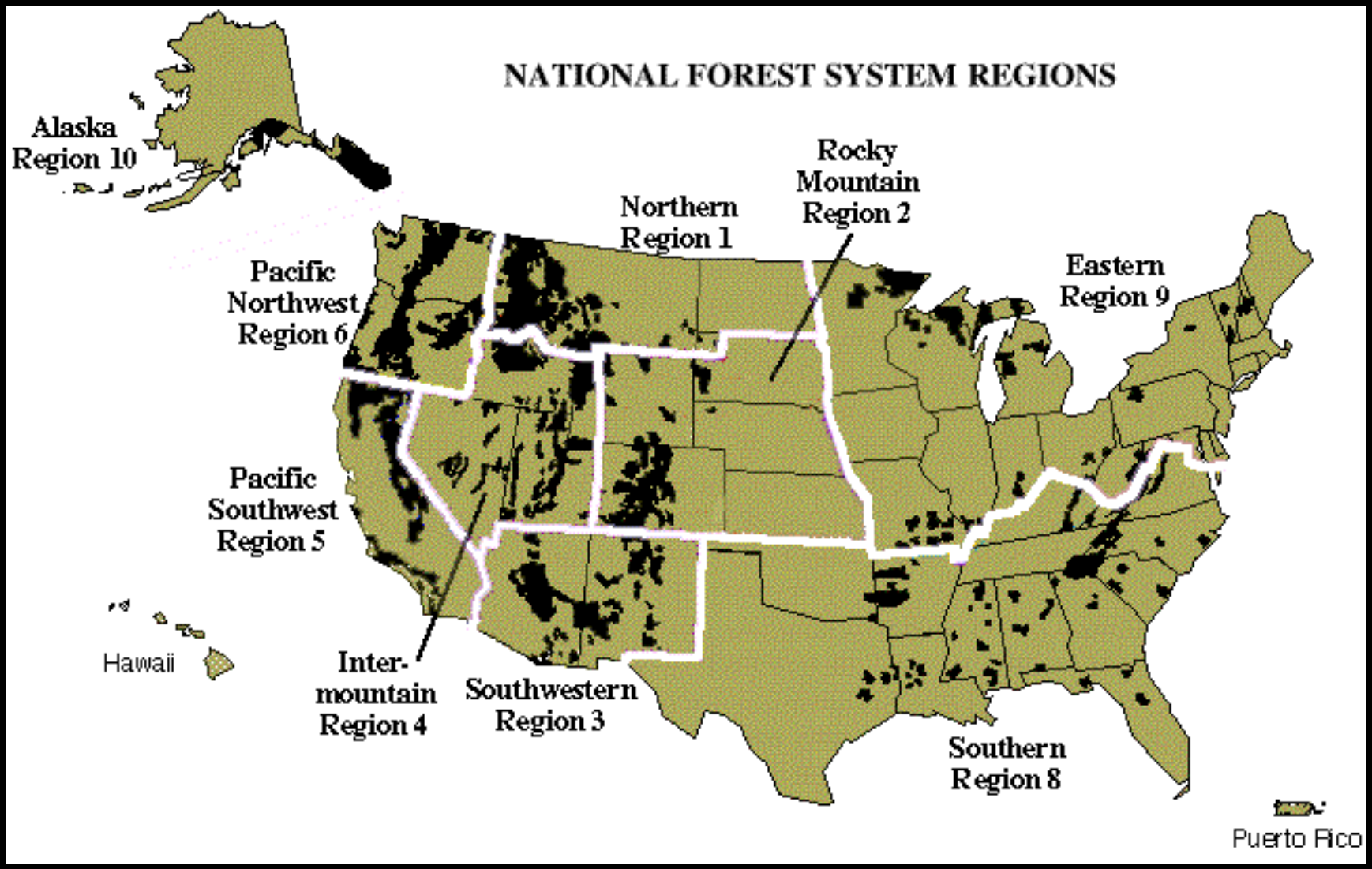
Introduction to USFS Remote Sensing Aircraft

