# Satellite Imagery and CRSSP Implementation

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USDA Remote Sensing Advisor

# Global Monitoring Data Sources for Estimating Crop Production

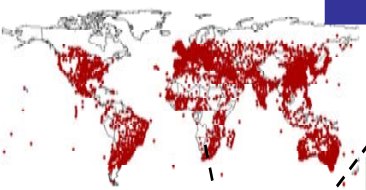

United States Department of Agriculture

## Production Estimates and Crop Assessment Division (PECAD)

*USDA/FAS/PECAD, USDA South Building, 1400 Independence Ave., SW, Rm 6053, Washington DC, 20250*

*URL:http://www.fas.usda.gov/pecad/pecad.html*


## WMO STATION DATA



- Daily station data for rainfall, & min/max temperatures
- Archive from1979

## COARSE-RESOLUTION IMAGERY (Air Force Weather Agency)

*METEOSAT*

*GOES*

*SSM/I*

## GRIB (RASTER)

Rainfall images (8-km)

## AGRMET (POLYGRIDS)

- Daily polygrid data (25-51-km) for rainfall, snow, solar radiation, min/max temperatures, potential ET, and actual ET
- Archive from 1981

## MEDIUM-RESOLUTION SATELLITE DATA

*TERRA*

*SPOT IV*

*AVHRR/ NOAA*

LAC (~4000-6000 images/yr)

GAC (from NASA)

*Monitor vegetation conditions.*

## HIGH-RESOLUTION SATELLITE DATA

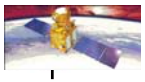
*SPOT*

~500-1000 images/yr

*Landsat*

~2000 images/yr

*AWIFS*



## ITARS DBMS

- Vegetation classification
- Vegetation stress
- Area planted estimates

## PCIWORKS (Image analysis)

## ECONOMIC INFORMATION

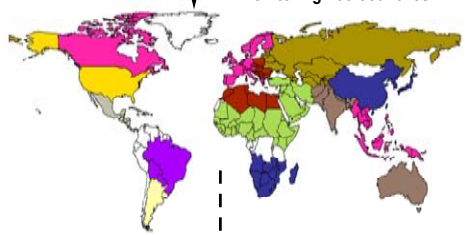
- *Attache reports (from USDA/FAS) for area harvested, yield, & production.*

75 offices monitoring 110 countries

- PECAD Agricultural Economists for Grains, Cotton, and Oilseeds
- National production data & news wires
- Regional experts & crop assessment travel

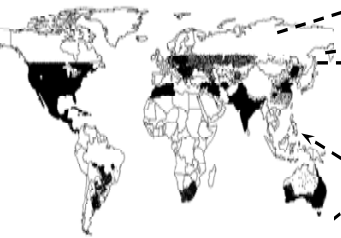
## PECAD REGIONAL CROP ASSESSMENT ANALYSTS

10 regional analysts monitoring 100 countries



## CADRE DBMS

Station & grid models available for these regions



## STATION PLOTTER (Multi-year time series comparisons)

## WEB PRODUCTS (Current year vs. normals)

## Convergence of Evidence Analysis

## ARCVIEW GIS (Multi-year comparisons)

*Station & polygrid data utilized to generate rainfall, temperature, & soil moisture images.*

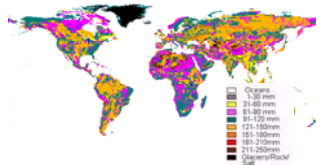
## 2-LAYER SOIL MOISTURE MODEL

- Estimates soil moisture for polygrids and stations.

## BASELINE REFERENCE DATA

*Historical crop area, yield, production,& trends connected to regional weather anomalies*

- Historical crop production databases
- Administrative boundaries
- Average temperature & rainfall spatial data
- Soil texture & water-holding capacity



## ALARM MODELS

- Act as meteorological data filters by providing early warning to adverse weather conditions that affect crop growth.
- Models crop stages for corn, wheat, and sorghum.
- Flags regional weather anomalies that exceed temperature and soil moisture thresholds for the particular crop.

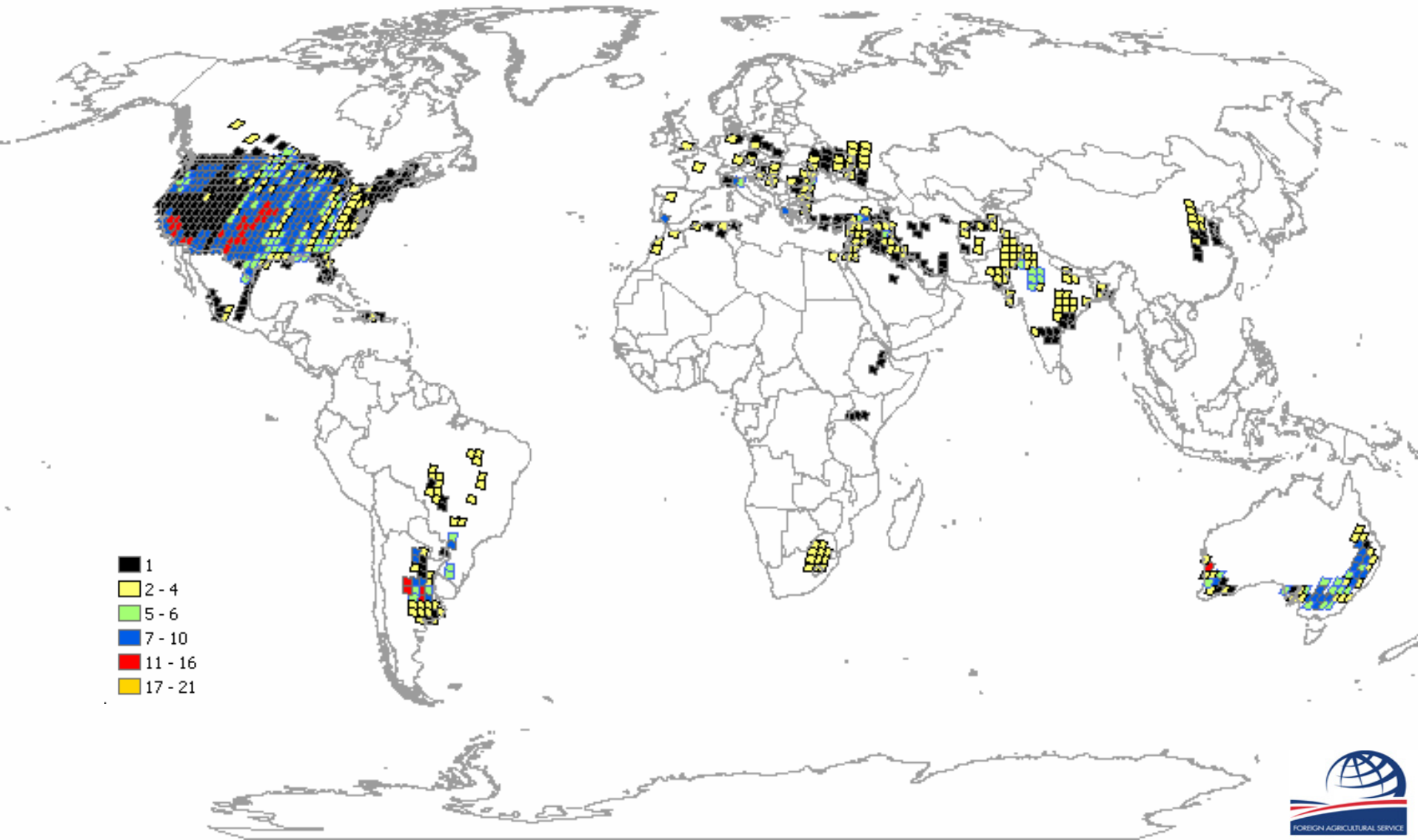
## CROP MODELS

- Monitor crop stress for corn, wheat, soybean, sorghum, and barley.
- Estimate relative yield reductions by some models.
- Models include wheat (CERES, AGRISTARS, Maas, & URCROP), corn (AGRISTARS & URCROP), soybean (Sinclair), sorghum (AGRISTARS) & barley (URCROP).

## CROP PRODUCTION ESTIMATES

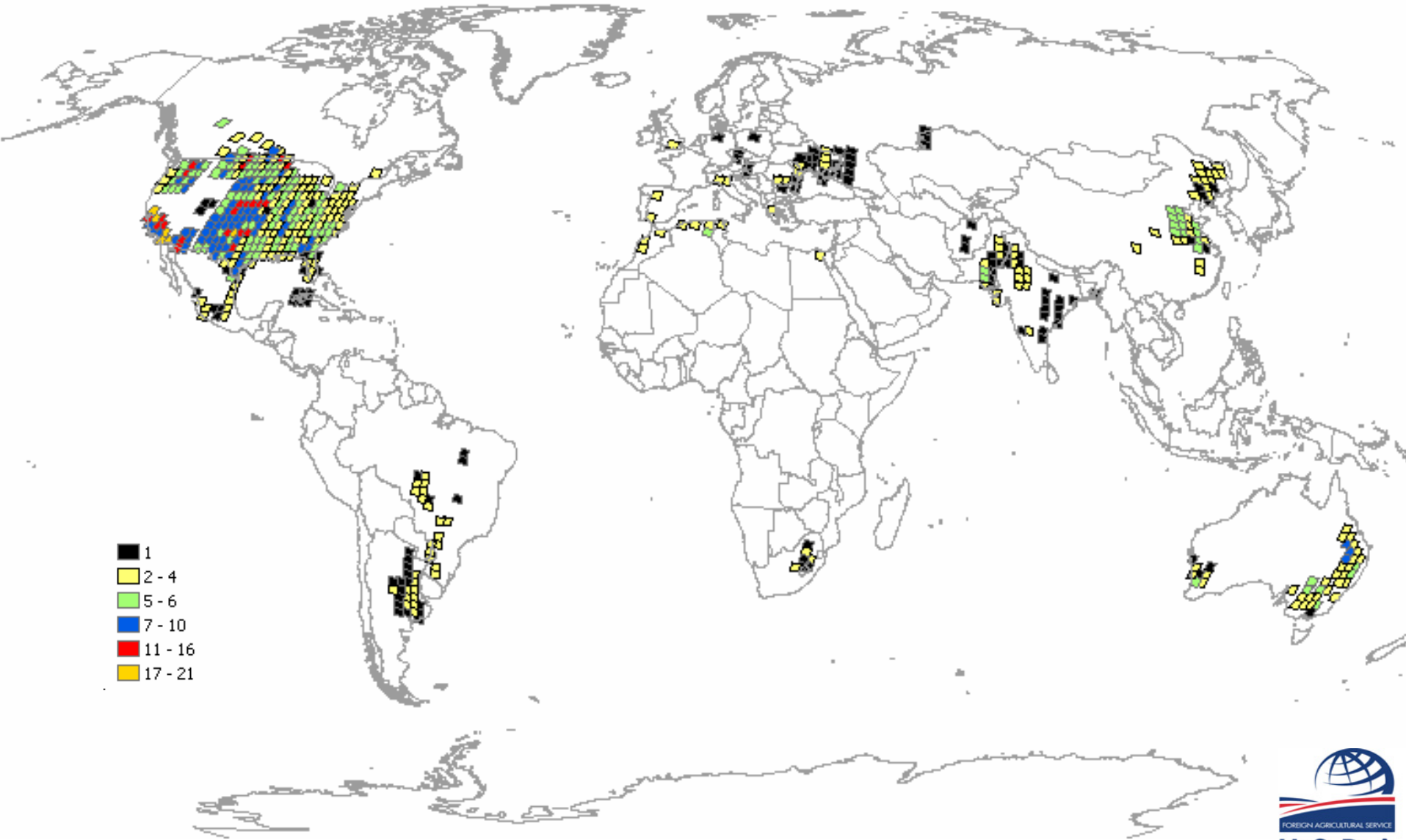
- Preliminary production estimates
- "Lockup" with USDA's World Outlook Board
- *USDA official production estimates released on the second week of each month*

