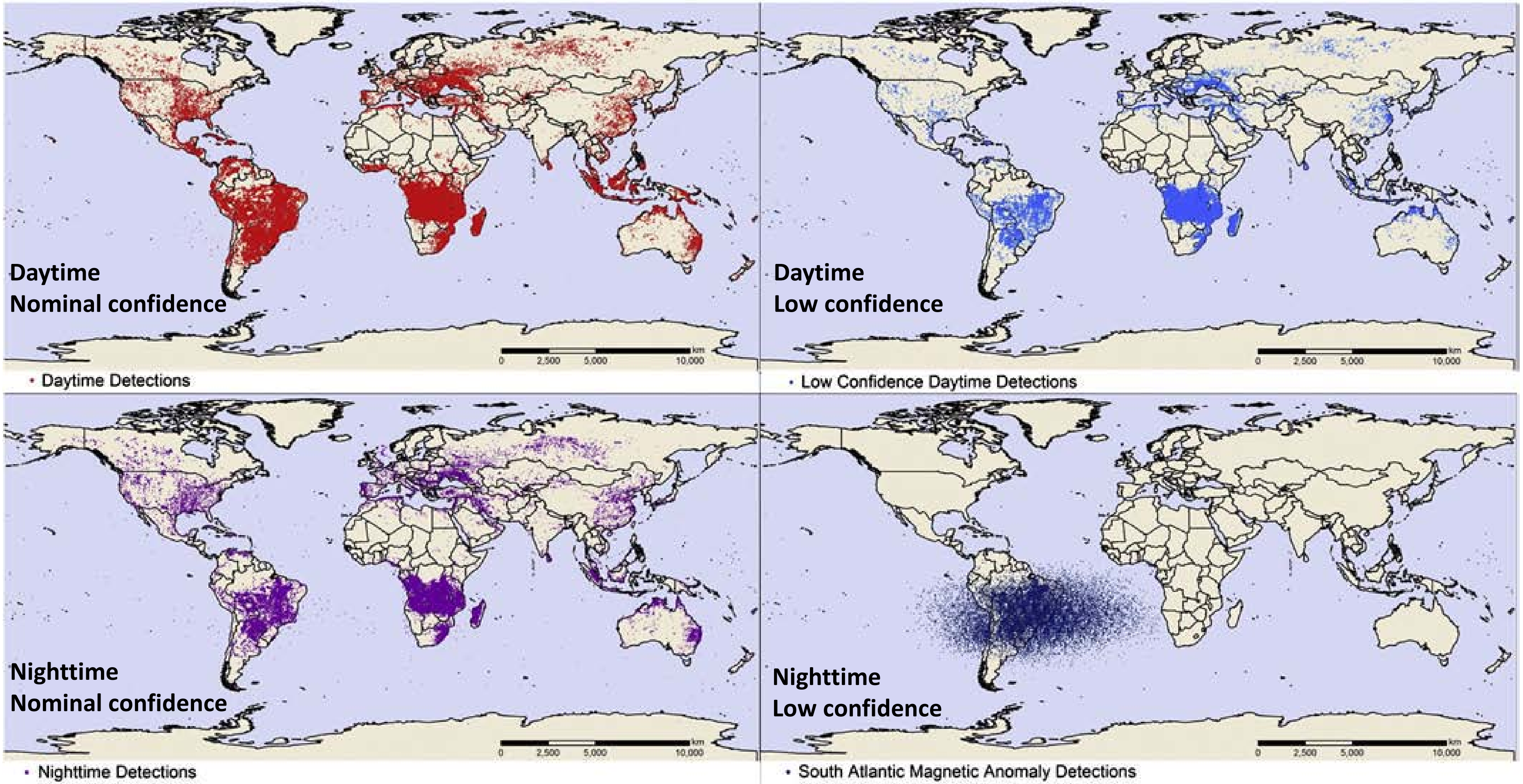


Yellow – fires
Grey - clouds

Replacement code



Global fires from VIIRS I-band data

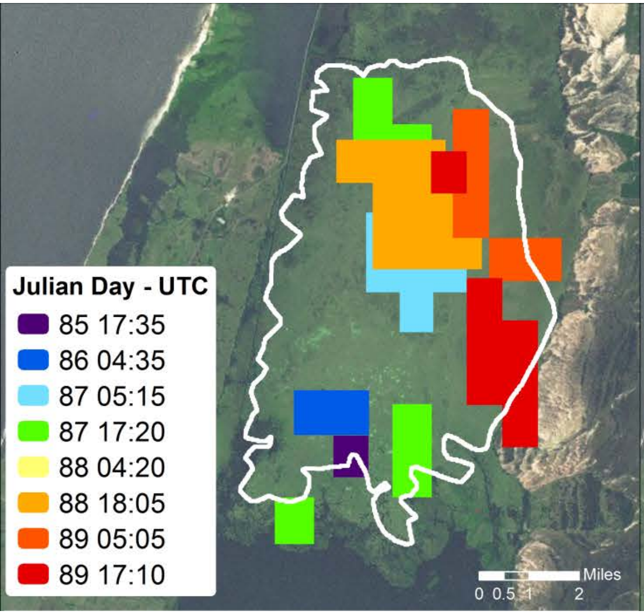


VIIRS 375 m fire algorithm output showing the accumulated daytime nominal confidence fire pixels (upper left), low confidence daytime pixels (upper right), nighttime fire pixels (purple; lower left), and SAMA-related low confidence nighttime pixels (dark blue; lower right) during 1–30 August 2013.

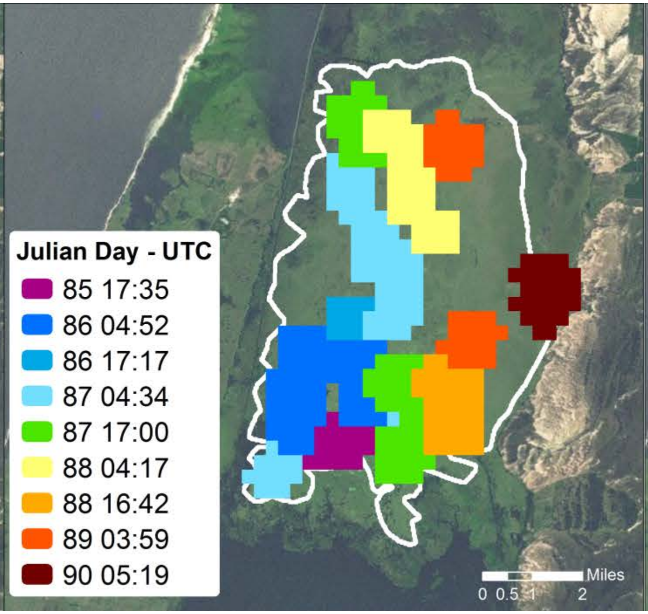
Wilfrid Schroeder, Patricia Oliva, Louis Giglio, Ivan A. Csiszar, The New VIIRS 375 m active fire detection data product: Algorithm description and initial assessment, Remote Sensing of Environment, Volume 143, 5 March 2014, Pages 85-96, ISSN 0034-4257, http://dx.doi.org/10.1016/j.rse.2013.12.008.

Improved Satellite Mapping of Active Fires Achieved Using VIIRS I-bands

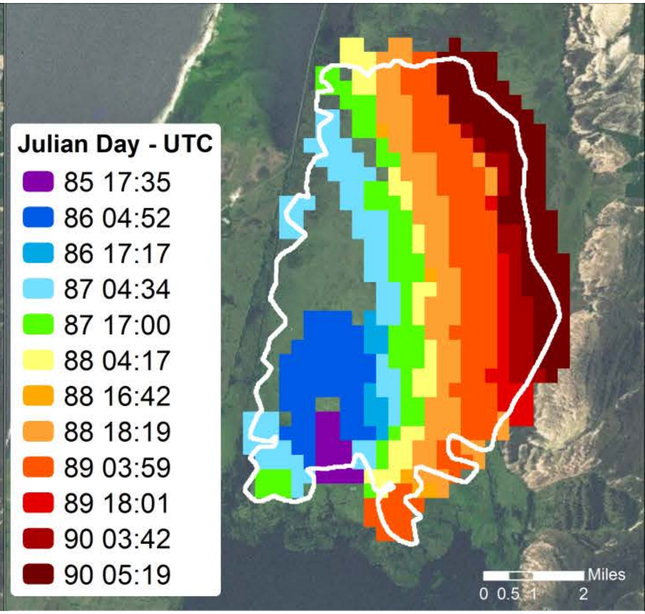
Wildfire in southern Brazil, March/2013



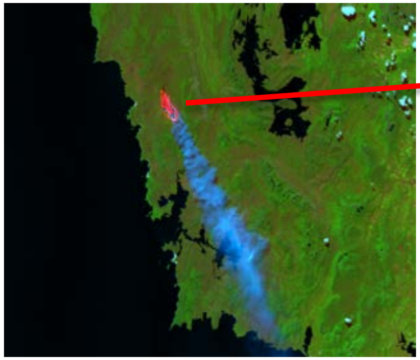
Aqua/MODIS 1 km
Spotty detection pixels and coverage gap at low latitudes

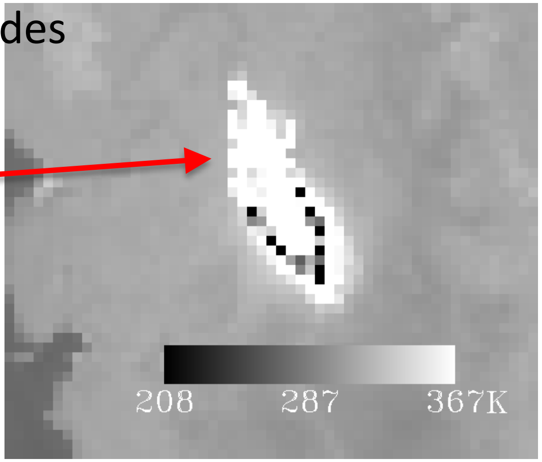


S-NPP/VIIRS 750 m
Spotty detection pixels



S-NPP/VIIRS 375 m
Improved fire line mapping





<u>Issues of VIIRS fire detection:</u>

- Anomalous behavior at sensor saturation
- Inconsistent quality flags
- Unknown saturation of native resolution pixels prior to aggregation (single-gain bands)
- South Atlantic Magnetic Anomaly

W. Schroeder, UMD

Global Observation of Forest and Land Cover Dynamics Fire Implementation Team Meeting

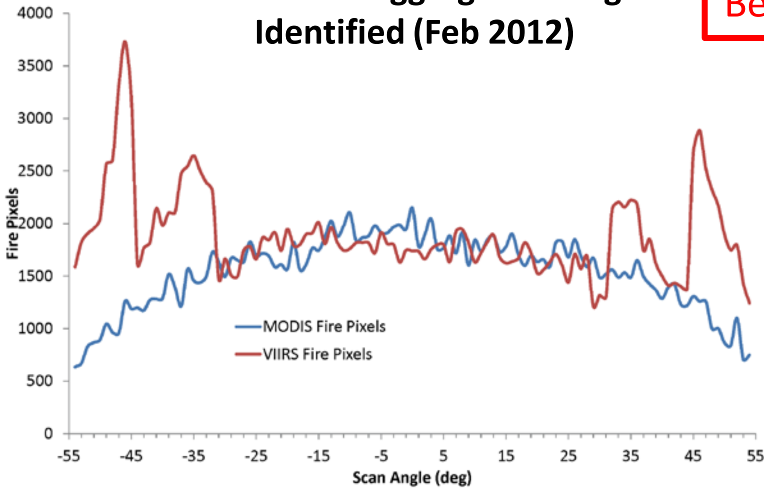
NOAA Center for Weather and Climate Prediction, College Park, MD, July 29-31 2014

S-NPP Product Evaluation

- Estimates of commission / omission errors and **comparison with MODIS**
  - The product performs well in comparison to MODIS and AVHRR
  - Increased resolution and VIIRS mapping geometry improves product quality for off nadir observations and increases spatial coverage
- **VIIRS sensor and Send Data Record (SDR) performance and quality flagging** (near the high end of the dynamic range) and the **ability to filter bad input data** without compromising detection of valid fire pixels
  - The majority of the work has been analysis of VIIRS SDR quality and work with the SDR team to implement fixes and changes
  - The frequency of the SDR-related detection errors decreased over time as SDR code changes were implemented in IDPS