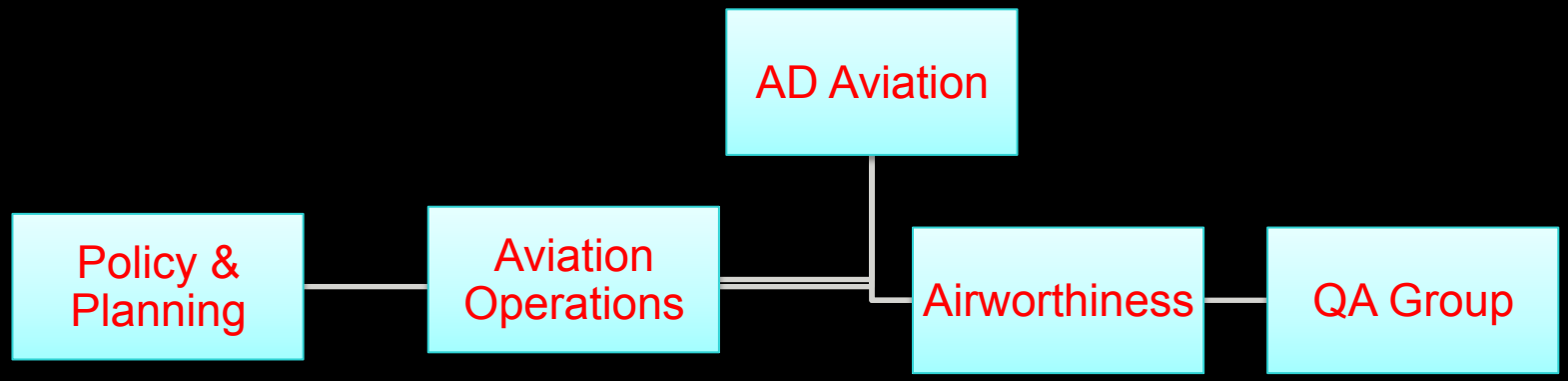
Presentation to the Fall 2011
ICCAGRA Meeting 11/27/11

US Forest Service Organization



FS Aviation Organization

- Art Hinaman is the Asst. Director Aviation
- All FS aviation is under this deputy area.



Introduction

- Owns and operates 27 aircraft and helicopters
- Contracts with over 800 aircraft and helicopters annually
- Missions Include:
  - Fire surveillance
  - Aerial reconnaissance
  - Air Attack
  - Delivery of smokejumpers
  - Firefighter and cargo transport
  - Aerial delivery of retardant and water
  - Natural Resource Management
  - Research

FS Aircraft (owned)

AIRCRAFT MAKE	AIRCRAFT MODEL	TYPE H/F	N#	MANF. YEAR	REGION	AIRPORT/ BASE	USE
1Bell	206 B III	H	N106Z	1970	R8	LZU	Proficiency/Training/RxFire
2Bell	AH-1F	H	N107Z	Uk	R5	RDD	Aerial Supervision Platform
3Bell	AH-1F	H	N109Z	Uk	R5	WJF	Aerial Supervision Platform
4Cessna	Stationair TU 206F	F	N111Z	1978	R1	MSO	Command & Control
5Douglas	DC-3TP	F	N115Z	1944	R1	MSO	Smokejumper
6Cessna	Stationair TU 206F	F	N126Z	1974	R2	BJC	FHP R2
7Beechcraft	King Air 100	F	N127Z	1974	R2	BJC	FHP WO
8Cessna	Stationair TU 206G	F	N136Z	1986	R6	RDM	Resource
9DeHavilland	DHC-6 Twin Otter	F	N141Z	1984	R4	MYL	Smokejumper
10Douglas	DC-3TP	F	N142Z	1944	R4	MYL	Smokejumper
11DeHavilland	DHC-6 Twin Otter	F	N143Z	1974	R4	MYL	Smokejumper
12Cessna	Citation 550	F	N144Z	2000	R4	OGD	Infrared
13Aero Commander	500	F	N147Z	1964	R4	OGD	Command & Control
14Beechcraft	King Air 90	F	N148Z	1969	R4	BOI	Excess- approved for sale
15Beechcraft	King Air 200	F	N149Z	1985	R4	OGD	Infrared
16Shorts	SD 330 Sherpa	F	N173Z	Uk	R6	RDM	Smokejumper
17Shorts	SD 330 Sherpa	F	N175Z	Uk	R5	RDD	Smokejumper
18Shorts	SD 330 Sherpa	F	N178Z	1985	R6	RDM	Smokejumper
19Shorts	SD 330 Sherpa	F	N179Z	1985	R1	MSO	Smokejumper
20Beechcraft	King Air 90	F	N181Z	1973	R8	LZU	Leadplane/ASM
21Beechcraft	King Air 200	F	N182Z	1978	R8	LZU	Command & Control
22DeHavilland	DHC-2 Beaver	F	N191Z	1956	R9	ELO	Detection/Suppression/LEI
23DeHavilland	DHC-2 Beaver	F	N192Z	1959	R9	ELO	Detection/Suppression/LEI
24DeHavilland	DHC-2 Beaver	F	N193Z	1957	R9	ELO	Detection/Suppression/LEI
25DeHavilland	DHC-2 Beaver	F	N106FS	1952	R10	JNU	Law Enforcement
26Piper	PA-18 Super Cub	F	N4340Z	1968	R5	WJF	Wildlife - SNAMP
27Cessna	185F	F	N 4704A	1974	R5	WJF	Wildlife - SNAMP