# 2003 Landsat Acquisitions



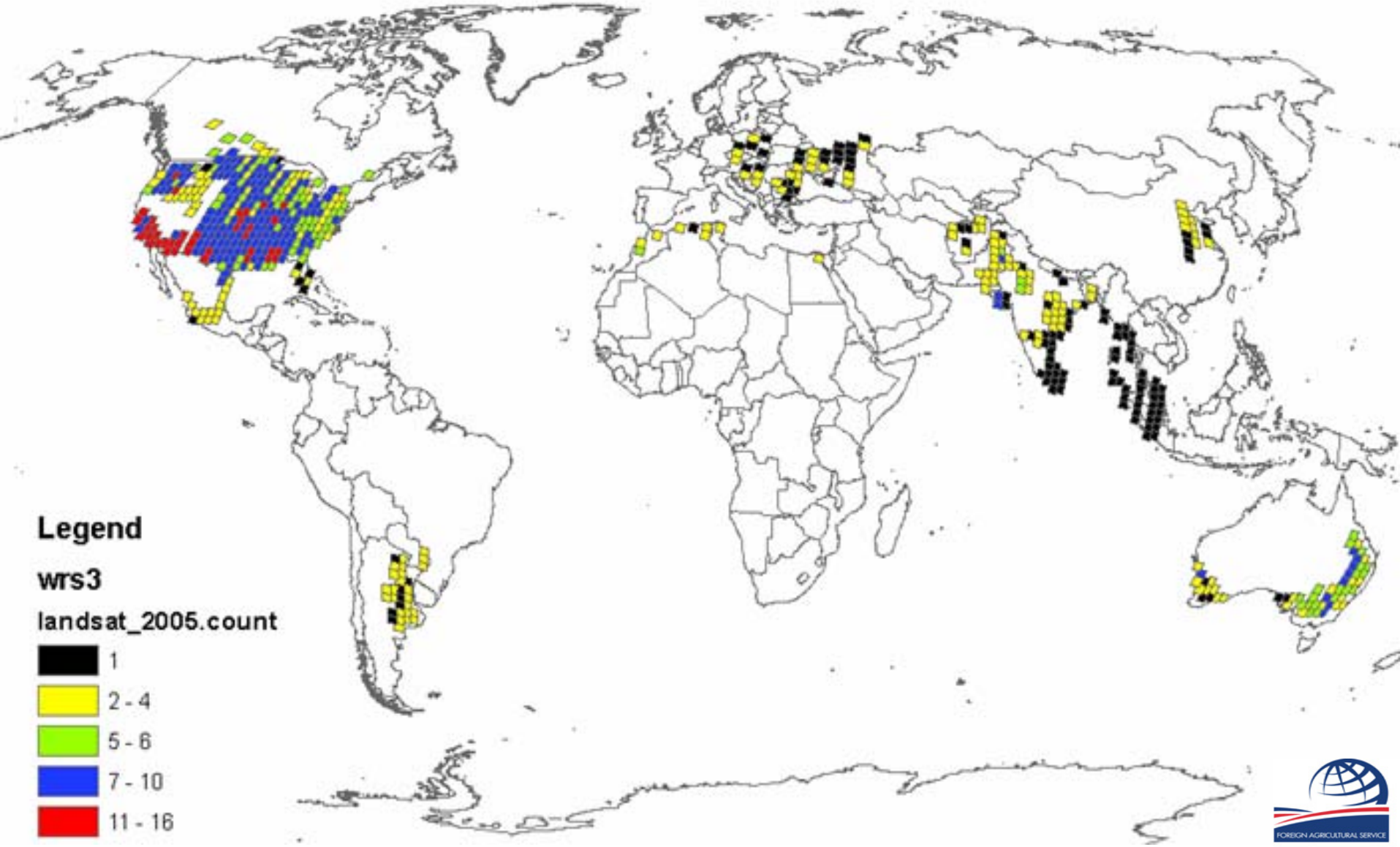

FOREIGN AGRICULTURAL SERVICE
USDA

# 2004 Landsat Acquisitions




FOREIGN AGRICULTURAL SERVICE
USDA

# 2005 Landsat Acquisitions

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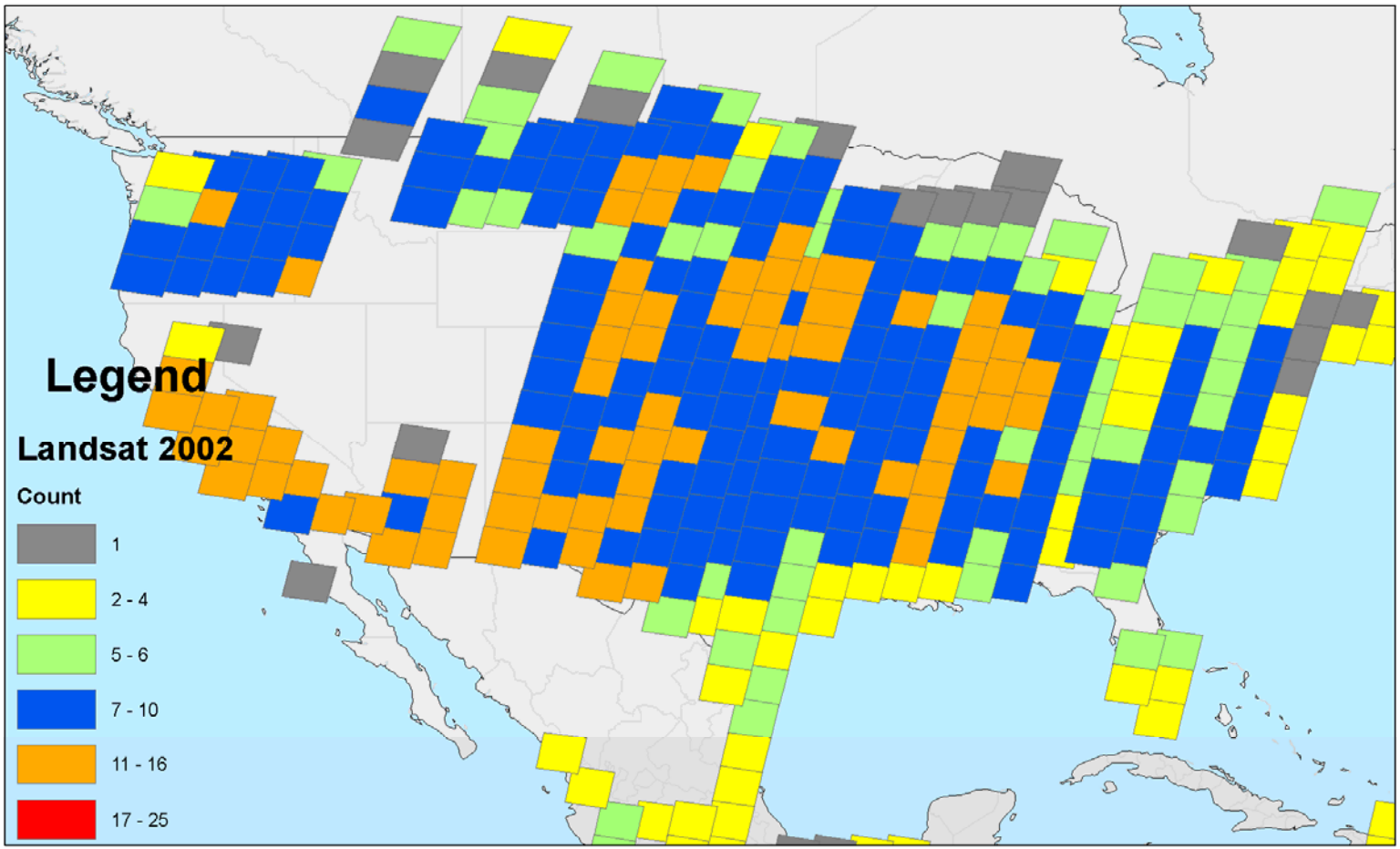
USDA

# 2002 Landsat in the USDA-SIA




USDA Satellite Imagery Archive (USDA-SIA)
Contact: Robert Tetrault (202) 690-0130
robert.tetrault@usda.gov
http://www.pecad.fas.usda.gov/remote.cfm

USDA-SIA
Collection includes Landsat 5
and Landsat 7
2002 Calendar year

# 2006 Landsat?

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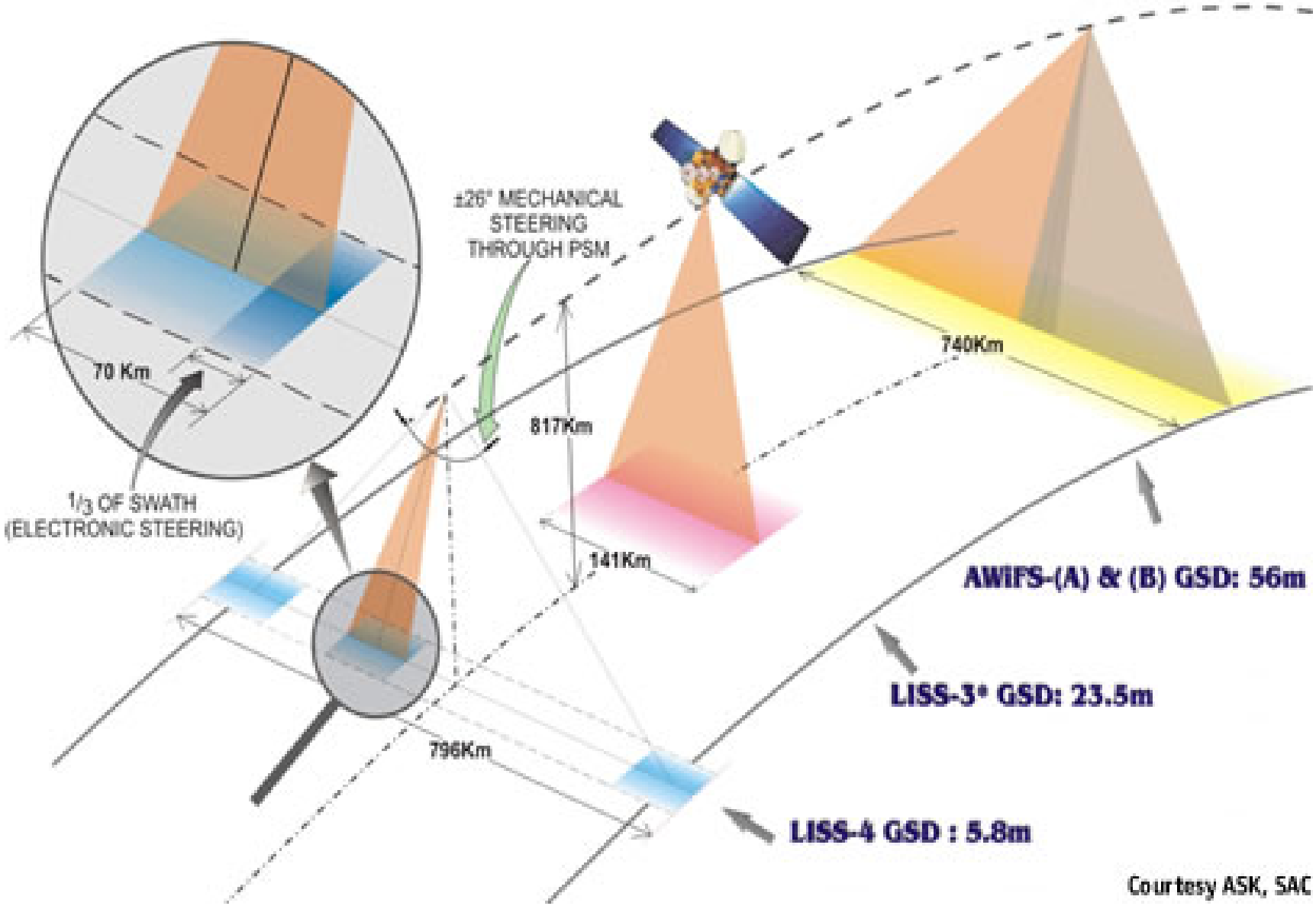
USDA

# IRS AWiFS and LISS



# Medium Resolution Imagery

- USDA HAS Transitioned from Landsat to AWiFS data for most Monitoring Applications:
  - Landsat status
  - Land imaging alternatives

# Impact of the Landsat-7 ETM+ SLC Anomaly


Note that the images show partial scenes

# Landsat-5 Status

- Solar-array drive malfunction: November 30, 2005 through January 26, 2006
  - Restored to operational status for acquiring both US and foreign coverage.
- Power outage: March 16, 2006
  - Traveling Wave Tube Amplifier (TWTA) tripped an Over Current Protection circuit.
  - Missed imaging Texas wildfires; however, operational status restored.
- Solar-array drive malfunction: August 11, 2006
  - Solar-array in fixed position at spacecraft “noon.”
  - Only US coverage, no foreign acquisition until power budget is restored.

# Landsat Data Gap

- The extent of the Landsat Data Gap based on numerous assumptions:
  - Complete Gap: ***2008 to 2011***
    - 2008: fuel depleted for Landsat-5; 10% probability for Landsat-7 gyro failure.
      - Landat-5 solar array drive malfunction may increase gap.
    - 2011: launch of the Landsat Data Continuity Mission (LDCM)
      - Assumes one satellite, similar to Landsat-7.
  - Partial Gap: ***2003 to Indefinite***
    - 2003: Landsat-7 SLC anomaly; Landsat-5 operational but only 16-day revisit.
    - Indefinite: No US government plans to provide better than 16-day revisit.
      - Does not meet requirements for operational agricultural applications.

# Land Imaging Alternatives

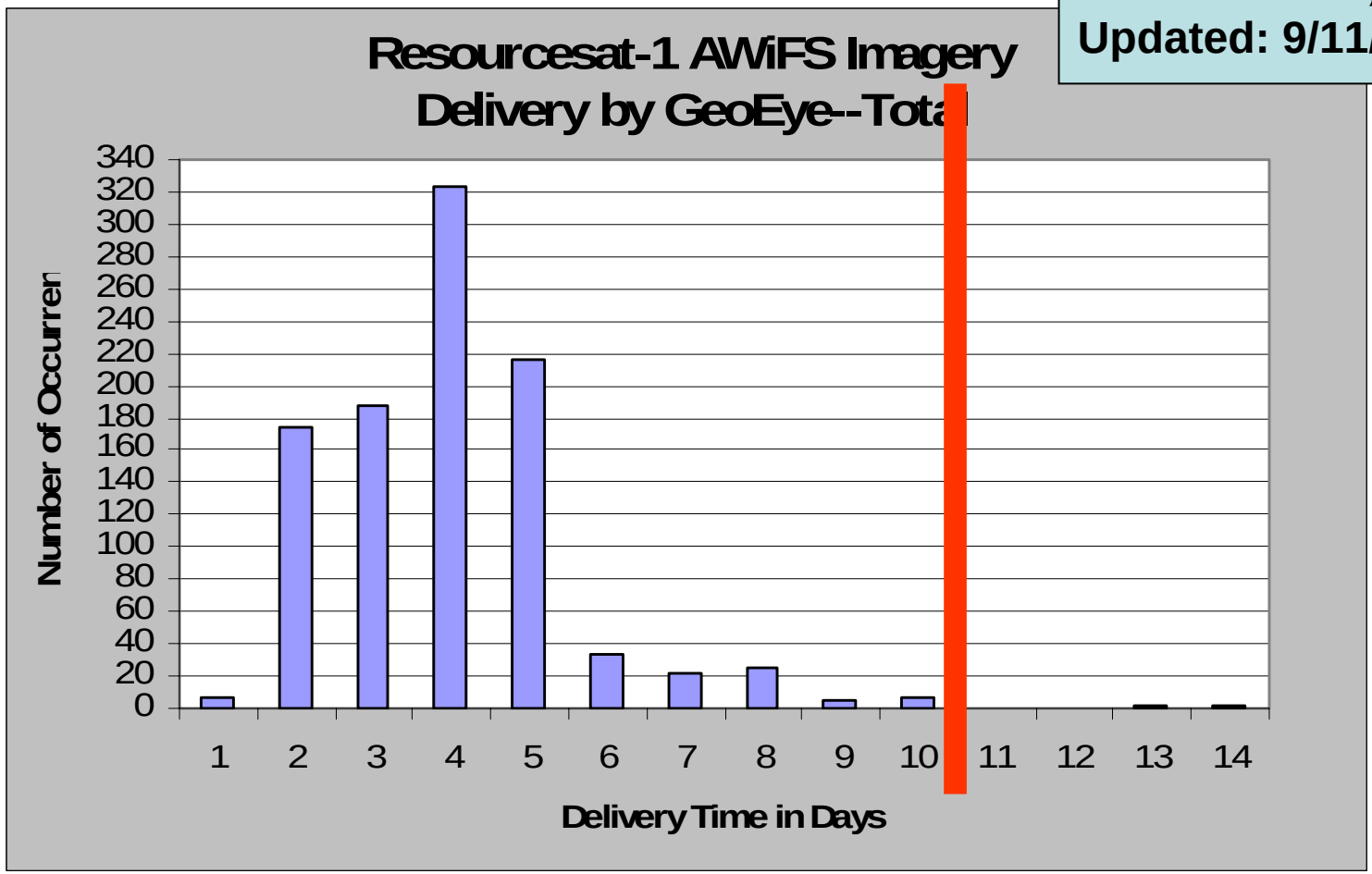
## Landsat Data Continuity Working Group

- IRS-ResourceSat-1
  - Launched October 2003
  - Status: Operational
  - Revisit Rate: 24 days
    - ***wide swath width for AWiFS allows 5-day revisit.***
  - Data Product Characterization: Reviewed by JACIE
  - Follow-on mission (ResourceSat-2) scheduled for mid 2008

