



RSAC Update on NIROPS- Related Activities

NIROPS 2014 Closeout Meeting

December 3, 2014



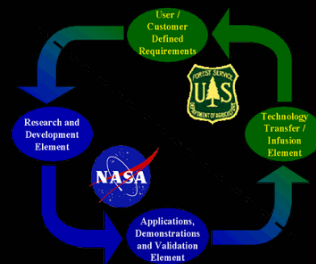
USDA Forest Service, Remote Sensing Applications Center,
FSWeb: <http://fsweb.rsac.fs.fed.us>
WWW: <http://www.fs.fed.us/eng/rsac/>

Presentation Outline

- Current & Future Sensors
 - Spring 2014 AMS Test Missions
- NIROPS Website and Online Ordering
- 2014 Firehawk Support Summary
- 2013 Sources Sought Notice
- 2014 Infrared Field User Guide and Vendor Listings

Inter-Agency AMS Tech Transfer Activities 2014

- Acquisition of new ground station laptop
- Updates/refinements of the On-Board Processing System (OBP)
 - User interface, mission planning software and documentation (users guide)
- USFS IR Technician training
 - Simulations of imagery acquisition and processing workflow
- AMS installed in N144Z in late March
 - Initial bore site and integration test missions
 - Refinement of imagery ortho-rectification



2014 AMS Testing/Integration

- Conducted test flights from March through late May
 - Flew 10 target areas, including 2 wildfire incidents (multiple days)
- Significant test objectives/goals:
 - Technician training
 - Test OBP system for NRT data production and delivery
 - Remote control of sensor from the ground

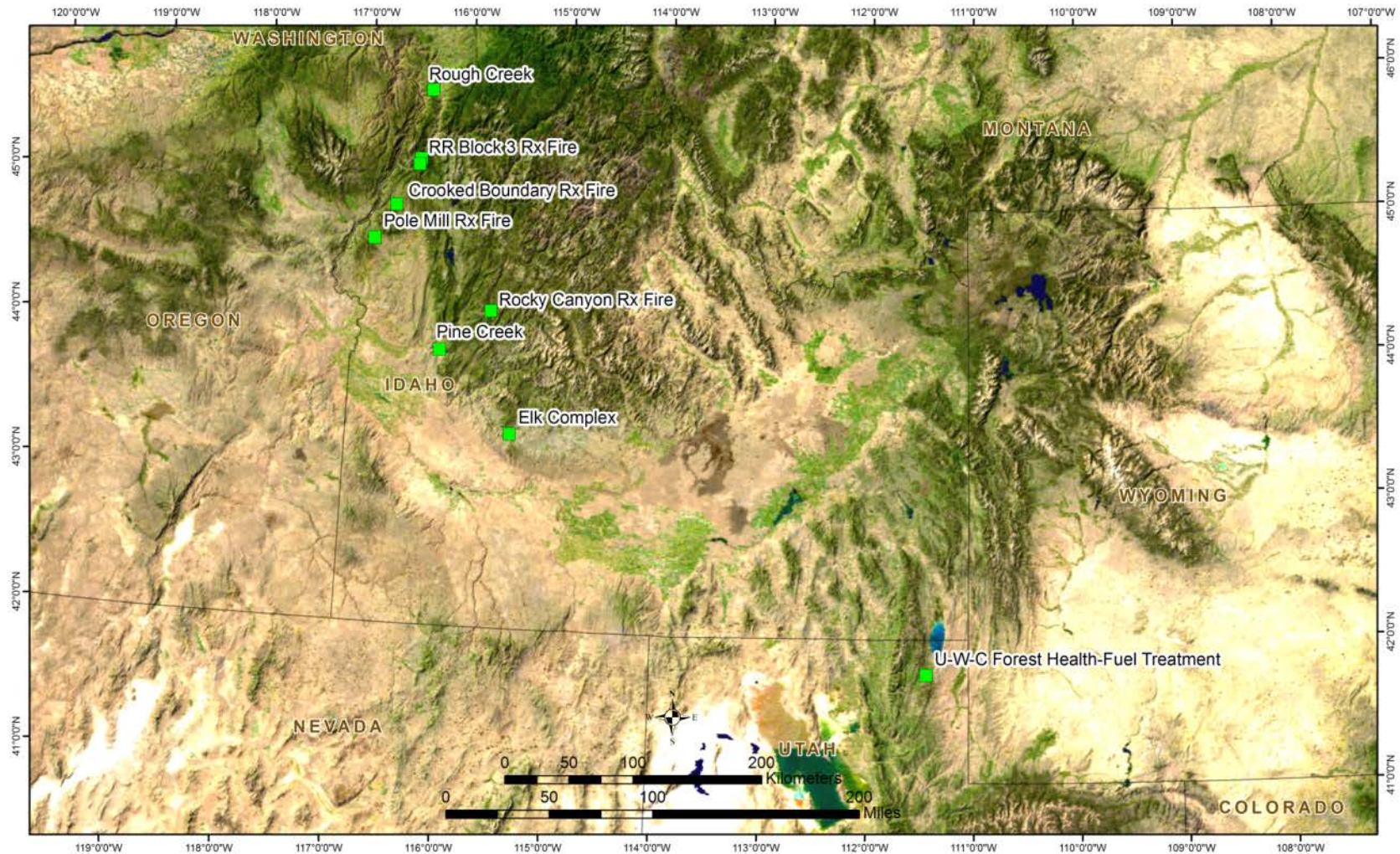
144Z AMS Installation



Proposed Spring 2014 AMS Missions

Description	Agency	Size (acres)	Mission Type	Status
Bear River Bird Refuge Rx Fires (Unit 9)	USFWS	800-2,500	Prescribed Fire	—
Fish Springs Bird Refuge Rx Fires	USFWS	1,000	Prescribed Fire	—
Merchant Valley Rx Fire	USFS	200-500	Prescribed Fire	—
Crooked Boundary Rx Fire	USFS	8,000	Prescribed Fire	Completed
Bald Hill Rx Fire	USFS	5,500	Prescribed Fire	—
Pole Mill Rx Fire	USFS	2,800	Prescribed Fire	Completed
Rapid River Block 2 Rx Fire	USFS	1,600	Prescribed Fire	Completed
Rapid River Block 3 Rx Fire	USFS	2,500	Prescribed Fire	Completed
Rocky Canyon Rx Fire	USFS	1,500	Prescribed Fire	Completed
Summit Boundary Rx Fire	USFS	3,580	Prescribed Fire	—
Long Canyon - Pismo Rx Fire	CalFIRE	1,202	Prescribed Fire	—
Long Canyon - Pismo Rx Fire	CalFIRE	273	Prescribed Fire	—
Barlow Rx Fire	Ventura Co. Fire	—	Prescribed Fire	—
Cooper Knoll Central Rx Fire	USFS	100-300	Prescribed Fire	—
Payette Rx Fire	USFS	500-700	Prescribed Fire	Completed
Underground fire near Filmore CA	NA	—	—	—
Milville Fire	State	2,848	Post fire	—
State Fire	State	29,827	Post fire	—
Patch Springs Fire	BLM	31,010	Post fire	—
Playground Fire	BLM	2,650	Post fire	—
Elk Complex	USFS	131,258	Post fire	Completed
Pine Creek	USFS	2,797	Post fire	Completed
Rough Creek	USFS	2,600	Post fire	Completed
Wildflower	BLM	1,754	Post fire	—
Forest health-fuel treatment area for Uinta-Wasatch-Cache	USFS	25,000-3,000	Forest Health	Completed
Forest health site on west Uintas	USFS	—	Forest Health	—

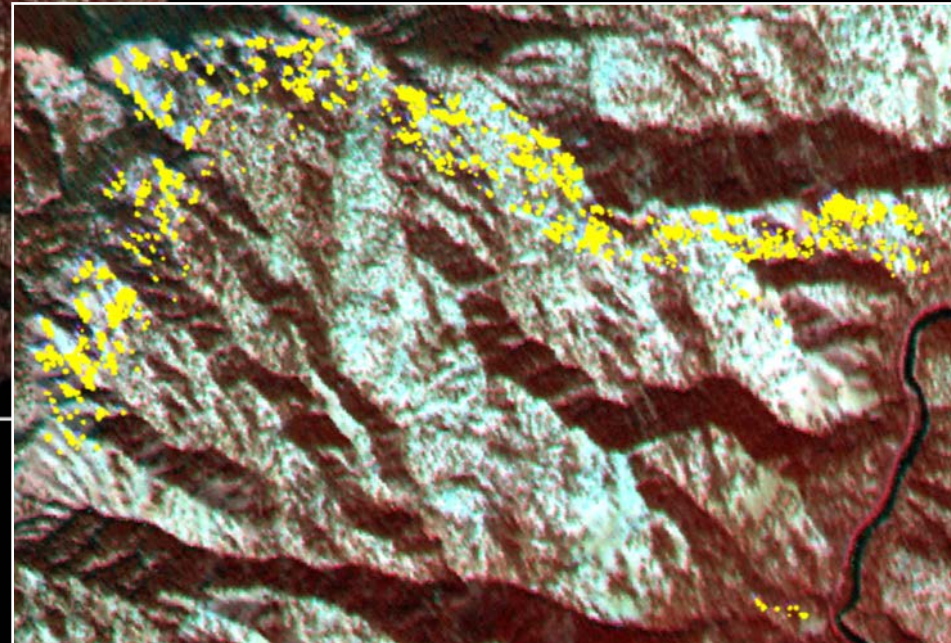
Completed Spring 2014 AMS Missions



Prescribed Fire: Rocky Canyon, Boise NF

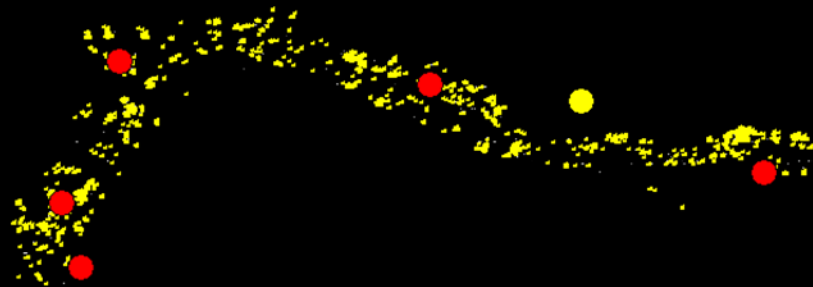


- April 11, 2014
- Planned ~1,500ac/600ha burn
- AMS fire product (CCRS)
- CIR visual image (bands 7,5,3)
- AMS hot spots enhanced for visualization



