

# Global Agriculture Monitoring at USDA/FAS (2007 Update)

*USDA, Foreign Agricultural Service (FAS)*

*Production Estimates and Crop  
Assessment Division (PECAD)*

# REORGANIZATION

# Global Agriculture Monitoring at USDA/FAS (2007 Update)

*USDA, Foreign Agricultural Service (FAS)*

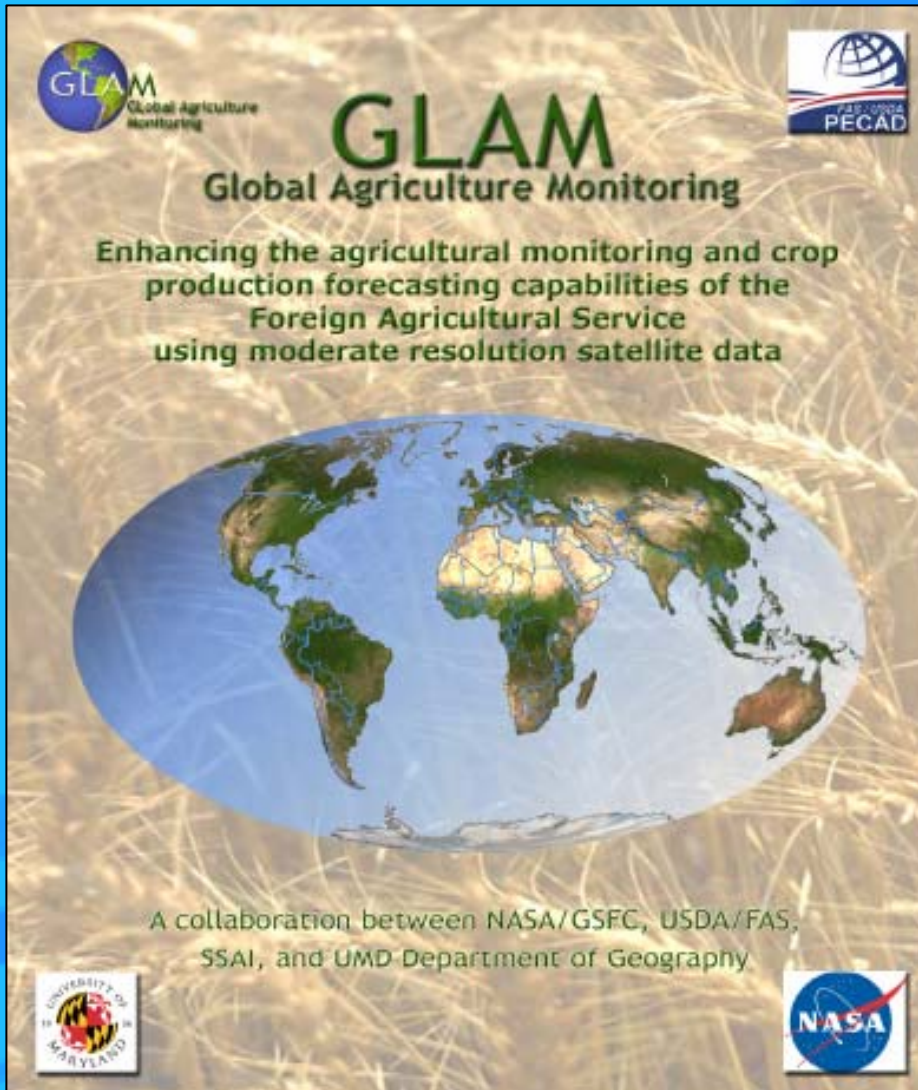
*Office of Global Analysis (OGA)*

FAS

# FAS missions

performed by OGA through funding from GLAM and the Remote Sensing Program

- **Global Crop Production Intelligence and Analysis-**  
*core mission*
  - World Agriculture Production (WAP)
  - Primary international input to World Agriculture Supply and Demand Estimates (WASDE)
  - Market/Trade and Food Security Analysis
- **FSA Early Warning and Crop Conditions-**  
*Department program efficiency*
  - Direct report to FSA administration
- **USDA Satellite Imagery Archive (SIA)-**  
*Department program efficiency*
  - USDA space program leadership and centralized acquisition management



**GLAM is the NASA-USDA led partnership to leverage NASA technology to improve the FAS global agriculture monitoring and reporting mission.**

From FAS Mission Statement and Appropriations:

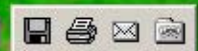
- ...maintain a world-wide agriculture reporting system
- ...analyze production and trade
- ....using remote sensing and other technologies