Better than 16-day revisit requirement met by AWiFS

# Access to Resourcesat-1 AWiFS Data: ***Delivery***

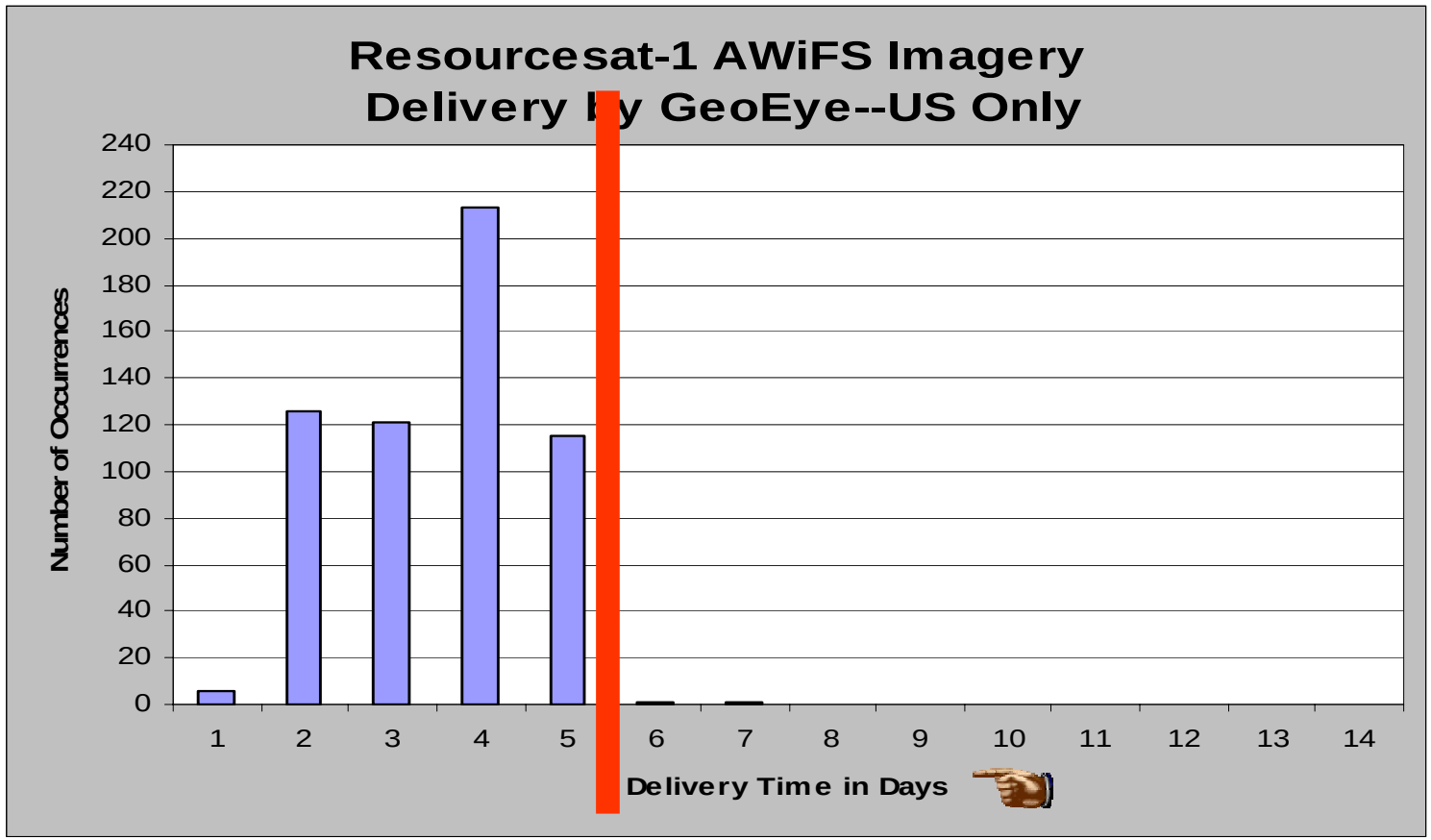
**Count: 1,099**
**Updated: 9/11/2006**




AWiFS Delivery by GeoEye has met and *exceeded* contract specifications

# Access to Resourcesat-1 AWiFS Data: *US Delivery*

**Count: 678**
**Updated: 9/11/2006**




AWiFS Delivery for US imagery has met and *exceeded* contract specifications

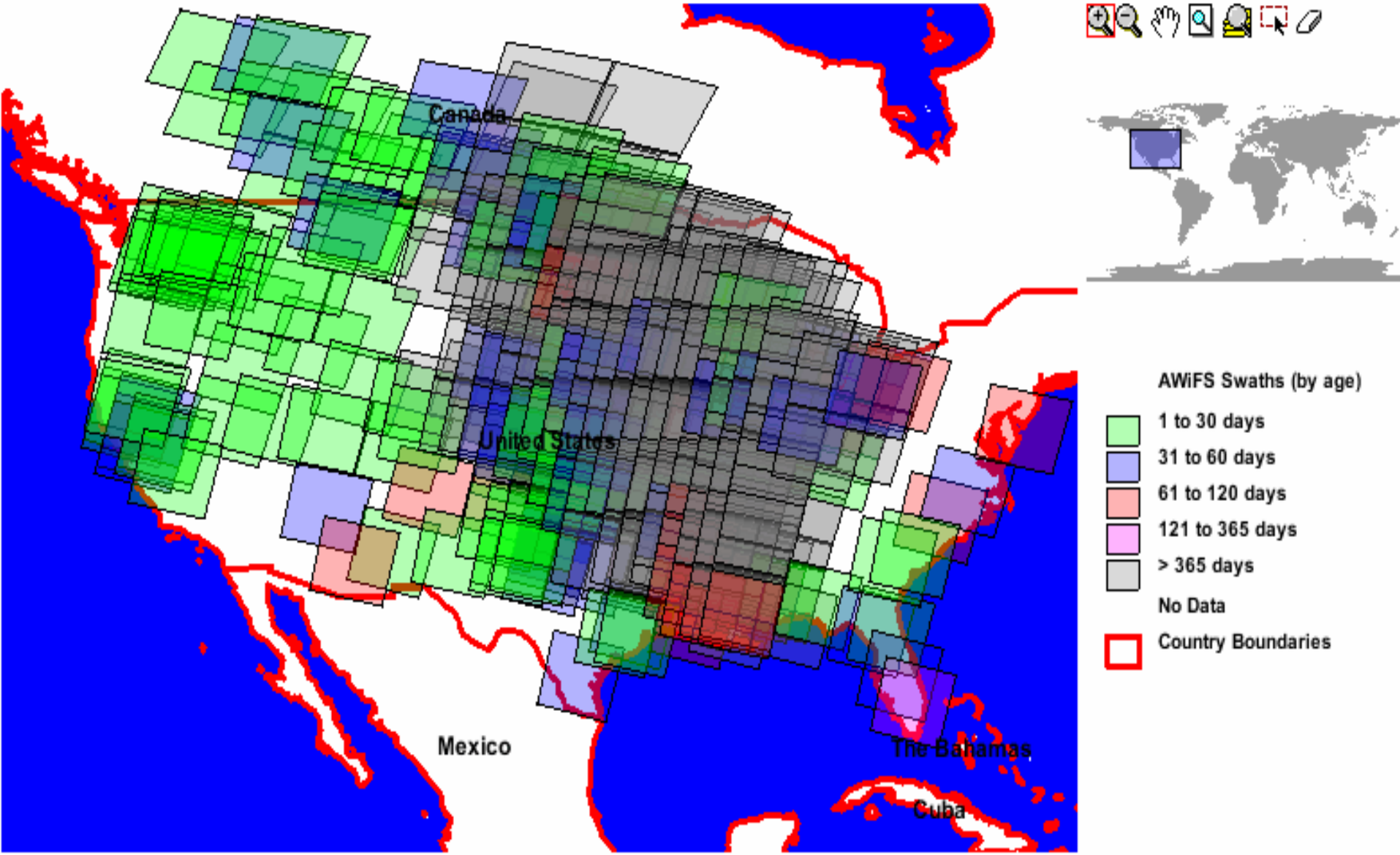
# Access to Resourcesat-1 AWiFS Data: ***Coverage***

- World-wide Coverage
  - International Ground Stations
  - Standing Orders take ~ 15 days to implement. They consist of:
    - Start date
    - End Date
    - Path/Row/Quad
  - Shutter control for coverage of India.

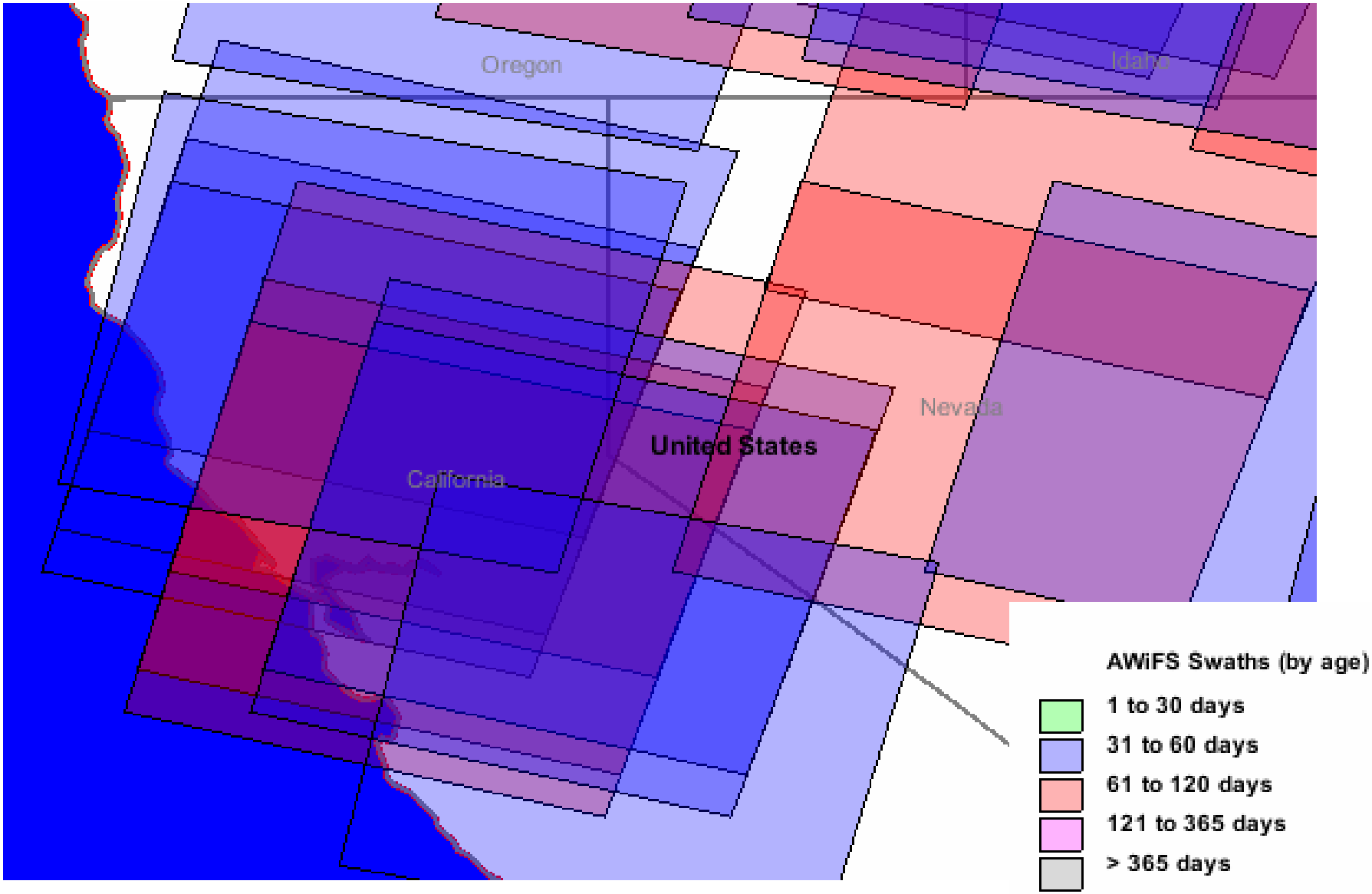
- USDA-FAS Standing Orders in Process
  - Russia and Ukraine
  - Siberia and Kazakhstan
  - Europe
  - China
  - US
  - Canada
  - Pakistan
  - Bangladesh
  - Sri Lanka
  - South Africa
  - Argentina

# Access to Resourcesat-1 AWiFS Data:

## *Coverage*



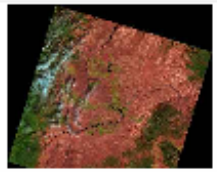
# Example for Northern California from 11/13/2006: 157 2006 AWIFS Images in Archive



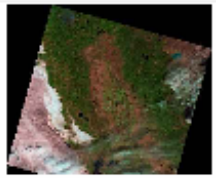
Your Search Returned 157 Results.

THUMBNAILS

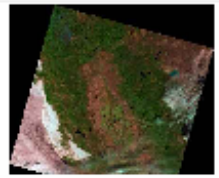
1. IRS_AWIFS, FULL, 09/30/06



2. IRS_AWIFS, FULL, 09/30/06



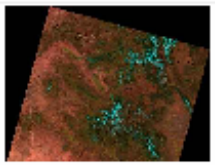
3. IRS_AWIFS, FULL, 09/30/06



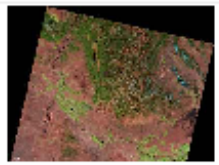
4. IRS_AWIFS, FULL, 09/30/06

5. IRS_AWIFS, FULL, 09/30/06

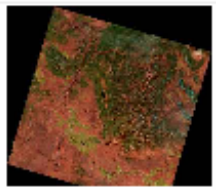
6. IRS_AWIFS, FULL, 09/28/06



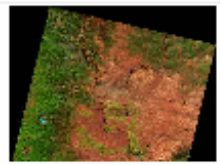
7. IRS_AWIFS, FULL, 09/28/06



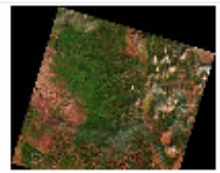
8. IRS_AWIFS, FULL, 09/27/06



9. IRS_AWIFS, FULL, 09/26/06



10. IRS_AWIFS, FULL, 09/26/06



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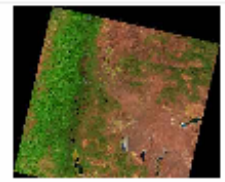
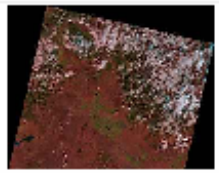


12. IRS_AWIFS, FULL, 09/26/06

13. IRS_AWIFS, FULL, 09/26/06



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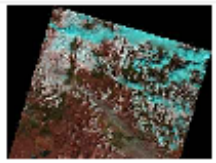

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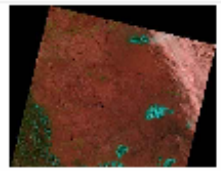

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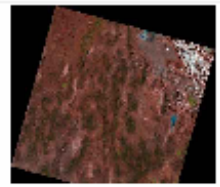
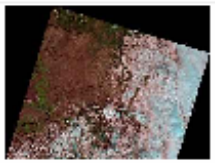


17. IRS_AWIFS, FULL, 09/17/06

18. IRS_AWIFS, FULL, 09/17/06



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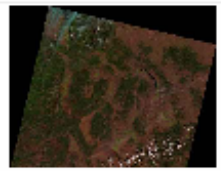
20. IRS_AWIFS, FULL, 09/16/06

21. IRS_AWIFS, FULL, 09/16/06



22. IRS_AWIFS, FULL, 09/13/06

23. IRS_AWIFS, FULL, 09/13/06

24. IRS_AWIFS, FULL, 09/12/06

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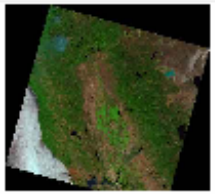
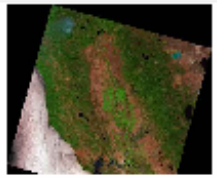
THUMBNAILS


31. IRS_AWIFS, FULL, 09/06/06


32. IRS_AWIFS, FULL, 09/06/06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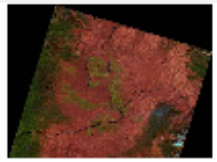
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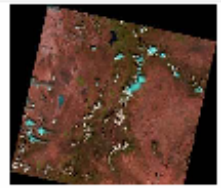
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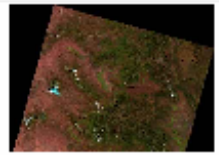
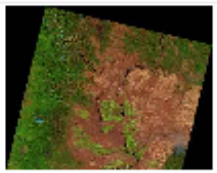

36. IRS_AWIFS, FULL, 09/04/06


37. IRS_AWIFS, FULL, 09/02/06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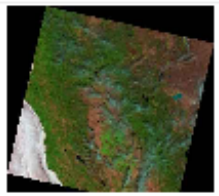
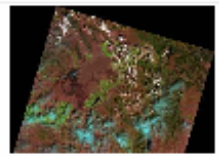
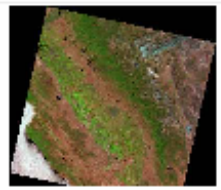

39. IRS_AWIFS, FULL, 09/02/06


40. IRS_AWIFS, FULL, 09/02/06


41. IRS_AWIFS, FULL, 08/29/06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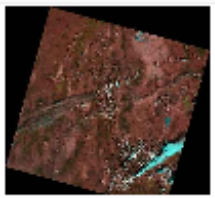
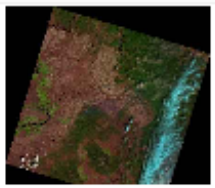
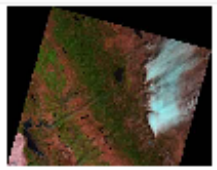

43. IRS_AWIFS, FULL, 08/24/06


44. IRS_AWIFS, FULL, 08/23/06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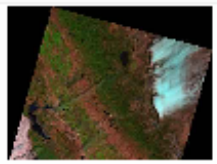
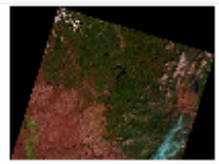
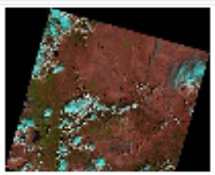
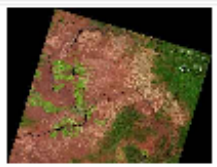

46. IRS_AWIFS, FULL, 08/23/06

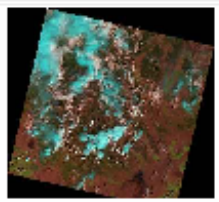

47. IRS_AWIFS, FULL, 08/23/06

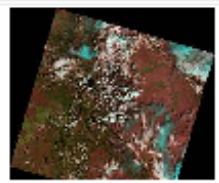

48. IRS_AWIFS, FULL, 08/20/06

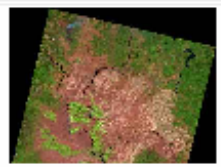

49. IRS_AWIFS, FULL, 08/20/06


50. IRS_AWIFS, FULL, 08/19/06


51. IRS_AWIFS, FULL, 08/18/06


52. IRS_AWIFS, FULL, 08/15/06

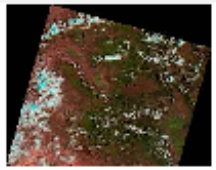

53. IRS_AWIFS, FULL, 08/15/06


54. IRS_AWIFS, FULL, 08/14/06

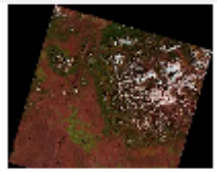
Your Search Returned 157 Results.

