

Identifying Crops in the Lower Forty Eight

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Under Contract to: USDA/NASS



Overview of the USDA's

National Agricultural Statistics Service

Provider of timely, accurate, and useful statistics in service to U.S. agriculture

NASS - Data and Statistics - Microsoft Internet Explorer

Address: http://www.nass.usda.gov/Data_and_Statistics/index.asp

USDA United States Department of Agriculture
National Agricultural Statistics Service

The 2002 Census of Agriculture is the most comprehensive source of statistics portraying our nation's agriculture

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- Education and Outreach
- Statistics by State
- Select a State

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Data and Statistics

Quick Stats (Agricultural Statistics Data Base)

NASS publishes U.S., state, and county level agricultural statistics for many commodities and data series. Quick Stats offers the ability to query by commodity, state(s) and year(s), providing the most up-to-date statistics including all relevant. The query dataset can be downloaded for easy use in your database or spreadsheet.

- Query our Quick Stats Data Base

Additional Crops County Resources

Maps of crops county estimates for acreage and yield are available from NASS as both CSV data files and maps. County data from Quick Stats data is also available in pre-extracted data sets by year and by crop.

Census of Agriculture

To query Census of Agriculture data, choose from the Census years below. To view the Census publications, click here:

- Data Queries for 2002, select below:
- Select a Census Query
- Data Queries for 1997, 1992, 1987

Interactive Data

NASS provides a variety of tools for interacting with our Census datasets.

Interactive Statistical Maps

Interactive Census Maps for 2002 Census Highlights

Table Lens Application for 1997 Census Data

Last modified: 12/30/05

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2001 Wildlife Damage Survey

7.7 Percent of Crop Value Lost to Deer and Geese

Maryland farmers lost \$17.2 million of corn, soybeans and wheat to deer or geese during 2001, translating to Maryland farmers losing 7.7 percent of the crop value to deer and geese. Soybeans account for the greatest economic loss, totaling \$9.1 million, 11 percent. Corn losses were \$6.6 million, 5.8 percent and wheat \$1.5 million, 5.6 percent. Deer damage resulted in losses of \$13.6 million, 6.1 percent, while geese losses were \$3.6 million, 1.6 percent.

Production losses totaled 6.0 million bushels. Corn losses were 3.2 million bushels, soybean losses are 2.2 million bushels and wheat accounted for 0.6 million bushels. Production losses to deer were 4.7 million bushels and geese 1.3 million bushels.

In terms of yield, losses to deer were most severe in Central and Western Maryland, while geese damage greater on the Eastern Shore. Corn yield losses of 9.6 bushels per acre and 7.4 bushels per acre were reported in Central and Western Maryland, respectively. The Lower Eastern Shore reported the highest soybean loss of 6.1 bushels per acre.

Sixty-two percent of farms reported deer or geese damage to one or more crops. Damage was reported on percent of farms raising corn, 58 percent of farms growing soybeans and 27 percent of farms with wheat.

Region	Crop	Acres Harvested	Harvested Yield (bushels)	Average Yield Loss (bushels)	Production Loss (bu)	Economic Loss (\$)
Western Maryland	Corn	5,500	124,400	7.4	40,100	83
	Soybeans	300	36,700	12.3	3,700	14
	Wheat	200	45,200	2.3	460	1
Central Maryland	Corn	124,200	582,400	9.9	1,202,200	2,419
	Soybeans	92,200	34,000	3.7	360,700	1,478
	Wheat	38,200	63,000	3.3	126,200	318
Southern Maryland	Corn	25,200	132,200	4.9	146,200	299
	Soybeans	43,200	39,000	3.0	142,200	314
	Wheat	16,200	27,000	0.9	14,400	36
Upper Shore	Corn	157,200	159,200	3.1	800,700	1,241
	Soybeans	13,200	19,000	3.9	64,400	234
	Wheat	1,200	2,200	1.8	2,200	5

NEWS RELEASE

NATIONAL AGRICULTURAL STATISTICS SERVICE

United States Department of Agriculture • Washington, DC 20250
Ag Statistics Hotline: (800) 727-9540 • www.nass.usda.gov

Contact: Ellen Dougherty, (202) 690-8122
Jeff Geuder, (202) 720-2127

USDA FORECAST

Washington, Aug. 10, 2007

history in 2007, according to Agriculture's National Ag 13.1 billion bushels, 10.6 percent.