Comparison with Aqua MODIS

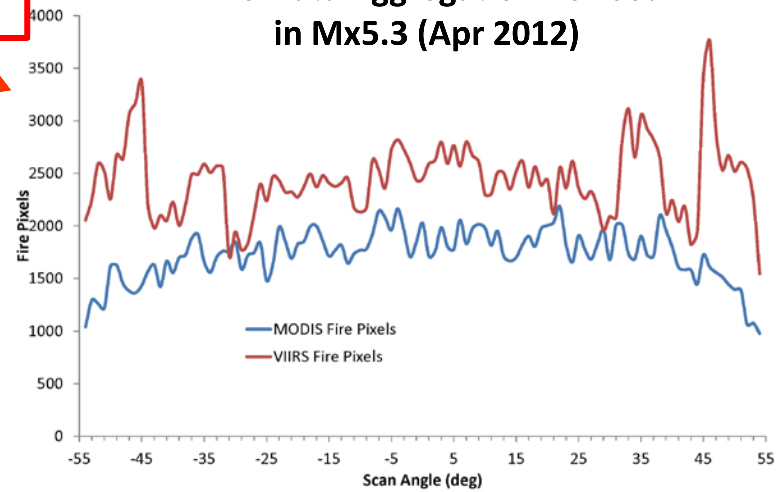
M13 Data Aggregation Bug Identified (Feb 2012)



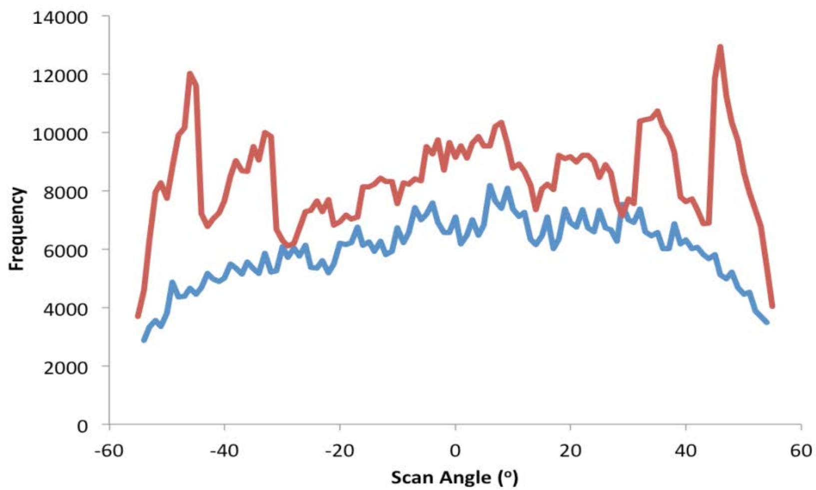
19 Jan - 13 Feb 2012

Beta maturity

M13 Data Aggregation Revised in Mx5.3 (Apr 2012)



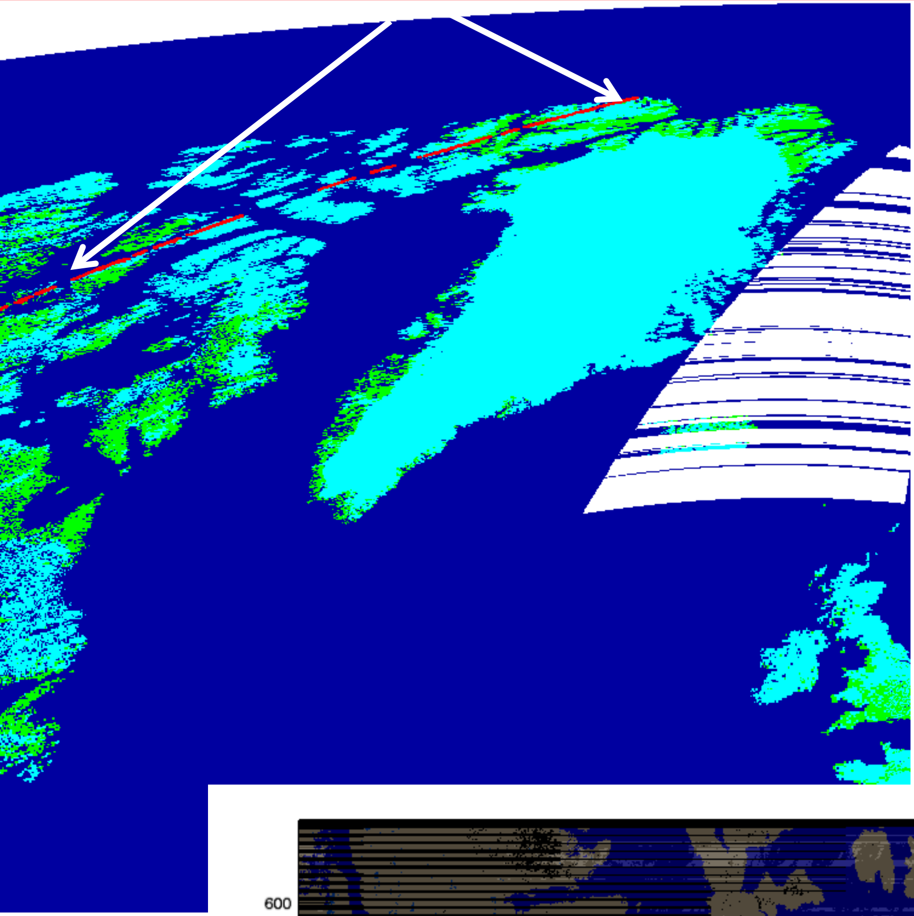
11 May - 10 Jun 2012



Feb - Jun 2013

The <u>overall features</u> of the Aqua MODIS and S-NPP functional dependence on scan angle <u>remained the same a year later</u> and over a longer time period

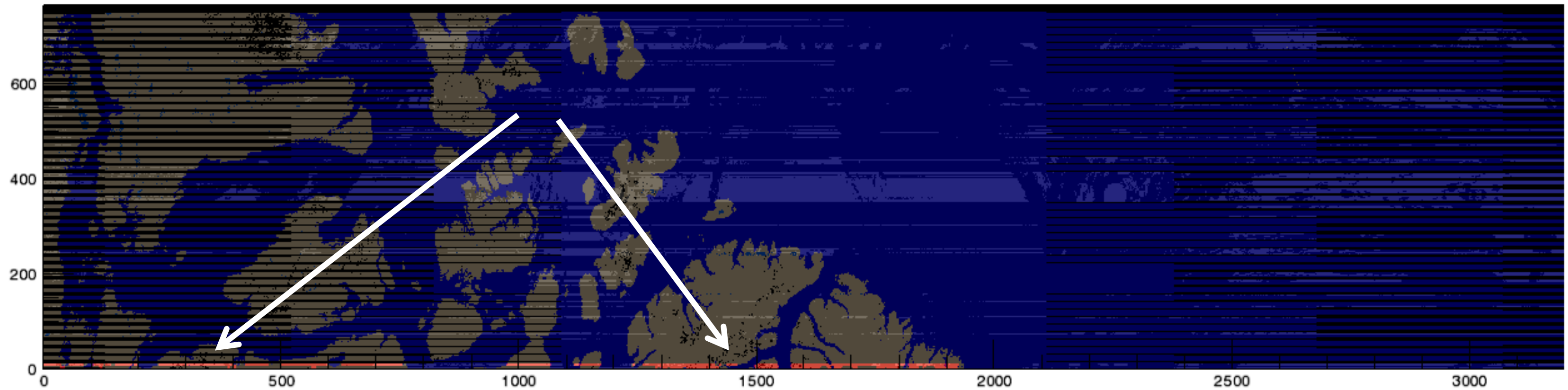
Primary quality issue: bad scan lines



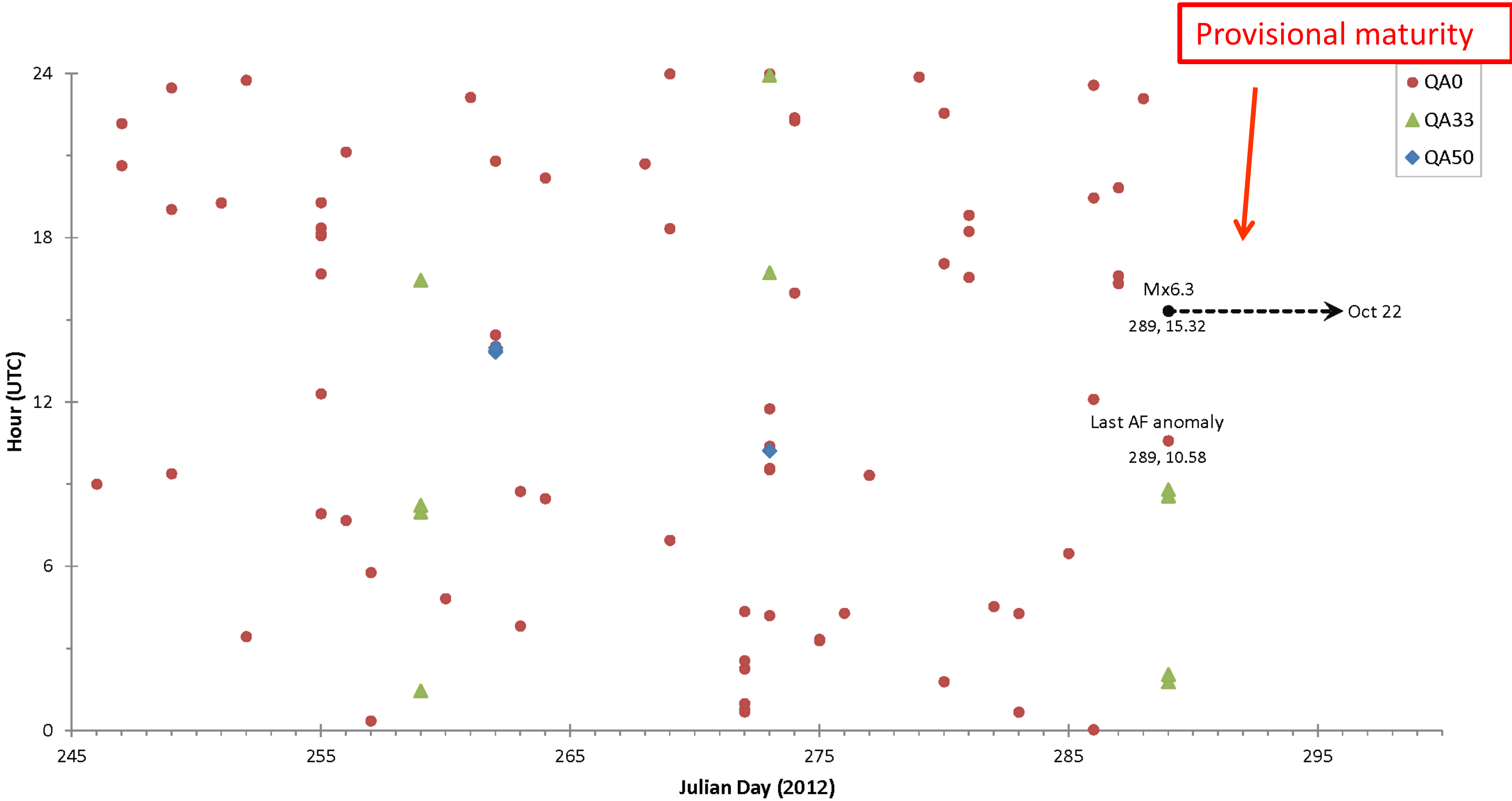
July 15 2014 14:33:19 UTC

NPP_VAFIP_L2(Active Fire IP) on 2014196, LPEATE (AS3001)