FireWatch

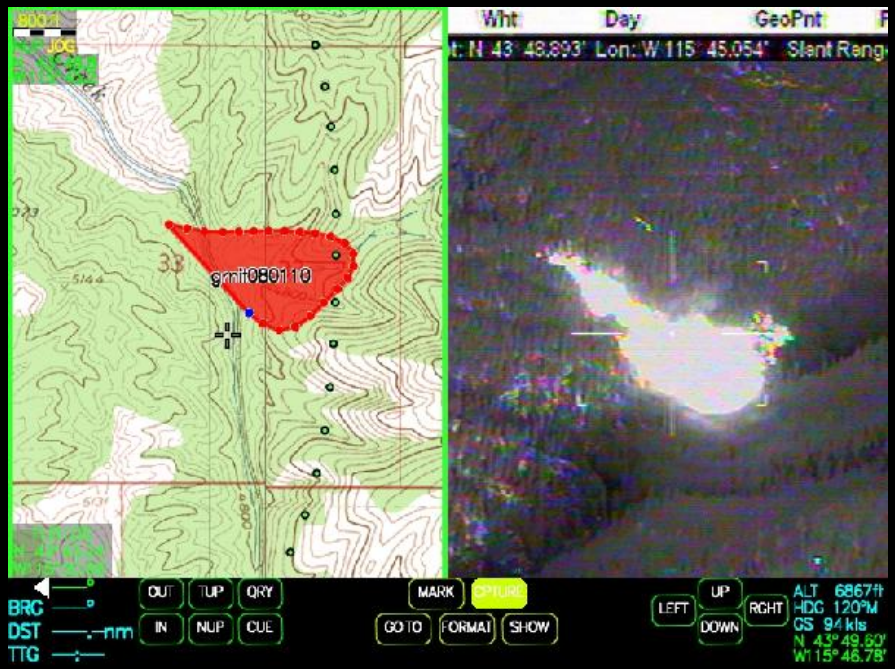
Flight Rate - $2200.00 per hour
Support Vehicles (2) $0.40 per mile
Contact Stan Kubota skubota@fs.fed.us

- Surplus AH-1 Cobra attack helicopters
  - Two in operation
  - Extensive refit for Air Attack and Mapping operations
- Microwave and sat phone transmission of data
  - Microwave for live video feed to data van at ICP
- ROVER units for live data feed to line personnel

Sensors

- **FLIR Star Safire III**
  - 3-5 µm band (Mid-IR)
  - Video is standard daylight (EO)
  - Laser rangefinder
  - Avalex mapping program
- **Max – Viz**
  - Fixed 8-12 µm (LWIR)
  - Pilot situational awareness
- **Available Compartment for Additional Sensors**
  - Located under cockpit
  - Capacity 400-450 lbs, 75 lbs per sq. ft.

FireWatch Imagery/Products



EO/IR Video Clips

Output from Avalex can in ingested by ArcMap to create PDF maps, Kmz files

N149Z Specifications

Flight Rate - $1040 per hour
Contact Clair Mendenhall
cmmendenhall@fs.fed.us

King Air 200

Primary Mission – Infrared Fire Mapping (April – October)

AirCell Datalink

Average 204 Kbs downlink
Continuous coverage CONUS at 10,000 AGL

Sensor Pod

Removable sensor pod with 12 in wide by 8 in wide sensor hole open to atmosphere
12 x12 access hatch allows aircraft to remain pressurized

N144Z Specifications

Cessna Citation Bravo

- Primary Mission – Infrared Fire Mapping (April – October)