Based on conditions: per acre, up 3.7 bushels from behind the 160.4 bushels per million acres of corn for grain.

Yield forecasts are high Delta. Meanwhile, hot, dry and eastern Corn Belt, Ohio

WISCONSIN AGRICULTURAL STATISTICS SERVICE

P.O. Box 8934 Madison, WI 53708-8934

In cooperation with WI Department of Agriculture, Trade and Consumer Protection

2002 Dairy Producer Opinion Survey

November 2002

Wisconsin Milk Production to Recover

Milk production is expected to increase in Wisconsin during the next five years according to a survey conducted by the Wisconsin Agriculture Statistics Service. This statewide survey of producers asked for their plans with the assumption that milk prices for the next five years will be at the same level as the past five years. The survey was conducted during May and June 2002.

Based on the survey, 60 percent of producers expect to keep the same herd size, 20 percent plan to increase herd size, and 20 percent intend to discontinue milking by 2007. Actual results will depend on future milk prices, input prices, financing availability, crop yields, and other factors.

The number of herds projected for 2007 shows that the diversity of small to large herds will continue. The most prevalent herd size will remain at 50 to 99 cows.

http://www.nass.usda.gov:8080 - 2002 Census of Agriculture - SVG Interactive Mapping - United S - Microsoft Internet Explorer

National Agricultural Statistics Service

2002 Census of Agriculture

United States | All data items are from Chapter 2 - Table 1. Area Summary Highlights: 2002 Selected crops harvested - Land in orchards (acres)

State: United States - County Level | Data Item: Selected crops harvested - Land in orchards (acres)

United States Total: 5,330,439

State: Total: 5,330,439

County: Total: 5,330,439

Download data as CSV | XML | PDF

Help | Print | Return to

Legend

Scale: National | Zero or Data Withheld <= 20,000

(Changes the data range based on National or State level)

Comparisons: 6 | 20,001 to 40,000

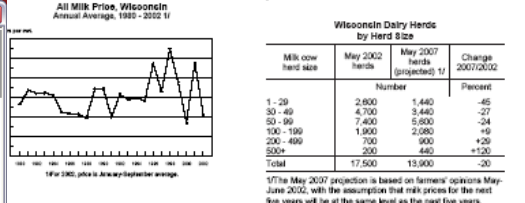
Color: Green | 40,001 to 60,000

100,001 to 100,000

100,001 >=

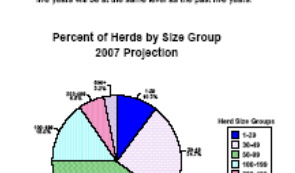
Source: USDA-NASS 2002 Census of Agriculture © USDA-NASS 2005-2006

Navigate: Mouse-over a specific state/county to view the state/county level data. Right click to zoom (option-click for MAC users). Hold the Alt key and click+drag to pan. For additional assistance with this application, click here to view the support page.