IDPS / STAR AIT: AF-EDR Granule Version A1M



Impact of M13 SDR dual gain fix on active fire product performance

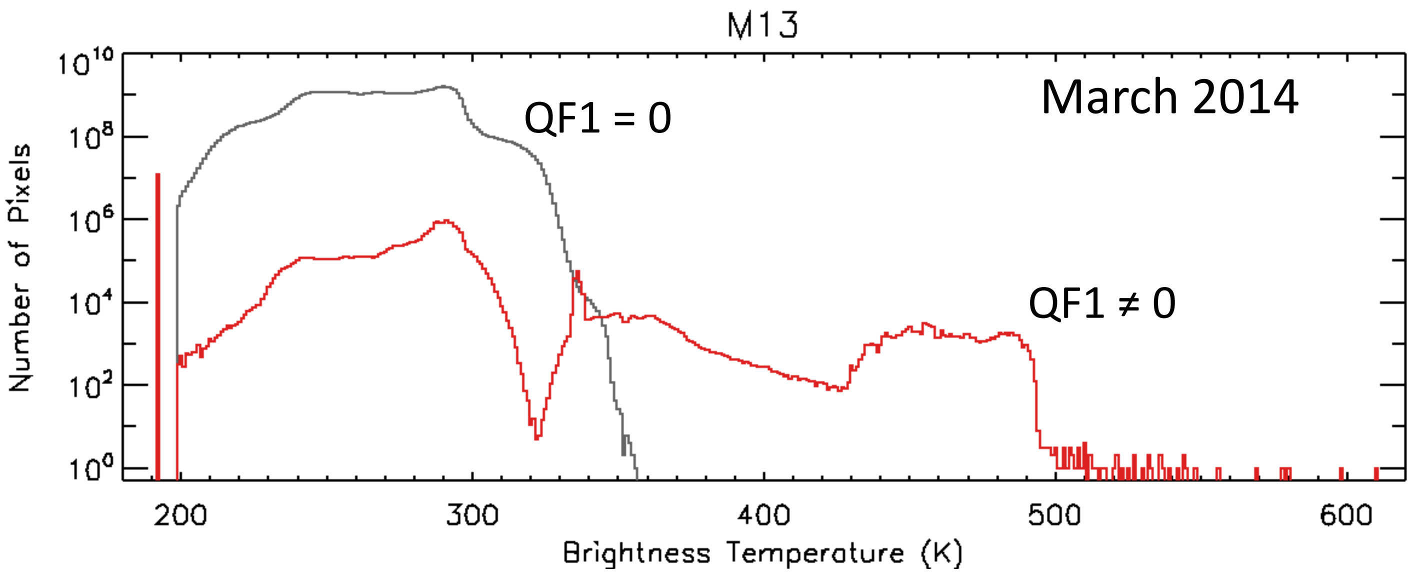


Effectivity date for Provisional Maturity: October 16, 2012
(first full day after the implementation of IDPS Mx6.3 on October 15)

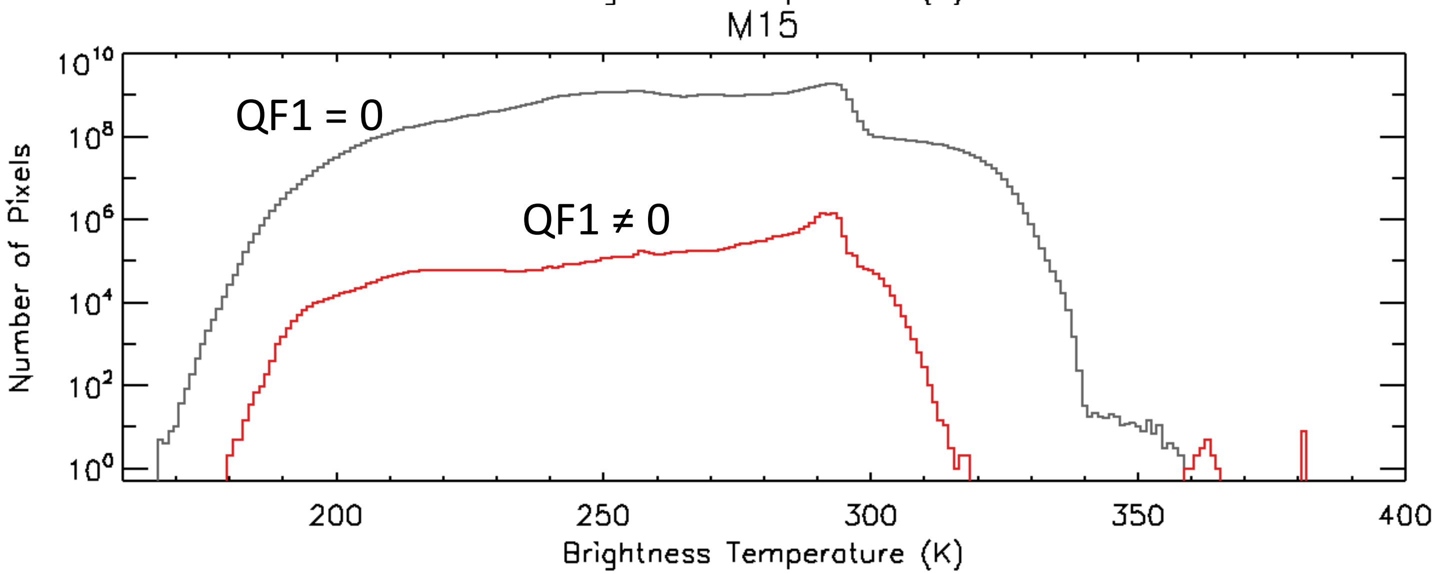
Csiszar, I., W. Schroeder, L. Giglio, E. Ellicott, K. P. Vadrevu, C. O. Justice, B. Wind, 2014: Active fires from the Suomi NPP Visible Infrared Imaging Radiometer Suite: Product status and first evaluation results, *J Geophys Res Atmos*, 119, doi:10.1002/2013JD020453.

Issues: input SDR quality flagging

Suomi NPP product quality and maturity has been driven by input VIIRS SDR performance



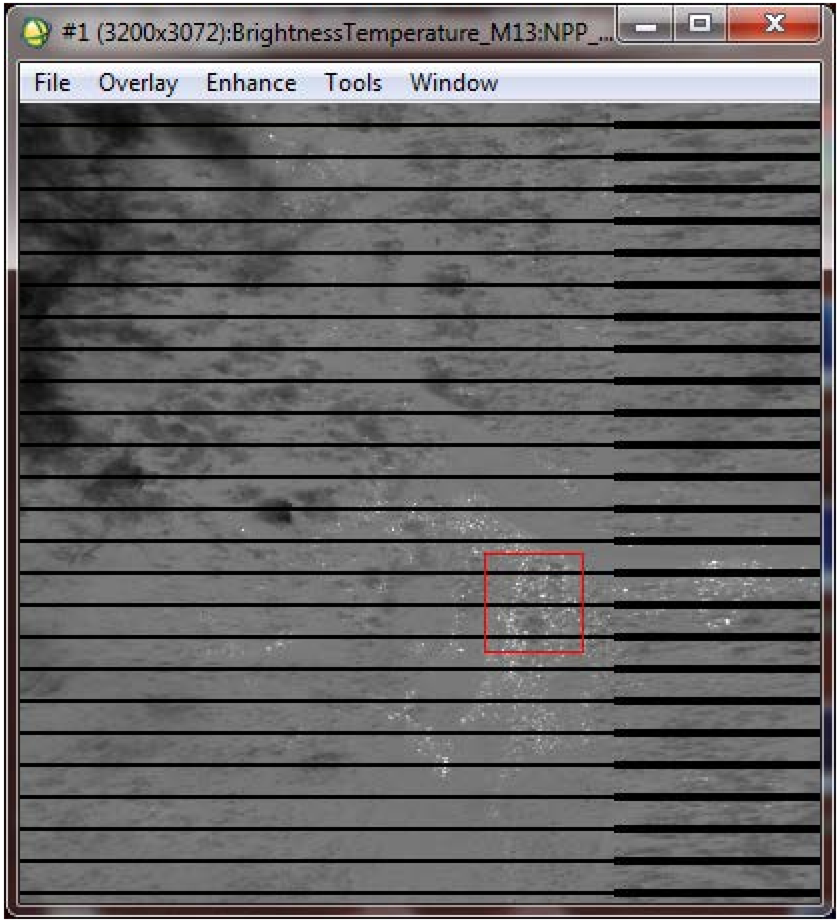
The fire team is performing verification by analyzing known granules and cumulative statistics.

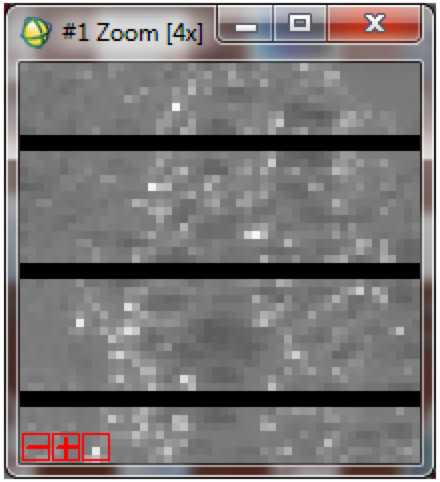


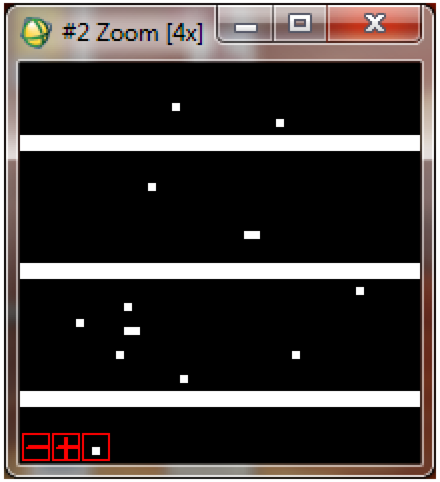
These results are based on Mx7.2 processing within LandPEATE.

March 12, 2014: Mx7.2 (LPEATE)

M13 Brightness temperature





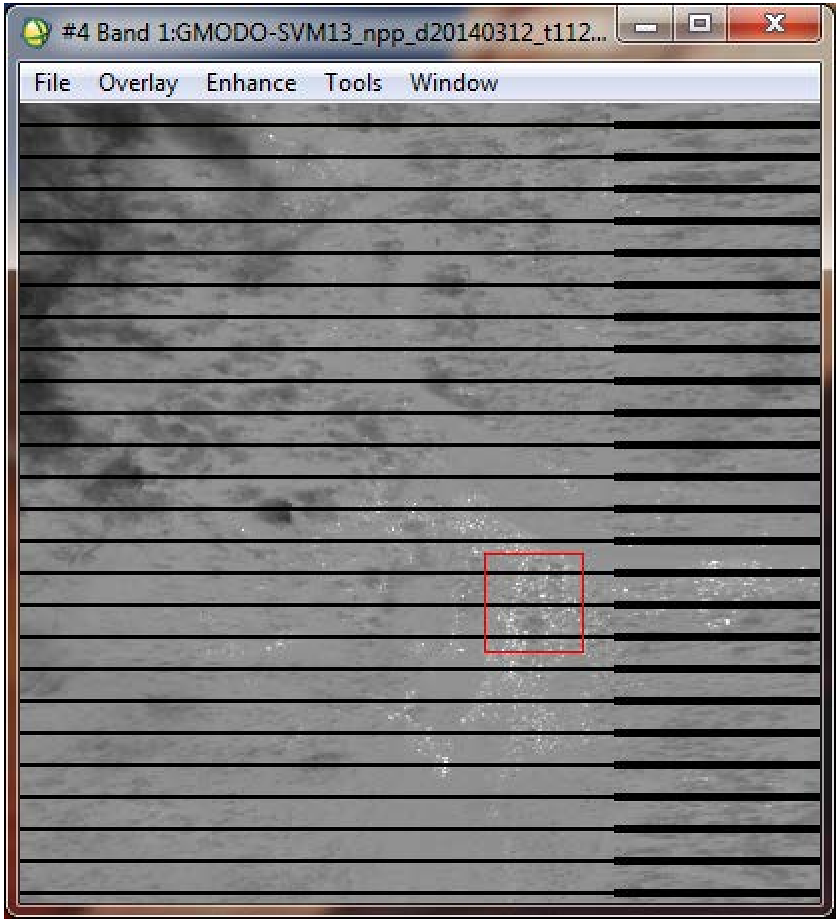


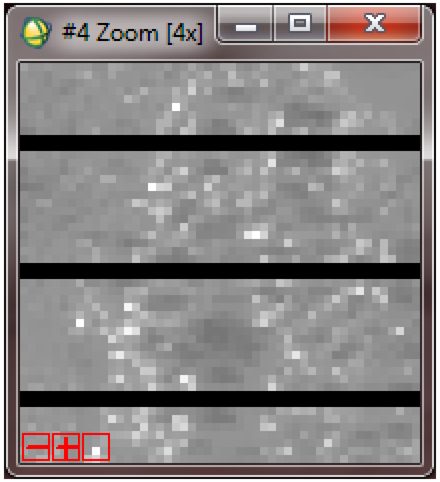
QF1="poor calibration" for all pixels with TB>~340K