AirCell Datalink

- Average 204 Kbs downlink
- Continuous coverage CONUS at 10,000 AGL

Sensor Bay

- Port Side blister
- Opening 18 in long 15 wide
- Sensor bay 24 in long 17 wide

Flight Rate - $1760 per hour
Contact Clair Mendenhall
cmmendenhall@fs.fed.us

PHOENIX System Installation – N144Z

Pod and Remote IRIN Support: One IRIN, Multiple Fires

Interpreter(s) located at RO, SO, RD, hotel, home

Phoenix data in WinZip archive

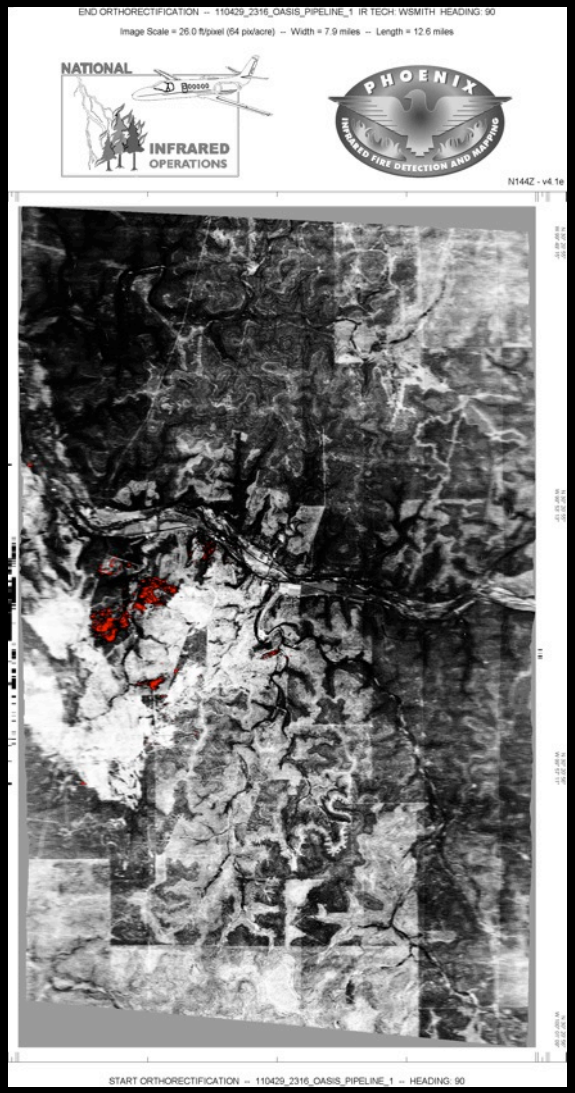
Phoenix data in WinZip archive

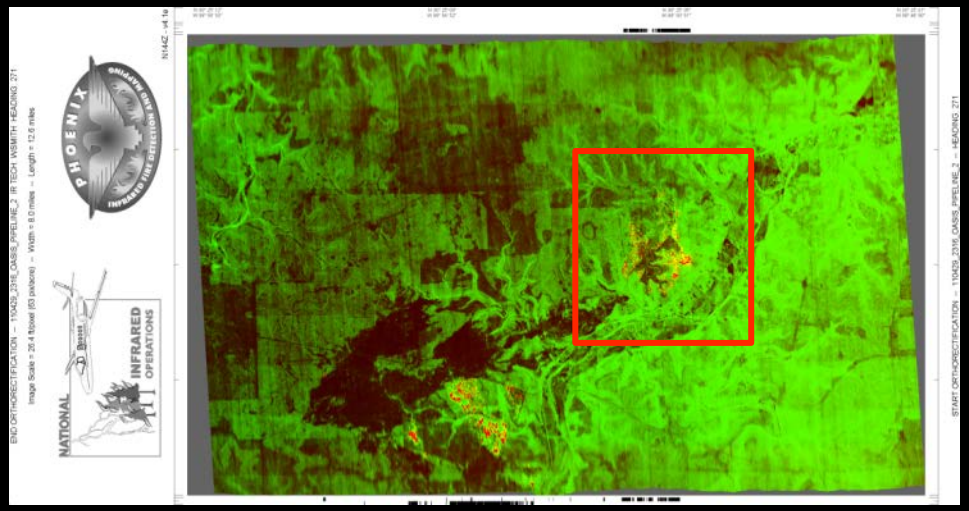
Shapefiles, PDFs in WinZip archive