Wisconsin Dairy Farmer Plans for May 2007 1/ by Herd Size

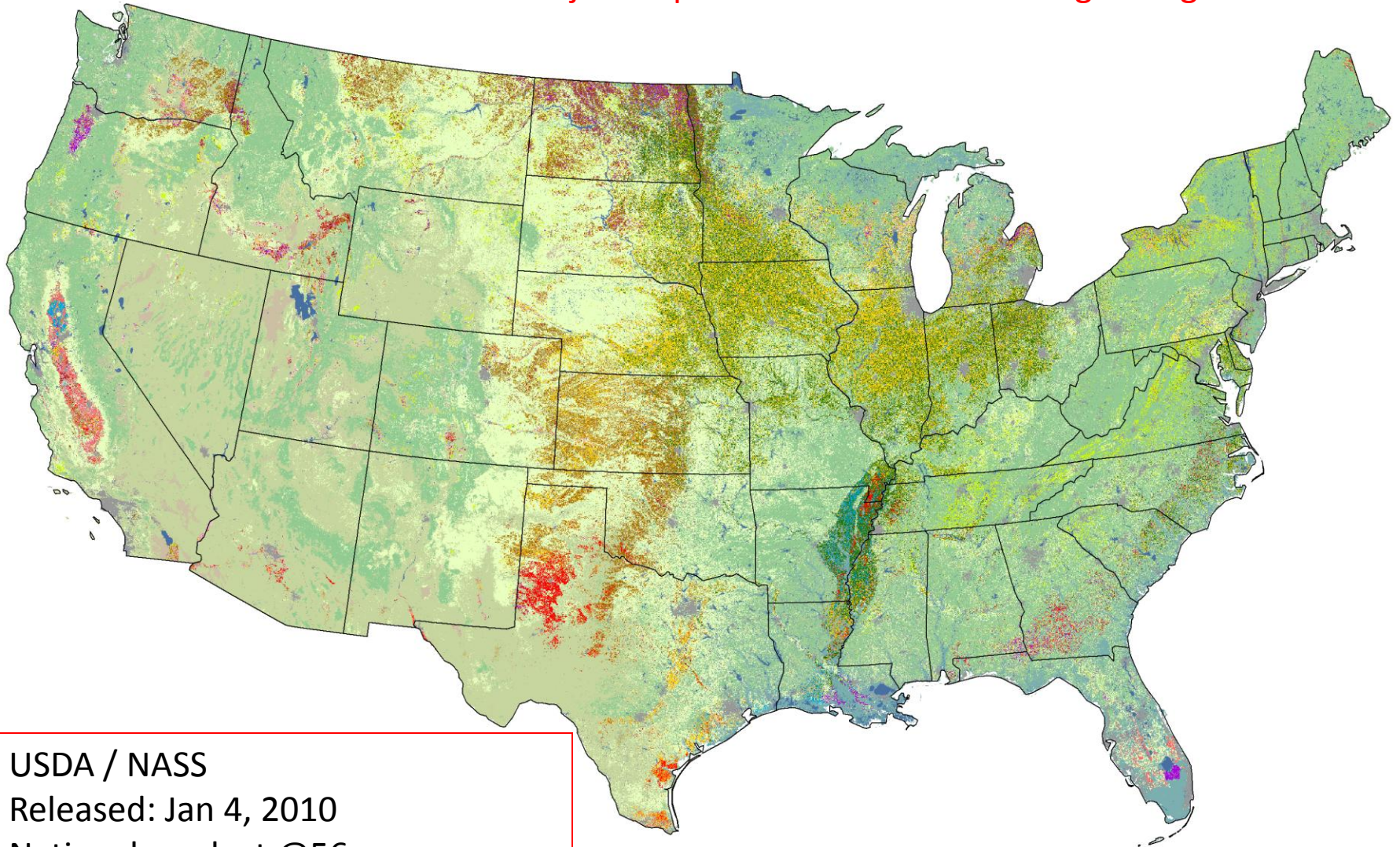
Milk cow herd size	Herds	Keep same herd size	Increase herd size	Discontinue milking
9	2,600	47	17	36
49	4,700	71	9	20
99	7,400	65	19	16
199	1,900	53	37	10
499	700	33	59	8
500+	220	22	78	0
Total	17,500	62	29	20



1/ The May 2007 projection is based on farmers' opinions May-June 2002, with the assumption that milk prices for the next five years will be at the same level as the past five years.

2009 Cropland Data Layers

First time ever – “Major Crops” identified in the same growing season!