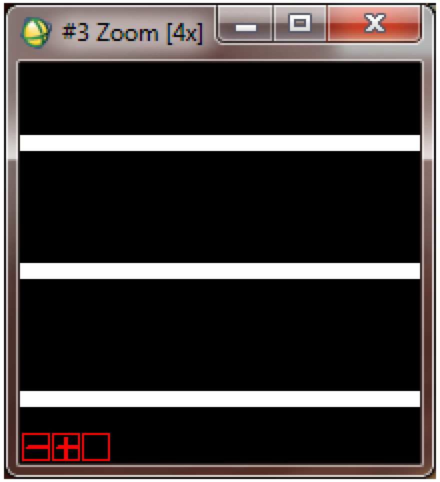
NPP_VMAE_L1.A2014071.1125.P1_03001.2014071153736.hdf

March 12, 2014: Mx8.2 (IDPS)

M13 Brightness temperature







QF1="good' for all pixels with TB>~340K

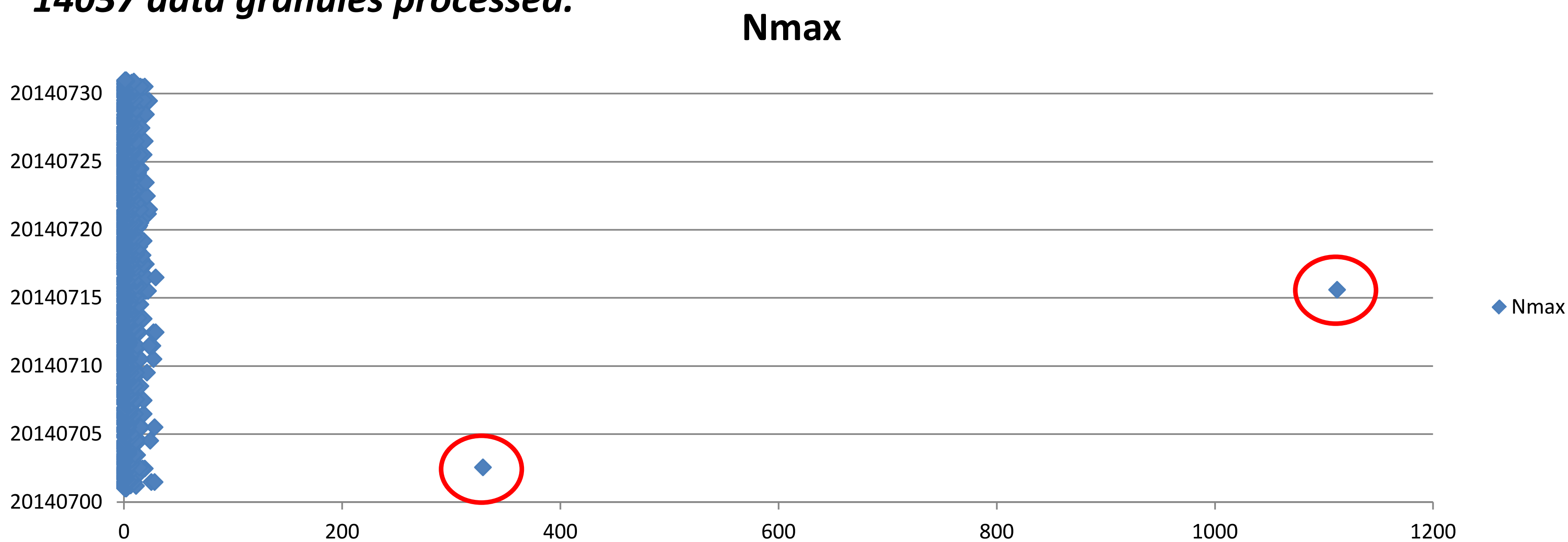
GMODO-SVM13_npp_d20140312_t1122236_e1128040_b12287_c20140905202032208584_noaa_ops.h5

IDPS Mx8.4 vs. Mx8.5 evaluation for key SDR changes using overlapping data

- **IDPS operational data stream**
  - 4/28/14 onward
    - Mx8.4 TTO 5/22/2014 14:40 UTC
    - Mx8.5 TTO 8/13/2014 15:25 UTC
- **Mx8.5 Factory Bench Test data from Raytheon**
  - 7/2/2014
- **Mx8.5 Integration and Testing data from Raytheon**
  - 7/30/2014 – 8/1/2014; 8/4/2014 – 8/14/2014
- **STAR AIT processing using Mx8.5 for select granules**
  - 7/15/2014

IDPS Mx8.3 and Mx8.4performance

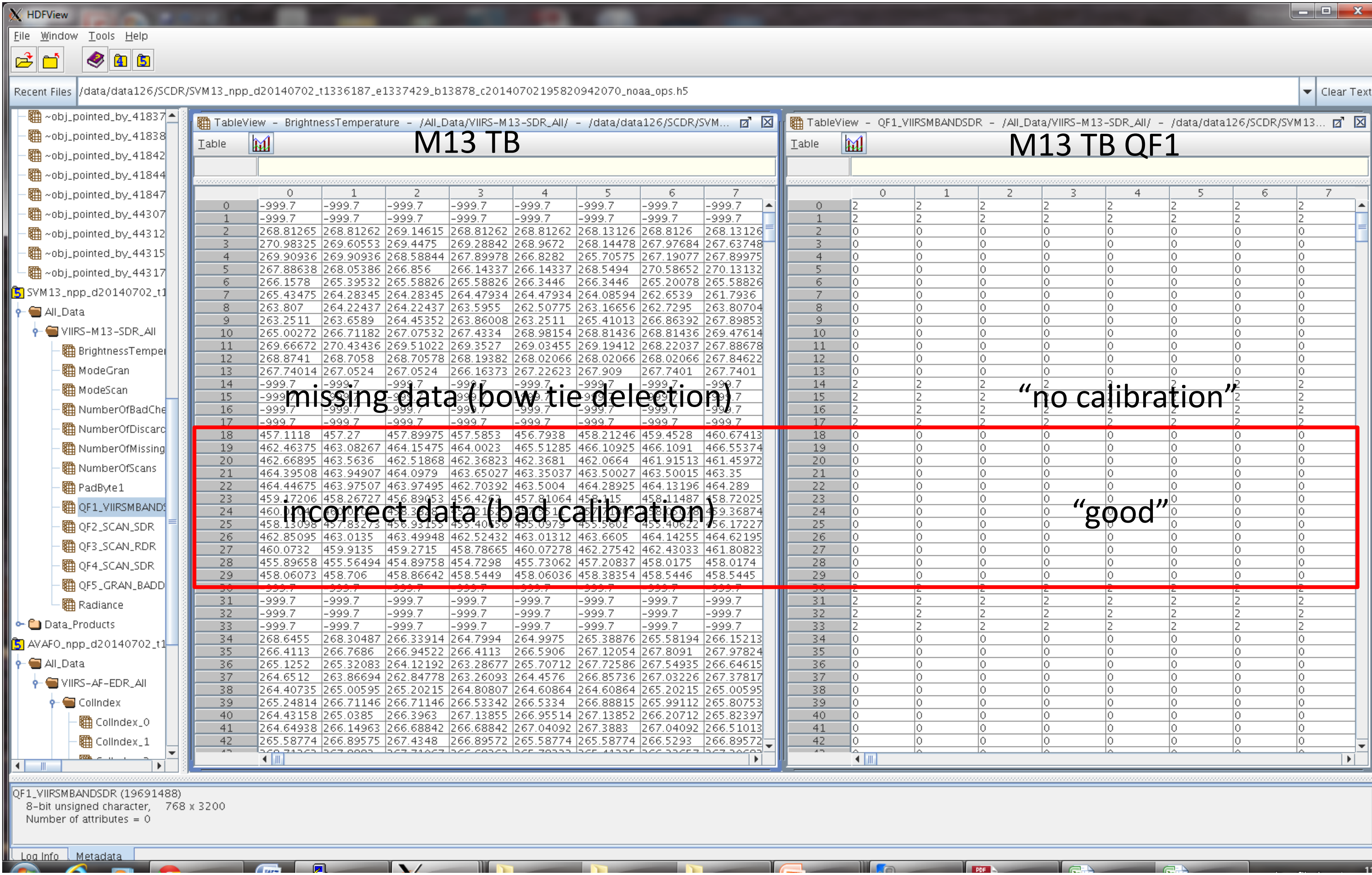
IDPS AVAFO granules from STAR SCDR were processed for April 30 – September 02 2014. Only July 2014 is shown here. No other spurious detections were found out of the total of 14037 data granules processed.



Nmax: maximum number of active fire detections within a single scan line within a granule

Spurious detections: July 02, 2014 13:36:18 – 13:41:59 (Nmax: 329)
July 15, 2014 14:33:19 – 14:34:41 (Nmax: 1112)