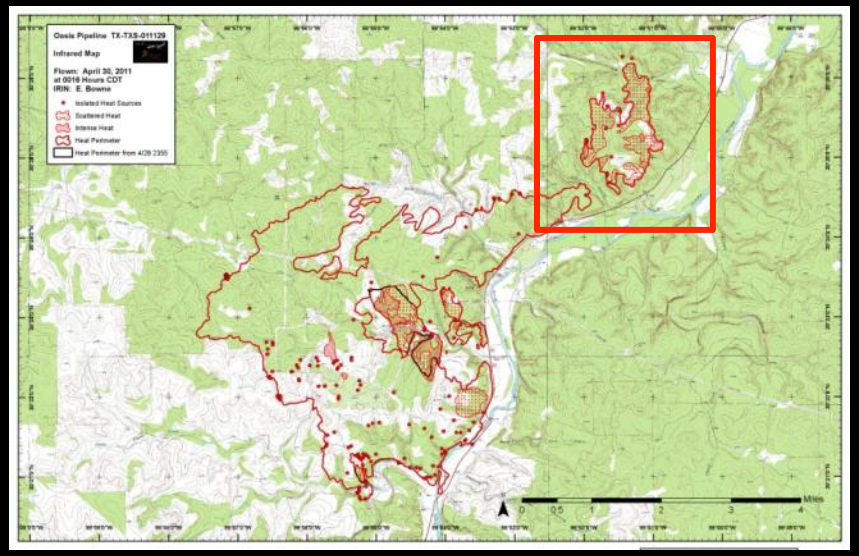
ftp.nifc.gov/ NIROPS

ftp.nifc.gov/ Incident Spec Data/ IR

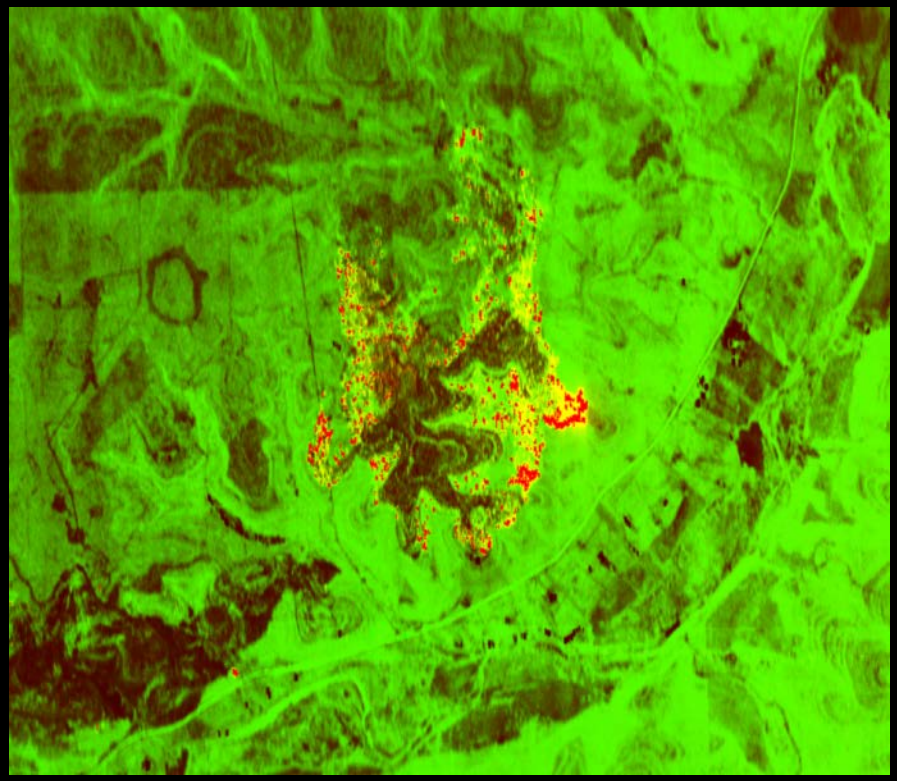
Phoenix Imagery/Products

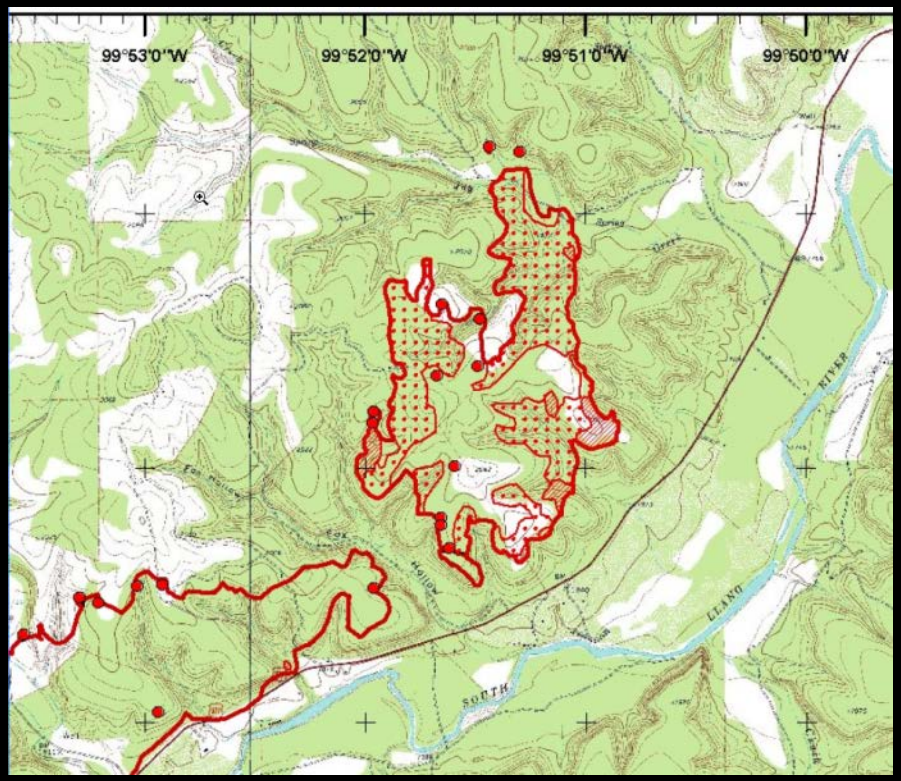






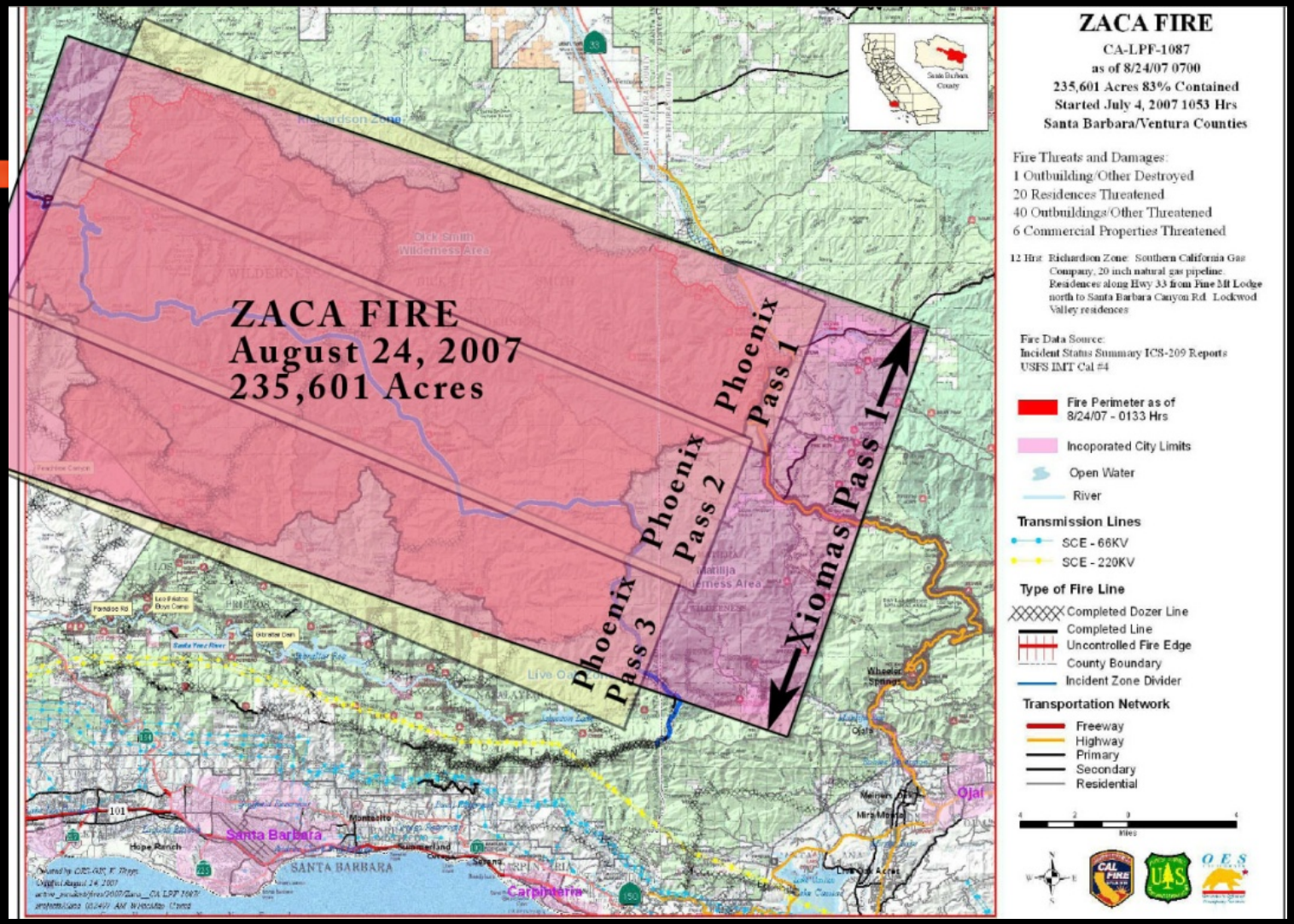
Phoenix Imagery Details