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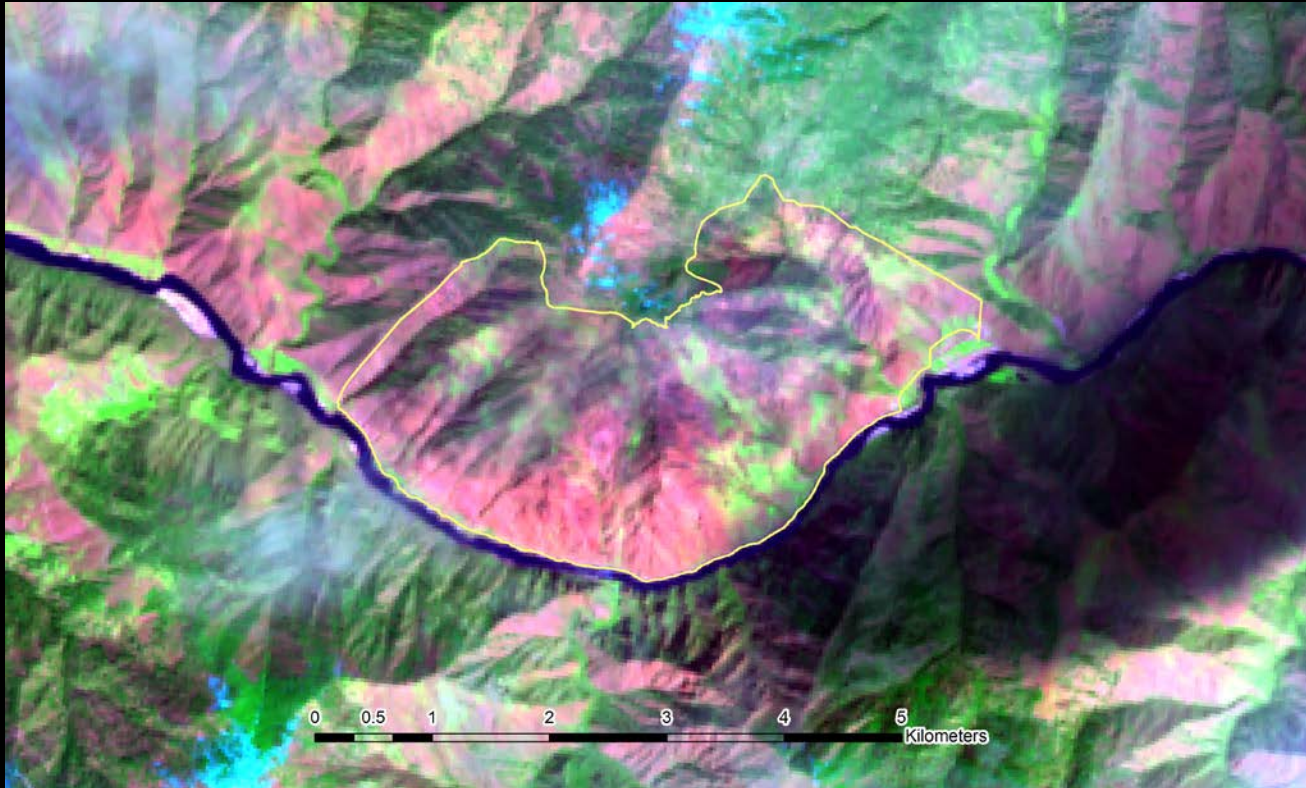
AMS Overflight at ~1945 UTC (~1245 MDT)

VIIRS Overpass at ~2046 UTC (~1346 MDT)

VIIRS I-Band 375m Product (Schroeder)

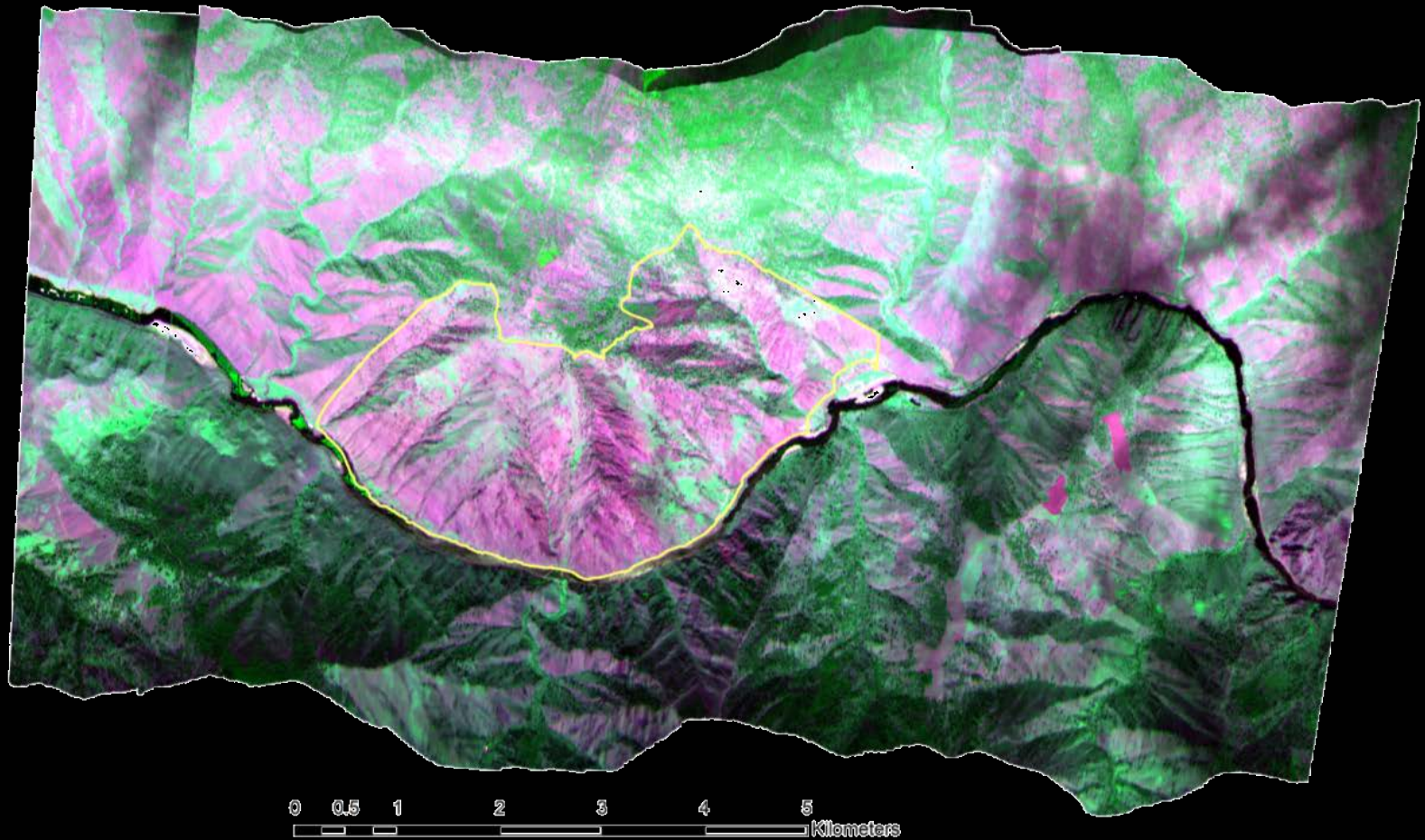
VIIRS-AF 750m Product (NASA-Direct Readout Lab)

Post-Fire: Rough Creek



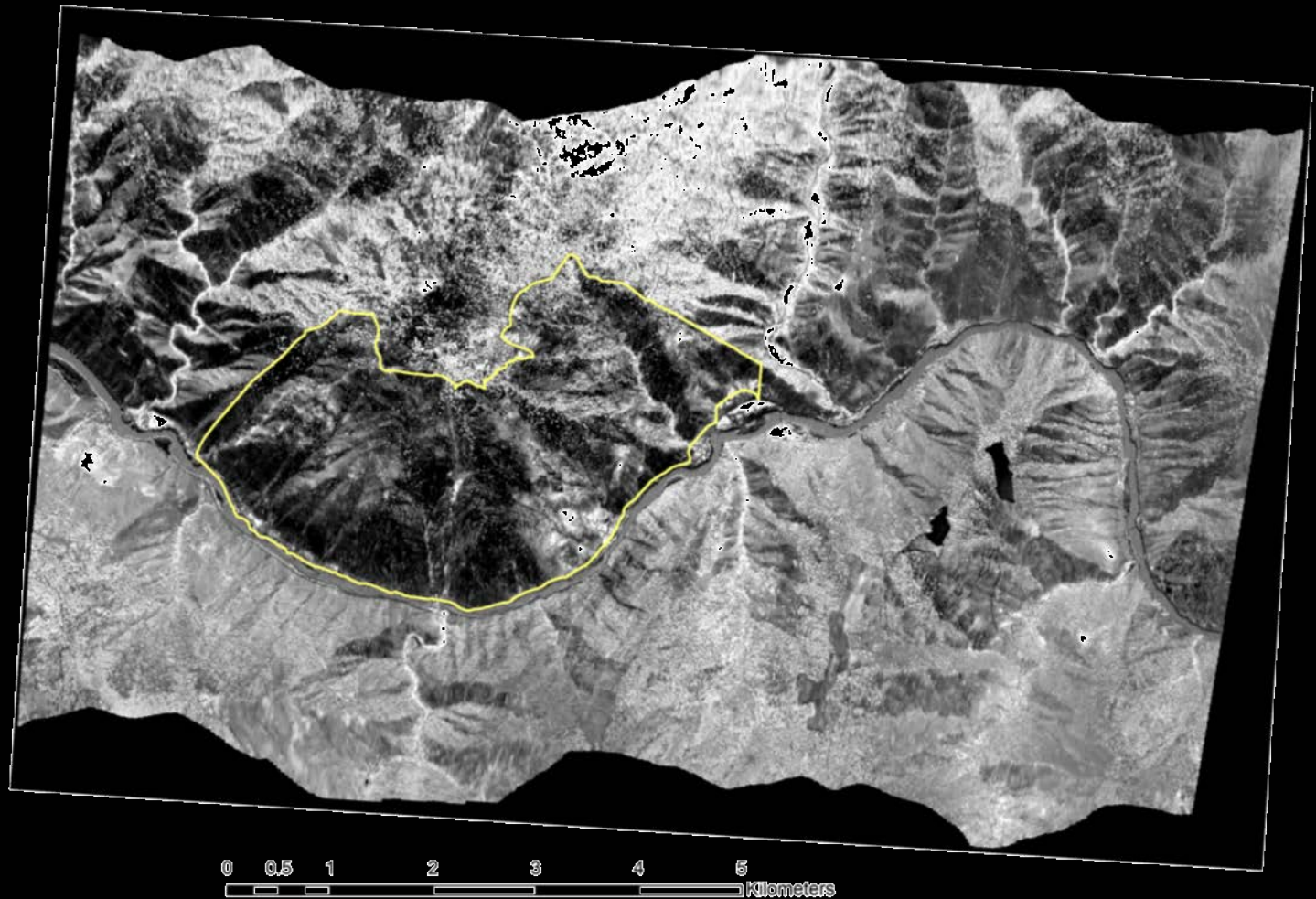
- Landsat 8, May 23, 2014
- False color composite
 - Bands 7, 5, 4