Mx8.4: July 2, 2014 case



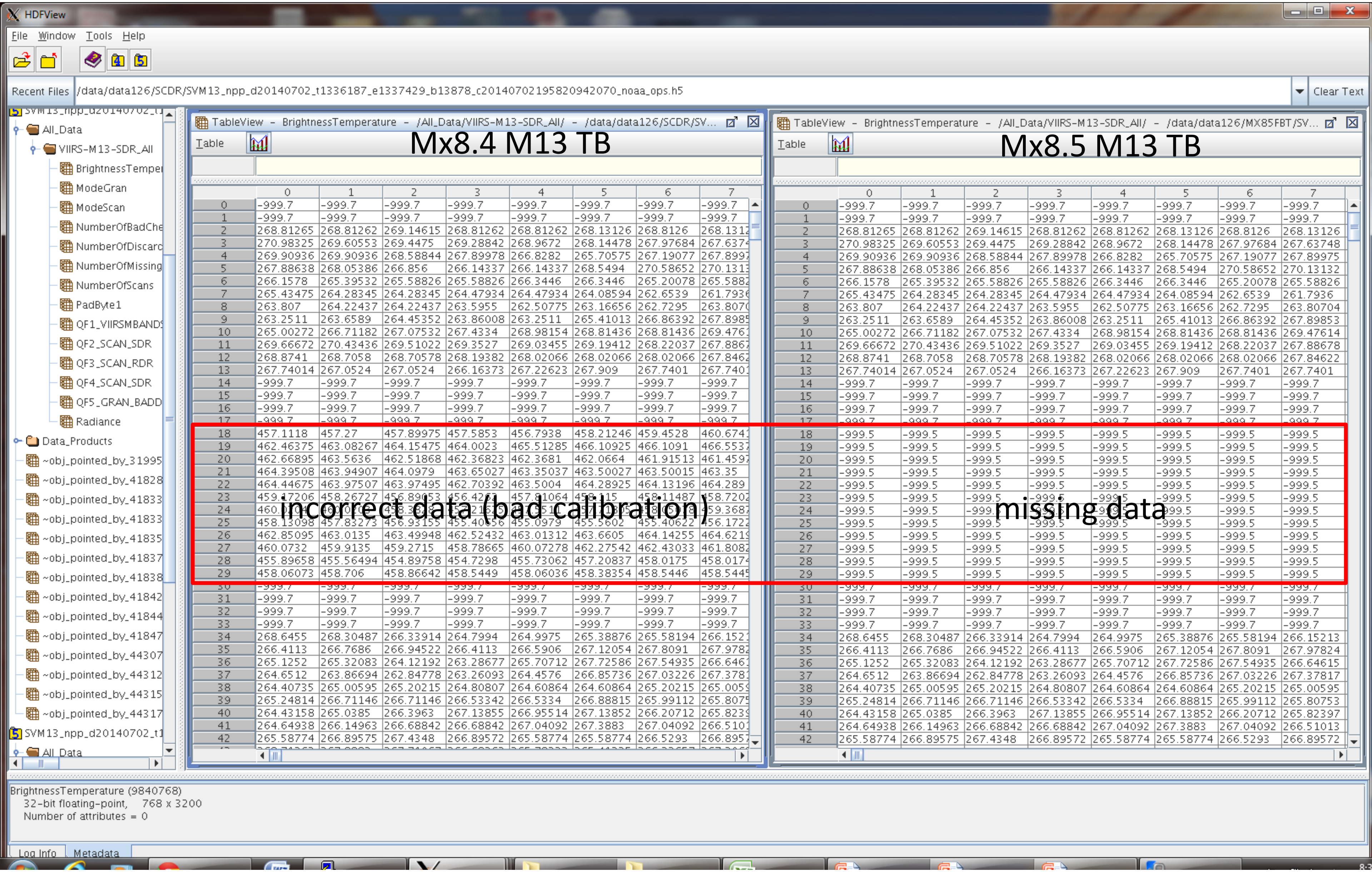
M13 TB

	0	1	2	3	4	5	6	7
0	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
1	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
2	268.81265	268.81262	269.14615	268.81262	268.81262	268.13126	268.8126	268.13126
3	270.98325	269.60553	269.4475	269.28842	268.9672	268.14478	267.97684	267.63748
4	269.90936	269.90936	268.58844	267.89978	266.8282	265.70575	267.19077	267.89975
5	267.88638	268.05386	266.856	266.14337	266.14337	268.5494	270.58652	270.13132
6	266.1578	265.39532	265.58826	265.58826	266.3446	266.3446	265.20078	265.58826
7	265.43475	264.28345	264.28345	264.47934	264.47934	264.08594	262.6539	261.7936
8	263.807	264.22437	264.22437	263.5955	262.50775	263.16656	262.7295	263.80704
9	263.2511	263.6589	264.45352	263.86008	263.2511	265.41013	266.86392	267.89853
10	265.00272	266.71182	267.07532	267.4334	268.98154	268.81436	268.81436	269.47614
11	269.66672	270.43436	269.51022	269.3527	269.03455	269.19412	268.22037	267.88678
12	268.8741	268.7058	268.70578	268.19382	268.02066	268.02066	268.02066	267.84622
13	267.74014	267.0524	267.0524	266.16373	267.22623	267.909	267.7401	267.7401
14	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
15	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
17	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
18	457.1118	457.27	457.89975	457.5853	456.7938	458.21246	459.4528	460.67413
19	462.46375	463.08267	464.15475	464.0023	465.51285	466.10925	466.1091	466.55374
20	462.66895	463.5636	462.51868	462.36823	462.3681	462.0664	461.91513	461.45972
21	464.39508	463.94907	464.0979	463.65027	463.35037	463.50027	463.50015	463.35
22	464.44675	463.97507	463.97495	462.70392	463.5004	464.28925	464.13196	464.289
23	459.17206	458.26727	456.89053	[illegible]	457.81064	[illegible]	458.11487	458.72025
24	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	459.36874
25	458.13098	457.83273	456.93155	[illegible]	455.0979	455.5602	455.40622	456.17227
26	462.85095	463.0135	463.49948	462.52432	463.01312	463.6605	464.14255	464.62195
27	460.0732	459.9135	459.2715	458.78665	460.07278	462.27542	462.43033	461.80823
28	455.89658	455.56494	454.89758	454.7298	455.73062	457.20837	458.0175	458.0174
29	458.06073	458.706	458.86642	458.5449	458.06036	458.38354	458.5446	458.5445
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
32	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
33	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7	-999.7
34	268.6455	268.30487	266.33914	264.7994	264.9975	265.38876	265.58194	266.15213
35	266.4113	266.7686	266.94522	266.4113	266.5906	267.12054	267.8091	267.97824
36	265.1252	265.32083	264.12192	263.28677	265.70712	267.72586	267.54935	266.64615
37	264.6512	263.86694	262.84778	263.26093	264.4576	266.85736	267.03226	267.37817
38	264.40735	265.00595	265.20215	264.80807	264.60864	264.60864	265.20215	265.00595
39	265.24814	266.71146	266.71146	266.53342	266.5334	266.88815	265.99112	265.80753
40	264.43158	265.0385	266.3963	267.13855	266.95514	267.13852	266.20712	265.82397
41	264.64938	266.14963	266.68842	266.68842	267.04092	267.3883	267.04092	266.51013
42	265.58774	266.89575	267.4348	266.89572	265.58774	265.58774	266.5293	266.89572

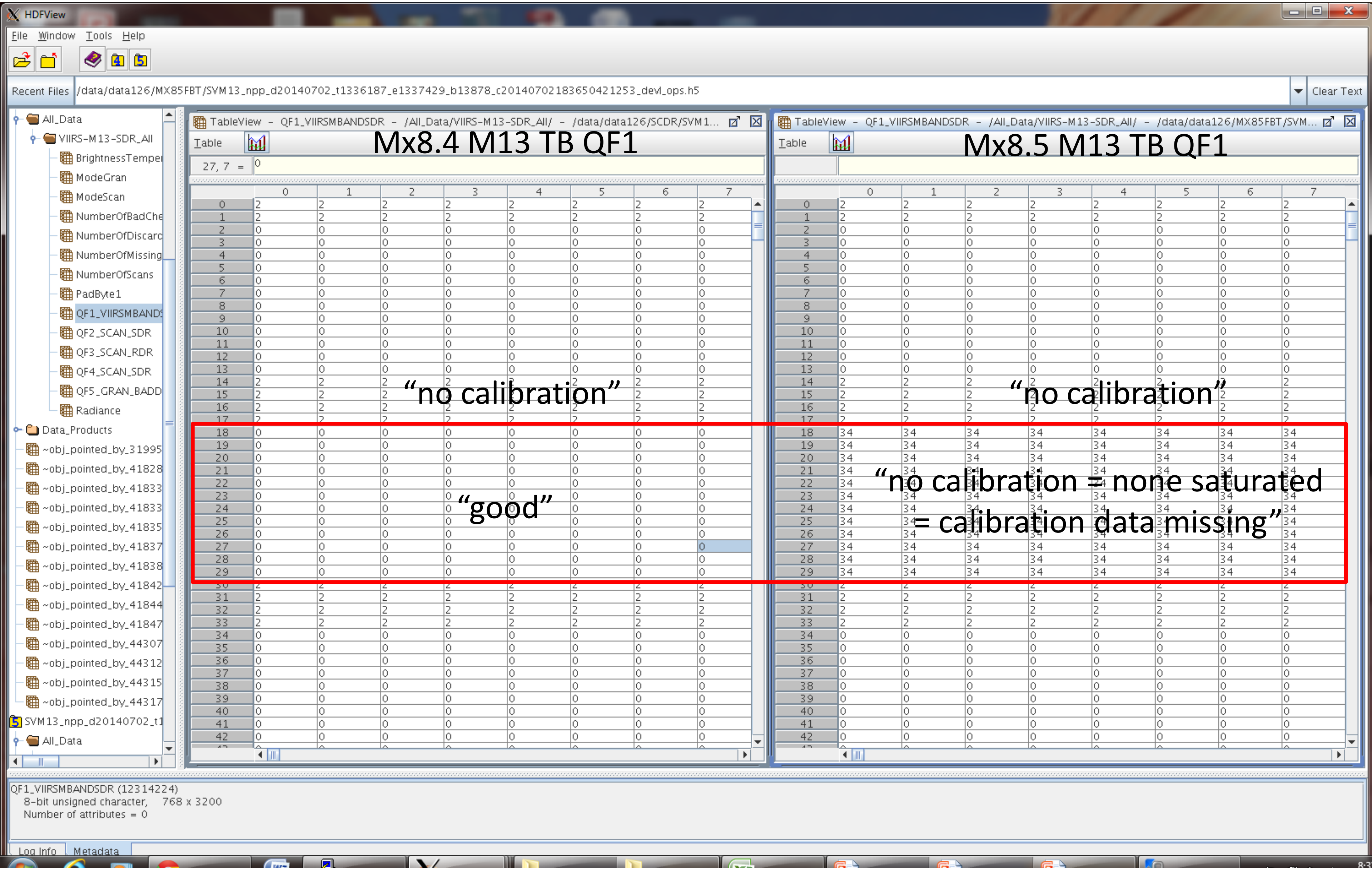
M13 TB QF1

	0	1	2	3	4	5	6	7
0	2	2	2	2	2	2	2	2
1	2	2	2	2	2	2	2	2
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	2	2	2	2	2	2	2	2
15	2	2	2	[illegible]	[illegible]	[illegible]	[illegible]	2
16	2	2	2	2	2	2	2	2
17	2	2	2	2	2	2	2	2
18	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	0	0	0	[illegible]	[illegible]	0	0
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0
30	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	2	2	2	2	2	2	2	2
32	2	2	2	2	2	2	2	2
33	2	2	2	2	2	2	2	2
34	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0