# Crop Explorer



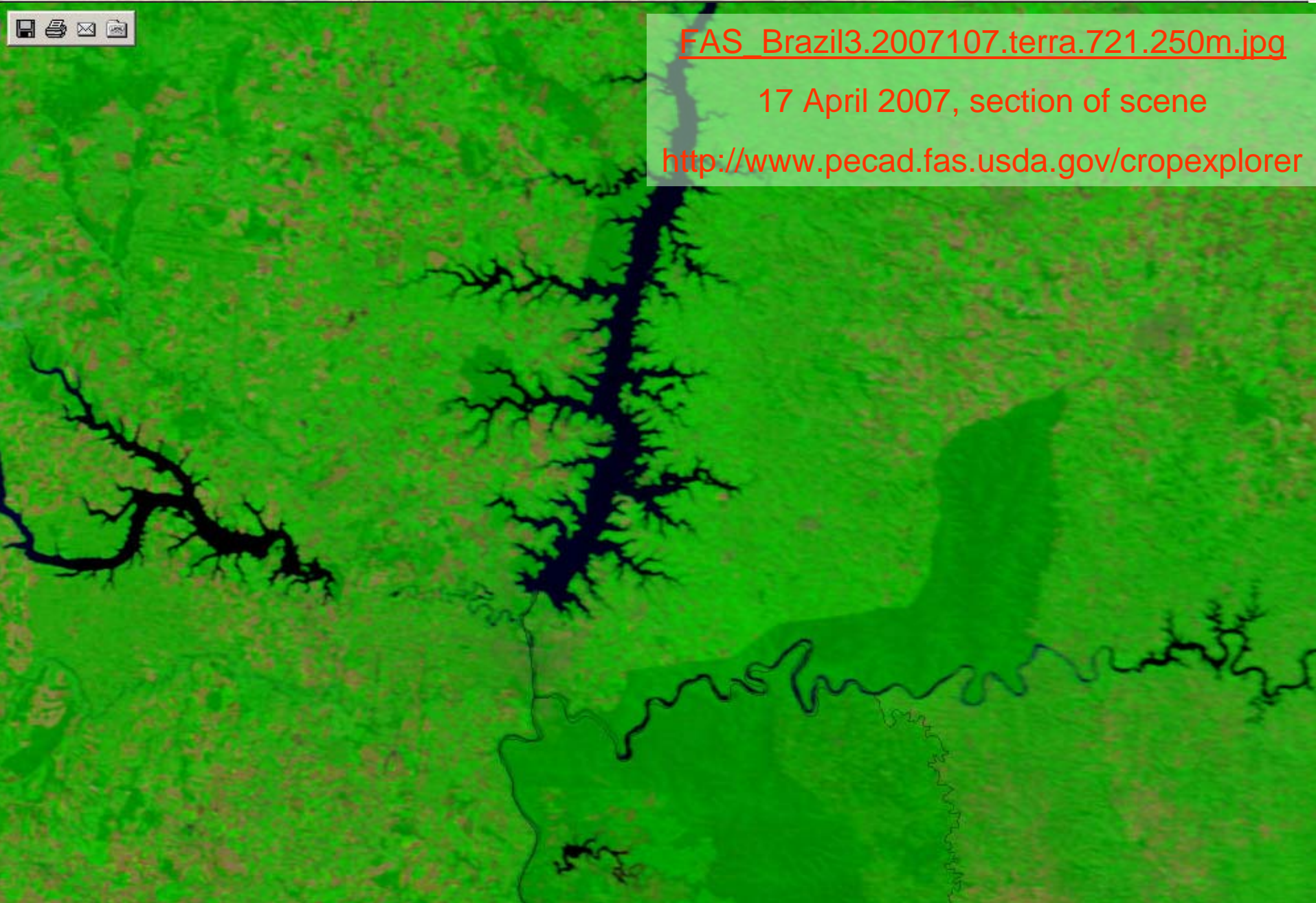
2



[FAS\\_Brazil3.2007107.terra.721.250m.jpg](http://www.pecad.fas.usda.gov/cropexplorer)