Post-Fire: Rough Creek



- AMS (April 18, 2014)
- 2 flight lines
- AMS false color composite
 - Bands 10, 7, 9

Post-Fire: Rough Creek



- AMS (April 18, 2014)
- AMS continuous Normalized Burn Ratio (NBR) image
- $NBR = \frac{AMS \text{ bands } (7-10)}{7+10} \times \frac{1000 + 3000}{2}$

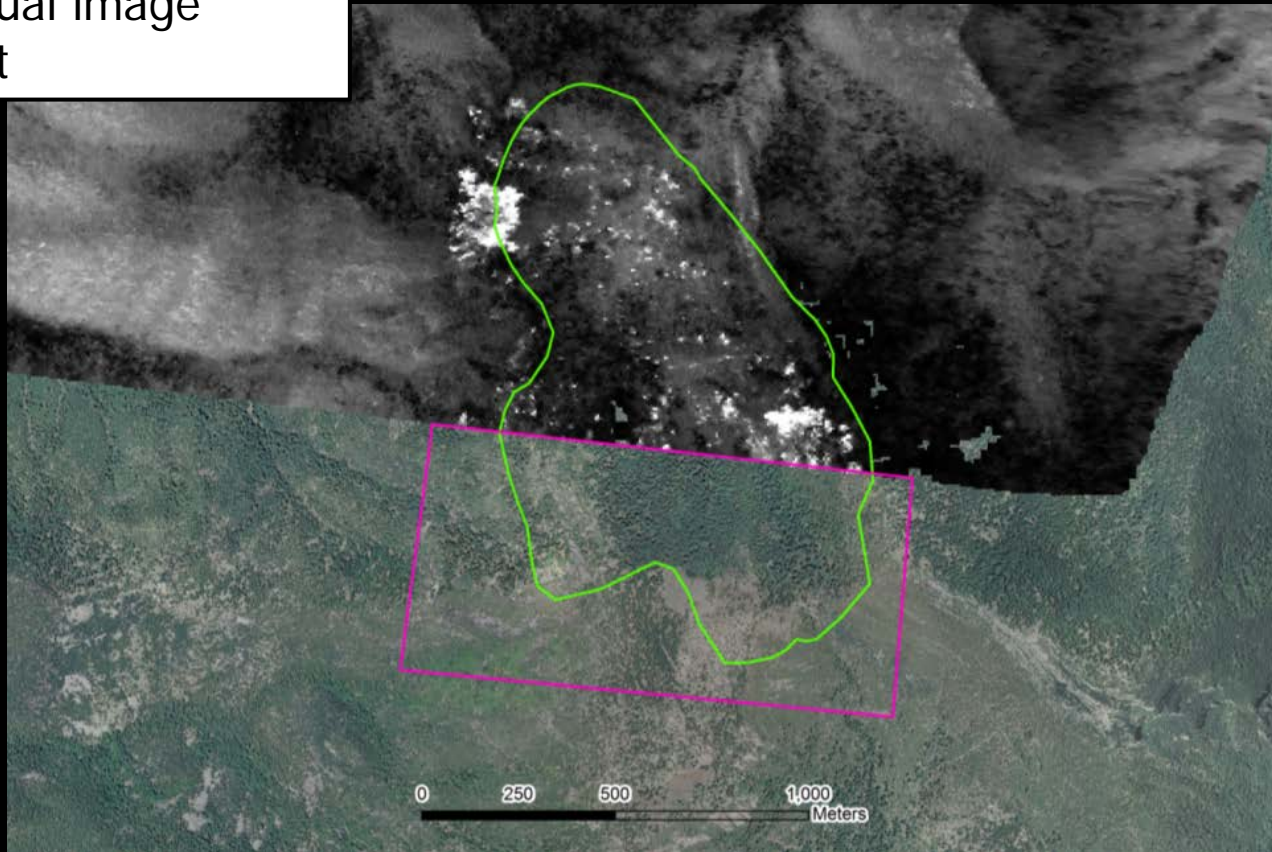
Wildland Fire Support

- Brown Fire, AZ
 - Coronado NF
 - SW of Sierra Vista, AZ
 - Same area impacted by Monument Fire in 2011
 - ~250 acres
 - Type 1 IMT assigned
- Acquired AMS data on two nights
 - April 15 & 16



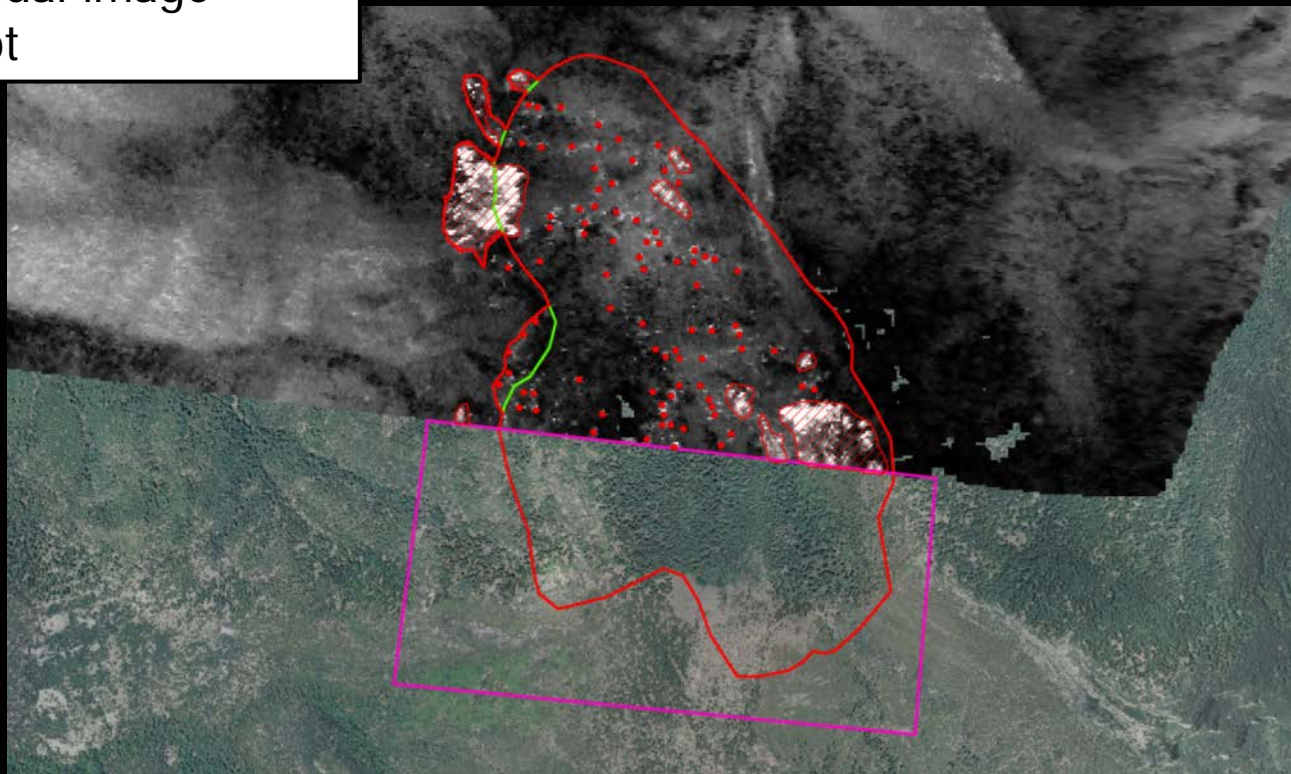
Brown Fire -April 15/16, 2014

- AMS Night Fire Product
- Bands 11, 12 for hot spots
- Band 12 visual image
- White = Hot

