



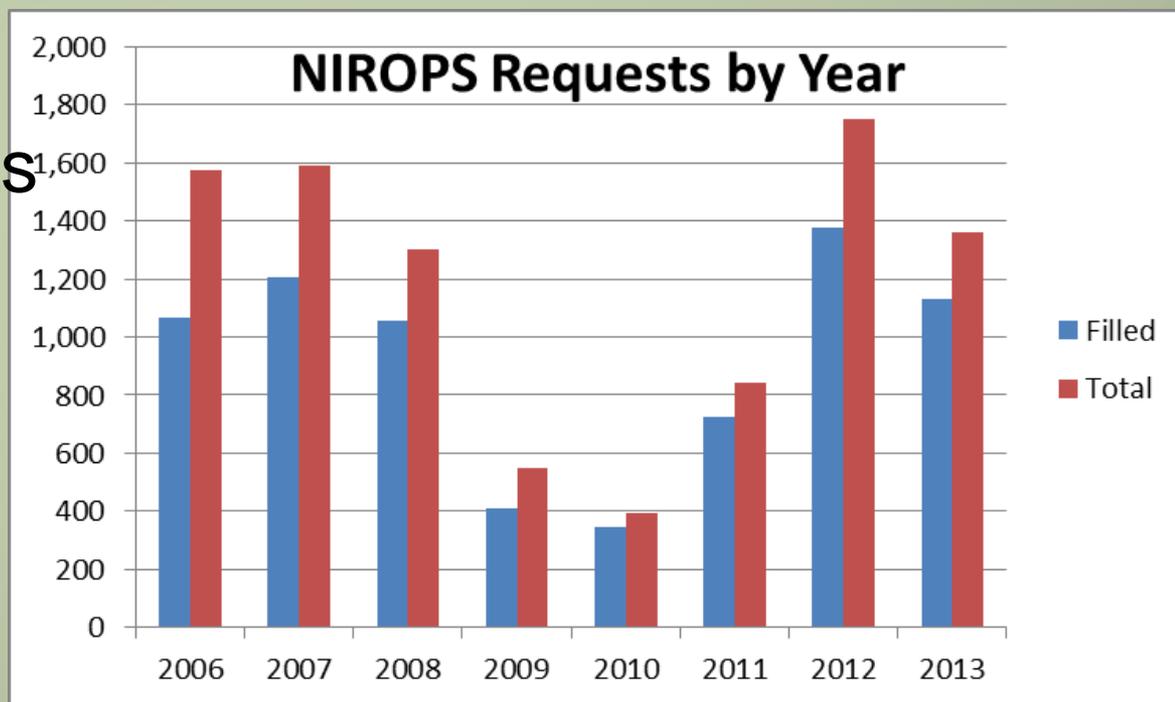
# National Infrared Operations

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## 2013 NIROPS Requests

- Acreage burned was 60% of the 10 year average (and 44% of 2012)
- Still a busy season
- Third highest number of orders filled after 2012 and 2007
- 1,362 total requests
- 1,129 filled
- UTF rate of 17% (10% for non-weather)

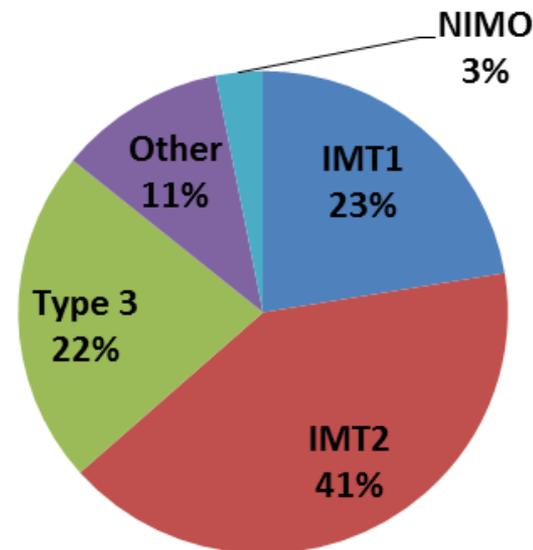




## Who is Requesting?

- 2013 was the first year we captured this information on the flight requests
- Very good response
- Need to make sure info is updated for transitions

**NIROPS Flight Requests**



## Timely Delivery of Products

- Many IMTs looking for IR products at 0400/0430 for incorporation into AM briefing maps
- Flight schedule (and thus delivery schedule) can change nightly
  - Last flown fire may be first the next night
- *Planned* Flight schedule usually set by 2100 MDT
- IRIN may not get imagery until 0330 or later
- Set up a communication protocol with IRIN (text/call when posted)