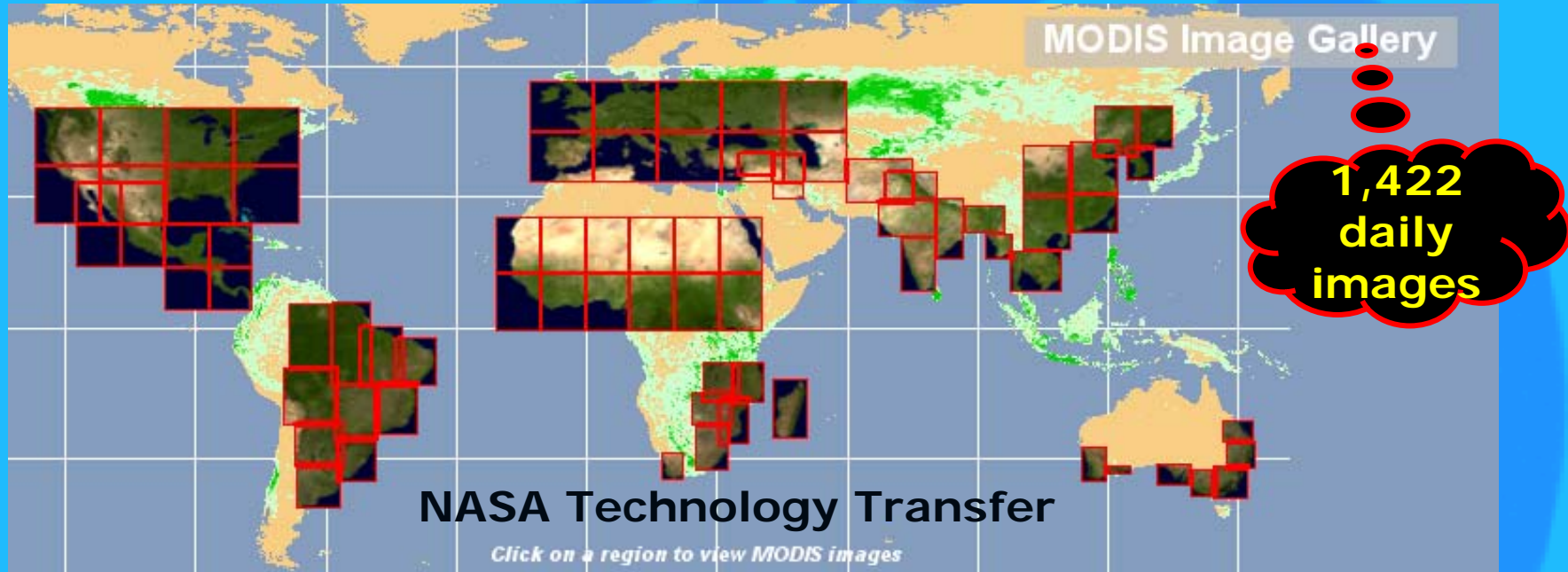
17 April 2007, section of scene

<http://www.pecad.fas.usda.gov/cropexplorer>



# MODIS Rapid Response Image Gallery 2

<http://www.pecad.fas.usda.gov/cropexplorer/>



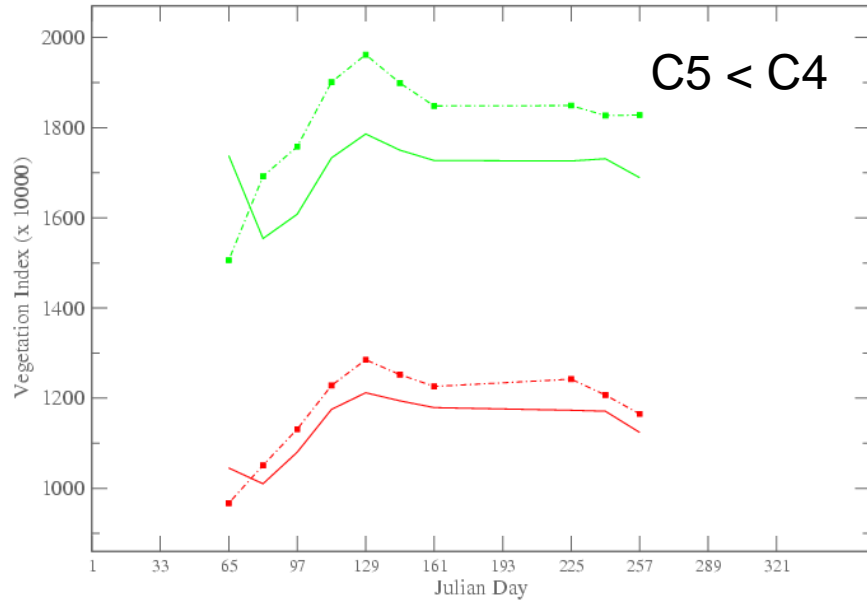
**MODIS provides rapid views of agricultural regions.**

- Two satellites (aqua & terra); three resolutions (250m, 500m, & 1,000m); two formats (jpg & geoTiff); three band combinations (true color; 7,2,1; and NDVI).
- Images are available ~ **six hours** after acquisition.

