



# The View from inside the Beltway

NIROPS Closeout / TFRSAC Summary



December 2014

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# Tactical Fire Remote Sensing Advisory Committee (TFRSAC)

**Mission:** Ensure that the WRAP program is supporting the firefighter's technology needs. Identify "gaps & opportunities"; transfer capable technology and development applications to the Field.

**Membership:** Stakeholders from NASA, USDA Forest Service, DOI Bureau of Land Management, Universities, and including Firefighters from 3 nations, with expertise in fire detection/mapping, aviation, communications, and ground operations.

**Last meeting: October 22 -23 / Reno NV**



# TFRSAC

**42 Attending in person / 30 via webex**



## Tactical Fire Remote Sensing Advisory Committee (TFRSAC)



Fall Meeting / October 23, 2014

*"We'll bring our eggheads, you bring yours, and we'll scramble 'em together" – Vince A.*

**Meeting location:** Desert Research Institute, 2215 Raggio Parkway, Reno, Nevada

**Moderators:** Vince Ambrosia (408-666-7609 cell), Everett Hinkley (801-455-8764 cell)

### TFRSAC AGENDA – Thursday October, 23 2014

**7:30 am**      **Breakfast on your own**

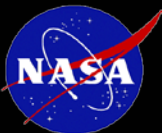
**8:30 am**      **Meeting start** – A Webex and conference line will be available for those who cannot attend in person.

**Morning Presentations** (20 minutes each)

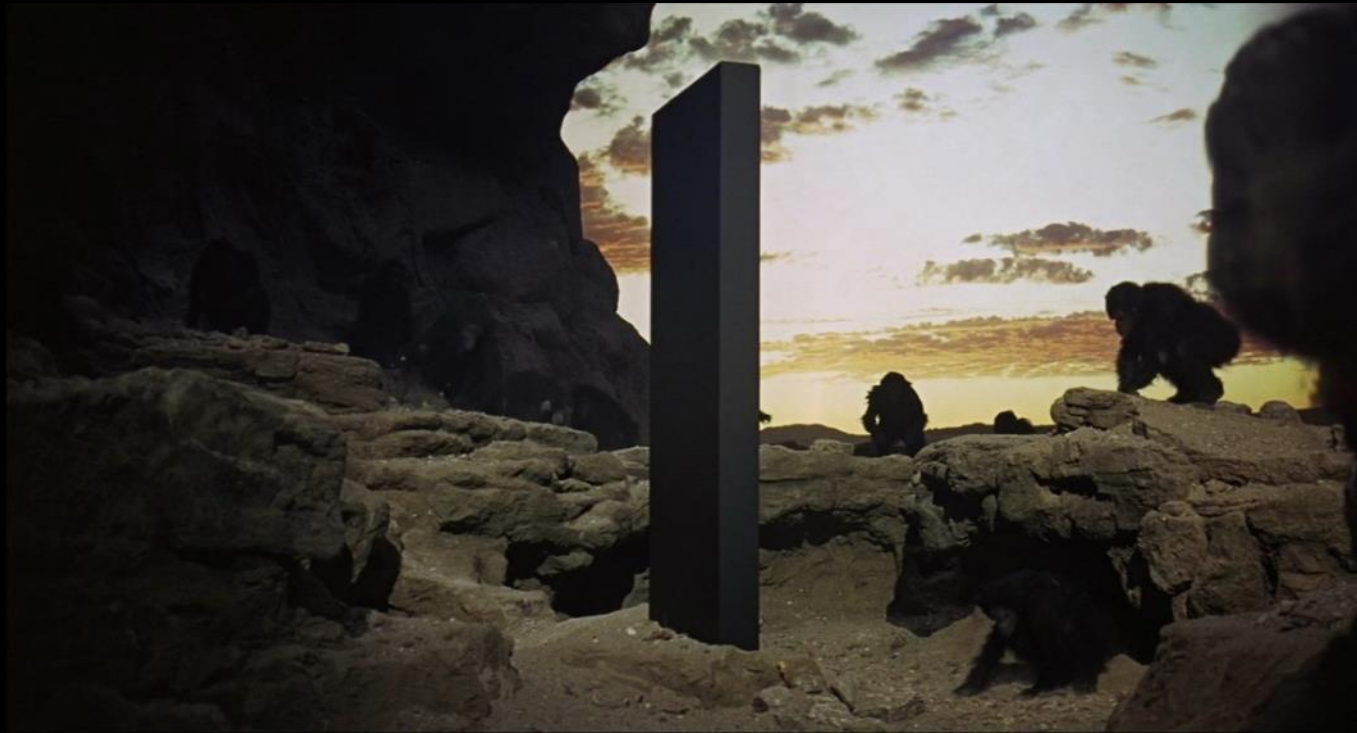
- Welcome and Introductions
- Desert Research Institute

Vince & Everett

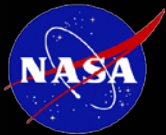
Adam Watts / Tim Brown



# Technology – New Capabilities New Challenges

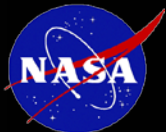


*Google Earth – First Look 2004*



# Technology and Wildfire

- Wildfires
  - Do response teams have sufficient tactical information to effectively and safely manage the incident?
  - Work with fire management teams to identify gaps.
- Technology
  - What is the role of RS technology in disasters/wildfire?
  - Current RS capabilities: what do we currently bring to the fight?
  - Can remote sensing technology be better applied to assist in decision-making, increase safety, and reduce losses?
  - Are there underutilized technologies (identify opportunities)?
    - New Sensors
    - Unmanned Aircraft Systems
    - Crowd Sourcing?