July 2: Mx8.4 vs. Mx8.5 M13 TB

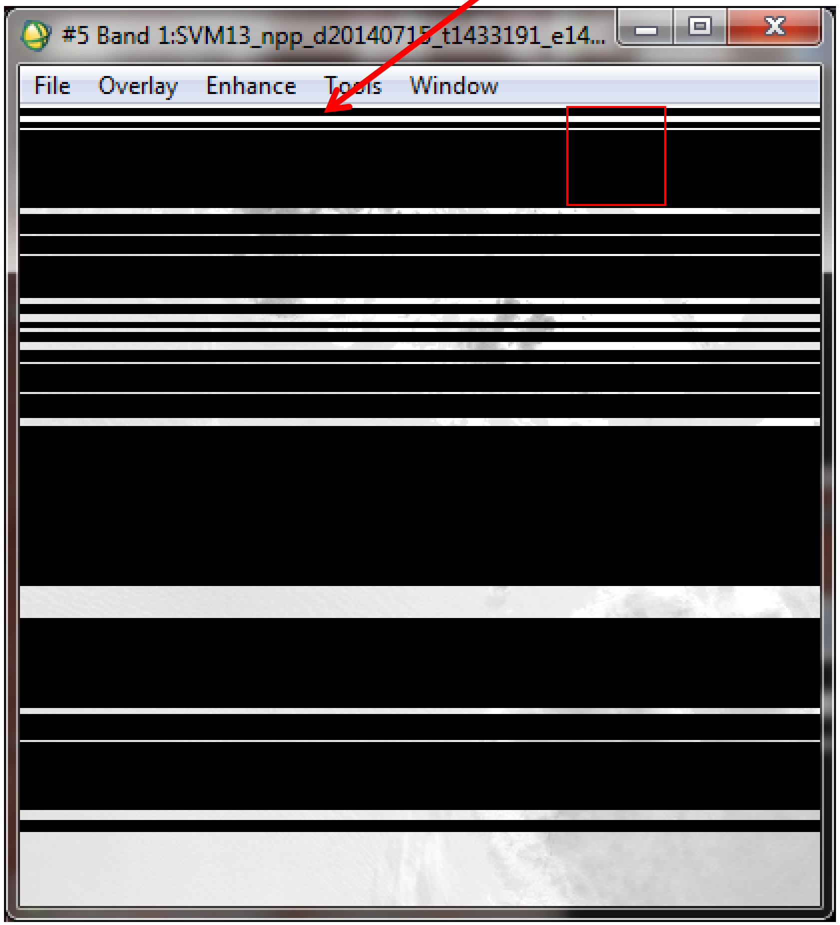


July 2: Mx8.4 vs. Mx8.5 M13 QF1

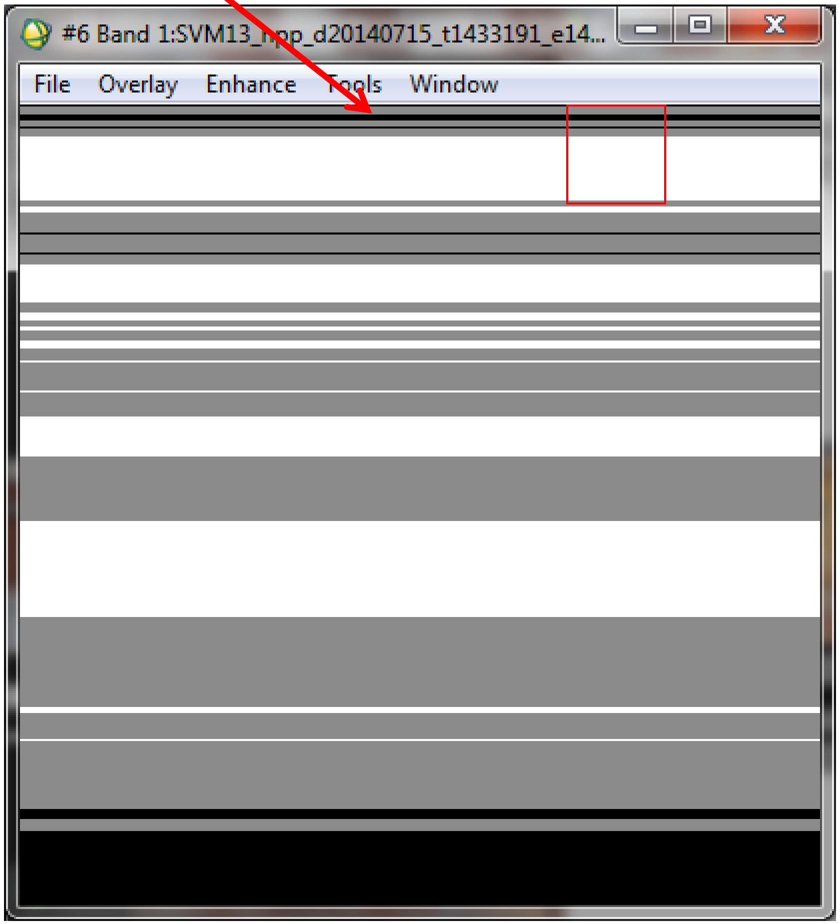


July 15 case: Mx8.4 vs. Mx8.5

M13 TB > 400K



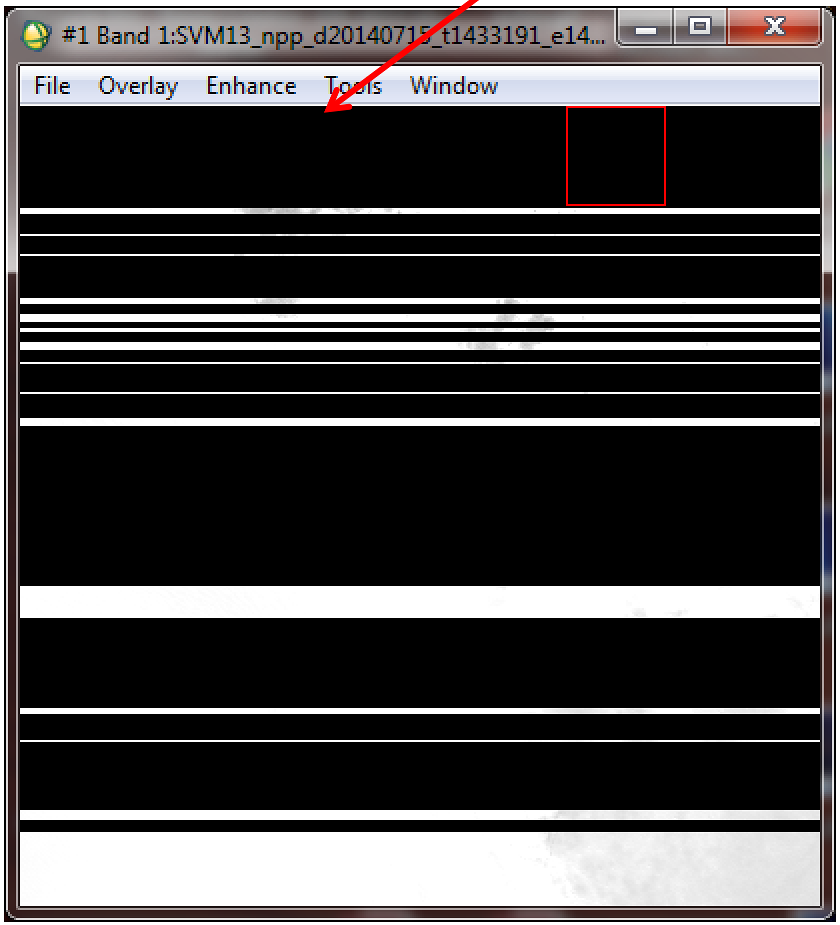
QF=0



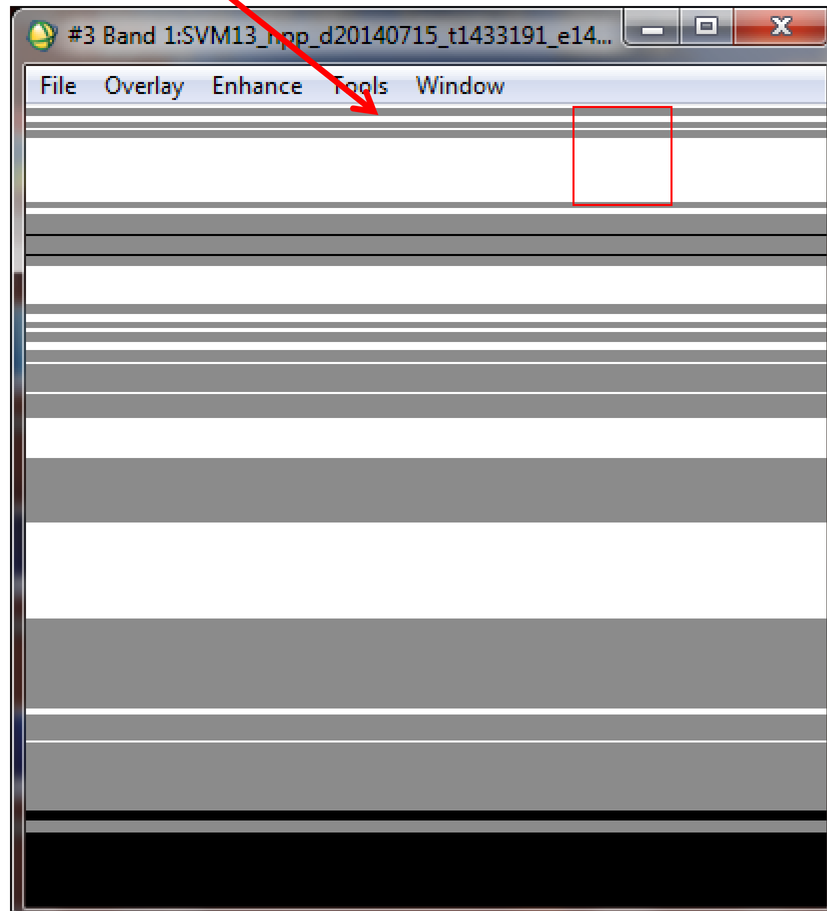
IDPS Mx8.4 A1granule version

July 15 case: Mx8.4 vs. Mx8.5

-999.50



QF=34



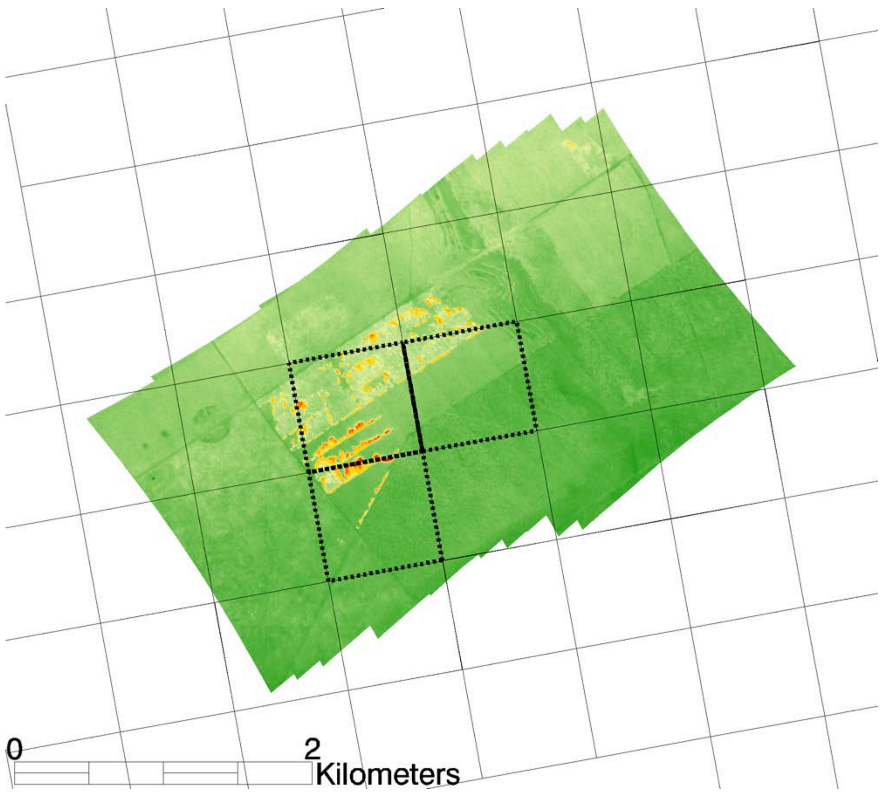
IDPS Mx8.5 code run by STAR AIT

Field Validation Using Coincident Airborne Reference Data

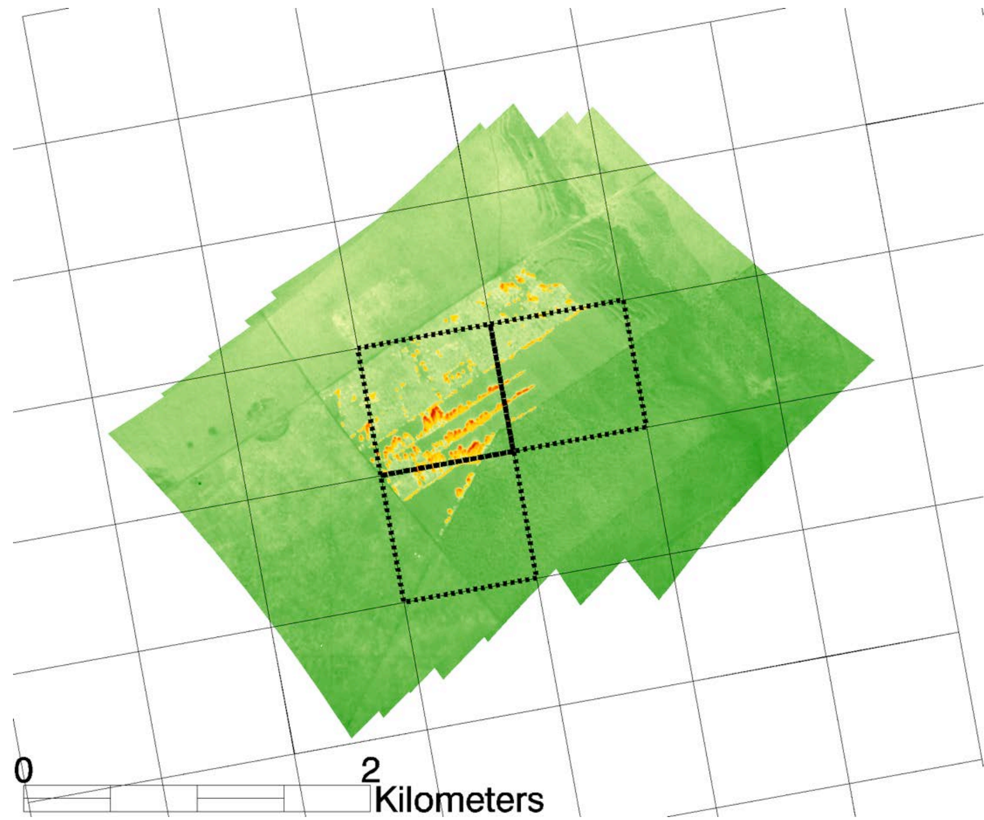
Prescribed Fire Combustion and Atmospheric Dynamics Research (RxCadre) experiment at Eglin Air Force Base/FL
1-15 Nov 2012