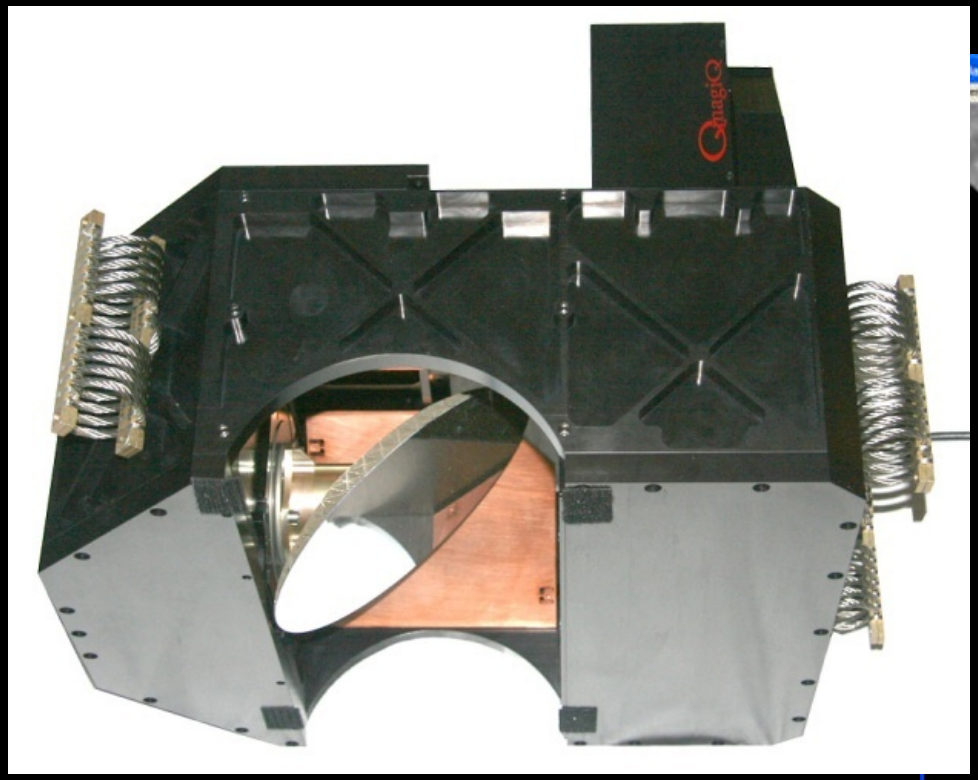
Shapefiles are used to create Kmz files, detailed interpreter logs are also delivered.

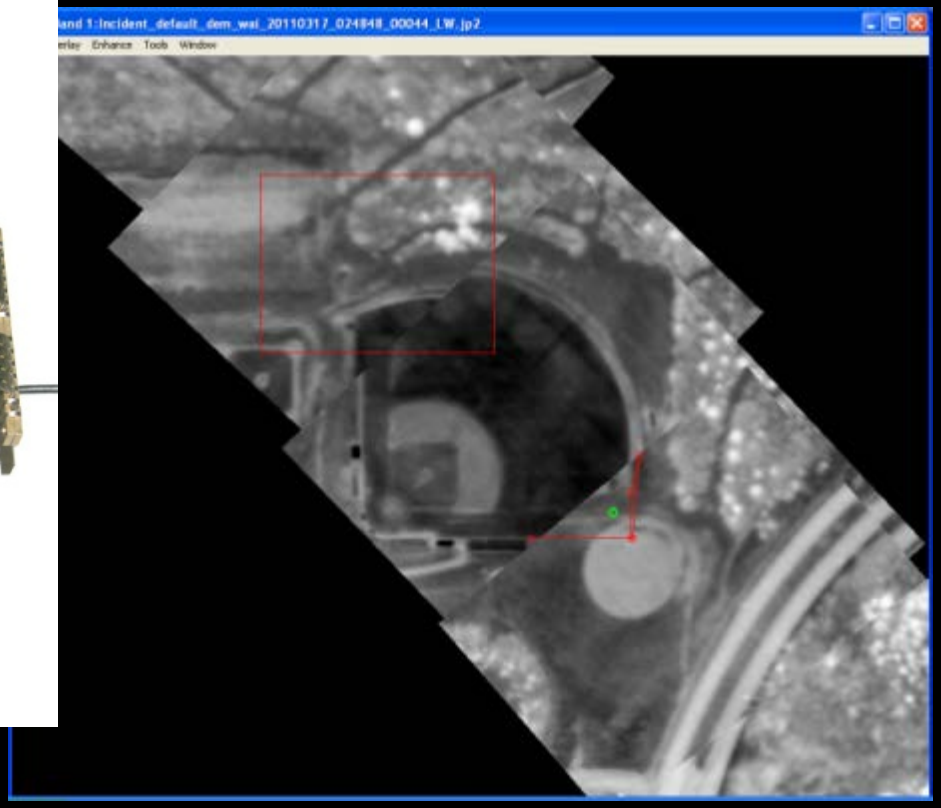
Goal is to reduce operational costs by a factor of 2X to 3X by increasing coverage rate and decreasing flight time