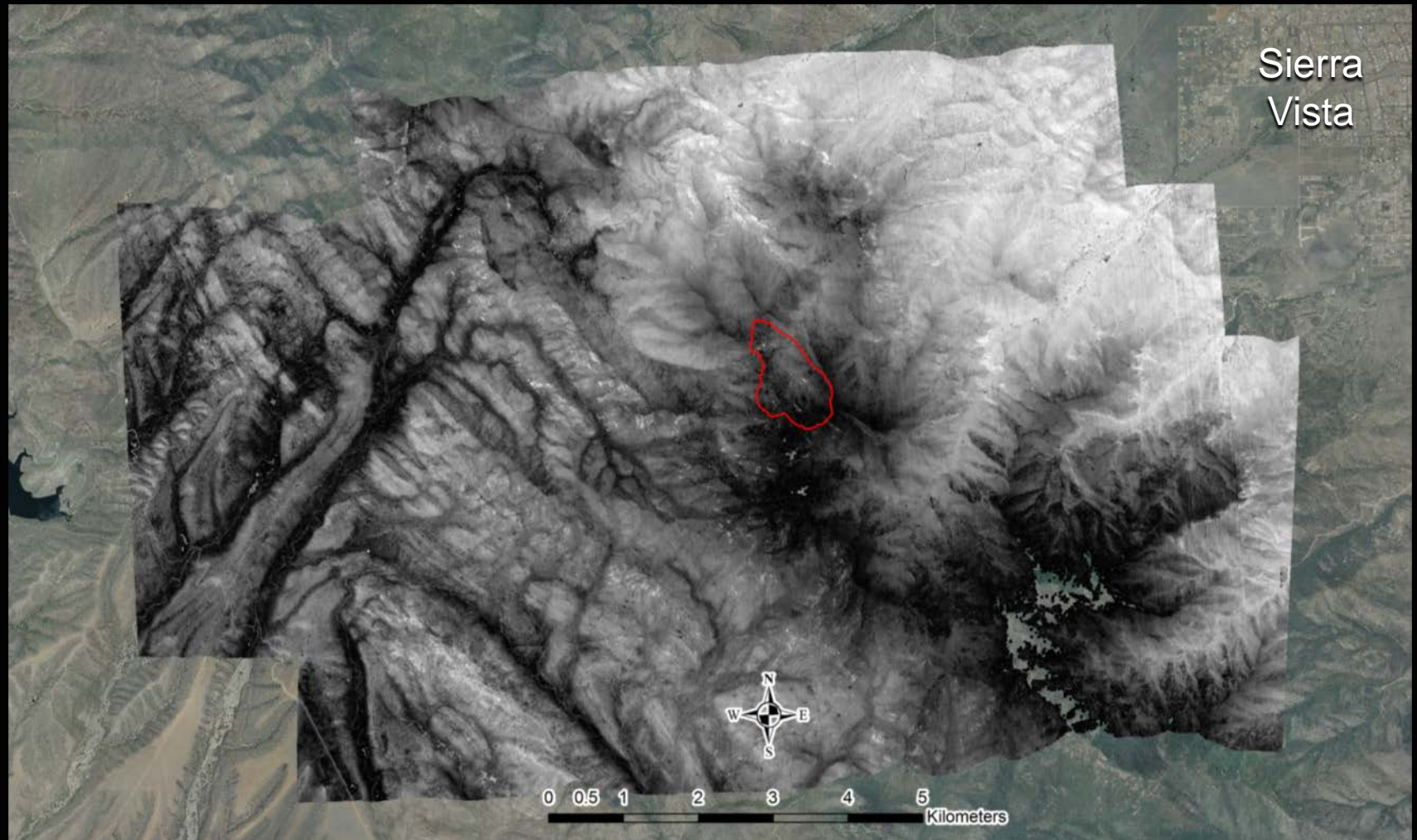


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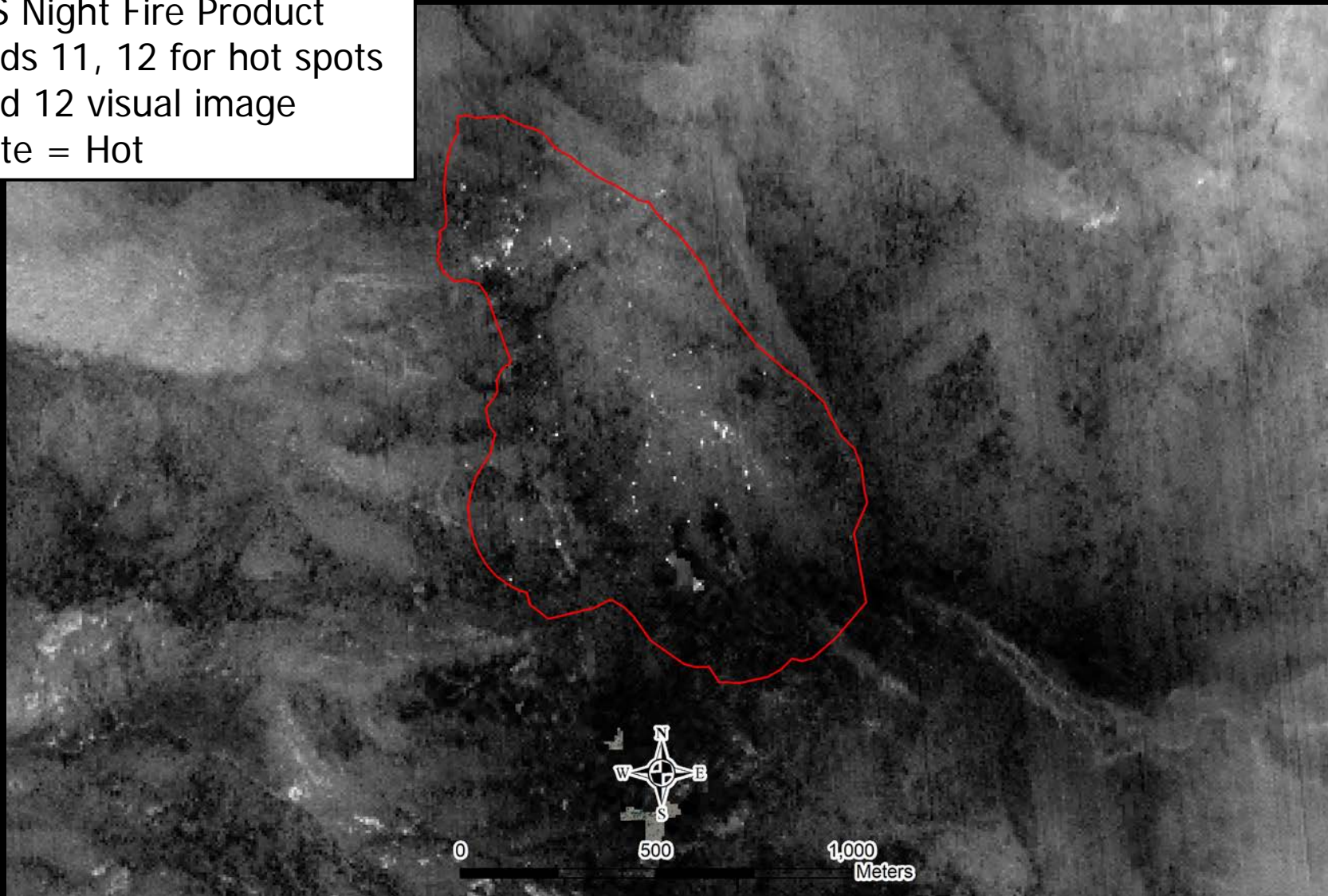