THUMBNAILS

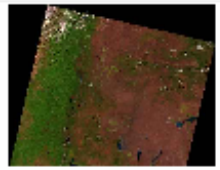
61. IRS_AWIFS, FULL, 08/13/06



62. IRS_AWIFS, FULL, 08/11/06

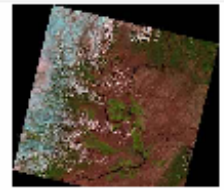


63. IRS_AWIFS, FULL, 08/09/06

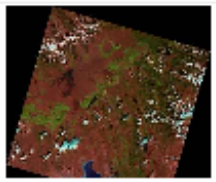


64. IRS_AWIFS, FULL, 08/09/06

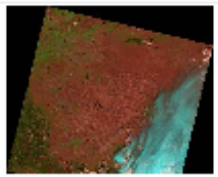
65. IRS_AWIFS, FULL, 08/09/06



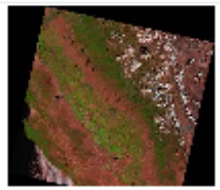
66. IRS_AWIFS, FULL, 08/09/06



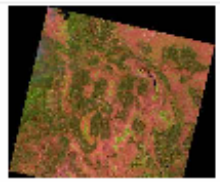
67. IRS_AWIFS, FULL, 08/05/06



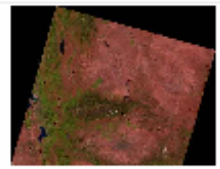
68. IRS_AWIFS, FULL, 08/01/06



69. IRS_AWIFS, FULL, 07/31/06

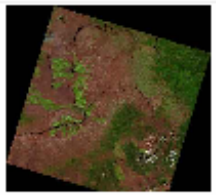


70. IRS_AWIFS, FULL, 07/27/06



71. IRS_AWIFS, FULL, 07/27/06

72. IRS_AWIFS, FULL, 07/26/06

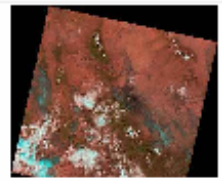


73. IRS_AWIFS, FULL, 07/25/06

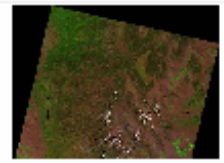
74. IRS_AWIFS, FULL, 07/25/06

75. IRS_AWIFS, FULL, 07/25/06

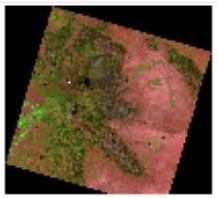
76. IRS_AWIFS, FULL, 07/25/06



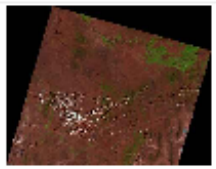
77. IRS_AWIFS, FULL, 07/23/06



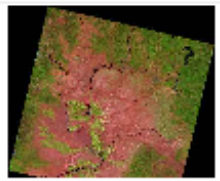
78. IRS_AWIFS, FULL, 07/22/06



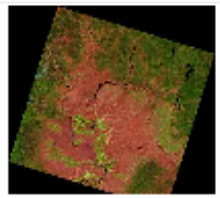
79. IRS_AWIFS, FULL, 07/22/06



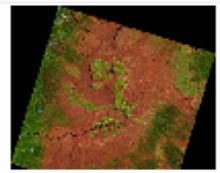
80. IRS_AWIFS, FULL, 07/21/06



81. IRS_AWIFS, FULL, 07/21/06



82. IRS_AWIFS, FULL, 07/20/06



83. IRS_AWIFS, FULL, 07/20/06

84. IRS_AWIFS, FULL, 07/20/06

USDA Satellite Imagery Archive

# Browse

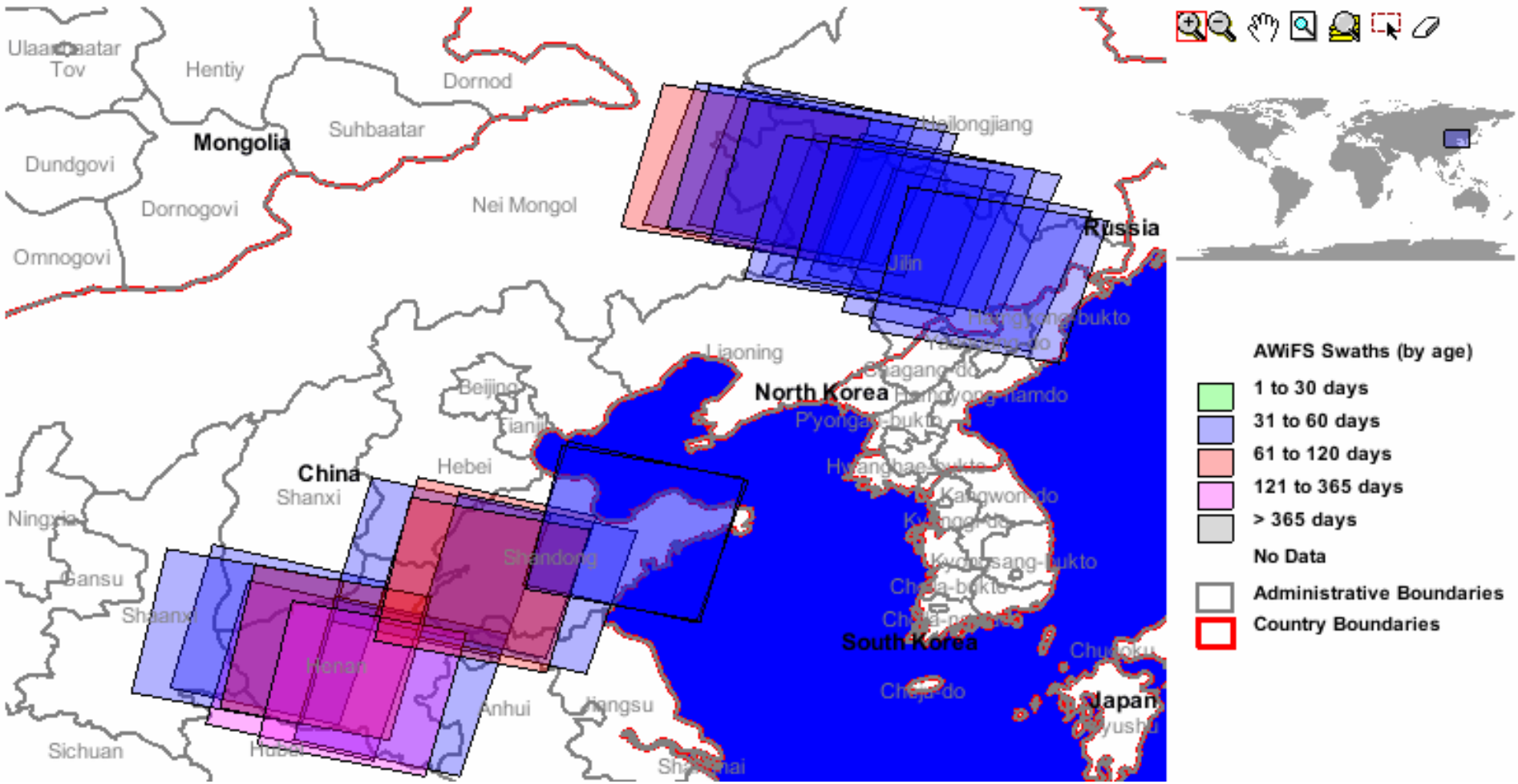
Click to view FGDC Metadata

| Sensor | Date | Image name | Version | Path | Start Row |
|---|---|---|---|---|---|
| IRS_AWIFS, FULL | 09/16/06 | J245041_20060916_D.jpg | 4 | 245 | 41 |

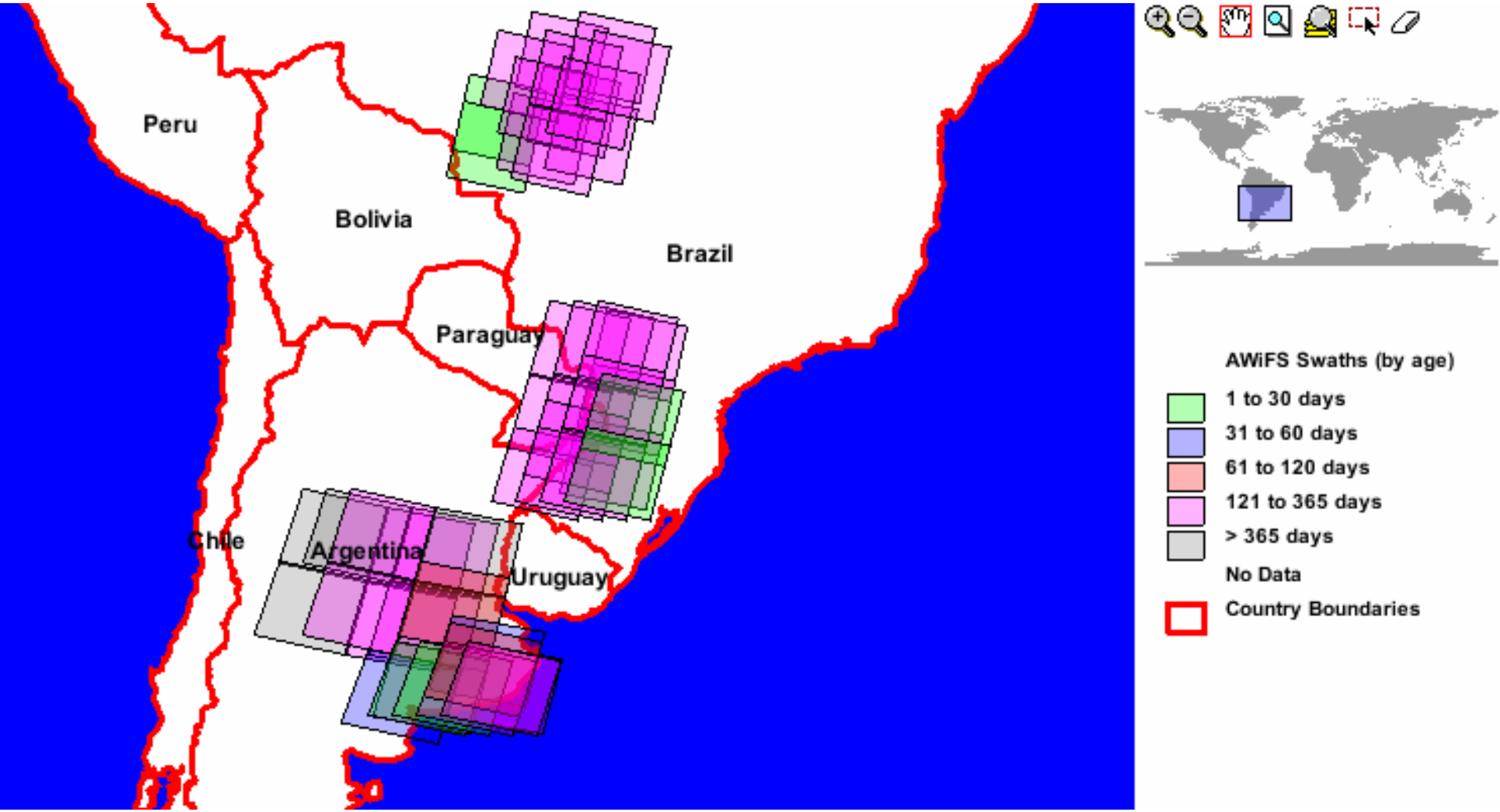
# Table Version of Query Results

| ITEM | IMAGE | DESCRIPTION | SIZE (Mb) | ACQUISITION DATE | PATH | START ROW | END ROW | ANALYST AREA | VERSION | NORTH | SOUTH | EAST | WEST |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | J316087_20061029_B.JPG | IRS_AWIFS, FULL | 200756736 | OCT. 29, 2006 | 316 | 87 | 87 | SA | 2 | - 11 | - 15 | - 56 | - 60 |
| 2 | J316088_20061029_B.JPG | IRS_AWIFS, FULL | 200684544 | OCT. 29, 2006 | 316 | 88 | 88 | SA | 2 | - 12 | - 16 | - 57 | - 61 |
| 3 | J324106_20061021_C.JPG | IRS_AWIFS, FULL | 216482816 | OCT. 21, 2006 | 324 | 106 | 106 | AR | 3 | - 36 | - 40 | - 58 | - 63 |
| 4 | J088050_20061018_B.JPG | IRS_AWIFS, FULL | 209720320 | OCT. 18, 2006 | 88 | 50 | 50 | IN | 2 | 33 | 29 | 74 | 69 |
| 5 | J328096_20061017_C.JPG | IRS_AWIFS, FULL | 213070848 | OCT. 17, 2006 | 328 | 96 | 96 | SA | 3 | - 24 | - 28 | - 50 | - 55 |
| 6 | J328098_20061017_C.JPG | IRS_AWIFS, FULL | 213823488 | OCT. 17, 2006 | 328 | 98 | 98 | SA | 3 | - 27 | - 31 | - 51 | - 56 |
| 7 | J323106_20061016_C.JPG | IRS_AWIFS, FULL | 220790784 | OCT. 16, 2006 | 323 | 106 | 106 | AR | 3 | - 36 | - 40 | - 59 | - 64 |
| 8 | J087052_20061013_D.JPG | IRS_AWIFS, FULL | 208466944 | OCT. 13, 2006 | 87 | 52 | 52 | IN | 4 | 27 | 23 | 71 | 67 |
| 9 | J135039_20061013_B.JPG | IRS_AWIFS, FULL | 218188800 | OCT. 13, 2006 | 135 | 39 | 39 | CH | 2 | 46 | 42 | 129 | 123 |

# China (**11/13/2006**)



# South America **(11/13/2006)**



# ASRC MS IMAGERY PRIME VENDOR

## Global Satellite Imagery and Services

## USDA/FAS/PECAD

- Digital Globe
- Earthsat
- Eurimage
- MDA Geospatial Services-Radarsat International
- OrbImage
- Space Imaging
- SPOT
- USGS

# USDA Satellite Imagery Archive Overview of Goals, Services, Budget and Risks

- The USDA Satellite Imagery Archive (USDA-SIA) was formed March 16, 2000 by a MOU signed by the Under Secretaries of:
  - Farm, Foreign Agricultural Service
  - Marketing and Regulatory Programs
  - Natural Resources and Environment
  - Research, Education and Economics
  - Chief Economist
  - Chief Information Officer

