RSAC Update on NIROPS-Related Activities

NIROPS 2010 Closeout Meeting

November 3-4, 2010

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

- RSAC Program Restructuring
- Future Sensors
  - Airborne sensors -> NIROPS
  - Satellite sensors -> Active Fire Mapping Program
- N182Z Update
- NIROPS Website Status
- 2010 Firehawk Support Summary
RSAC Organization and Functional Areas

**CENTER DIRECTOR**
- USDA Interagency Coord.
- Outreach & Marketing
- WO/CIO Coord.
- GAC Membership
- RSSC Membership
- Conference / Workshop Planning & Admin.
- Intra-agency Coord.
- GMO Leadership
- Center Leadership
- RSAC Operations
- ODAA (Roadless, ARRA...)

**RSAC Operations**
- RDAS RDAS
  - (Rapid Disturbance Assessment & Services)
  - Active Fire Mapping
  - NEROPS
  - IR Interpreter
  - Incident & Asset Mgmt.
  - MTBS
  - BAER
  - RAVG
  - Disaster Response
  - UAVs / New Platform Evaluation
  - Sensor Evaluation

- RPM M RPM M
  - (Resource Mapping, Inventory & Monitoring)
  - FIA (TRSB Projects)
  - MTLC
  - CMIM / Veg Mapping
  - TEUI
  - Statistics, Sampling Design & Support

- RSEAT RSEAT
  - (Remote Sensing Evaluation, Application & Training)
  - RSSC Projects
  - LEI
  - FHP
  - DASM
  - UAVs / New Platform Evaluation
  - Sensor Evaluation
  - RS Helpdesk
  - RS Training Development & Delivery
  - Tech Transfer Development & Distribution
  - Disturbance Mapping

- ED&S ED&S
  - (Enterprise Data & Services)
  - Clearinghouse
  - RS Software Acquisition & Development
  - Geospatial Software Management
  - Enterprise Data Center Management & Coord.
  - Geospatial Hardware Evalu. & Benchmarking
  - CIO Coord.
  - Desktop Support
  - IT Admin Coord.
  - Web Application Development and Hosting
RSAC Program Areas - Points of Contact

- **RDAS POCs:**
  - Brad Quayle (Assistant Program Leader)
    - bquayle@fs.fed.us/801-975-3737
  - Tom Zajkowski (Remote sensing/GIS specialist)
    - tzajkowski@fs.fed.us/801-975-3758
  - Jan Johnson (Remote sensing/GIS specialist)
    - jvjohnson@fs.fed.us/801-975-3762

- **RSEAT POC:**
  - Haans Fisk (Program Leader)
    - hfisk@fs.fed.us/801-975-3760
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## NIROPS Airborne Sensors

### Future Airborne Sensors for Pre-fire, Active and Post-fire Assessment

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Type of Sensor</th>
<th>Spectral Resolution</th>
<th>Field of View</th>
<th>Spatial Resolution</th>
<th>Targeted Platform</th>
<th>Designer/Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAI</td>
<td>Wide angle step-stare mirror</td>
<td>VIS/NIR/SWIR/TIR (6 bands)</td>
<td>90°</td>
<td>1.5-3.5m</td>
<td>144Z</td>
<td>Xiomas/NASA</td>
</tr>
<tr>
<td>AMS</td>
<td>Line scanning spectrometer</td>
<td>VIS/NIR/SWIR/TIR (12 bands)</td>
<td>85.9°</td>
<td>3 – 50m</td>
<td>182Z</td>
<td>NASA</td>
</tr>
<tr>
<td>GPSAR</td>
<td>Broadband, synthetic aperture radar</td>
<td>All phases &amp; frequencies between 300MHz – 3,000 MHz</td>
<td>N/A</td>
<td>~1m</td>
<td>UAV and helicopter platforms</td>
<td>Mirage Systems/NASA</td>
</tr>
<tr>
<td>TMAP</td>
<td>LADAR Multispectral</td>
<td>EO/IR/LADAR</td>
<td>18°</td>
<td>~1m</td>
<td>UNK</td>
<td>Lockheed Martin</td>
</tr>
<tr>
<td>UAV_IR</td>
<td>EO/IR Gimbal</td>
<td>EO/IR</td>
<td>45°</td>
<td>2m</td>
<td>UAV</td>
<td>USFS RSAC/NRS</td>
</tr>
</tbody>
</table>
# Forest Service AFM Program Satellite Sensors

Currently Leveraged Satellite Sensor Assets w/Thermal Capabilities

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Platform (Type)</th>
<th>Spatial Resolution (Reflectance/TIR Bands)</th>
<th>Temporal Resolution (per instrument)</th>
<th>Fire Algorithm</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODIS</td>
<td>EOS Terra &amp; Aqua (Polar orbiting)</td>
<td>250m, 500m, 1km/1km</td>
<td>2 times daily</td>
<td>MOD14/MYD14</td>
<td>Direct Readout; NASA Rapid Response System</td>
</tr>
<tr>
<td>AVHRR</td>
<td>NOAA 15, 18, 19, MetOp-A (Polar orbiting)</td>
<td>1.1km/1.1km</td>
<td>2 times daily</td>
<td>FIMMA</td>
<td>NOAA Direct Readout via NOAA NESDIS</td>
</tr>
<tr>
<td>GOES Imager</td>
<td>GOES 11/13 (Geostationary)</td>
<td>1km/4km</td>
<td>4 times hourly</td>
<td>WF-ABBA</td>
<td>NOAA NESDIS</td>
</tr>
</tbody>
</table>