Brown Fire -April 16/17, 2014



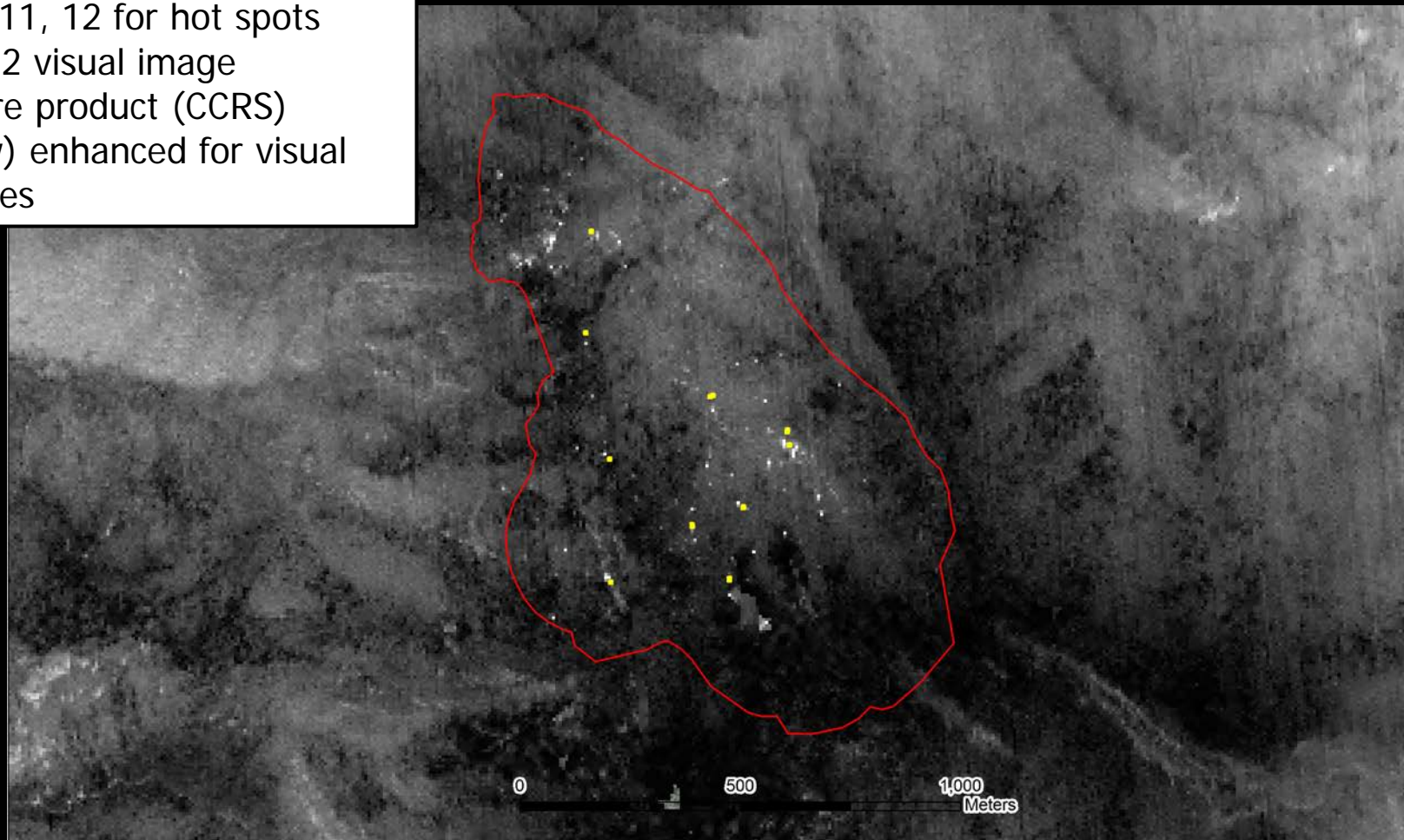
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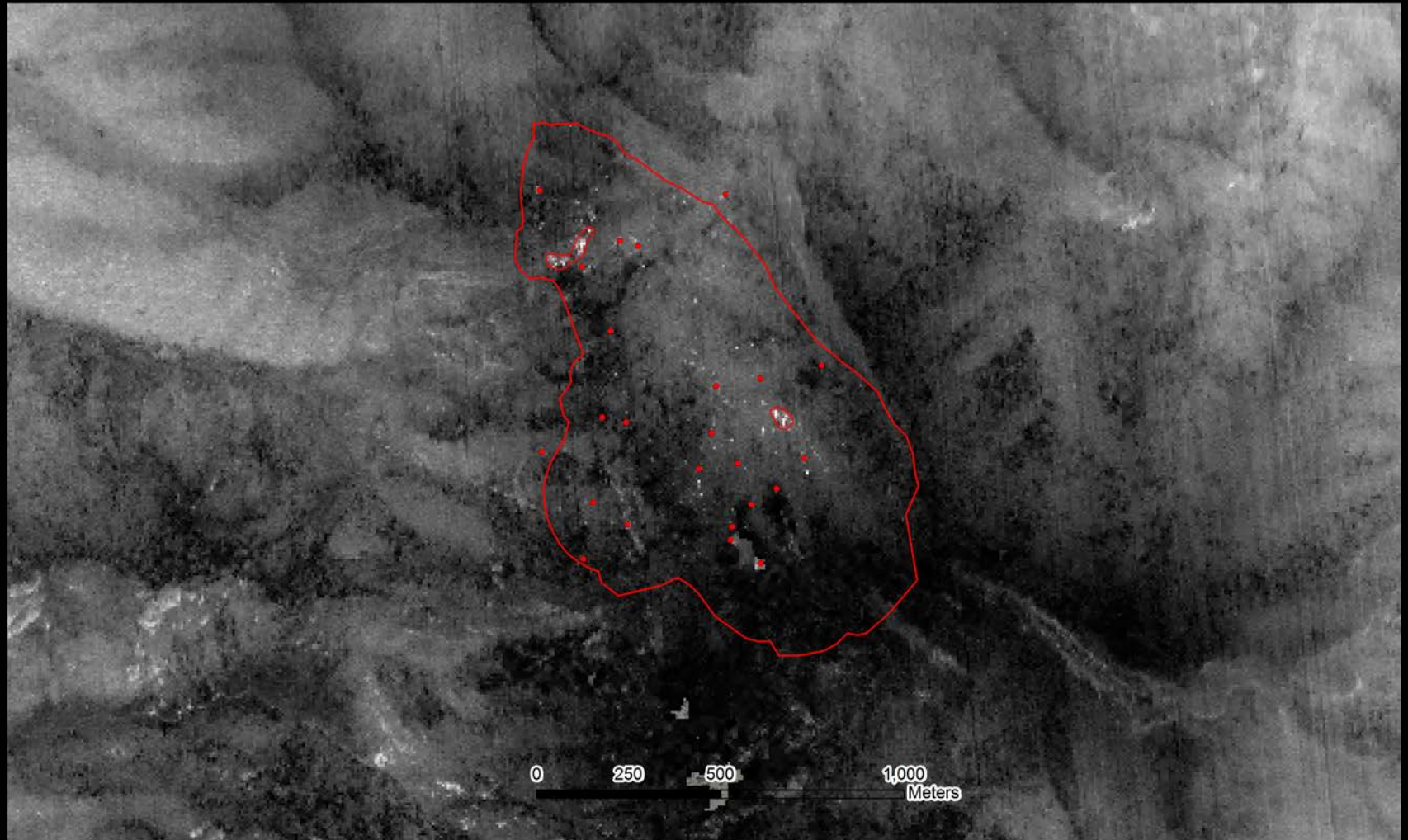


Brown Fire -April 16/17, 2014

- AMS Night Fire Product
- Bands 11, 12 for hot spots
- Band 12 visual image
- AMS fire product (CCRS) (yellow) enhanced for visual purposes



Brown Fire -April 16/17, 2014



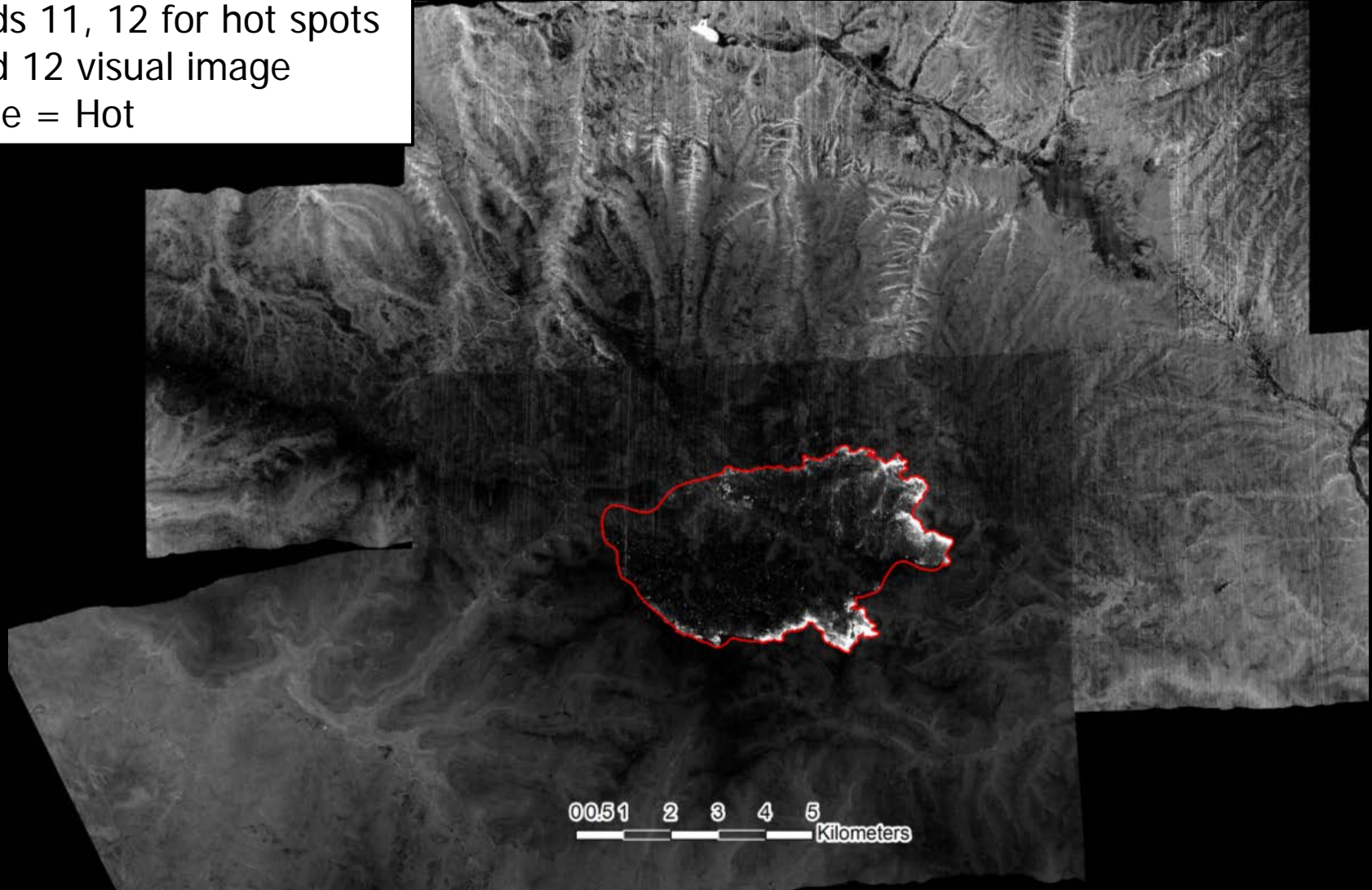
Wildland Fire Support

- Signal Fire, NM
 - Gila NF
 - NE of Silver City, NM
 - ~5,400 acres
 - Type 2 IMT assigned
- Acquired AMS data on three nights
 - May 12, 13, 14