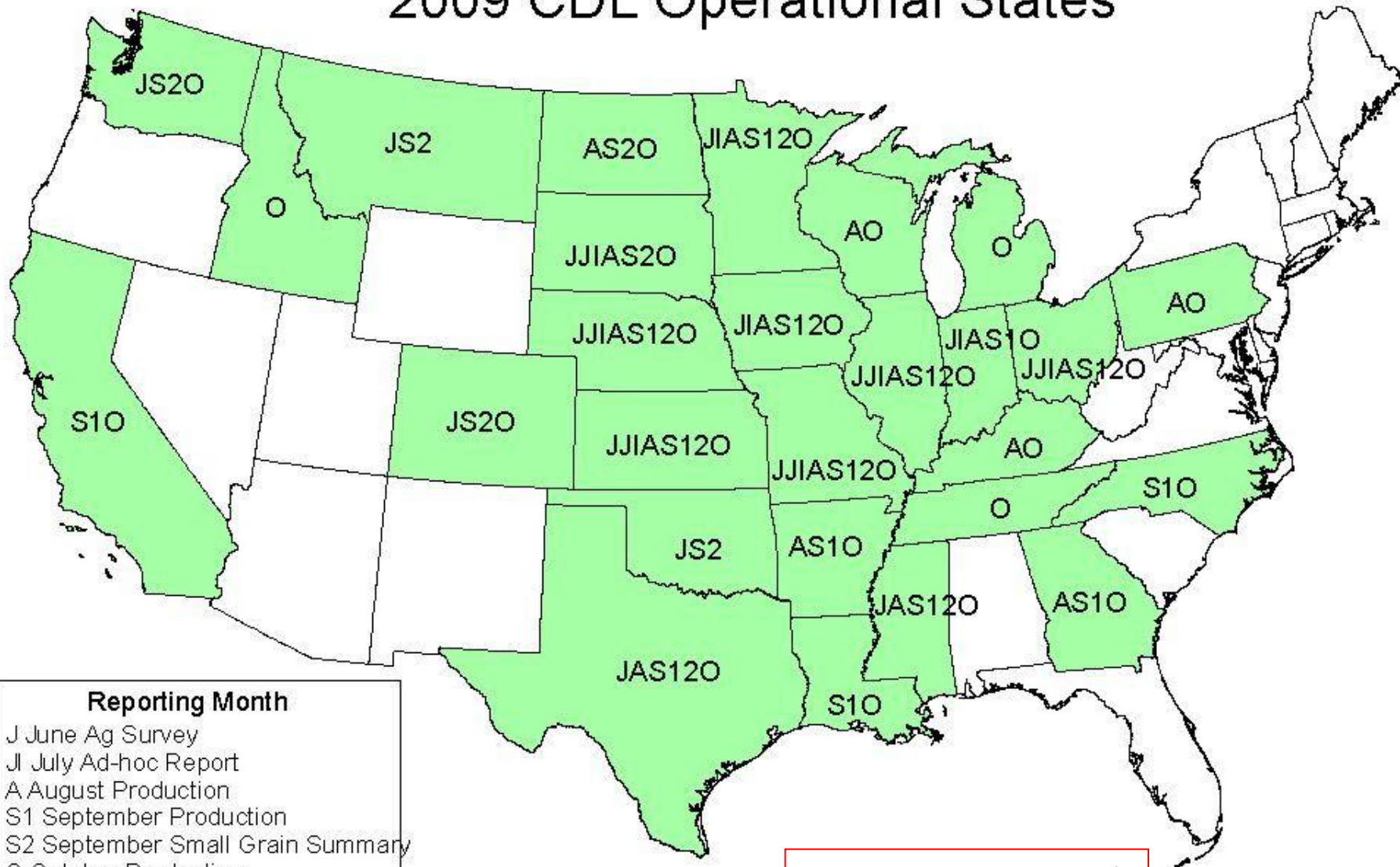


USDA / NASS

Released: Jan 4, 2010

National product @56m

2009 CDL Operational States



2009 Craighead County Arkansas

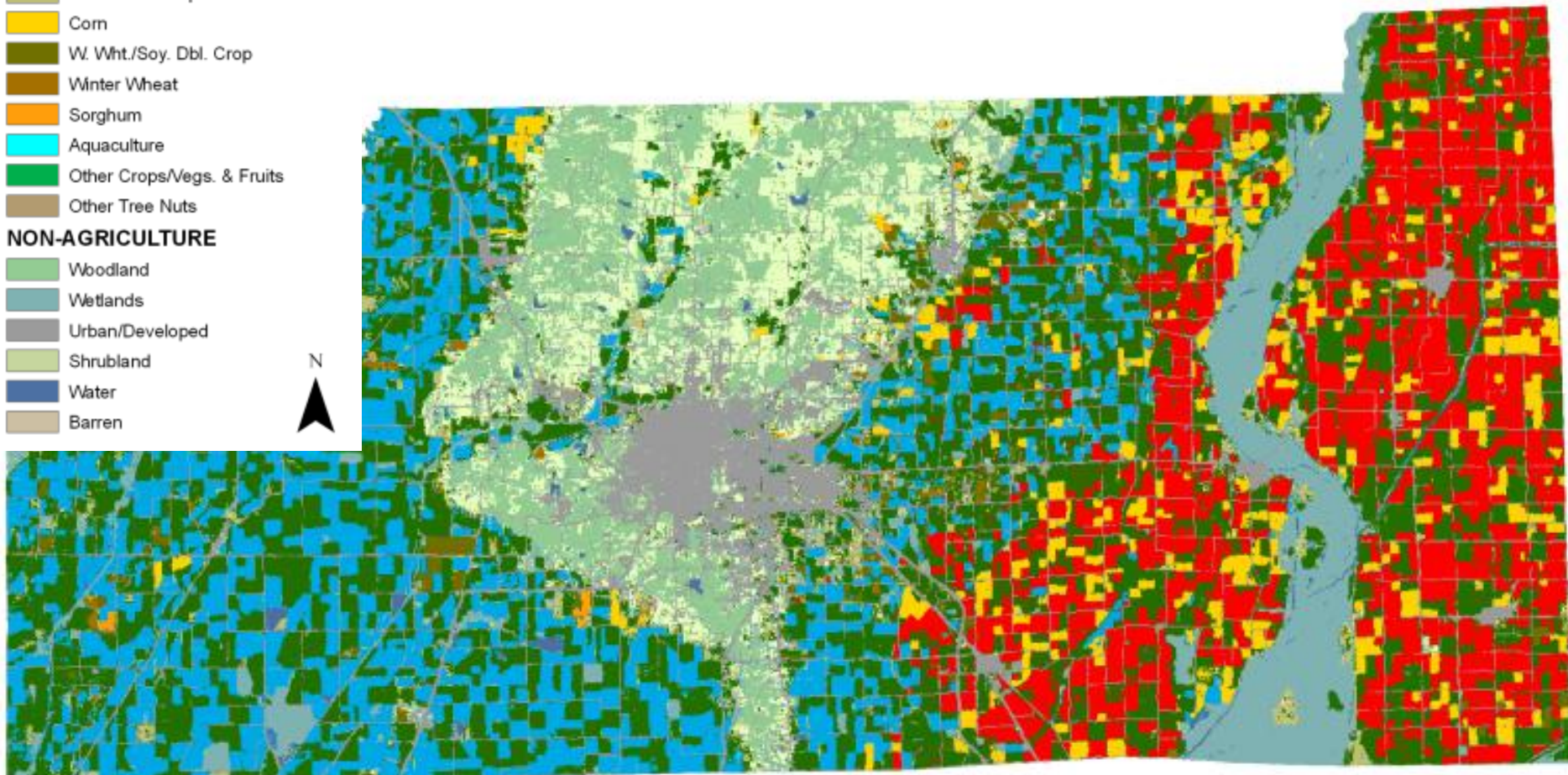
Land Cover Categories

AGRICULTURE

- Pasture/Grass
- Soybeans
- Rice
- Cotton
- Fallow/Idle Cropland
- Corn
- W. Wht./Soy. Dbl. Crop
- Winter Wheat
- Sorghum
- Aquaculture
- Other Crops/Vegs. & Fruits
- Other Tree Nuts

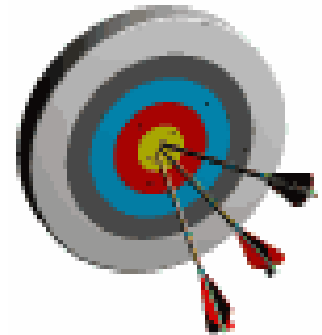
NON-AGRICULTURE

- Woodland
- Wetlands
- Urban/Developed
- Shrubland
- Water
- Barren



Cropland Data Layer (CDL) Objectives

- “Census by Satellite”
 - *Annually* cover major program crops and regions
 - Crops accurately geo-located
- Deliver in-season remote sensing acreage estimates
 - NASS Official Reports
 - Update planted area
 - Reduce respondent burden
- Provide timely, accurate, useful estimates
 - Measurable error
 - Unbiased/independent estimator
 - State, District, County
- Public domain crop specific crop classification
 - Hosted @ [NRCS Geospatial Data Gateway](http://www.nrcs.usda.gov/research/Cropland/SARS1a.htm) or <http://www.nass.usda.gov/research/Cropland/SARS1a.htm> or
 - Google “Cropland Data Layer”