## Example – August 22, 2013 144Z

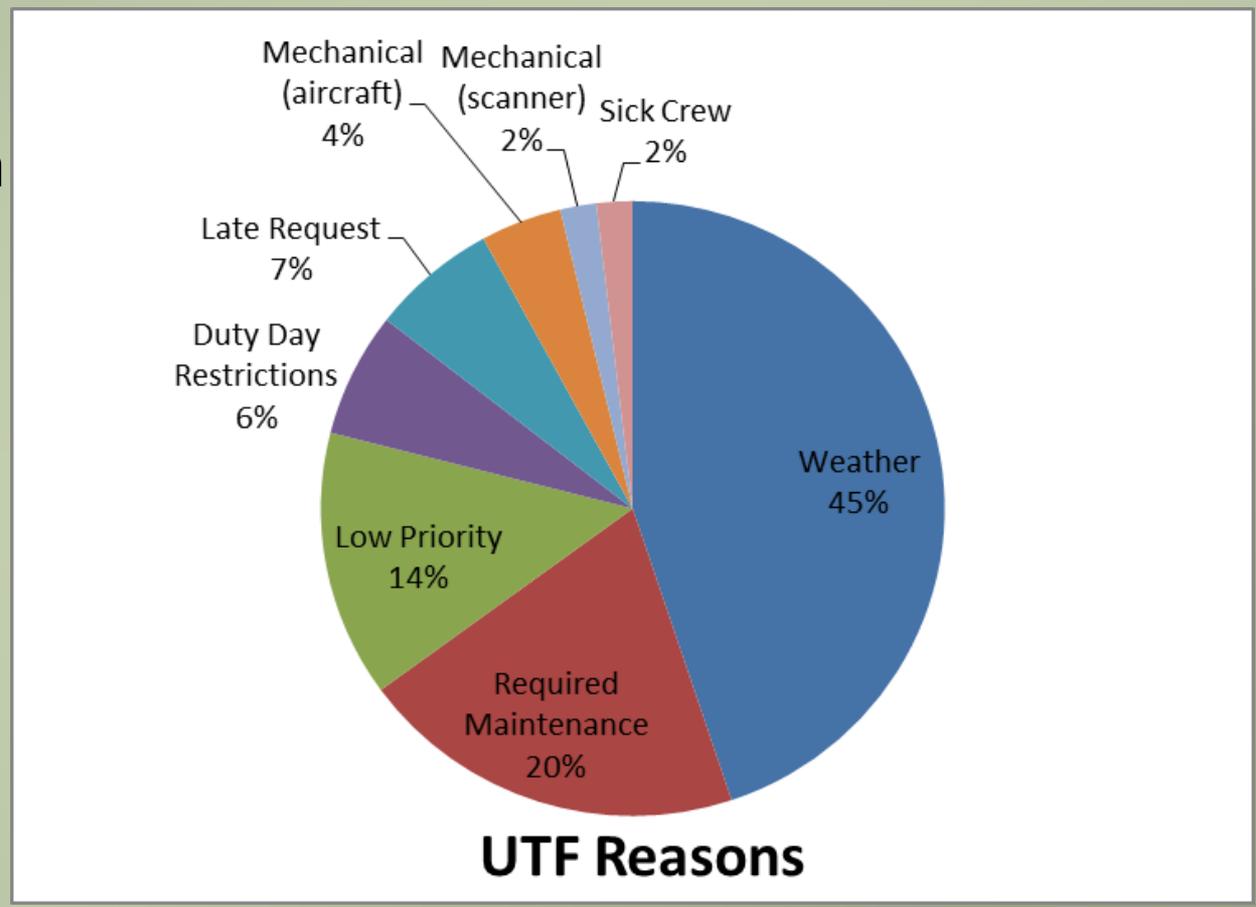
- Depart 1900 MDT from Boise
  - Beaver Creek, Little Queens, House Creek, Vinegar, Government Flats
- Depart 2100 MDT from Redmond
  - Whiskey, Douglas, Big Windy, Labrador, Butler, Salmon River, Corral
- Depart 0100 MDT from Redding
  - Hough, American, Chestnut, Rim, Shirley/Tenant
- RON Lancaster 0330 MDT





## UTFs (Unable to Fill) in 2013

- 214 total UTFs
- UTF rate drops from 17% to 10% when weather UTFs are not counted