# Terra C5 Vs. C5 Southwestern US Shrubland and Grassland Biomes (LDOPE)

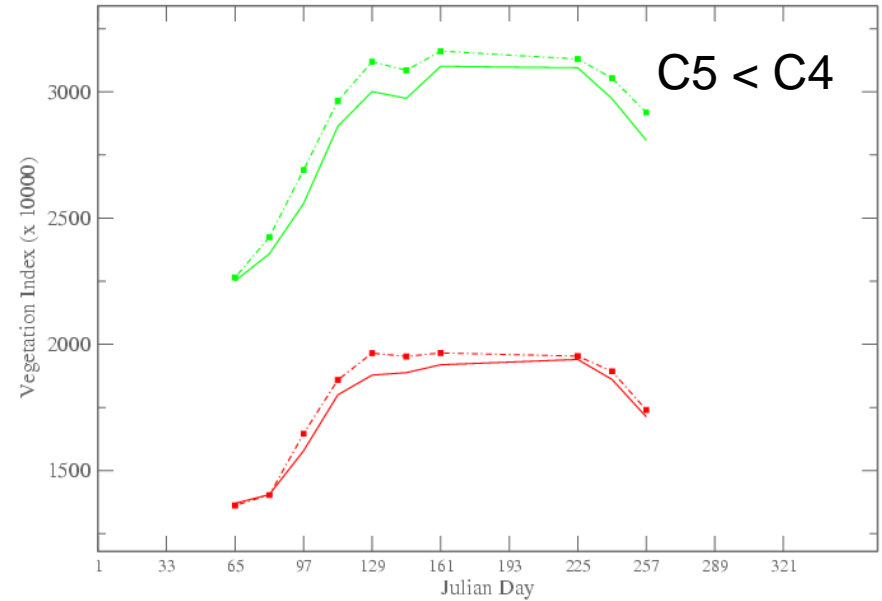
## Shrubland Biome

C4 dashed line, C5 solid line



## Grassland Biome

C4 dashed line, C5 solid line



Tue Jan 16 17:11:25 2007

Tue Jan 16 17:11:23 2007

C4 – dashed line

EVI ———

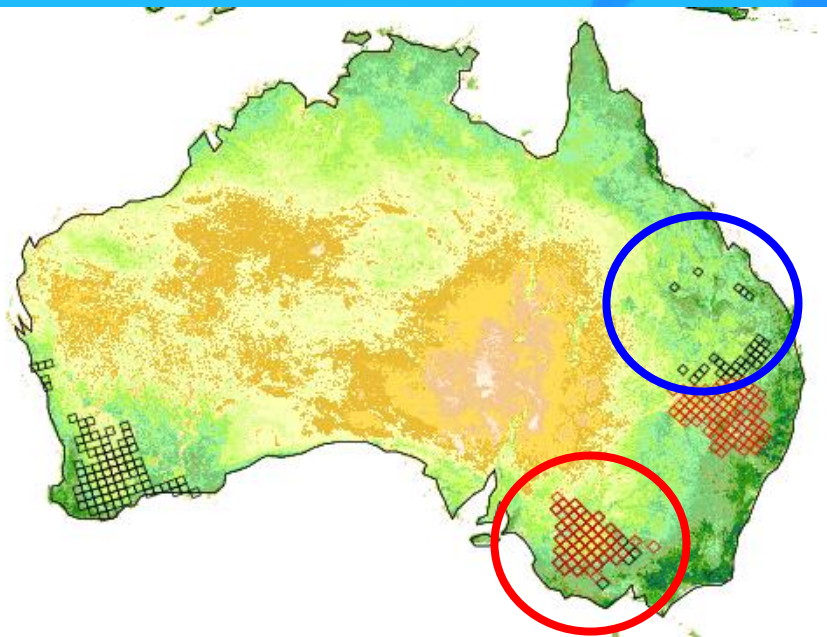
NDVI ———

16 July 2007

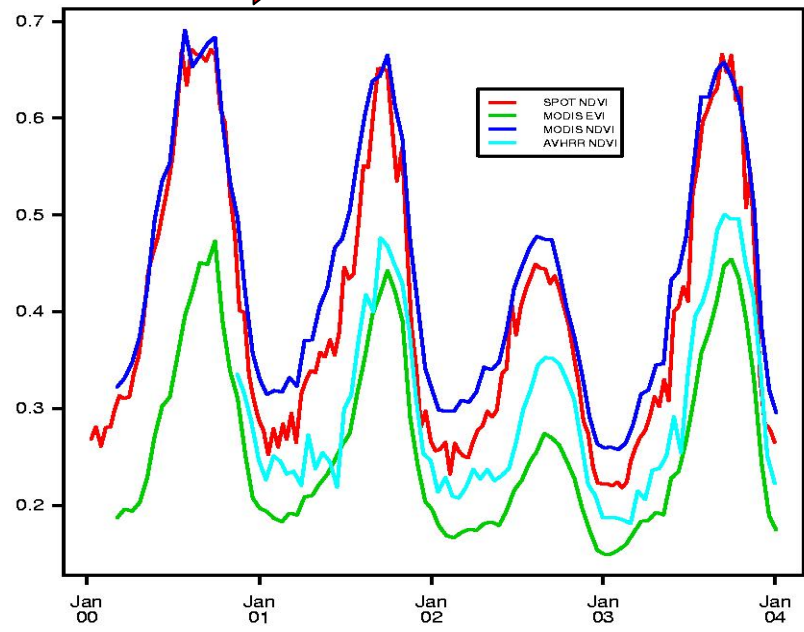




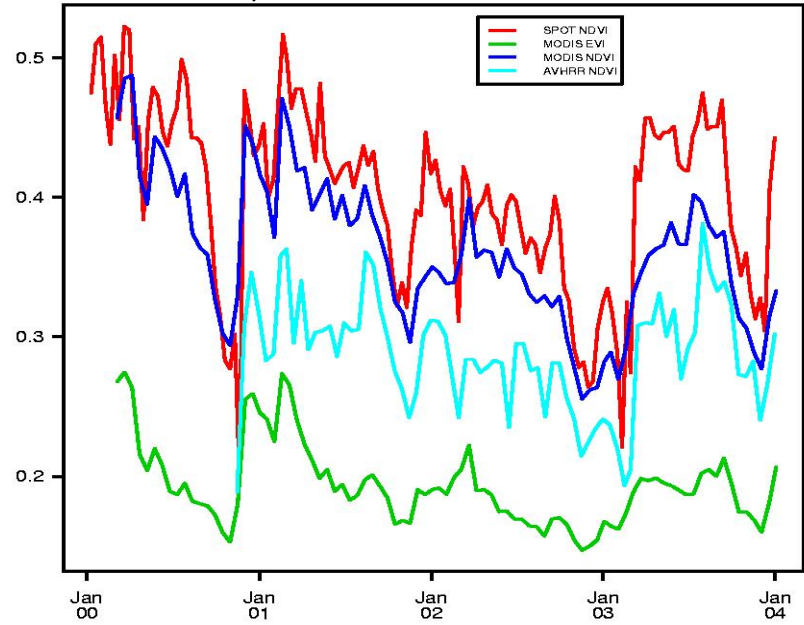
# Cross-Sensor Comparisons



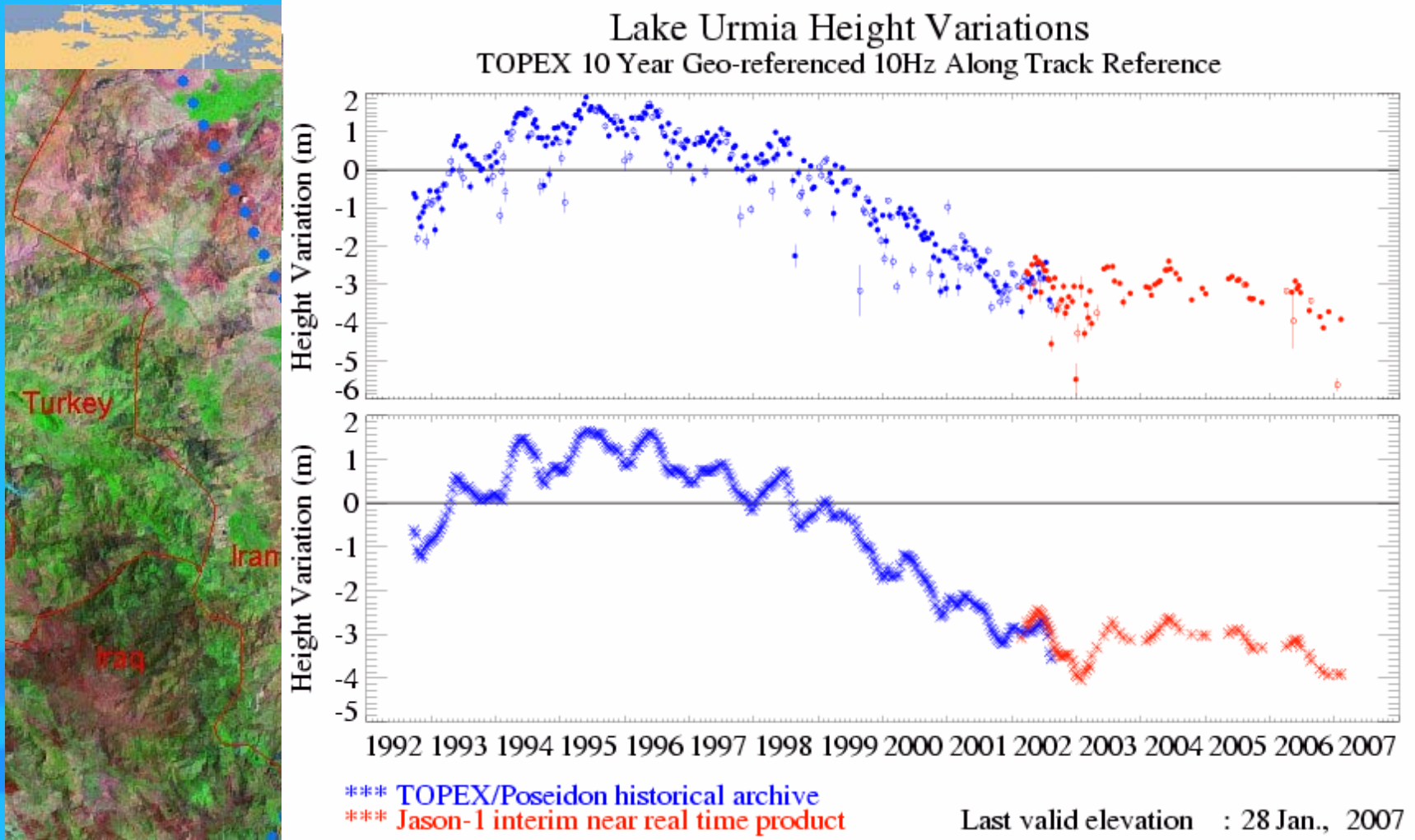
Victoria AU (barley)



Queensland AU (cotton)



# Global Reservoir and Lake Monitor



Reservoir Monitor connects satellites TOPEX/Poseidon and JASON-1 for altimeter data with Landsat data from the Landsat Global Visualization from USGS (GloVis). *An Integrated Geospatial Information Solution.*

# Making GLAM Work

- Accepting the FAS DSS format
  - Crop Explorer (web portal)



The screenshot shows the Crop Explorer web portal. At the top, it features the USDA logo and the text "United States Department of Agriculture Foreign Agricultural Service". Below this is a banner with images of crops and the text "Crop Explorer". The main content area is titled "Explore by Region" and lists various regions with their respective countries. A world map is centered on the page, with green highlights indicating the locations of the sites. The regions and their countries are:

- North America**
  - United States
  - Canada
- Central America**
  - Mexico
  - Central America and Caribbean
- South America**
  - Brazil
  - Northern South America
  - Southern South America
- Europe**
  - Europe
- Middle East**
  - Iran, Iraq, Syria and Turkey
- Oceania**
  - Australia
- Former Soviet Union**
  - Kazakhstan
  - Russia, Azerbaijan, Armenia and Georgia
  - Ukraine, Moldova, and Belarus
- Africa**
  - North Africa
  - Southern Africa
  - East Africa
  - West Africa
- Asia**
  - Eastern China
  - South Asia
  - Southeast Asia
  - Central Asia
  - Korea