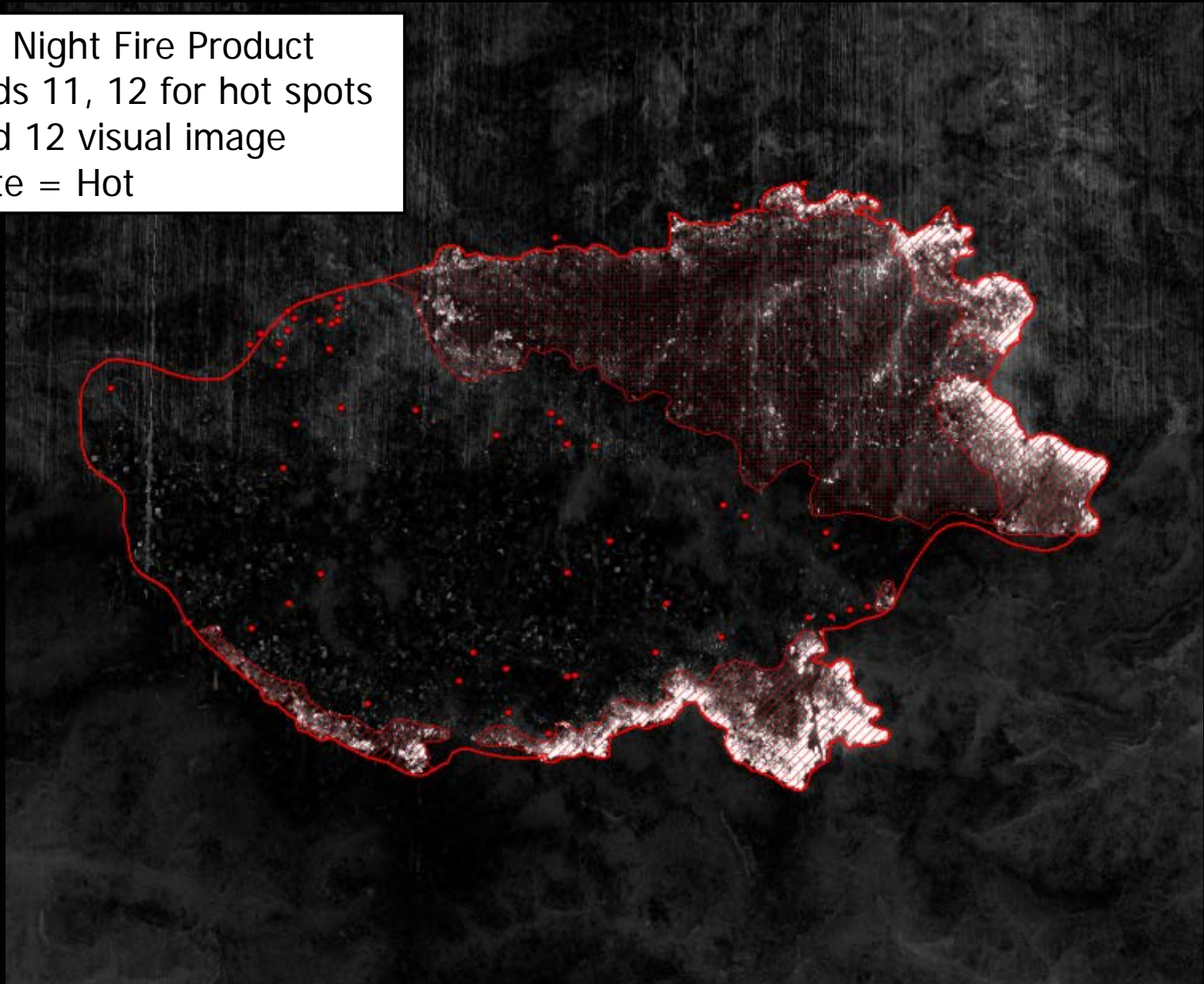
Signal Fire – May 12/13, 2014

- AMS Night Fire Product
- Bands 11, 12 for hot spots
- Band 12 visual image
- White = Hot



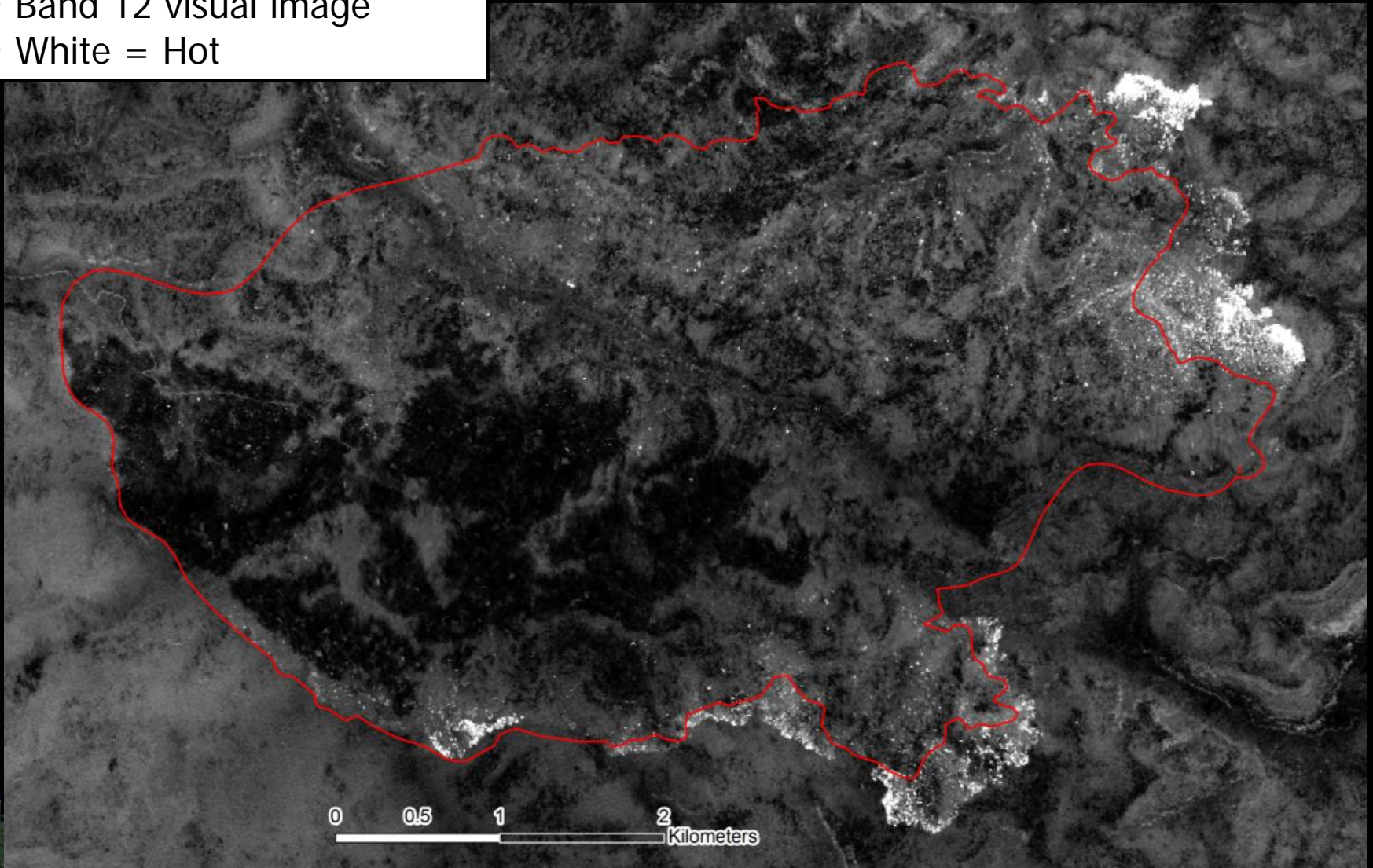
Signal Fire – May 12/13, 2014

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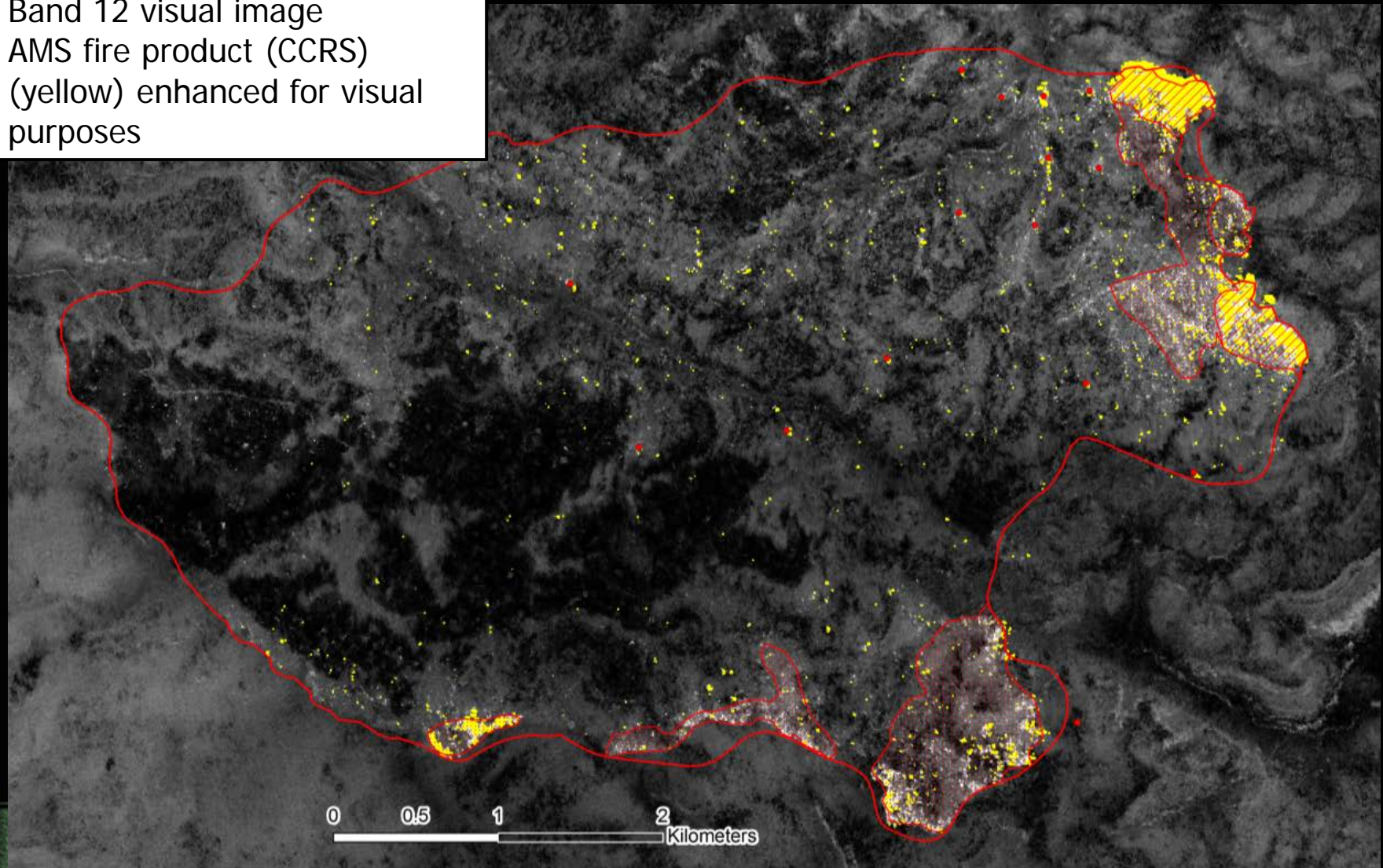
Signal Fire – May 13/14, 2014

- AMS Night Fire Product
- Band 12 visual image
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Signal Fire – May 13/14, 2014

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- AMS fire product (CCRS) (yellow) enhanced for visual purposes