VIIRS 750 m Active Fire Algorithm Validation Using Airborne Reference and Auxiliary (fire mask replacement code) Input Data

Grassland fire 10 Nov 2012
(≈16ha flaming/smoldering; 150MW)



VIIRS 18:47:22 UTC
WASP 18:45:28-18:46:04 UTC

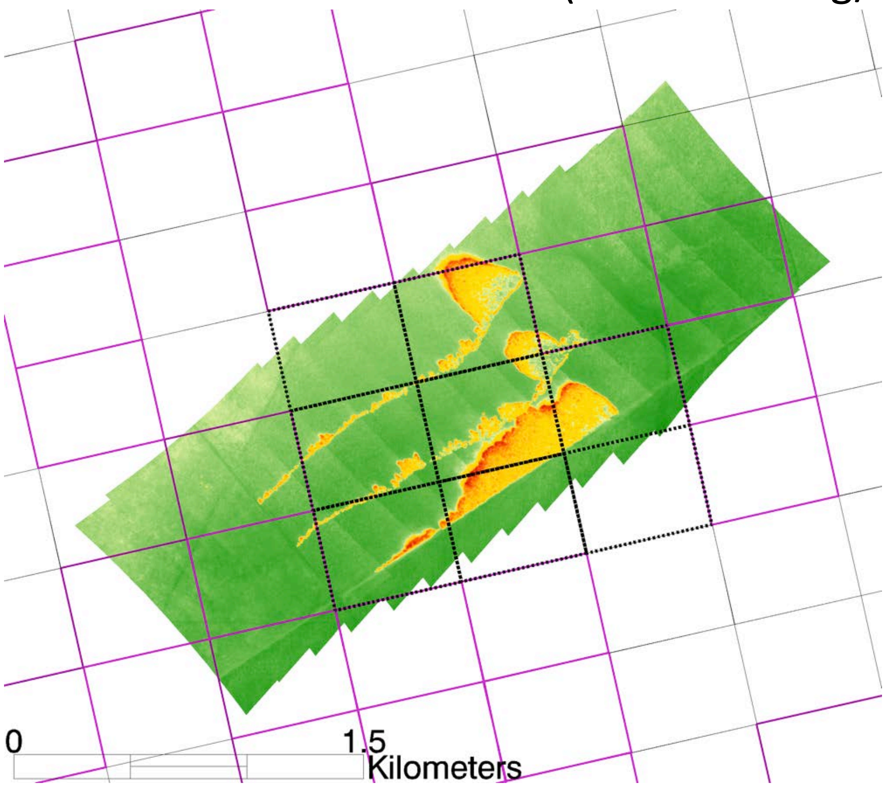


VIIRS 18:47:22 UTC
WASP 18:48:55-18:49:22 UTC

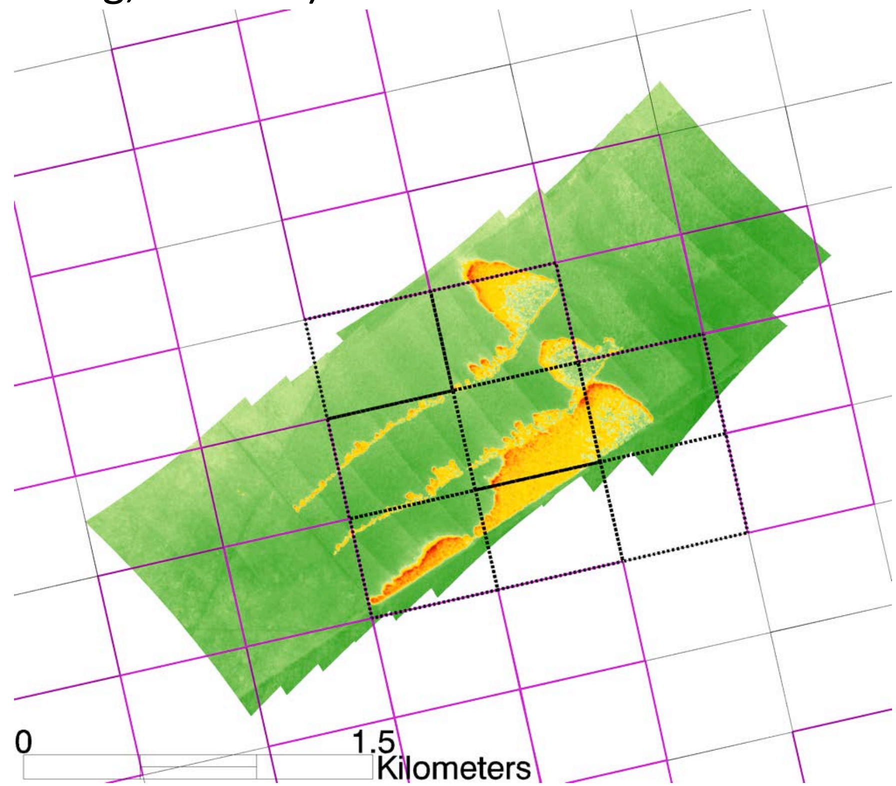
Cloud pixel
Fire pixel
Land pixel

VIIRS 750 m Active Fire Algorithm Validation Using Airborne Reference and Auxiliary (fire mask replacement code) Input Data

Pine forest understory fire 11 Nov 2012
(≈28ha flaming/smoldering; 236MW)



VIIRS 18:28:34 UTC
WASP 18:25:39-18:26:06 UTC

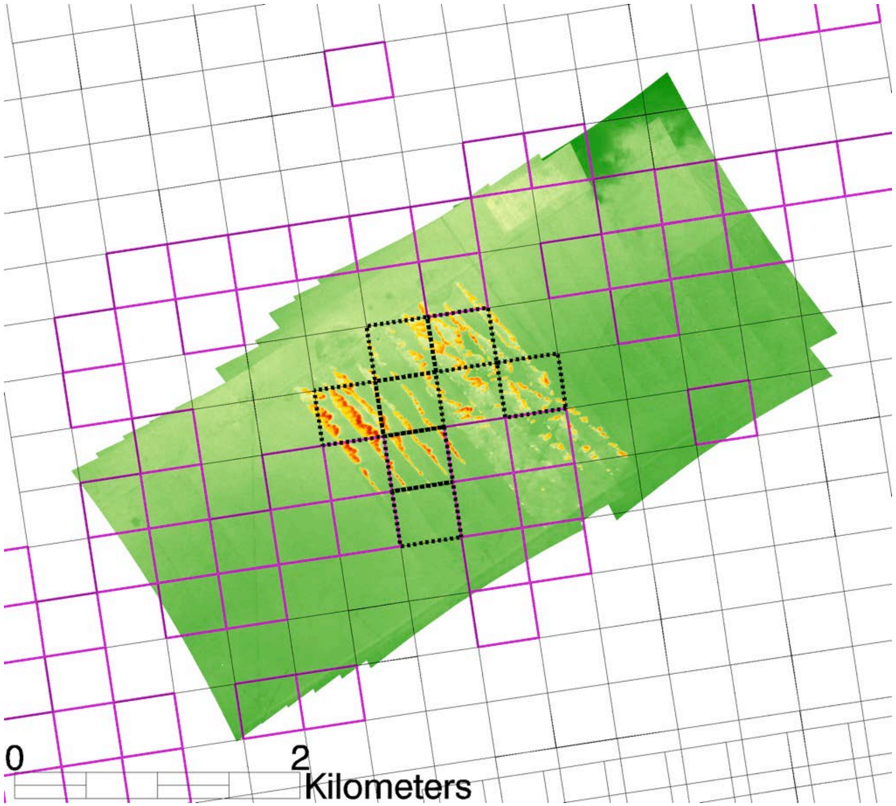


VIIRS 18:28:34 UTC
WASP 18:29:30-18:30:06 UTC

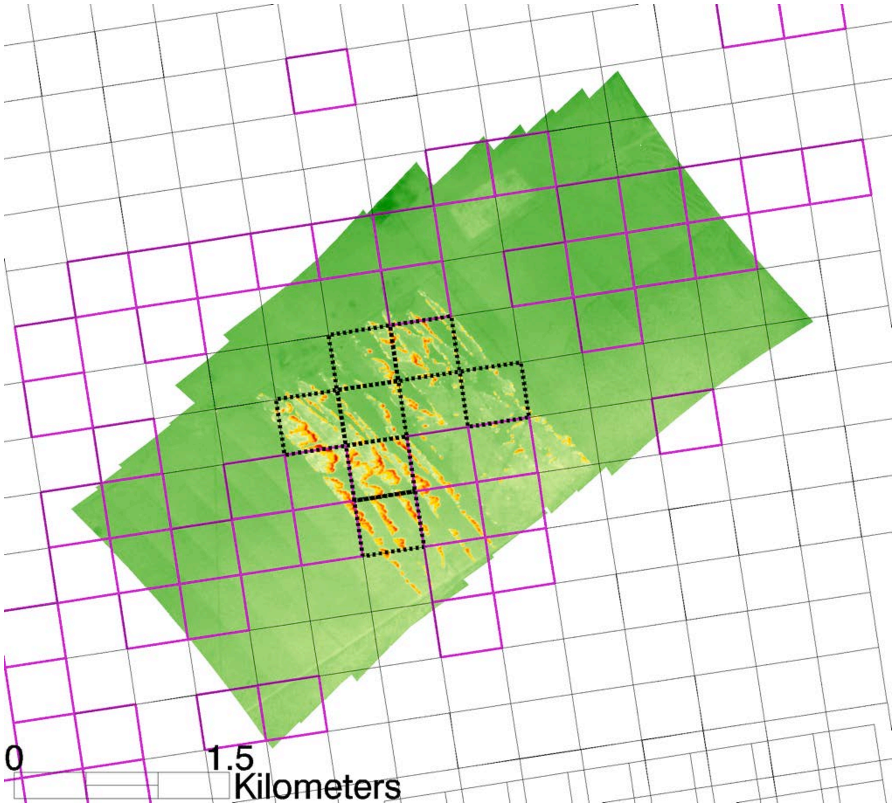
Cloud pixel
Fire pixel
Land pixel

VIIRS 750 m Active Fire Algorithm Validation Using Airborne Reference and Auxiliary (fire mask replacement code) Input Data

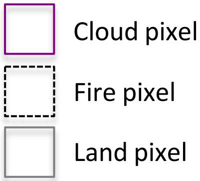
Grassland fire 04 Nov 2012
(≈35ha flaming/smoldering; 158MW)