## Notification of UTFs

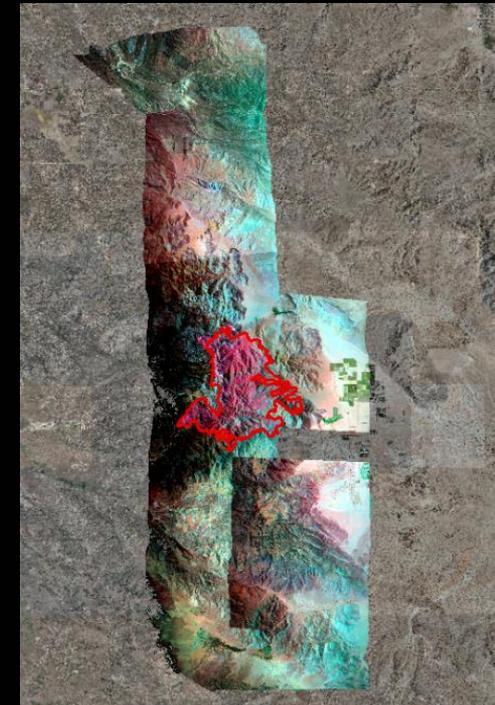
- Starting last year added a field to scanner order for SITL email
- This year automatic email will be sent to IRIN and SITL when flight is UTF'd (along w/ UTF reason)
- Could be @ 1700/1800 MDT when mission plan is developed or later for WX or mechanical
- Set up communication protocol for later UTFs

## Communication

- Primary communication is between IRIN and SITL
- Make your information needs known to SITL or agree on communication protocol
- Updated perimeters for use in nightly interpretation
- During high activity IRIN likely covering more than one fire
- Regular posting of perimeters to <ftp.nifc.gov>
  - Limits misuse of IR perimeters

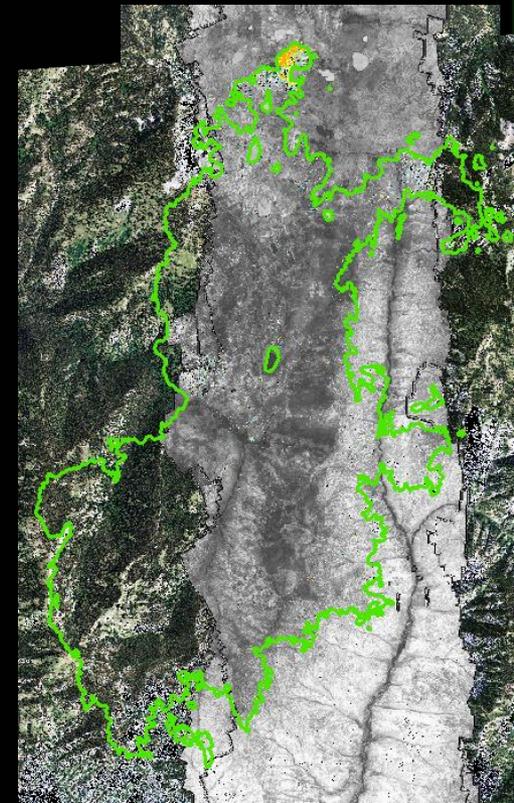
# Autonomous Modular Sensor (AMS)

- Sensor system developed by NASA
  - Flown on NASA Ikhana (Predator B) UAS in 2007, 2008, 2009
- 16 channel line scanner system (Visible, NIR, SWIR, Thermal IR)
- Multi-mission capability
  - Active fire, burn severity assessment, forest health
  - Both day and night capability for active fire mapping
- Transferred from NASA to USFS in March 2013
  - NASA working with USFS on software upgrades and system training
  - Testing/integration flights will be conducted this spring



# Wide Area Imager (WAI)

- Developed by Xiomas under NASA SBIR
- 5 channel “step stare” sensor system
  - 2 thermal channels using QWIPS detectors
  - CIR digital camera (Green, Red, Near-IR)
- Multi-mission capability
  - Active fire, burn severity assessment, forest health
- Active fire mapping evaluation conducted in July 2013 on fires in central Idaho
  - No issues with active fire mapping at night



# Sensor Summary

Sensor System	Spatial Resolution	Spectral Resolution	Swath Width	Production Rate	Data Delivery	Platform
AMS^^	17.5 meters at 23,000 ft. ASL	16 channels: Visible, NIR, SWIR, MIR, Thermal IR	8.1 miles at 23,000 ft. ASL	TBD	Near real time using Aircell system	TBD**
WAI^^	3.5 meters at 40,000 ft. ASL	2 thermal IR channels; 3 Visible, Near IR	15 miles at 40,000 ft. ASL	2.9 million acres per hour	Near real time using Aircell system	Citation Bravo
Phoenix	3.5 meters at nadir at 10,000 ft. AGL	2 thermal IR channels	6 miles at 10,000 ft. AGL	300,000 acres per hour	Near real time using Aircell system	King Air B200, Citation Bravo

\*\* RSAC is working with FAM to access a suitable platform for the AMS

^^ The AMS and WAI are multi-mission capable sensor systems