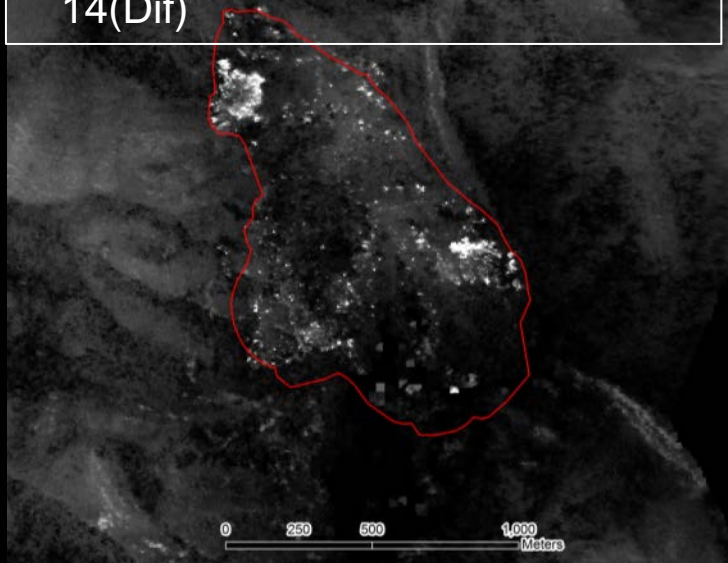
AMS Night Fire Product Desired Modifications

- Current night fire visual product is single band LWIR, Band 12
- Change to a 3-band visual output product
 - Bands 12, 11, 11 or 12, 11, 10
 - Visually correlate hot spot output with Bands 11, 12
- NASA-Ames staff indicates that this is not an issue
 - Western States Fire Mission output a 3-band visual thermal product

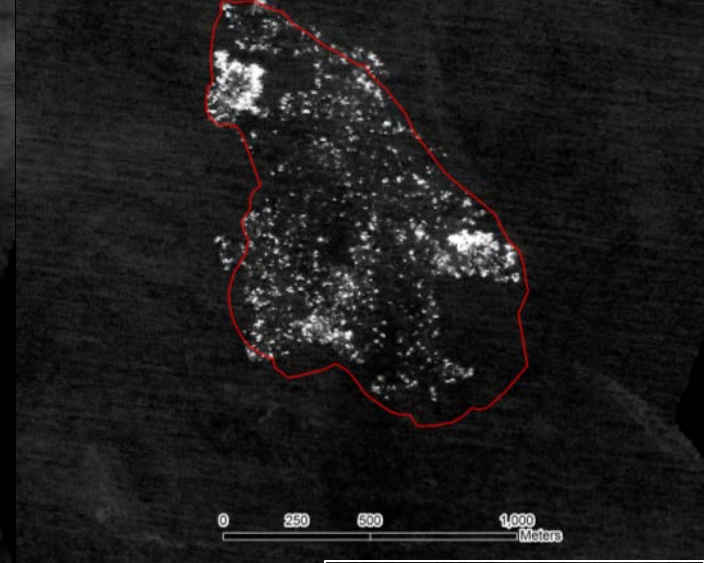


AMS Hot Spot Product Threshold

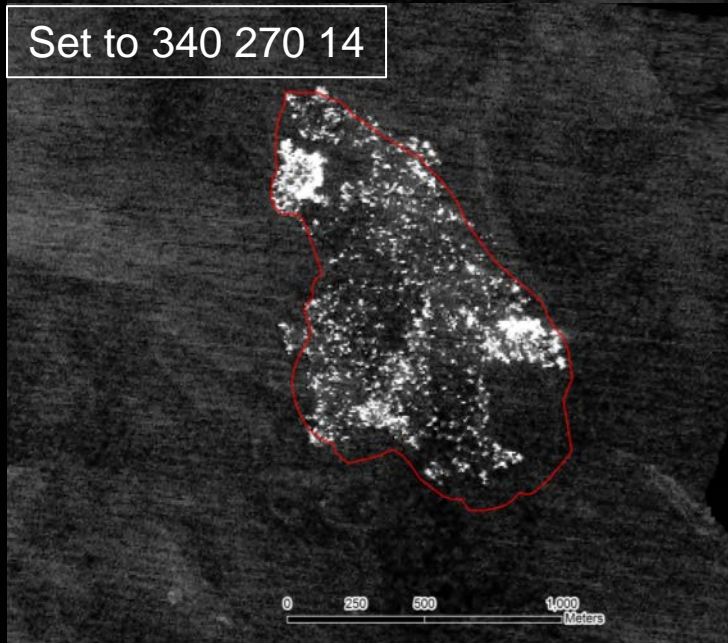
"Day" Default = 380(11) 290(12)
14(Dif)



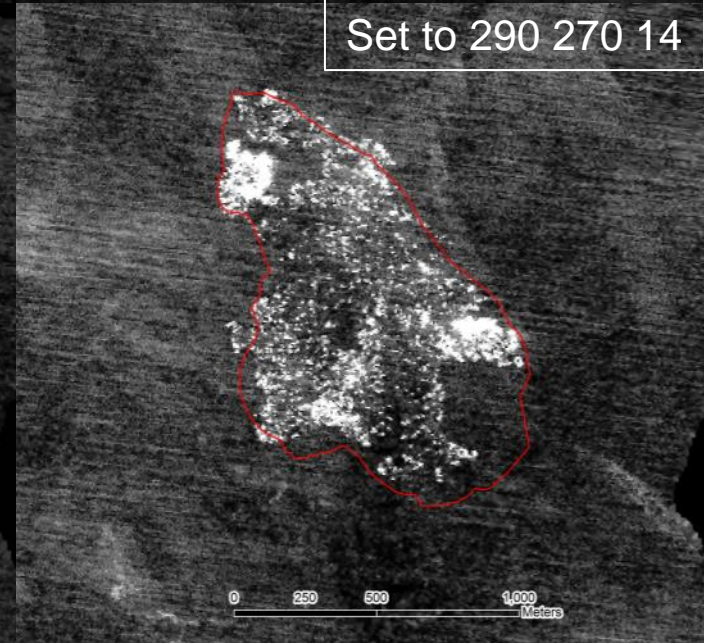
Set to 360 280 14



Set to 340 270 14



Set to 290 270 14



AMS Night Fire Product Threshold

- Is there a way to incrementally adjust the current threshold algorithm?
- Concern is not the heat concentrations but the more scattered/isolated heat sources
- NASA-Ames staff will investigate



Upcoming AMS Activities

- Test command/control of AMS from ground
 - Finalize and test AirCell/AMS configuration
 - Need fixed IP for ground station and access through BLM/FS firewall
 - Plan to conduct flight tests early CY2015
 - Provide options to increase safety and efficiency



Continuing AMS Activities

- Identify designated USFS platform for the AMS
 - Proposal to F&AM for N182Z
 - Address requisite platform upgrades
 - Sensor port configuration or pod installation
 - AirCell data link installation
 - Demonstrate value to provide multi-mission support
 - Tactical fire support “surge” aircraft; daytime fire missions
 - Post-fire/post-storm assessment
 - Forest health monitoring
 - Cal/Val of satellite products



NIROPS Website 2014

NATIONAL INFRARED OPERATIONS

HOME ABOUT REPORTS IMAGERY LINKS TRAINING IRIN AREA IR SCANNER ORDERS SOCIAL WORKSHOP CLOSEOUTS



Serving the fire management community with Infrared Imagery since 1964.



[Download the NIROPS KML](#)



NIROPS 3833 S Development Ave. Boise, ID 83705



NIROPS Website and IR Ordering Page

- Modifications for 2014 season
 - Re-formatted the PDF output (again)
- Issues during 2014 season
 - Noticeable lag time when “Submit As New” and “Update” are clicked and the site responds
 - MODIS detects not displaying in scan box
 - Google Map display “exceeding allowable quota for site”
- Modifications for 2015 season?
 - Submit your requests ASAP so we can compile and prioritize a list for the programmer

NIROPS Website Usage Summary for 2014

March 1 – October 31

- Items of interest:
 - 17,076 visits to the website; 5,064 unique visitors
 - 260,912 page views
 - 27% of visits were from mobile devices
 - Tablets – 15%
 - Smart Phones – 12%

Year	Visits	Unique Visitors	Page Views	Smart Phone(%)	Tablet(%)
2014	17,076	5,064	260,912	12	15
2013	21,314	7,205	274,625	9	10
2012	22,089	8,053	300,319	6	3
2011	18,073	6,829	90,367	3 (mobile)	

2013 Sources Sought Notice (SSN)

- 14 firms responded to the SSN
 - 5 incomplete responses
 - 1 firm went out of business
 - 1 firm was a agricultural mapping start-up
 - 7 firms had at least some experience in wildland fire mapping
- Summary available on the NIROPS website under “Reports” <http://nirops.fs.fed.us/reports>

2014 Infrared Field User Guide and Vendors Listing

- Update based on SSN responses
- Guide and Listing available on the NIROPS website under "Reports"

<http://nirops.fs.fed.us/reports>



United States
Department of Agriculture
Forest Service—Engineering



Remote Sensing
Applications Center

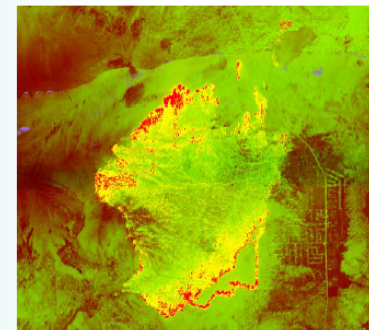
November 2014 (UPDATE)
RSAC-1309-RPT3

Infrared Field Users' Guide

Brad Quayle, Jan Johnson
Remote Sensing Applications Center
Salt Lake City, Utah

Lloyd Queen
The Department of Forestry Management
University of Montana
Missoula, Montana

Tom Mellin
National Infrared Program Manager
Albuquerque, NM



NIROPS KMZ Tool

- Redesigned as a stand alone executable
- More flexibility for shapefile names
- "Other" data