- AVHRR swath width: ~2,500 km
- MODIS swath width: 2,330 km
MODIS, AVHRR and GOES Comparison

Southwest British Columbia
August 16, 2010 1900 MDT
## Potential Future Satellite Sensor Assets w/Thermal Capabilities

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Platform (Type)</th>
<th>Spatial Resolution (Reflectance/TIR Bands)</th>
<th>Temporal Resolution (per instrument)</th>
<th>Launch Date(s)</th>
<th>Fire Algorithm</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIIRS</td>
<td>NPP, JPSS, DWSS (Polar orbiting)</td>
<td>375m/750m</td>
<td>2 times daily</td>
<td>2011 2015...</td>
<td>TBD</td>
<td>Direct Readout; Rapid Response</td>
</tr>
<tr>
<td>SGLI</td>
<td>GCOM-C (Polar orbiting)</td>
<td>250m, 1km/500m</td>
<td>Daily to once every 2 days</td>
<td>2013 2017 2021</td>
<td>TBD</td>
<td>Direct Readout; NASA/JAXA</td>
</tr>
<tr>
<td>AVHRR</td>
<td>MetOp (Polar orbiting)</td>
<td>1.1km/1.1km</td>
<td>2 times daily</td>
<td>2006 2012 2017</td>
<td>FIMMA</td>
<td>Direct Readout; EUMETSAT/NOAA NESDIS</td>
</tr>
<tr>
<td>SLSTR</td>
<td>Sentinel-3 (Polar orbiting)</td>
<td>500m/1km</td>
<td>Daily to once every 2 days</td>
<td>2013</td>
<td>TBD</td>
<td>European Space Agency</td>
</tr>
<tr>
<td>GOES-ABI</td>
<td>GOES R/S (Geostationary)</td>
<td>500m, 1km/2km</td>
<td>4 to 12 times hourly</td>
<td>2015 2017...</td>
<td>based on WF-ABBA</td>
<td>Direct Readout; NOAA NESDIS</td>
</tr>
</tbody>
</table>

- VIIRS swath width: 3,000 km
- GCOM-C SLGI swath width: 1,400 km
- AVHRR swath width: ~2,500 km
- Sentinel-3 SLSTR swath width: 1,675 km
- MODIS swath width: 2,330 km
NPOESS VIIRS Status

- National Polar-orbiting Operational Environmental Satellite System (NPOESS) has been restructured (February 2010)
  - NOAA/NASA -> Joint Polar Satellite System (JPSS)
    - Afternoon orbit
    - Sensors: VIIRS, CrIS, ATMS, OMPS, and CERES/ERBS
    - Launch dates: 2015 for first JPSS launch
  - DoD -> Defense Weather Satellite System (DWSS)
    - Early morning orbit
    - Sensors: VIIRS and SEM-N
    - Launch dates: 2018 for first DWSS launch
    - Note: DMSP will continue for one, possibly two, more launches (2012 and 2014)
  - NPOESS Preparatory Project (NPP) will still be launched
    - Afternoon orbit
    - Sensors: VIIRS, CrIS, ATMS, OMPS, and CERES/ERBS
    - Launch date: September 2011
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N182Z

- Beechcraft B200 King Air stationed in USFS Region 8
- WO F&AM is working to upgrade and equip as a “multi-mission” aircraft
  - Engine replacement
  - Avionics upgrade
  - RVSM certification
- Operational plan and MOU between WO F&AM and R8 will be developed
  - Address deployment schedule and prioritization for western U.S. fire seasons and R8 operational needs
- Working group to formulate 5-year plan
  - R8, WO F&AM, RSAC
  - Ensure support for multiple sensor/systems integration into the future
RSAC is monitoring upgrade schedule status and providing necessary coordination/support to facilitate transition

- Technical consultation on AirCell solicitation/installation
- Technical assistance w/development of N182Z 5-year plan
- Coordination with NASA on testing and delivery of sensor systems
- Coordination of implementation and operational plans for sensors
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NIROPS Website Usage Summary for 2010

January 1 – October 11, 2010

- 10,849 visits by 3,264 unique visitors
- 71,169 pageviews

Frequently accessed content:

<table>
<thead>
<tr>
<th>Pages</th>
<th>Pageviews</th>
<th>% Pageviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>/cdekml/popup.html</td>
<td>18,341</td>
<td>25.8%</td>
</tr>
<tr>
<td>/rcr/newScanner/request/view/a</td>
<td>15,098</td>
<td>21.2%</td>
</tr>
<tr>
<td>/rcr/newScanner/map</td>
<td>9,944</td>
<td>14%</td>
</tr>
<tr>
<td>/rcr/newScanner/</td>
<td>5,889</td>
<td>8.3%</td>
</tr>
<tr>
<td>/rcr/newScanner/logout</td>
<td>3,756</td>
<td>5.3%</td>
</tr>
</tbody>
</table>
Infrared Field Users Guide and Vendor Listing

- Updated for 2010 (draft)
- Available from NIROPS website
  - See “Reports” link
- Phone and email inquiries to vendors in summer 2010 (last update – 2008)
  - Added one vendor
    - Patriot Technologies LLC, Type 3a
  - Seven vendors removed
    - Out of business, out of IR business, platforms only,...
    - Both fixed-wing and rotor-wing
IR Online Ordering Interface

• Modifications to the form for 2010 season
  – Perimeters from GeoMac now display in Google Map interface
  – Lat/Lon coordinates display on “rubber band” box corners in map display
  – Form retains original submit time and most current update time

• No major issues identified during 2010 season
  – Update/maintenance issues to be addressed over the winter
    • Slight modifications to the user interface
    • Enhancements to the “How to” guide
    • Currently looking at a work around for the BLM Twitter block

• Modifications for 2011 season?
  – Submit your requests ASAP so we can compile a list for the programmer
NIROPS Product KMZ Tool

• Tool to generate GE KMZs from standard NIROPS datasets
  – Heat Perimeter
  – Intense Heat
  – Scattered Heat
  – Isolated Heat

• Address issues with administrative access on BLM computers

• Tool will be available soon from NIROPS website/FTP site
NIROPS Product KMZ Tool

- Tool to generate GE KMZs from standard NIROPS datasets
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  - Isolated Heat

- Address issues with administrative access on BLM computers

- Tool will be available soon from NIROPS website/FTP site
Alternate NIROPS FTP Site

• Nirops.org has gone away
• Will now utilize fsgeodata.net
  – FTP Server: ftp.fsgeodata.net
  – FTP Username: nirops@fsgeodata.net
  – FTP Password: Yes, there is a password
• Primary ftp site will remain ftp.nifc.gov/nirops
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Firehawk 2010 Summary

- Alaska incident support started on June 1
  - Request for activation to support Alaska GACC came from Alaska GACC IR Liaison
  - N149Z and IRINs in Fairbanks supporting other Interior fires
    - Firehawk covered fires in SW Interior (McGrath area)
  - Support continued until June 7
    - Two Brooks Range fires requested late
      - Killik R., Niakogon Mtn.

- Other GACC support
  - Aircraft “gap filler” requests
    - Russel Complex, North Ops
    - Dominic Point, Northern Region

- Data exploitation conducted at USGS-Denver
Note: Bull Fire (SouthOps) supported for one night on July 27 in anticipation of the potential lack of availability of 144Z.
# Firehawk 2010 Incident Support

<table>
<thead>
<tr>
<th>Incident</th>
<th>No. of Fires</th>
<th>GACC</th>
<th>No. Days Support&lt;sup&gt;a&lt;/sup&gt;</th>
<th>UTF-Weather</th>
<th>UTF-Other</th>
<th>Acres&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Killik River</td>
<td>1</td>
<td>Alaska</td>
<td>2</td>
<td>1</td>
<td></td>
<td>400</td>
</tr>
<tr>
<td>Lone Mtn</td>
<td>1</td>
<td>Alaska</td>
<td>3</td>
<td>1</td>
<td></td>
<td>51,996</td>
</tr>
<tr>
<td>McLean Cr.</td>
<td>1</td>
<td>Alaska</td>
<td>3</td>
<td>3</td>
<td></td>
<td>14,099</td>
</tr>
<tr>
<td>Mystery</td>
<td>1</td>
<td>Alaska</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>18,952</td>
</tr>
<tr>
<td>Niakogon Mtn.</td>
<td>1</td>
<td>Alaska</td>
<td>2</td>
<td>1</td>
<td></td>
<td>580</td>
</tr>
<tr>
<td>Turquoise Lk.</td>
<td>1</td>
<td>Alaska</td>
<td>6</td>
<td>1</td>
<td></td>
<td>91,885</td>
</tr>
<tr>
<td>Russel Complex</td>
<td>1</td>
<td>NOPS</td>
<td>1</td>
<td>1</td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Dominic Point</td>
<td>1</td>
<td>Northern Rockies</td>
<td>2</td>
<td>1</td>
<td>894</td>
<td></td>
</tr>
</tbody>
</table>

| Total             | 8 | 22 | 5 | 7 | 179,106 |

<sup>a</sup> AK Support started on 1 June

<sup>b</sup> Acreages from Alaska, North Ops, Northern Rockies GACCs

(Through October 18, 2010)
5.5% of the 399 support requests in 2010 were assigned to Firehawk.
Thanks

Comments/Questions?

USDA Forest Service, Remote Sensing Applications Center,
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