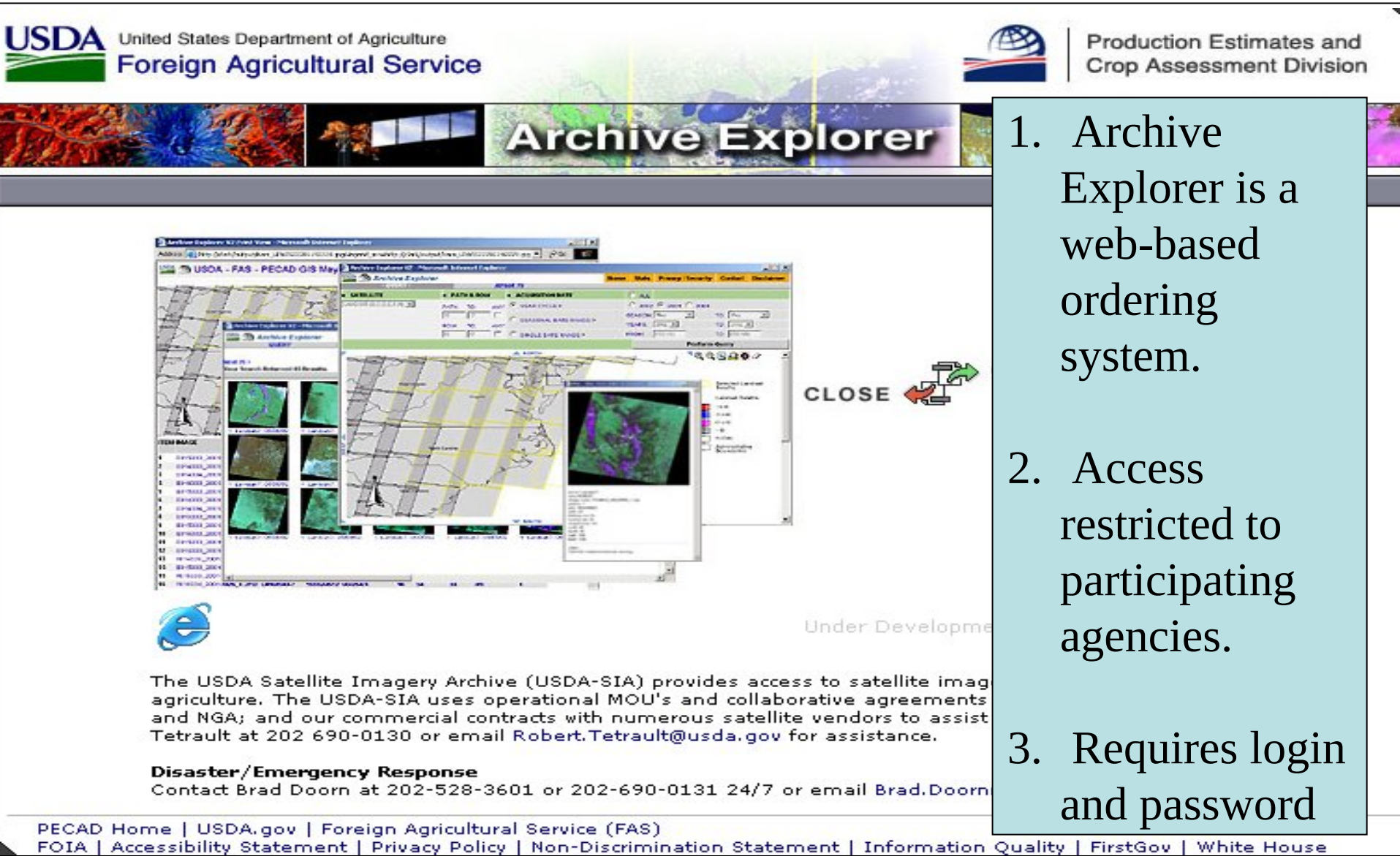
# Goals of the USDA Satellite Imagery Archive

1. Access to satellite imagery purchased by USDA for participating agencies.
2. Cost-sharing program to maximize the cost effectiveness of Department expenditures on satellite imagery.
3. Reduce the per-image price paid by USDA agencies, and take advantage of contracts already in place.
4. Benefit from leveraging the power of a single USDA purchasing body.

# Access to Satellite Imagery and Distribution Service

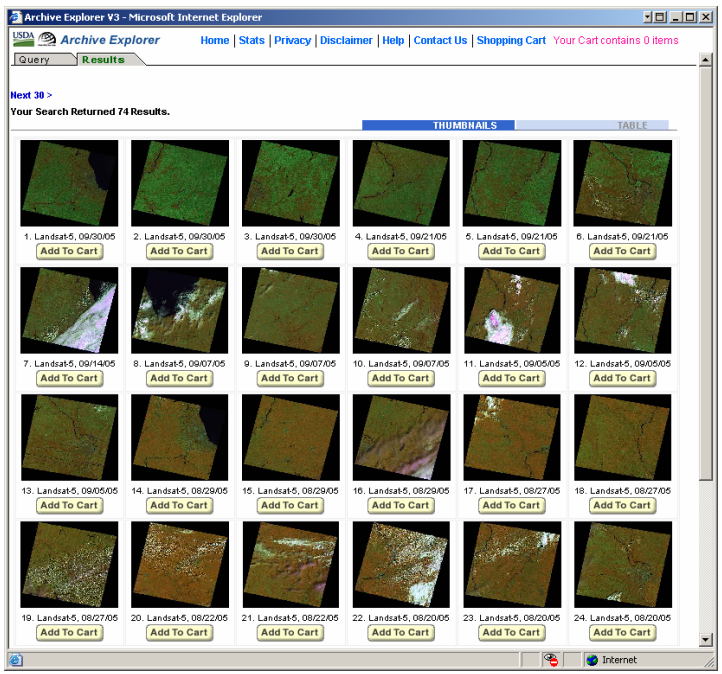
- Funding through agency's annual subscription fees (AD-672)
- Participating agencies have access to satellite imagery purchased by USDA (through Archive Explorer.)
- Archive Explorer is a web-based tool allowing search and discover for appropriate imagery.
  - Imagery is ***free*** to participating agencies.
- On-line ordering via "shopping cart."
- USDA-SIA (ASRC-IT) copies CD and delivers data via common carrier (e.g. FedEx)

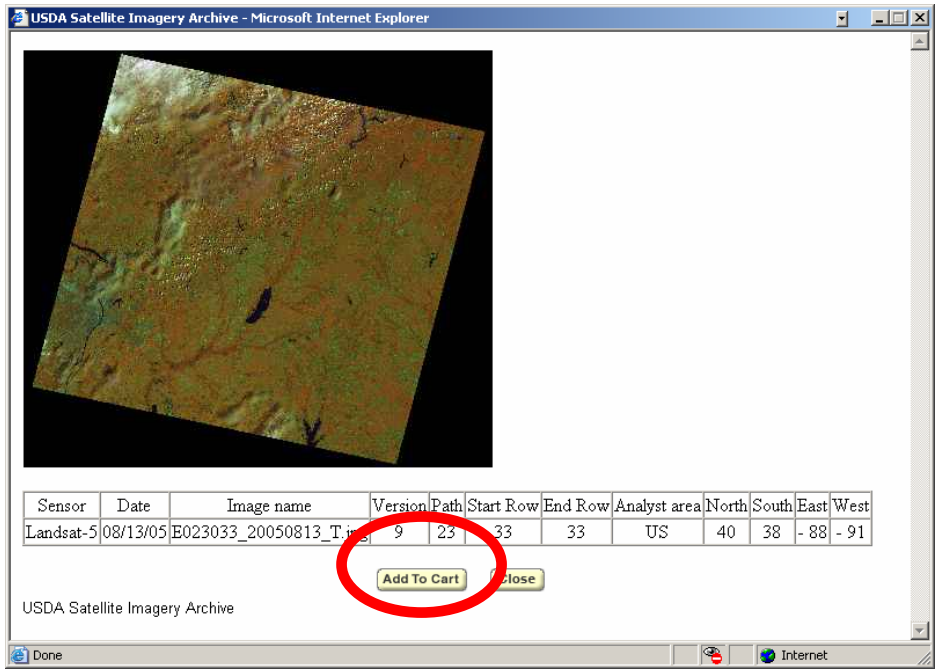
**Archive Explorer can be found at: http://www.pecad.fas.usda.gov/remote.cfm**




1. Archive Explorer is a web-based ordering system.
2. Access restricted to participating agencies.
3. Requires login and password

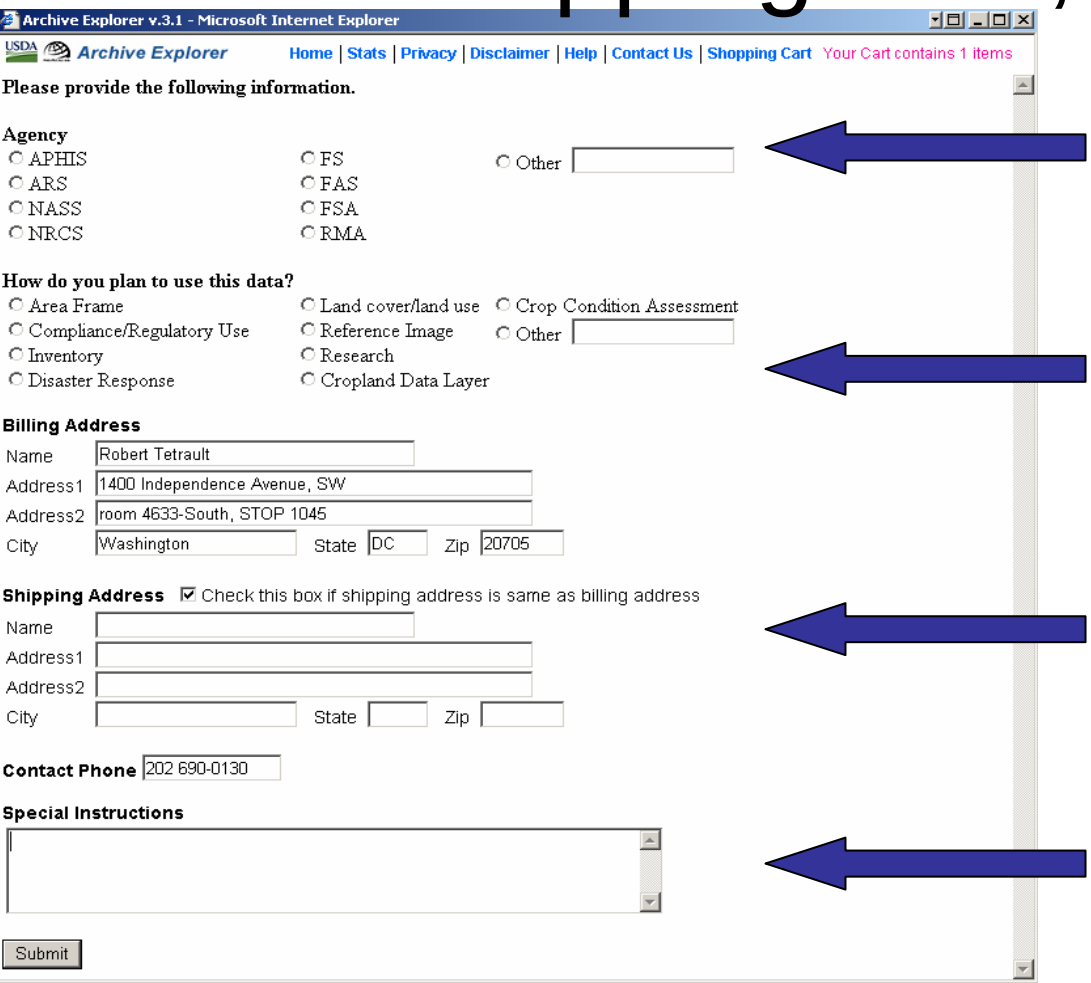
# Distribution Service Shopping Cart



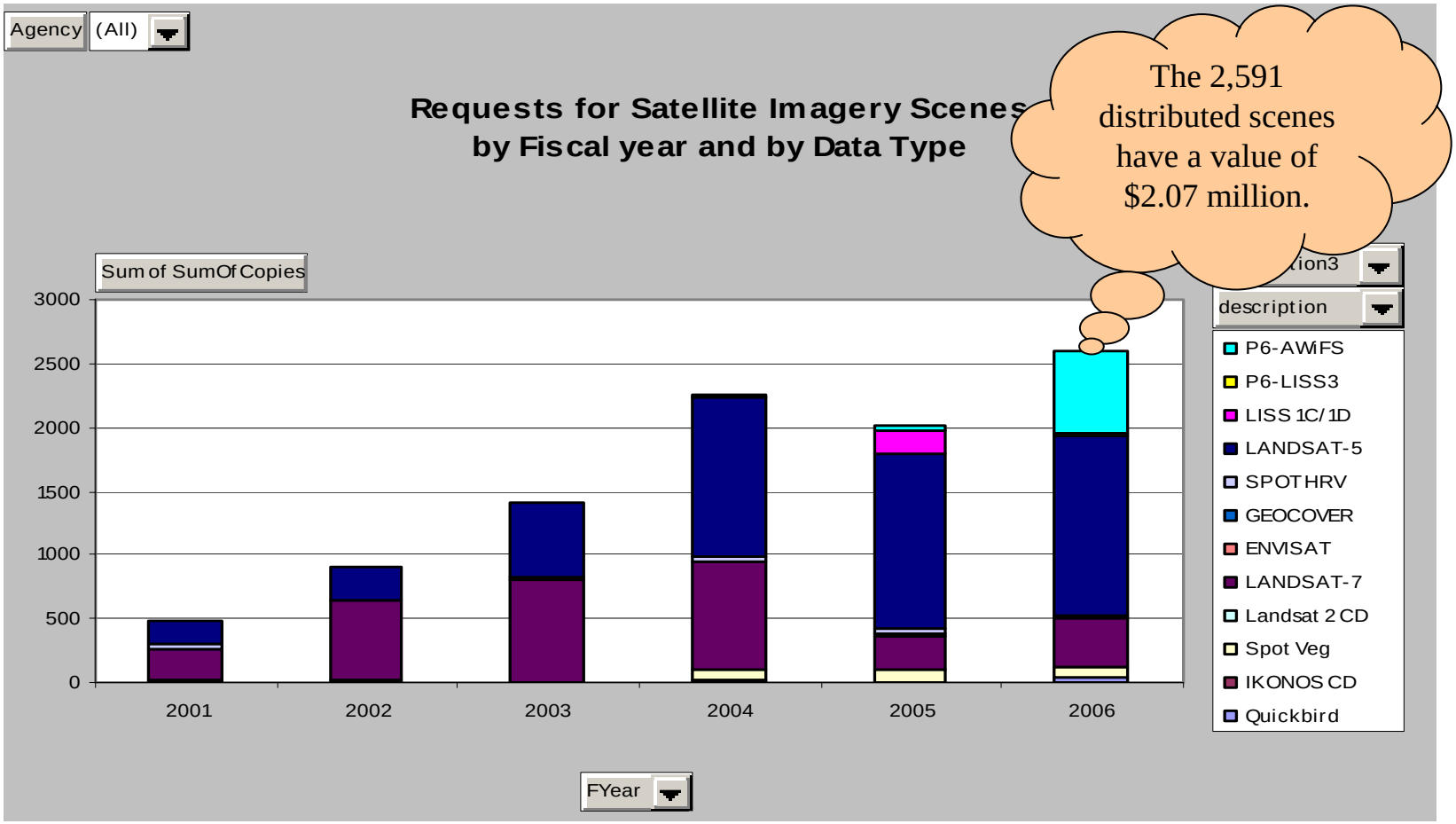

- "Add to Cart" buttons are on the thumbnail view as well as the larger view.

# Distribution Service Shopping Cart, continued




- Please check the appropriate agency.
- Categorize how you plan on using the satellite imagery.
- Please check to make sure your billing address, shipping address, and telephone number are correct.
- Send us any special instructions.