# Crop Explorer

- Open
- inte
- unk
- Info
- mu
- Aut
- spe
- imm
- 39
- gro
- Ma

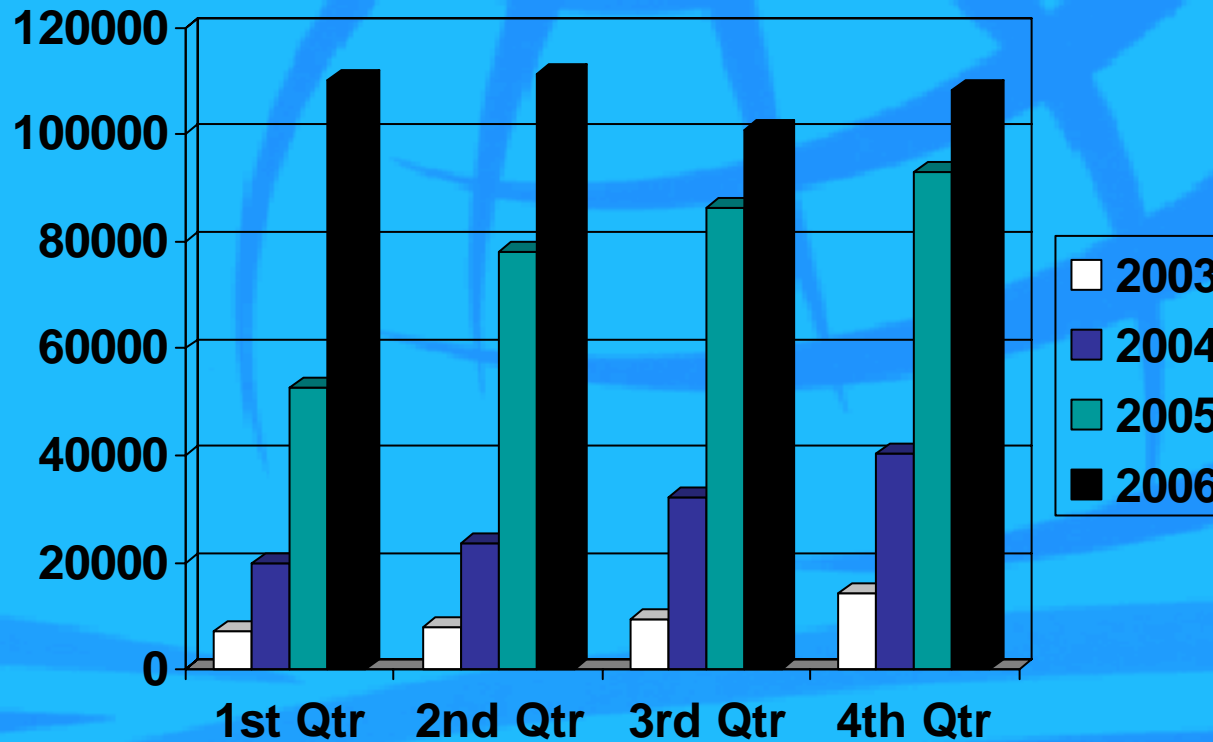


# Crop Explorer Overview

The screenshot shows the FAS Crop Explorer website interface. At the top left, there is a section titled "Explore by Region" with a list of regions: North America (United States, Canada), Central America (Mexico, Central America and Caribbean), South America (Brazil, Northern South America, Southern South America), Europe (Europe), Middle East (Iran, Iraq, Syria and Turkey), and Oceania (Australia). A world map is displayed with a "Site Index" label. To the right of the map are sections for "Former Soviet Union" (Kazakhstan, Russia, Azerbaijan, Armenia and Georgia, Ukraine, Moldova, and Belarus) and "Africa" (North Africa, Southern Africa, East Africa, West Africa). Below the map is an "Explore by Crop" section with a dropdown menu for "Select a Commodity" and a "Submit" button. Further down is the "Commodity Intelligence Reports" section, which contains two reports: "China Winter Wheat Planting Situation - 2007/08 Season" (dated Nov 01, 2006) and "Argentina Wheat Update: Rainfall Just in Time" (dated Oct 27, 2006). At the bottom left is the "Partnerships" section with logos for NASA, USGS, FEWS NET, and ASRC. On the right side of the page, there are sections for "News & Events" (with links to "Lake Victoria's Falling Waters" and "The FAS Crop Explorer: A Web Success Story"), "Related Sites" (with links to "Agricultural Production", "Foreign Agricultural Service", "Future of Land Imaging", "Global Reservoirs/Lakes", "Landsat GloVis", "MODIS Image Gallery", "MODIS NDVI Gallery", "MODIS NDVI Time Series", "MPA Accumulated Rainfall Maps", and "PECAD"), and "Metadata" (with links to "Live Data and Maps", "GeoSpatial One-Stop", "NASA Global Change", and "GeographyNetwork"). A "View images from the Global Reservoirs" section is also visible at the bottom right.