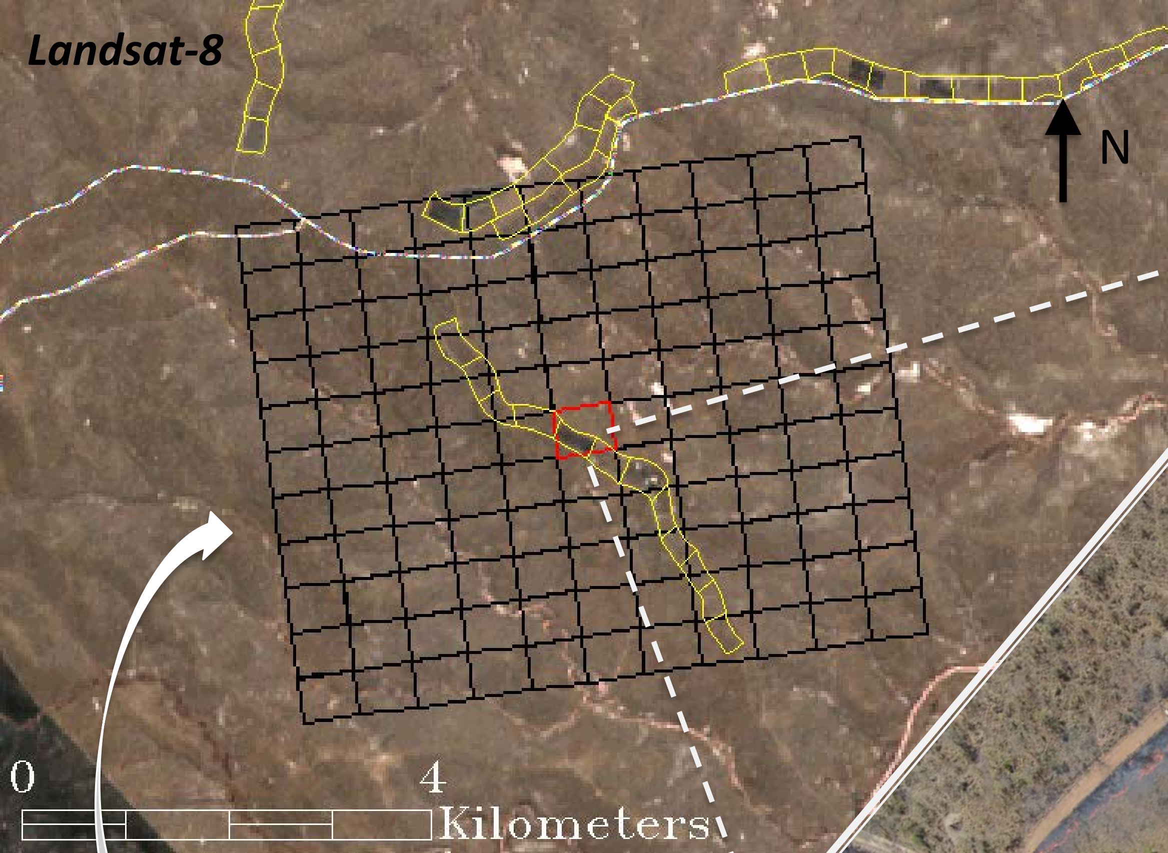


VIIRS 18:59:54 UTC
WASP 18:58:55-18:59:43 UTC

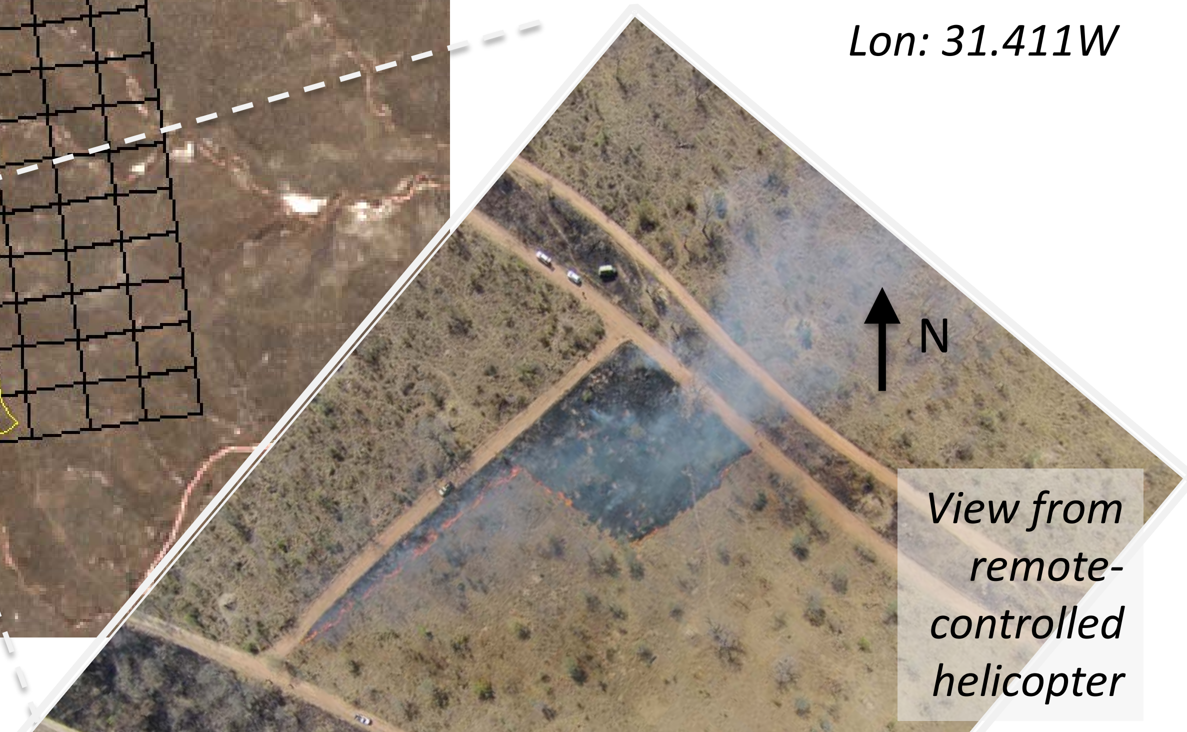


VIIRS 18:59:54 UTC
WASP 19:03:05-19:03:44 UTC





Plot: Biyamiti #5
19 August 2014
Lat: 25.131 S
Lon: 31.411W

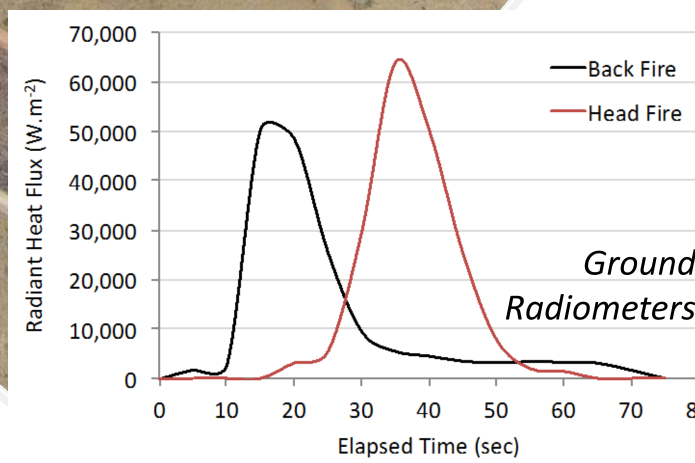


View from remote-controlled helicopter

Subset of VIIRS 375 m pixel grid (fire detection in red)

Surface-leaving FRP (VIIRS):
4.4±0.2MW
@ 13:24:26 h local time

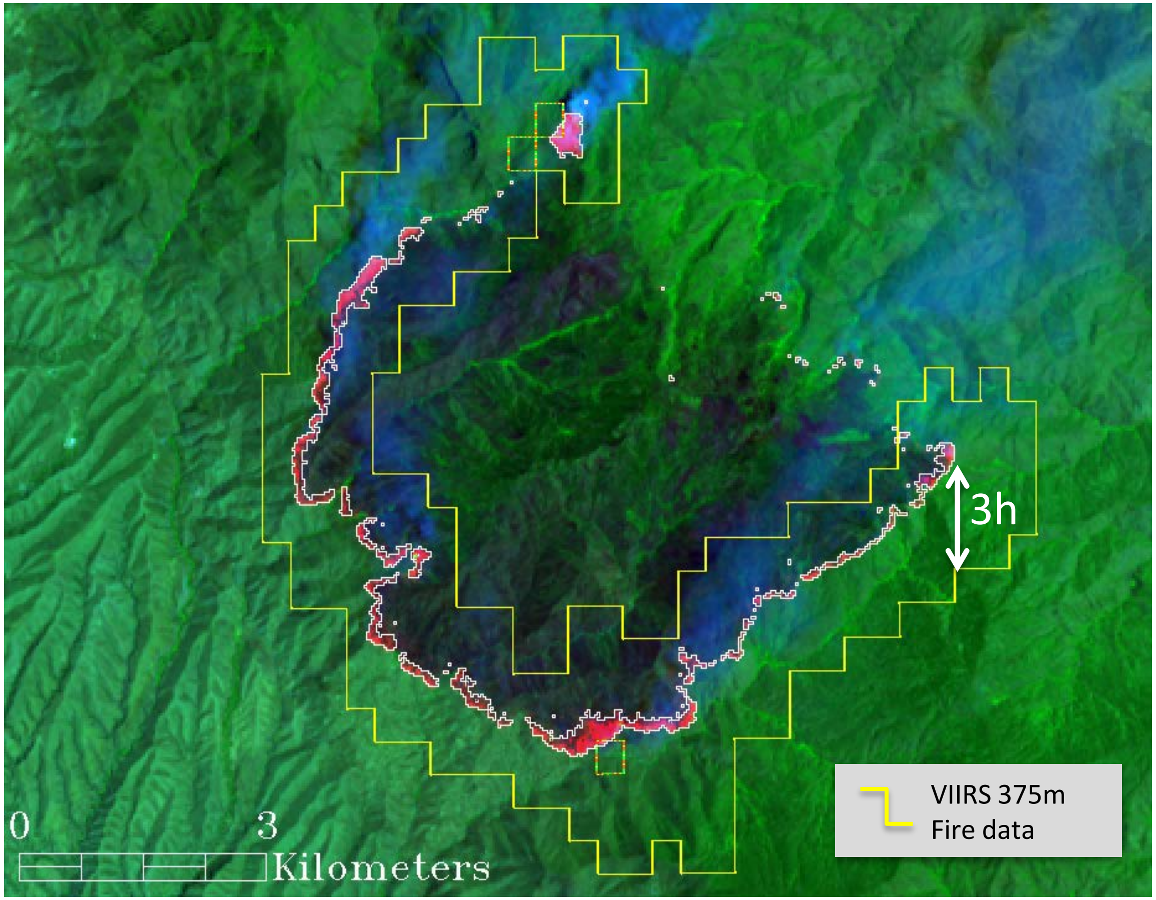
Length of active (back) fire front at time of VIIRS overpass: 200 m



Ground Radiometers

New Landsat-8 30 m Active Fire Data

Built on proven ASTER/Landsat (5&7) fire algorithms [Giglio *et al.*, 2008; Schroeder *et al.*, 2008]
Day & nighttime detections 16/8-day revisit (day/&night)
Spatial resolution providing detailed fire perimeter information (plus area estimate)



Conclusion

- The Suomi NPP Active Fire product has reached Validated 1 maturity status with an effectivity date of **August 13, 2014**.
  - The effectivity date corresponds to the Transition to Operations of IDPS Mx8.5, which includes the implementation SDR changes to address VIIRS Quality Flag and Calibration issues
  - Additional prior SDR changes also improved data quality
  - The team will continue systematic monitoring of product quality and will report any issues found immediately.
- The **Suomi NPP Active Fire ARP was declared Operational** by the NESDIS Satellite Products and Services Review Board (SPSRB)
  - Primary use in NOAA'S Hazard Mapping System

Path Forward

- An automated **long-term monitoring system** is being set up at STAR for quality monitoring and reactive maintenance of the Suomi NPP Active Fire product
- A processing code is available to generate a product that meets the **JPSS 1 requirements** is available
  - Developed as part of a NASA Science Team effort
  - Implemented at STAR
  - NOAA implementation details are being worked on
  - CDR is planned for October 2014
- Continuing efforts towards rigorous **validation** using **independent reference data**

For more information

- **NOAA JPSS**

  www.jpss.noaa.gov
- **NOAA STAR JPSS**

  www.star.nesdis.noaa.gov/jpss
- **VIIRS Fire Evaluation and Data Portal**

  viirsfire.geog.umd.edu
- **STAR JPSS 2014 Annual Science Team Meeting**

  www.star.nesdis.noaa.gov/star/meeting_2014JPSSAnnual_agenda.php

- Csiszar, I., W. Schroeder, L. Giglio, E. Ellicott, K. P. Vadrevu, C. O. Justice, B. Wind, 2014: **Active fires from the Suomi NPP Visible Infrared Imaging Radiometer Suite: Product status and first evaluation results**, *J Geophys Res Atmos*, 119, doi:10.1002/2013JD020453.
- Schroeder, W., P. Oliva, L. Giglio, I. A. Csiszar, **The New VIIRS 375 m active fire detection data product: Algorithm description and initial assessment**, Remote Sensing of Environment, Volume 143, 5 March 2014, Pages 85-96, ISSN 0034-4257, http://dx.doi.org/10.1016/j.rse.2013.12.008