# Goal 1: Access to Satellite Imagery USDA-SIA Delivered over 2,500 Scenes in FY2006



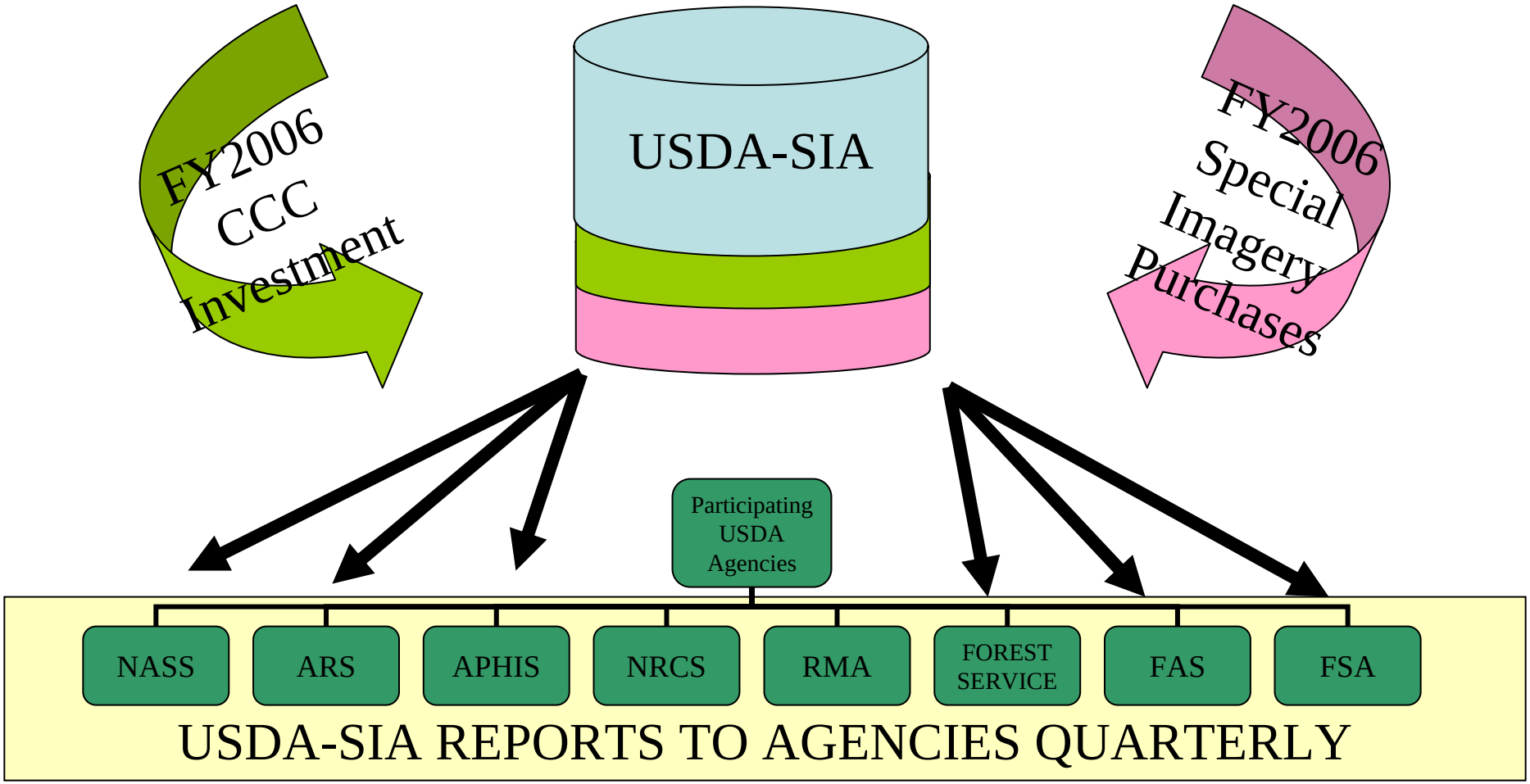
# Goal 2: Cost-sharing to Maximize Cost effectiveness

## Department Expenditures on Satellite Imagery

- USDA agencies participate in the USDA-SIA by transferring funds through agency's annual subscription fees (AD-672)
- Fees cover the cost of access and distribution of satellite imagery.
- Agencies can request any image in the USDA-SIA for ***free***.
- Agencies can request special imagery purchases with additional funds.
  - New imagery purchased using additional funds is available to all agencies.

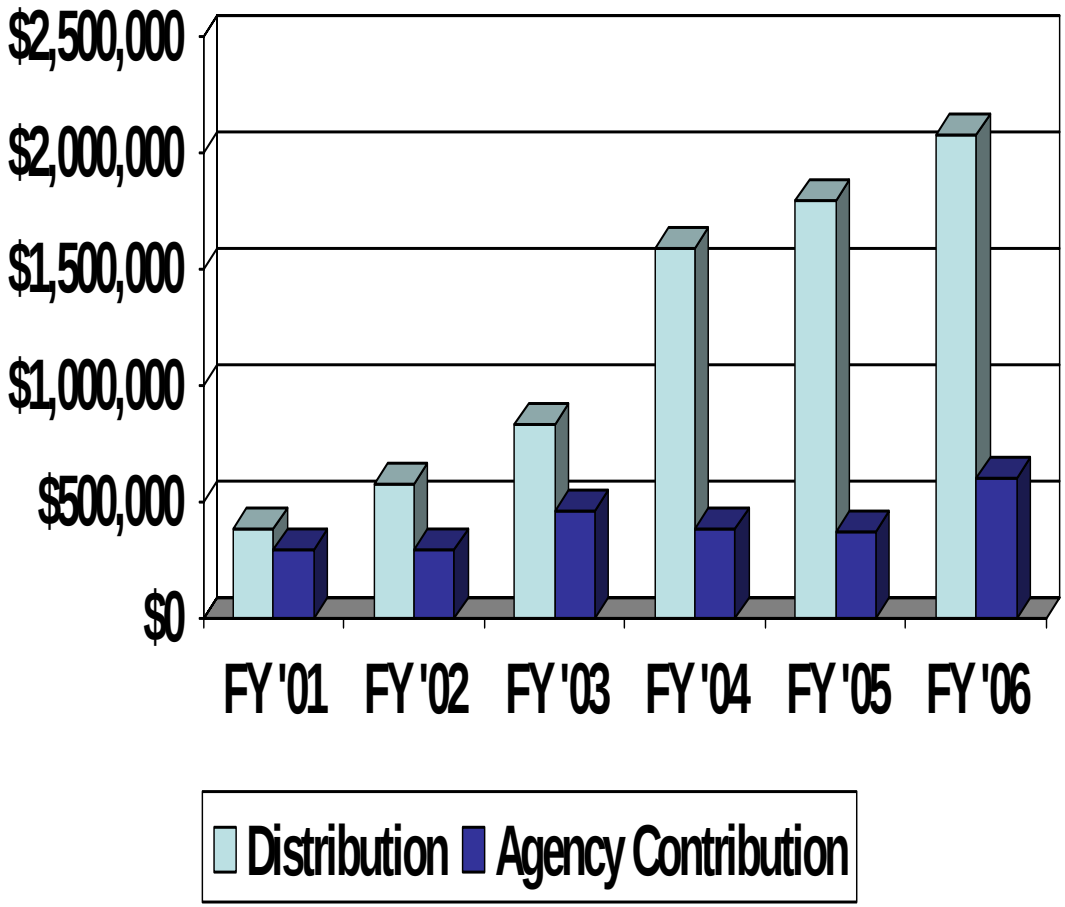
# USDA-SIA Benefits from Cooperation and the Satellite Imagery Collection Continues to Grow





# Value of Satellite Imagery Distributed by USDA-SIA





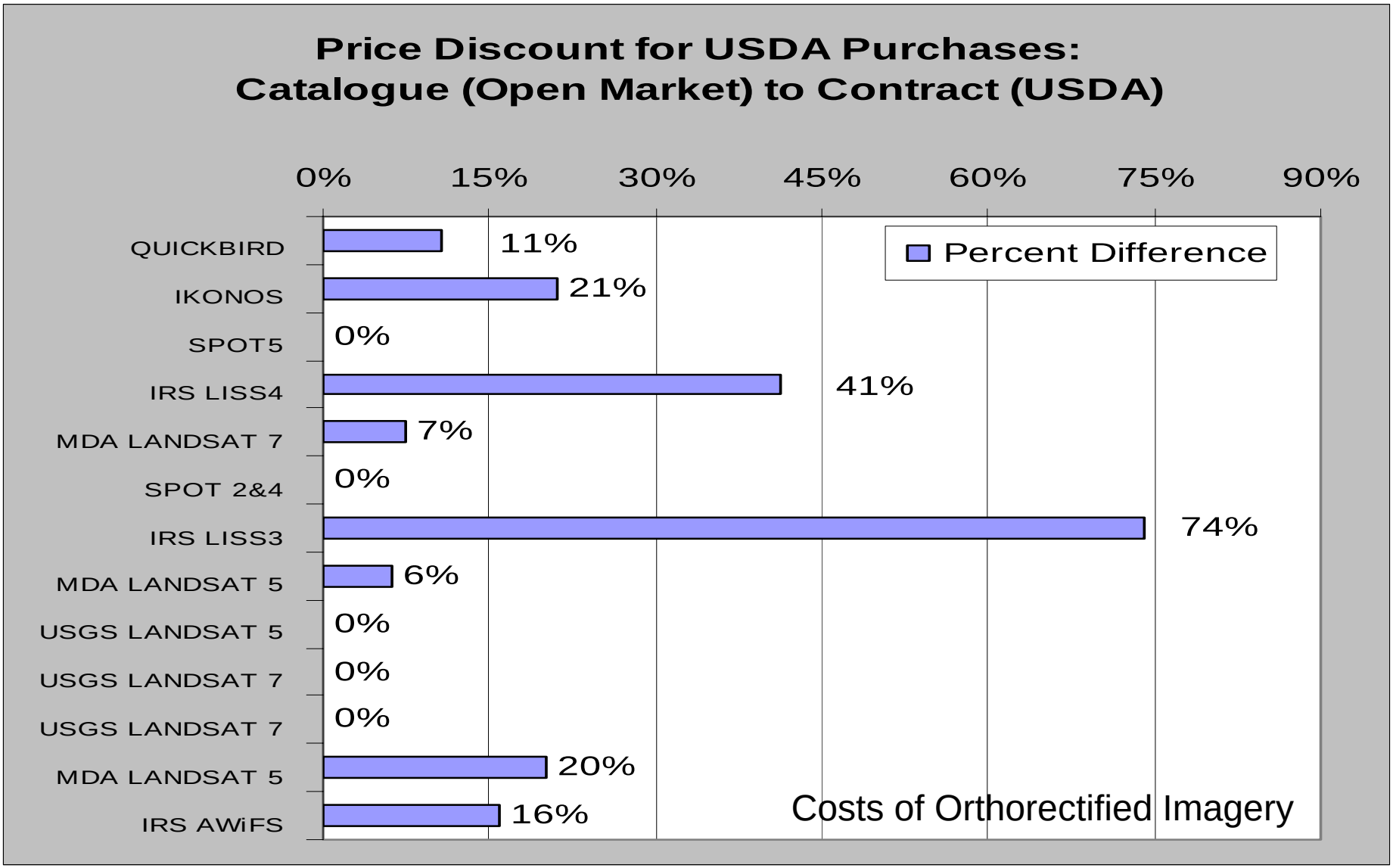

- USDA-SIA distributed satellite imagery valued at $2.07 million dollars in FY ’06.
  - Value assumes agencies would use catalogue prices from vendors.
  - Catalogue prices assumed constant from 2001 to 2006.
- Agency contribution varies by number of contributing agencies
  - Seven agencies contributed in FY ’06 @ $75,000 per year

# Goal 3: Reducing the Per-image Price and take Advantage of Contracts Already in Place

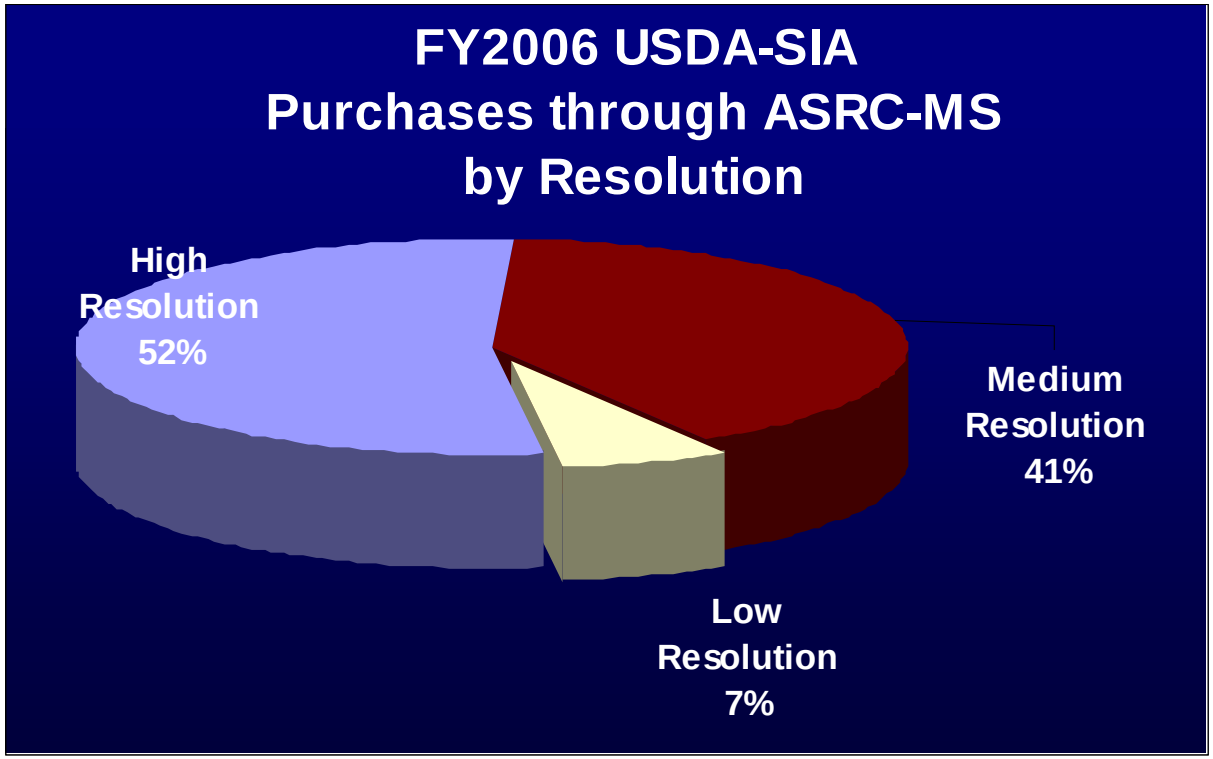


- USDA purchases satellite imagery from commercial vendors through ASRC-MS's Prime Vendor Contract-Price Matrix.
  - Negotiated prices with **seven vendors**.
  - Some vendors provided discounts, some did not.
- USDA purchases satellite imagery based on agency requirements.
  - Low resolution (worldwide coverage, FAS requirements)
  - Medium resolution (select broad areas, multiple agencies)
  - High resolution (specific project areas, special imagery purchases by specific agency)
- For medium resolution data, price on a per square kilometer basis has been reduced.