NIROPS KML Tool Build 60

Heat Perimeter

Intense Heat

Scattered Heat

Isolated Heat

Other Data

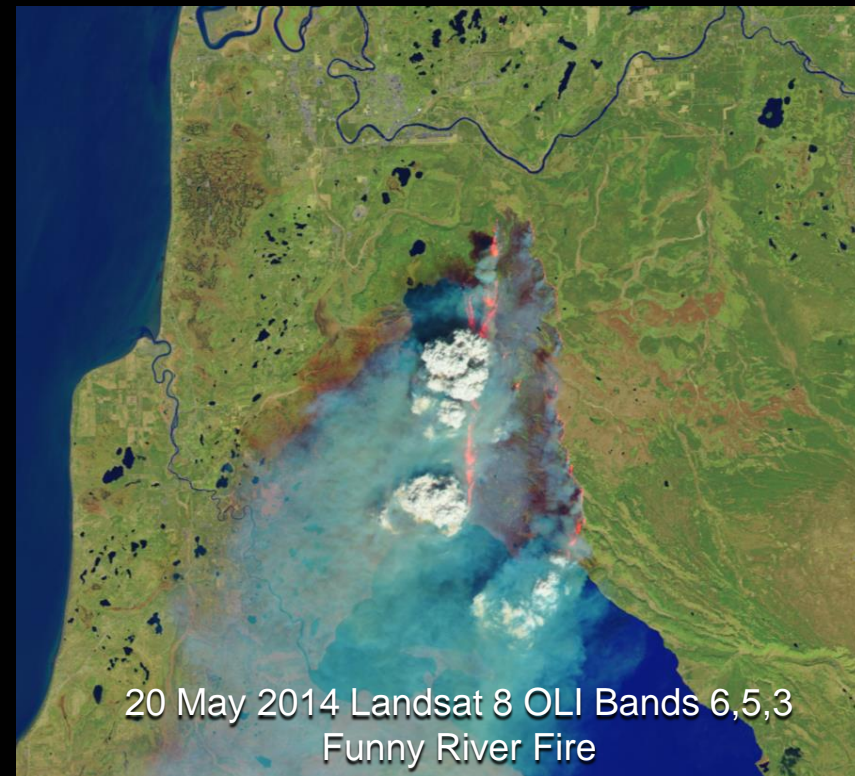
KMZ

Incident Timezone

Create KMZ Close

Aircraft3 2014 Summary

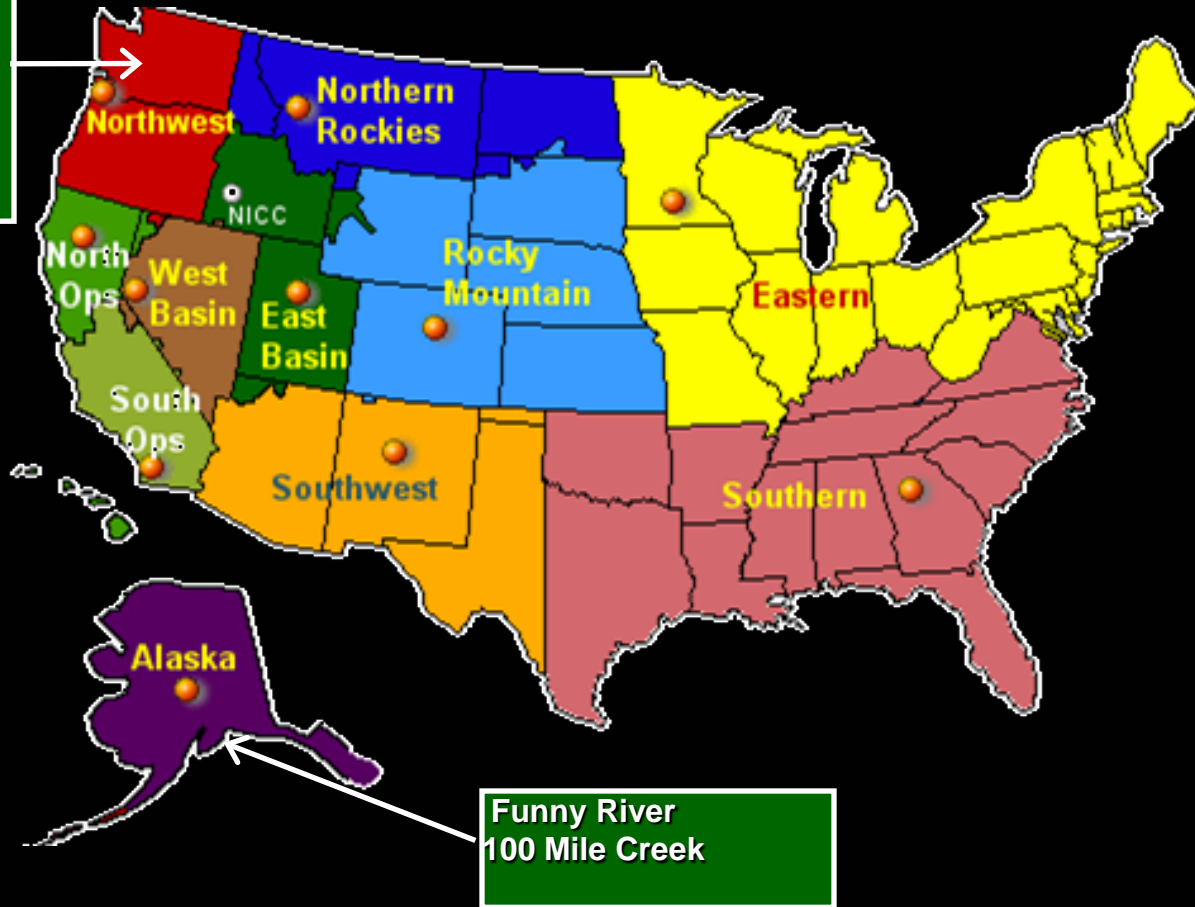
- Incident support started on May 24
 - Funny River Fire, AK
- Support requests were from Alaska GACC and the Northwest GACC
 - Northwest GACC support was requested during N149Z phase maintenance
- Incident support ended on August 13
 - Washington fires



20 May 2014 Landsat 8 OLI Bands 6,5,3
Funny River Fire

Aircraft3 2014 GACC Support

Devil's Elbow Complex
Duncan
Hansel
South Cle Elum Ridge
Snag Canyon
Upper Falls
Little Bridge Creek

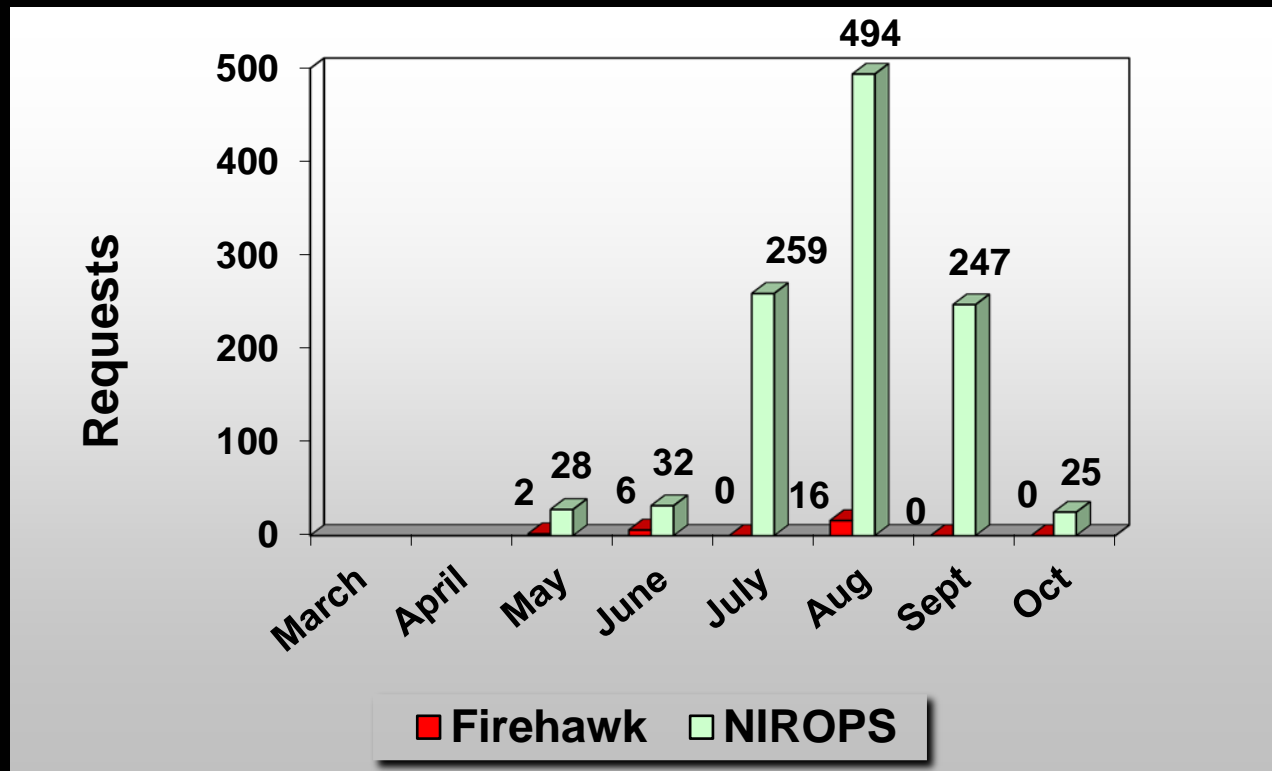


Aircraft3 2014 GACC Support

Geographic Area	No. of Fires	No. of Support Requests	UTF-Weather	UTF-Tech. Issue	Acres
AK	2	13	4	0	216,867
EGB	0	0	0	0	0
NOPS	0	0	0	0	0
NR	0	0	0	0	0
NW	7	28	4	9	60,941
RM	0	0	0	0	0
SOPS	0	0	0	0	0
SW	0	0	0	0	0
TOTAL	9	41	8	9	277,808

(Through November 26, 2014)

Aircraft3 2014 Support to NIROPS



Apr: n/a
May: 7%
Jun: 19%
Jul: n/a
Aug: 3 %
Sep: n/a
Oct: n/a

Through November 26, 2014

2.2% of the support requests in 2014 were assigned to Aircraft3



Thanks

Comments/Questions?



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