- Click on map to explore by region
- Review latest Commodity Intelligence Reports
- Connect to portal data from technology transfer partners
- Visit partners

# Crop Explorer Non-FAS Visits



.....plus ~200,000/quarter Non-FAS visits makes OGA one of the most used FAS applications from the Internet

.....2007 SAG Award Winner (GIS Web Sites) sponsored by ESRI

# Background for USDA Satellite Imagery Archive

- Established in 2000
- Redistributes data to participating agencies for a flat fee.
  - Business concept is **“all you can eat”** through website.
  - Delivered over 2,500 scenes in 2006.
- Agencies use data for their applications
  - Cropland data layer
  - Area frame analysis
  - Forest Fire burned area polygons
  - Crop program compliance
  - Crop insurance investigations
  - Agricultural research
  - Crop condition assessment
  - Forest Inventory/Forest Health
- USDA is one of the leading purchasers of commercial, medium resolution satellite imagery.
  - Purchased primarily Landsat data prior to 2006. Now, IRS-AWiFS



# Customer Summary

## Public/Stakeholders

- **Academia -46%**
- **Private Sector – 46%**
- **Government – 8%**
- **featured on 100's of web-sites, e.g. Chicago Board of Trade, John Deere, Cargill,....**
- **Private Sector collaborators (CRADA)**

## USDA SIA Members

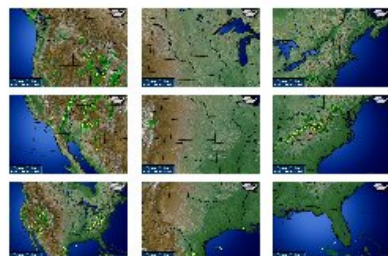
- **APHIS**
- **FSA**
- **RMA**
- **ARS**
- **NASS**
- **USFS**
- **CSREES**
- **FAS**
- **USGS**
- **International Partners**

- Wireless Quotes
- CBOT Advantage
- CBOT DataExchange
- Real-Time Quotes & Charts
- Commodity News for Tomorrow
- Delayed Quotes & Charts
- Time & Sales
- Settlement Prices
- Volume & OI
- Reports
- Historical Data
- Historical Volatility
- Commentaries
- Delivery Reports
- Liquidity Analyzer
- Weather**
- Data Vendors
- Market Data Online Billing

## Weather as of October 5, 2006 6:05 PM

	Four-Panel rainfall distribution map		Forecast
	Latest hour's temperatures		Latest totals
	Yesterday's high temperatures		Latest month-to-date rainfall totals
	Latest month-to-date rainfall totals		Latest windchill temperature values
	Latest windchill temperature values		Latest knots

### US Regional Radar Maps



http://www.pecad.fas.usda.gov - Crop Explorer for Major Crop Regions - Home - Micros...

File Edit View Favorites Tools Help

## Crop Explorer

---

### Explore by Region

<p><b>North America</b> United States Canada</p>	<p>Site Index</p>	<p><b>Former Soviet Union</b> Kazakhstan Russia, Azerbaijan, Armenia and Georgia Ukraine, Moldova, and Belarus</p>
<p><b>Central America</b> Mexico Central America and Caribbean</p>		<p><b>Africa</b> North Africa Southern Africa East Africa West Africa</p>
<p><b>South America</b> Brazil Northern South America Southern South America</p>	<p><b>Middle East</b> Iran, Iraq, Syria and Turkey</p>	<p><b>Oceania</b> Australia</p>
<p><b>Europe</b> Europe</p>		<p><b>Asia</b> Eastern China South Asia Southeast Asia Central Asia Korea</p>

Internet

The Crop Explorer Web Site features near-real-time global crop condition information based on satellite imagery and weather data. Thematic maps of major crop growing regions depict vegetative vigor, precipitation, temperature, and soil moisture. Time-series charts depict growing season data for specific agro-meteorological zones. Regional crop calendars and crop area maps are also available for selected regions.

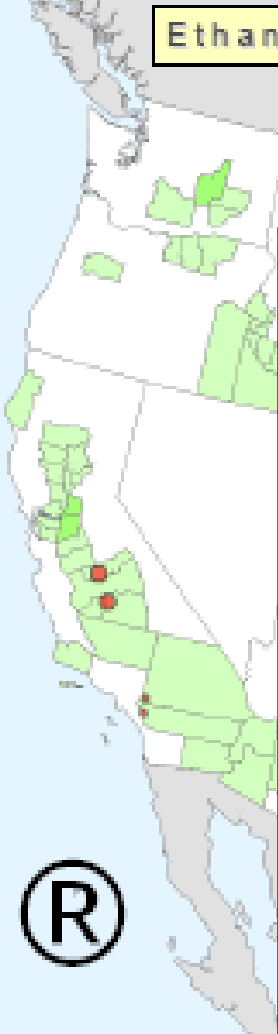
<http://www.pecad.fas.usda.gov/cropexplorer/index.cfm>