# Negotiated Prices Provide Discounts to USDA



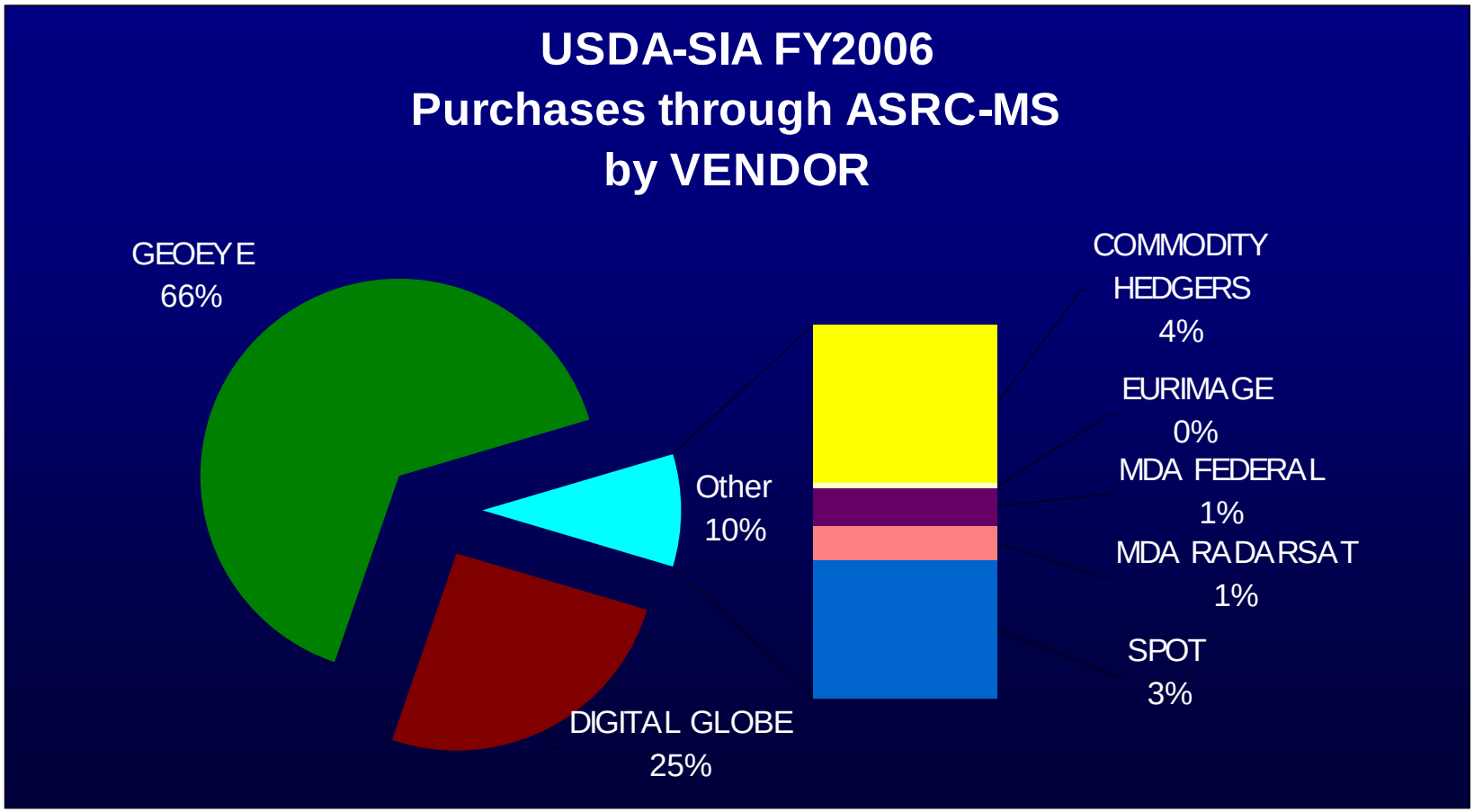
# USDA-SIA Purchased $3.5 Million in FY2006




- Prior to FY2006, USDA-SIA purchased mainly low resolution and medium resolution data.
- High resolution purchases due to new contract.
  - Special Imagery Purchases

**Low resolution:** 1 km GSD or greater, applicable for regional monitoring.
**Medium resolution:** 5 to 100 m GSD, applicable for field and forest monitoring.
**High resolution:** 0.5 to 5 m GSD, applicable for mapping and within field analysis.

# USDA-SIA Purchases in FY2006,



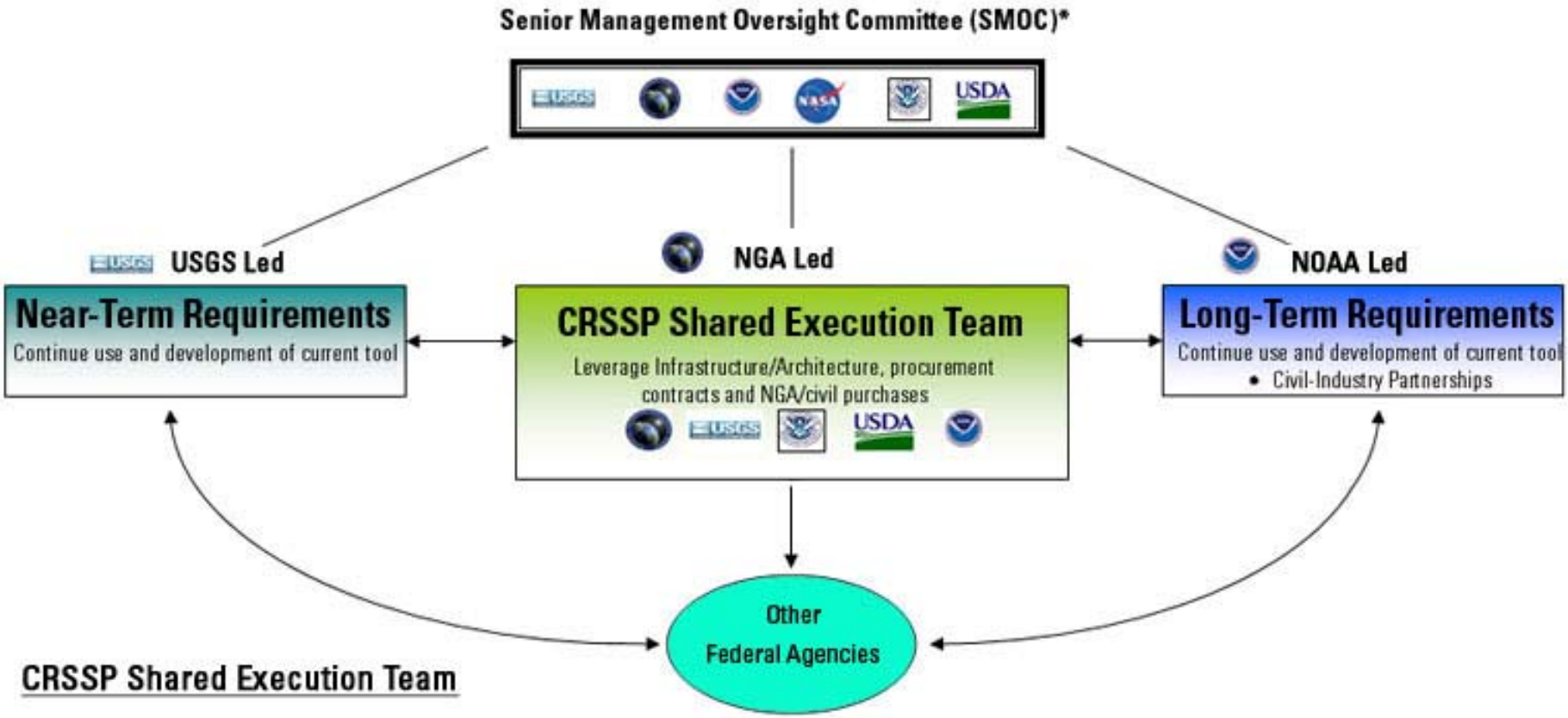

- ASRC-MS contract allows flexibility to choose vendor.
- Seven different vendors used in FY2006
- Contract allows flexibility for changing requirements.

# How to Initiate Purchase

## Ordering data through FAS Satellite Imagery Contract :

1. Contact Bob Tetrault-place order via robert.tetrault@FAS.usda.gov and Call Bob Tetrault at 202-690-0130
2. MPR money for high resolution imagery
3. Data will be ordered through a task order through the purchase order through the contract vehicle

# CRSSP Civil/NGA Shared Execution Construct




## CRSSP Shared Execution Team

- **Infrastucture/Architecture [I/A] (NGA/USGS)**
  - NGA provides for leveraging of its I/A and technology
  - USGS provides for leveraging of its I/A and technology
- **Contracts (NGA/USGS)**
  - Coordinate procurement vehicles
  - Ensure broad distribution options for civil needs
  - Bonus off NGA contracts
- **Purchase (NGA/civil agencies)****
  - Leverage NGA/civil purchases in areas of common interest
  - Upgrade licenses when additional needs can be met

*** The SMOC will report status and plans at the NGA-hosted CEO Sessions**

**** Budget – Each agency is responsible for seeking its own resources**

# CRSSP Requirements Process ~ Entry to Imagery

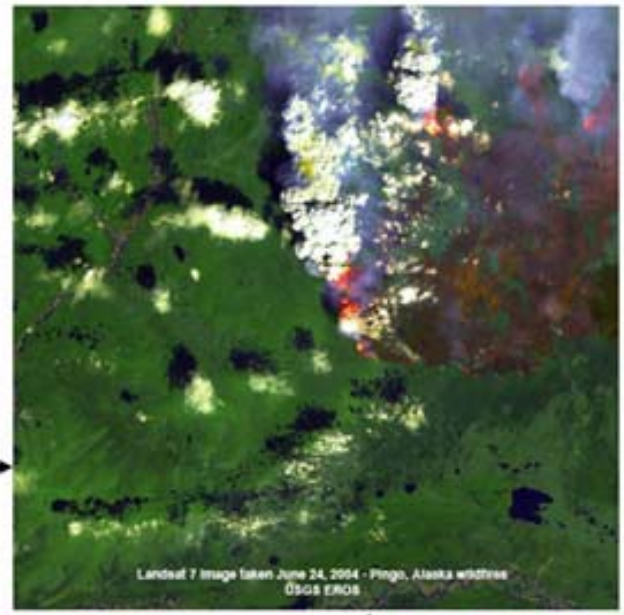
**User Submits Remote Sensing Requirement**

**Requirement Acceptance**
- Review & Validation

**Does the imagery exist?** (CRSSP library)

**YES**

**Image Data Delivery**
- Obtain from Government
- Procure license uplift from vendor




**NO**

**Are funds secured?**

**YES**

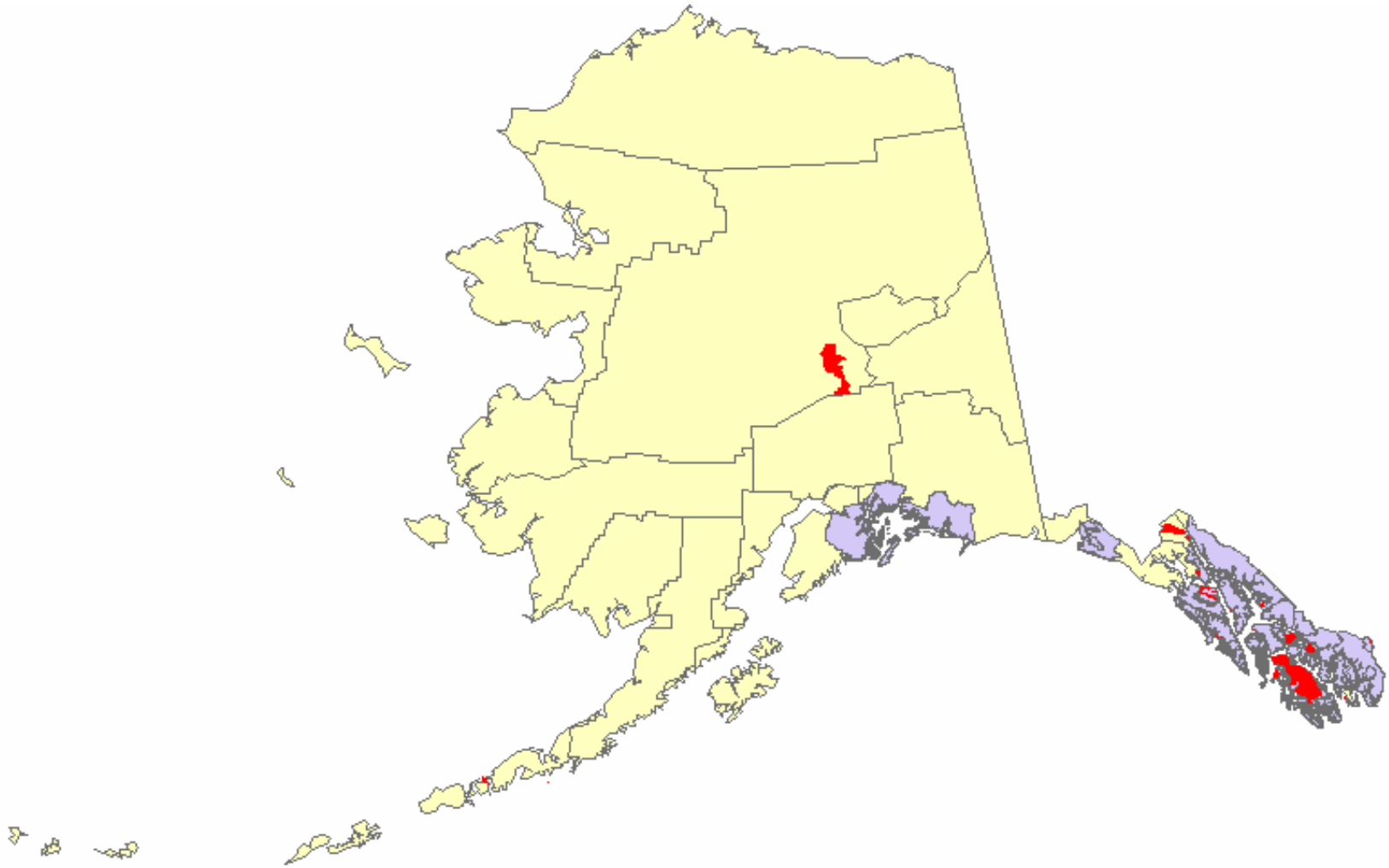
**NO**

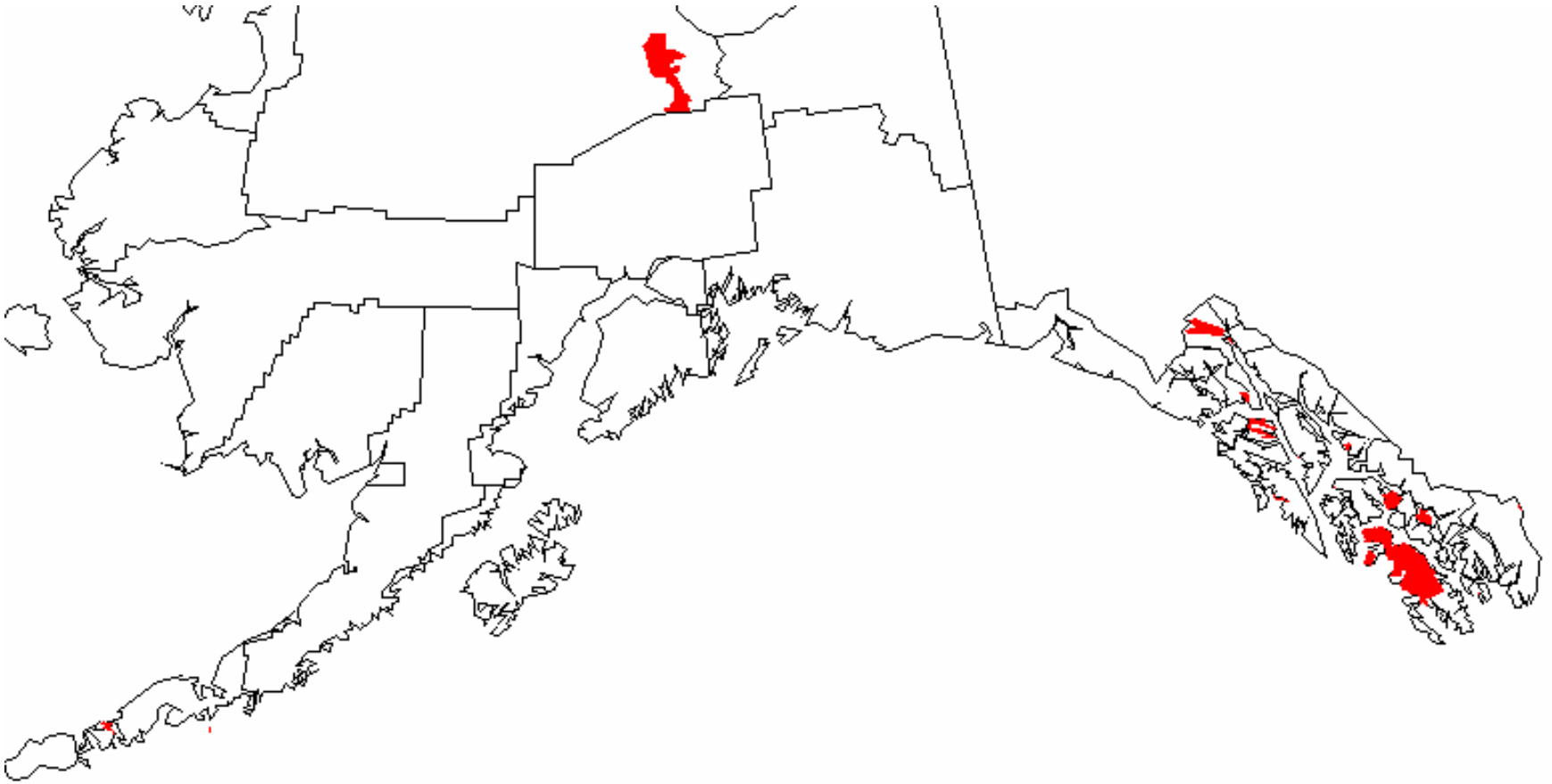
**Determine Intersections**
- Intersection discovery tool
- Potential partners