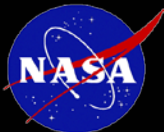


# Wildland Fires - Requirements

## What Information is Needed?

- **Fire detection and reporting** / where are the starts?
- **Fuel information** – what is available to burn?
- **Weather** - what are the current and predicted conditions?
  - Need good forecasting
  - And real time, high granularity **weather information** during event.
- **Where is the active fire / what is the behavior?**
  - Fire perimeter and active fire fronts
  - Where the fire has been (the black)
  - Lines of containment
- **Where are the firefighters? Assets at risk? People at risk?**

**Update frequency? Data accuracy?**



# Wildland Fires - Technology (RS)

## Platforms

- Satellites
- Manned aircraft
- Unmanned aircraft

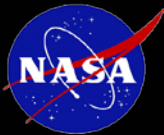
## Sensors

- Thermal Sensors
- Weather Sensors

## Data Telemetry Capabilities

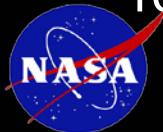
- Aircell Internet capability
- UAS radio repeaters

**Decision Support Tools** – Intelligent mission management technologies which take in data, analyze and then display the appropriate data to decision makers.



# Hawkeye – Fire Detection & Alerting

- Hawkeye leverages national systems for fire detection and alerting. In trial phase over past 2 fire seasons.
- Hawkeye has demonstrated a fire alert process with manual downgrade and dissemination of tipoff information.
- Hawkeye fire alerts have demonstrated a low false alarm rate, and proven “early detection capability”.
- Future capability may include automated fire detection and false alarm de-confliction based on the fusion of many divergent sources.
- All forensic case studies were very positive for Hawkeye fire alerts (i.e., good correlation between detections and actual fires in study areas).
- Hawkeye can support active fire monitoring, but additional requirements will require additional development work.





# Technology – Unmanned Aircraft Systems

## A menagerie of UAVs

As drones go domestic, both the models and the missions are multiplying.



### PREDATOR

Used by: DHS, NASA  
Used for: Border patrol and wildfire mapping.



### BAT

Used by: USDA  
Used for: Digital imagery to monitor rangeland vegetation.

### GLOBAL HAWK

Used by: NASA  
Used for: Tracking hurricanes and studying signs of climate change.



### DRAGON EYE

Used by: NASA  
Used for: Aerial mapping and in situ gas sampling.



### RAVEN

Used by: DOE, USGS, NASA  
Used for: Monitoring land change, wildfire mapping and general research.



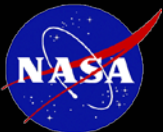
### T-HAWK

Used by: USGS  
Used for: Monitoring Fukushima radiation emissions and environmental mapping.



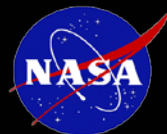
# UAS Application Areas

- Wildfire
  - Near real-time, high resolution fire detection and characterization
  - Tactical scale imagery and geospatial mapping/visualization products
  - Communications link/relay
- Resource Management
  - General remote sensing – hi res imagery, LiDAR and others....
  - Forest inventory
  - Resource mapping (fuels, forest health, etc.)
  - Rangeland Monitoring (grazing permits)
- Law Enforcement & Investigations
  - Surveillance
  - Detection/mapping of illegal activities



# Thoughts on UAS and Wildfire

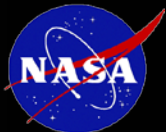
- Integrating UAS into fire operations is complicated, but not impossible
- UAS augments manned aircraft capacity
  - Expands the “tool kit”
  - Transfer of technologies
- It’s also about the mission objective, the sensor and related technologies
  - Sensor characteristics
  - Data and products
  - Communications; Delivery and dissemination of data/products
- Data and intelligence derived using UAS can potentially increase the safety and effectiveness of firefighters



# Wildland Fire S&T Task Force

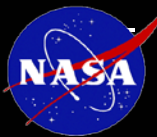
The Subcommittee on Disaster Response - Wildland Fire Science and Technology Task Force held a two-day planning meeting in August 2014 to discuss the best way forward to achieve the group's objectives as laid out in its charter.

The Task Force has the end goal **“to identify opportunities and mechanisms for increased Federal coordination and cooperation to support the development, access, and application of science and technology before, during, and after wildfires.”**



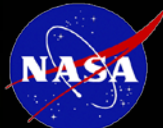
# Hot Stove Issues

- Center Manager Position at RSAC
  - Region 6 Remote Sensing Coordinator Position
- Center Integration: GSTC – RSAC
  - Impacts to remote sensing identity in the agency....
  - Impacts to our contracts and son on.....
- Geospatial / Remote Sensing Conferences
- Move out of leased building – on hold?
- USDA Remote Sensing Coordination Committee
  - Resurrected
- Unmanned Aircraft Systems: UAVs, UAS, Drones....
  - Lots of chatter and interest
  - Lots of opportunities and lots of tripwires





# Comments/Questions?



# Contact Information

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