Forest Service Beltway Update

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> Spring TFRSAC 2019 Mountain View California



Guidelines for Discussion Today

- No one will come... The week of Memorial Day.
- This meeting is about sharing ideas and challenges.
- It is a forum for exchange.
- We ask that members of the private sector check their business credentials at the door.



The Geospatial Management Office

The GMO provides a single organizational structure within the Washington Office to support all geospatial information program delivery in the Forest Service.

...is responsible for the policy, oversight, direction, and delivery of the Forest Service geospatial program, including geographic information systems (GIS), remote sensing, cartography, photogrammetry, geodesy, and global positioning systems (GPS).

... is positioned within the WO Engineering Staff, with the Geospatial Information Officer (GIO) serving as an Engineering Assistant Director.

...relies on the GTAC to promote, facilitate, and support the application of geospatial technologies throughout the Forest Service.



Components of the Geospatial Management Office

- Geospatial Information Officer
 - Deb Oakeson Acting GIO
- Headquarters Program Leads
 - Remote Sensing- Everett Hinkley
 - Geospatial Products & Services Betsy Kanalley
 - GIS- Lisa McBride
 - Data Management Lisa Delmonico
- Geospatial Technology& Applications Center
 - Deb Oakeson Center Director









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GPS Benefits: Space Users & Science Apps



Space Navigation & Attitude
 <u>Determination</u>: Enables new &
 improved spaceflight operations,
 including launch safety, station-keeping,
 rendezvous & docking, Geosynchronous
 Orbit (GEO) satellite servicing, and
 precision formation flying in High Earth
 Orbit (HEO).

- Earth Observation & Orientation: GPS is a remote sensing and weather forecasting tool through precise measurement of radio-occultation and reflected signals. Other applications include atmospheric sciences, geodesy, and geodynamics (monitoring sea level & ice thickness, gravity field, earthquake prediction and tsunami detection).
- <u>Hazard Monitoring & Alerts</u>: GPS provides spacecraft, such as GOES-R, continual monitoring and delivery of data products to save lives and preserve property. GPS also provides a global search and rescue (SAR) capability as a worldwide public safety utility.

GPS-enabled Space-based Science & Earth Observation



MMS: Four s/c in formation flying for space weather observation

GOES-R: Advanced weather prediction & hazard monitoring





Ongoing Challenges

- GTAC move to downtown Salt Lake City (complete!)
- Disposition of aerial film at SLC facility (FSA)
 - Large scanning effort underway
- Working with declining budgets and work force
- Integrating UAS into remote sensing business needs
- Working more collaboratively with the USDA department and other government agencies
- Adapting to new remote sensing data streams
- Understanding and adapting to the Geospatial Data Act



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Remote Sensing Working Groups

- Tactical Fire Remote Sensing Advisory Committee (TFRSAC) The TFRSAC is co-hosted by NASA and the Forest Service and is a broad collaborative forum for advancing and enabling the development and delivery of remote sensing platforms, sensors and decision support tools to the wildland fire community.
 Focus: largely unclassified.
 - The TFRSAC meets biannually and includes representatives from federal and state agencies, academic institutions, international partners, and the vendor community.
- Thermal Working Group (TWG) has authority and responsibilities as a standing sub-working group under the Overhead Persistent Infrared (OPIR) Working Group (OWG) and Civil Applications Committee (CAC). The TWG is the coordinating body for advancing and enabling the development and delivery of data, information or products derived from classified thermal remote sensing platforms to civil users. Focus: largely classified.
 - The Thermal Working Group meets frequently, often in concert with the TFRSAC meetings.



Remote Sensing Working Groups





Current State of Fire Immediate Response

- Forest Service manned aircraft (NIROPS)
 - Phoenix Imaging Systems
- Unmanned Aircraft
- Satellite systems
 - MODIS / VIIRS
- Ground observations (towers, etc)
- Firehawk fire mapping capability (aka: Aircraft 3)
- Hawkeye Fire Detection and Reporting System
- Firefly near real-time capability



Current Capabilities – National Systems

- Firehawk Fire Mapping Capability (Aircraft 3)
 - The Firehawk capability provides large scale fire detection/ mapping support to incident command operations. The Firehawk product is designed to have the same "look and feel" as products from NIROPS.

Hawkeye Fire Detection and Reporting System

- The Hawkeye Fire Detection and Reporting System uses airborne and space borne remote sensing assets to rapidly detect and report new fire starts within the continental United States.
- Detected fire starts are relayed to the Ignition Point Database (IgPoint) operated and managed by the Forest Service.



Hawkeye Fire Detection & Reporting 2018 to date

HawkEye anomalies for FY2018 for all U.S. and Canada

Hawkeye Anomaly Detection Stats – FY2018	
Quarter	Anomalies
FY2018Q1	26,491
FY2018Q2	33,309
FY2018Q3	22,573
FY2018Q4 (thru Aug 28)	20,466
Total Anomalies	102,839



Forest Service

Hawkeye Anomalies 2018 – Central US



Hawkeye Anomalies 2018 – Northern Latitudes



Closing Thoughts

- The value of National System support to wildland fire cannot be overstated.
- We desperately need existing/new cleared support from the civil community to provide the needed manpower to support the program during the fire season.
- We are actively working to find new cleared civil personnel to support exploitation.
- We are actively working to develop enhanced capabilities that build on Hawkeye.



Comments / Questions?



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This certificate is given to

Adam C. Watts, Vincent G. Ambrosia and Everett A. Hinkley

Authors of "Considerations for the Use of Unmanned Aircraft Systems in Remote Sensing and Scientific Research" which received the special prize of the Best Paper Award 2019 of *Remote Sensing* DOI:10.3390/rs4061671



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