**Image Data Delivery** (New Acquisitions)
- Contract vehicle
- Partnerships

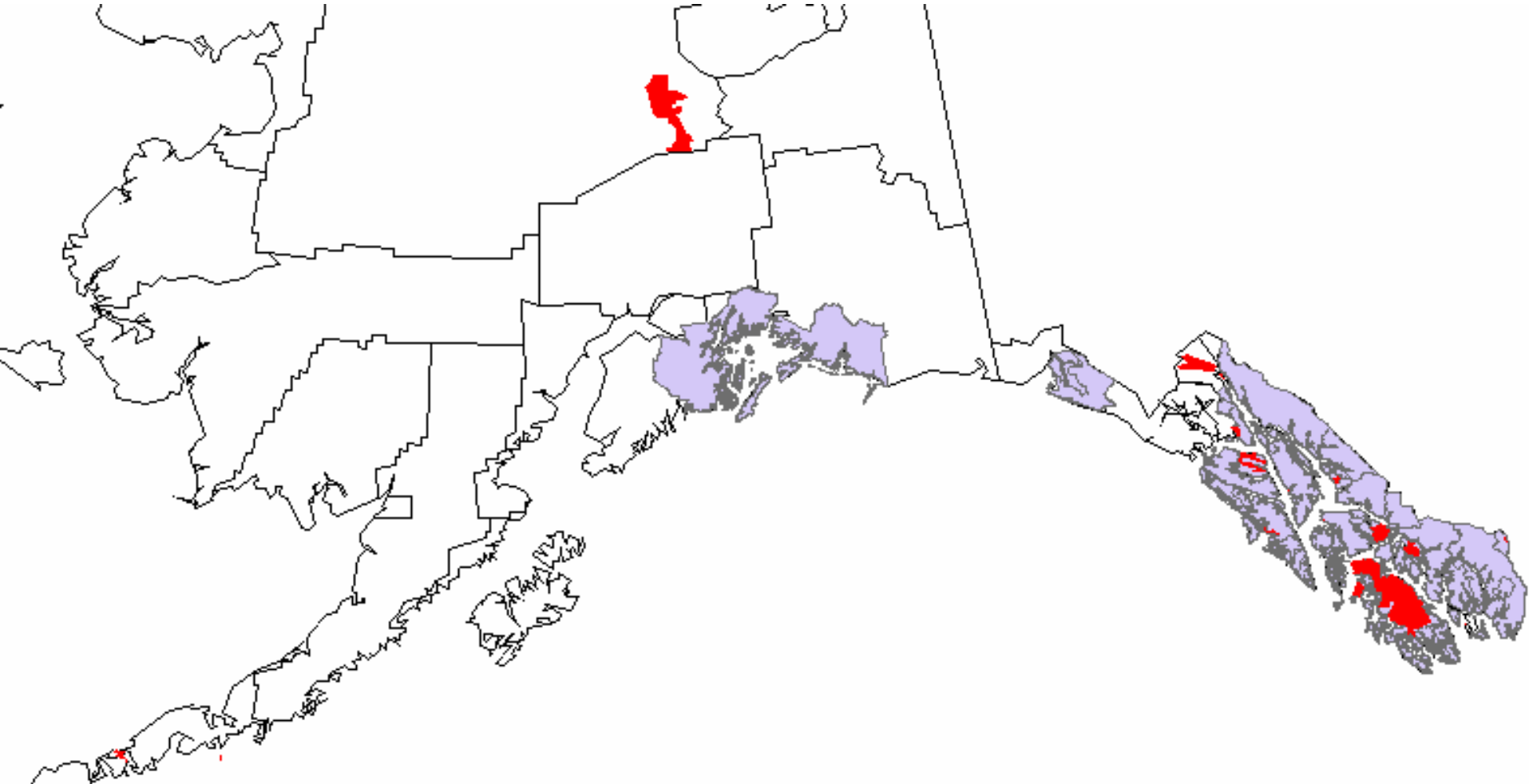
* The red boxes indicate processes that are or will be automated

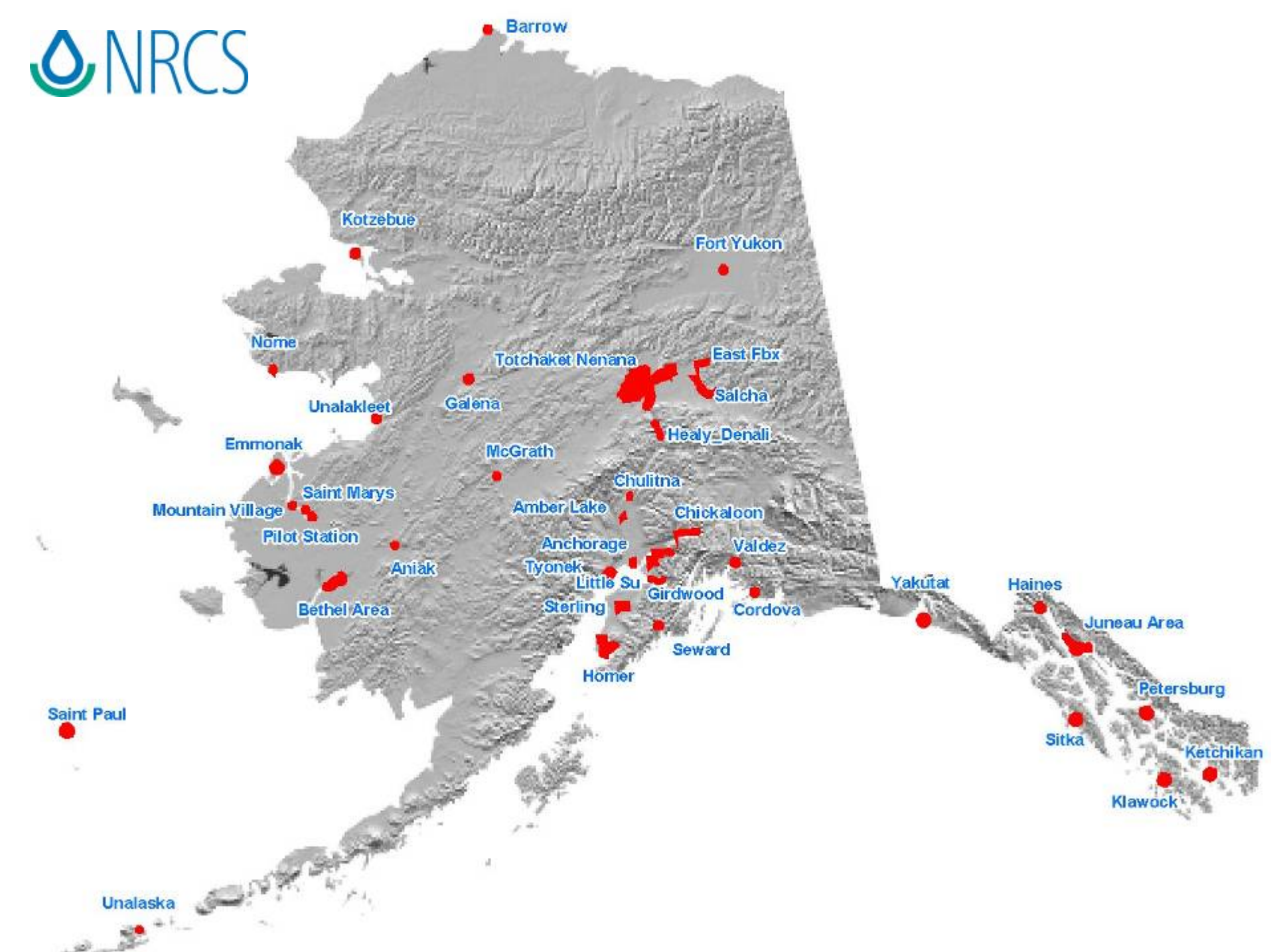
# Census Acquisitions in AK





# Intersection with Forest Service




NRCS
Barrow
Kotzebue
Fort Yukon
Nome
Totchaket Nenana
East Fbx
Salcha
Galena
Unalakleet
Healy_Denali
Emmonak
McGrath
Chulitna
Saint Marys
Mountain Village
Amber Lake
Chickaloon
Pilot Station
Anchorage
Valdez
Aniak
Tyonek
Little Su
Girdwood
Yakutat
Haines
Bethel Area
Sterling
Cordova
Juneau Area
Seward
Homer
Petersburg
Saint Paul
Sitka
Ketchikan
Klawock
Unalaska

# Getting Census  Imagery

Both the State Clearinghouse and the EROS data center have copies of the imagery and the DEMS and will be posting them at some point in the future.

# U. S. Department of Agriculture Requirements for Space-Based Earth Observations in Support of the U.S. Commercial Remote Sensing Space Policy

**Draft November 2006**

**Current round of updates by FAS, NRCS, FS**

**Early next year: Distribution to all.**

# JACIE input about NAIP Issues/More Analysis Required

- Standards that can be quality controlled:
  - Tone balancing mosaics
  - Consistent Color (image to image, year to year)
  - Post Processing Haze Reduction
  - 16 bit or 11-bit to 8 conversion
  - Detail loss at one or both ends of the histogram
  - Automation of Quality Control to the Maximum Practical Extent

- During technical evaluation of a contract proposal, can we rate one camera vs. another?
  - Framing vs. push-broom.

# USDA Issues/More Analysis Required As Presented to JACIE:

- Future Deliverables
  - When to take delivery on original digital collections?
  - Rectification Solution / enhancement as a deliverable?
  - Additional bits. (8 bit → 11 bit → 16 bits)

- Frame based vs. Line Scanner Cameras
  - GPS/IMU vs. GPS/IMU and AT solutions.
  - 4-band image creation.
  - During technical evaluation, an we rate the value of one camera vs. another?

- What are the Maximum Pan Sharpening ratios that should be allowed?
  - 1 meter true color image
    - all three bands be acquired at 1 meter or less

# Joint Agency Commercial Imagery Evaluation (JACIE)

- USDA has been invited to join the Joint Agency Commercial Imagery Evaluation (JACIE) team. The document describing purpose, parties, and responsibilities is attached. The JACIE characterizes commercial remote sensing data products and is a single federal government point for the commercial remote sensing industry for independent product characterization. The JACIE characterization of remote sensing data products are used by the USDA-SIA for informed decision-making about buying certain data products.

  Although joining the JACIE is without cost and each party funds its own participation, there are costs associated with the annual meeting in March 2007. Costs are anticipated at **~$9,000**.

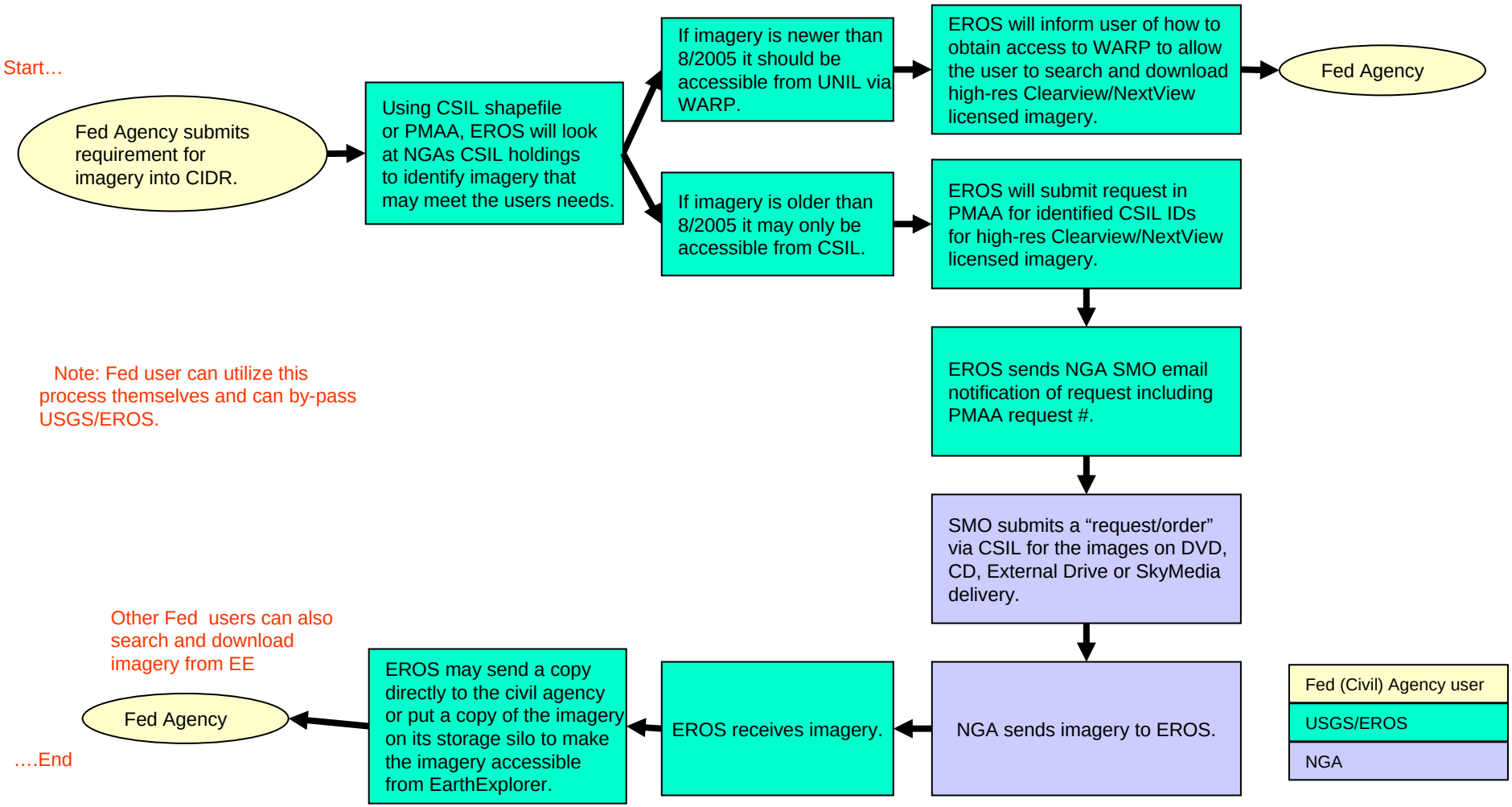
# Note From Harlan

- RSCC Agency Representatives:

  Please see the summary below from Bob Tetrault re: JACIE, which was discussed it the last RSCC meeting. Please email Bob (Robert.Tetrault@usda.gov) directly whether your agency supports or does not support the USDA joining JACIE. Your yes/no decision is needed by no later than Dec 22, 2006. If you need additional information on JACIE, please direct those questions directly to Bob as well.

- Funding Sources?

# Process for obtaining existing imagery from CSIL-UNIL. With or without USGS/EROS assistance.



# Simpler Method

- Download CSIL shapefiles
- See if any imagery was acquired.
- Find Something You Wanted?
  - Download using WARP
  - Call NGA Bob Lease and request imagery

# Links for Future Information and Data

- **USDA Aerial Photography Field Office**
  - **NAIP and USDA Aerial**
    - **http://apfo.usda.gov**

- **USDA Data Gateway**
  - **Data products packaged by county**
    - **http://datagateway.nrcs.usda.gov**

- **Forest Service geospatial data clearinghouse**
    - http://fsgeodata.fs.fed.us
  - **Data for National Forests**
    - **http://svinetfc4.fs.fed.us/**
- **Forest Service's Remote Sensing Applications Center (RSAC)**
  - **Fire Mapping, Resource Information**
    - **http://www.fs.fed.us/eng/rsac/**

- **Foreign Agricultural Service Crop Explorer (Global imagery, weather)**
  - http://www.pecad.fas.usda.gov/cropexplorer/

- **National Agricultural Statistics Service**
  - NASS **Cropland Data Layer**
  - http://www.nass.usda.gov/research/Cropland/SARS1a.htm