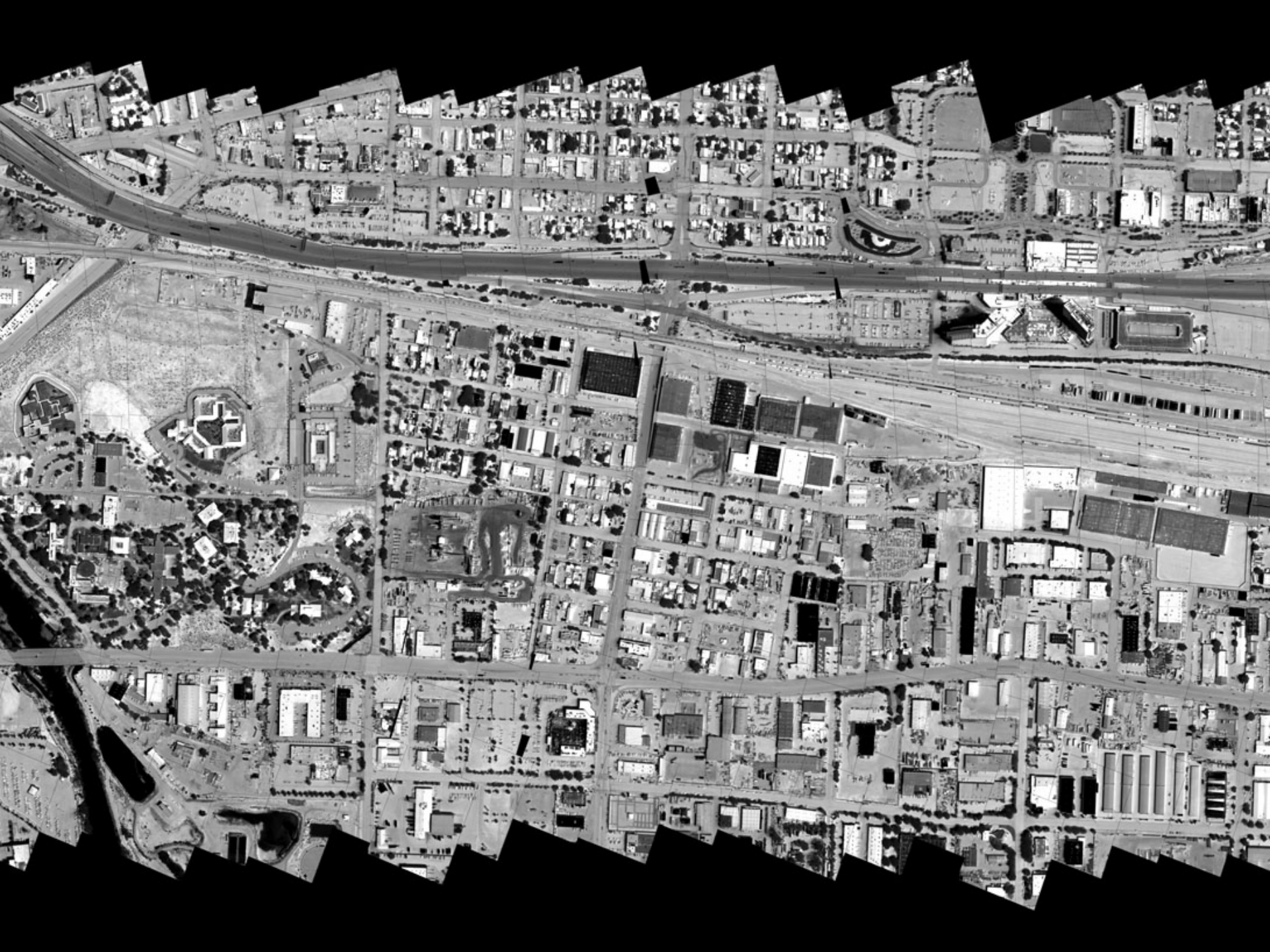


Coverage of the current Phoenix system operated by the U.S. Forest Service National Infrared Operations group. The Phoenix system has a 120 degree field of view and covers a swath approximately 6 miles wide from 10,000 feet. At this altitude the Phoenix system has a 12.5 foot pixel at nadir. The proposed Xiomas system will have a 12.5 foot pixel from 42,500 feet and approximately a 16 mile swath width resulting in a 3X increase in coverage.

Xiomas Wide Area Imager







DHS/USDA/DOI Cooperation

Monument Fire
Hereford, AZ
Lat/Lon: 26 10 22.08N 98 03 37.99W
NASOC-SV Analyst: Sutter

FOUO//LES

15 JUN 11
0047Z

Retardant Drop form Aircraft

FOUO//LES

Monument Fire
Hereford, AZ
Lat/Lon: 31 23 01.07N 110 15 43.38W
NASOC-SV Analyst: Sutter

15 JUN 11
0356Z

Fire Surrounding Residence

FOUO//LES

FOUO//LES

Questions?