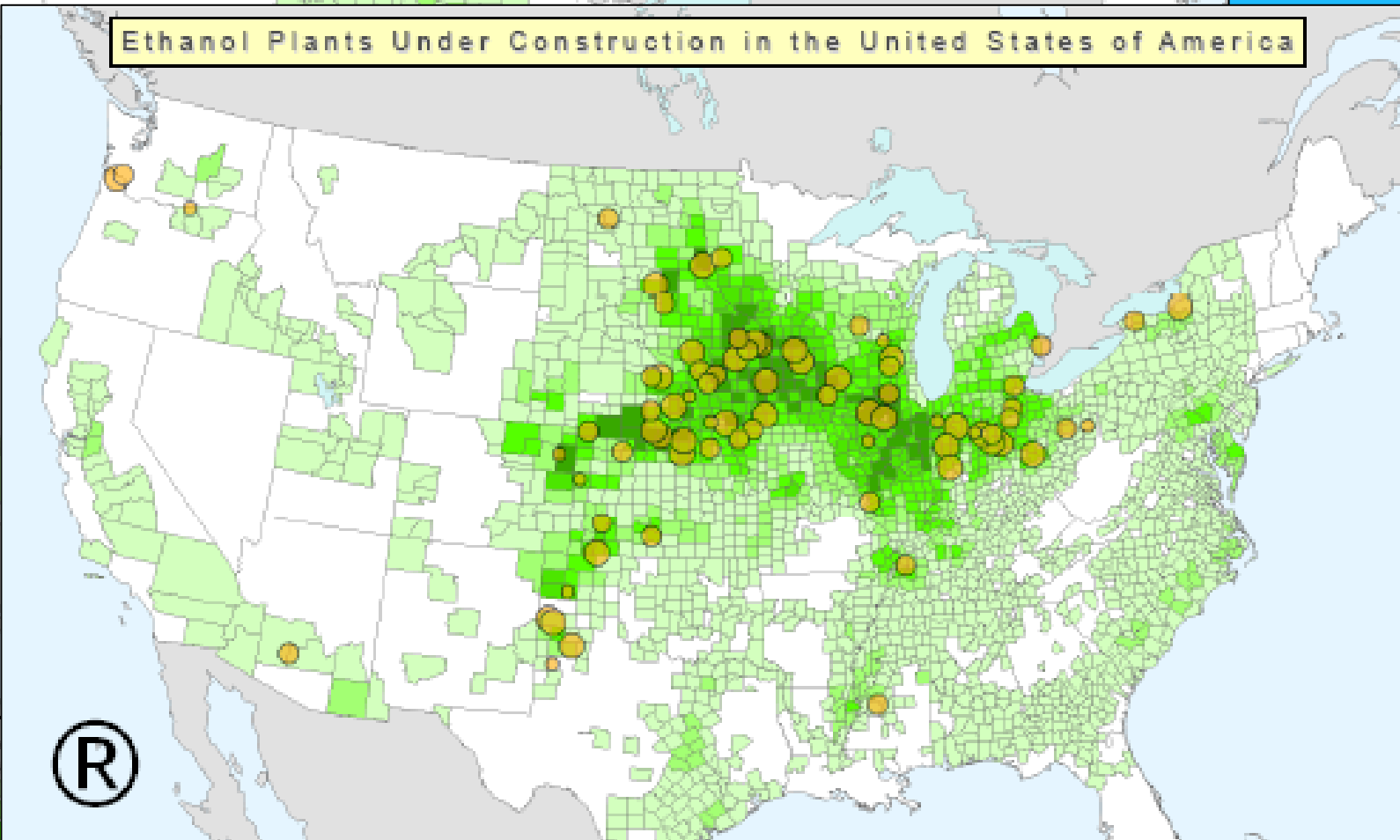
# New/proposed GLAM Activities

- **GLAM footprint at Goddard**
  - Operation access to NASA data streams for agriculture monitoring
- **Irrigated agriculture assessments(pending)**
  - University of Wisconsin
- **Rapid-response flood mapping(pending)**
  - Dartmouth
- **Enhanced/high-resolution global precipitation modeling**
  - USAF and NASA
- **High resolution imagery**
  - Field-sampling/area-frame strategies
  - Supplementing ground-truth

# Ethanol Plants In Production in the United States of America



# Ethanol Plants Under Construction in the United States of America



**Consumption (million tons)**

●	0.000001 - 0.120000
●	0.120001 - 0.300000
●	0.300001 - 0.600000
●	0.600001 - 1.400000
●	1.400001 - 3.700000

**Ethanol Plants Under Construction Consumption (million tons)**

●	0.000001 - 0.120000
●	0.120001 - 0.300000
●	0.300001 - 0.600000
●	0.600001 - 1.400000
●	1.400001 - 3.700000

**Average Corn Production (2002 - 2006)**

**Avg. Production (million tons)**

■	0.200001 - 0.200000
■	0.200001 - 0.200000
■	0.200001 - 0.400000
■	0.400001 - 0.800000
■	0.800001 - 1.400000

International Production Assessment Branch  
Office of Global Analysis  
Foreign Agricultural Service



# Technology Transfer from Space Agencies through USDA FAS to Agricultural Audience

5

## Related Sites

- [Agricultural Production](#)
- [Future of Land Imaging](#)
- [Global Reservoirs/Lakes](#)
- [Landsat GloVis](#)
- [MODIS Image Gallery](#)
- [MODIS NDVI Gallery](#)
- [MODIS NDVI Time Series](#)
- [MPA Accumulated Rainfall Maps](#)

- The “Related Sites” shows the partners’ contribution to **access and distribution** of the geospatial information.
  - Data is pre-processed by partner to FAS specifications and available through web interface, a portal of agricultural monitoring information.