CDL Program

Inputs

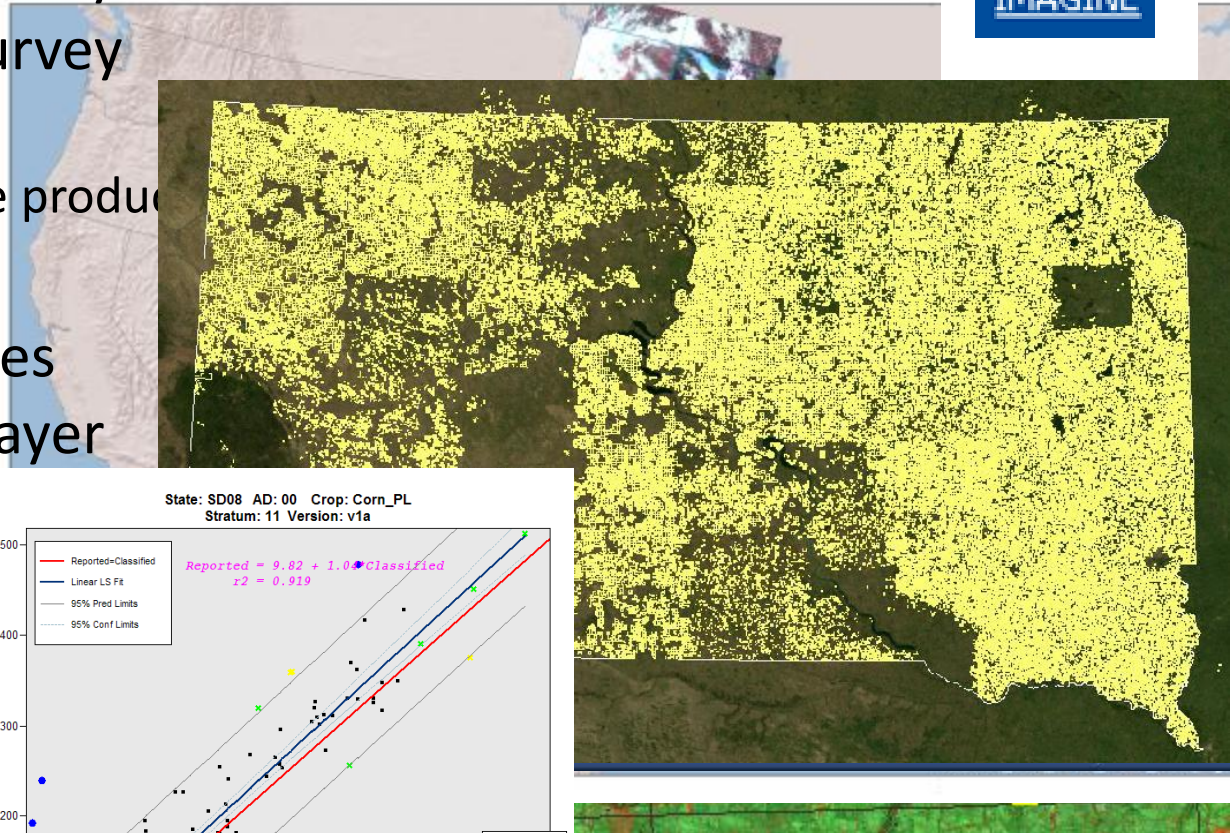
- Resourcesat-1 AWiFS imagery
- Farm Service Agency – Common Land Unit
- NASS June Ag Survey
- Ancillary data
 - NLCD & derivative products

Outputs

- Acreage Estimates
- Cropland Data Layer

Process

- Commercial software



Commercial Software Suite



- Imagery Preparation
 - ERDAS Imagine



- Image classification
 - Decision tree software
 - See5.0 www.rulequest.com



- Ground Truth Preparation
 - ESRI ArcGIS



- Acreage Estimation
 - SAS/IML workshop

IRS Resourcesat-1 AWiFS Imagery

740 km swath width

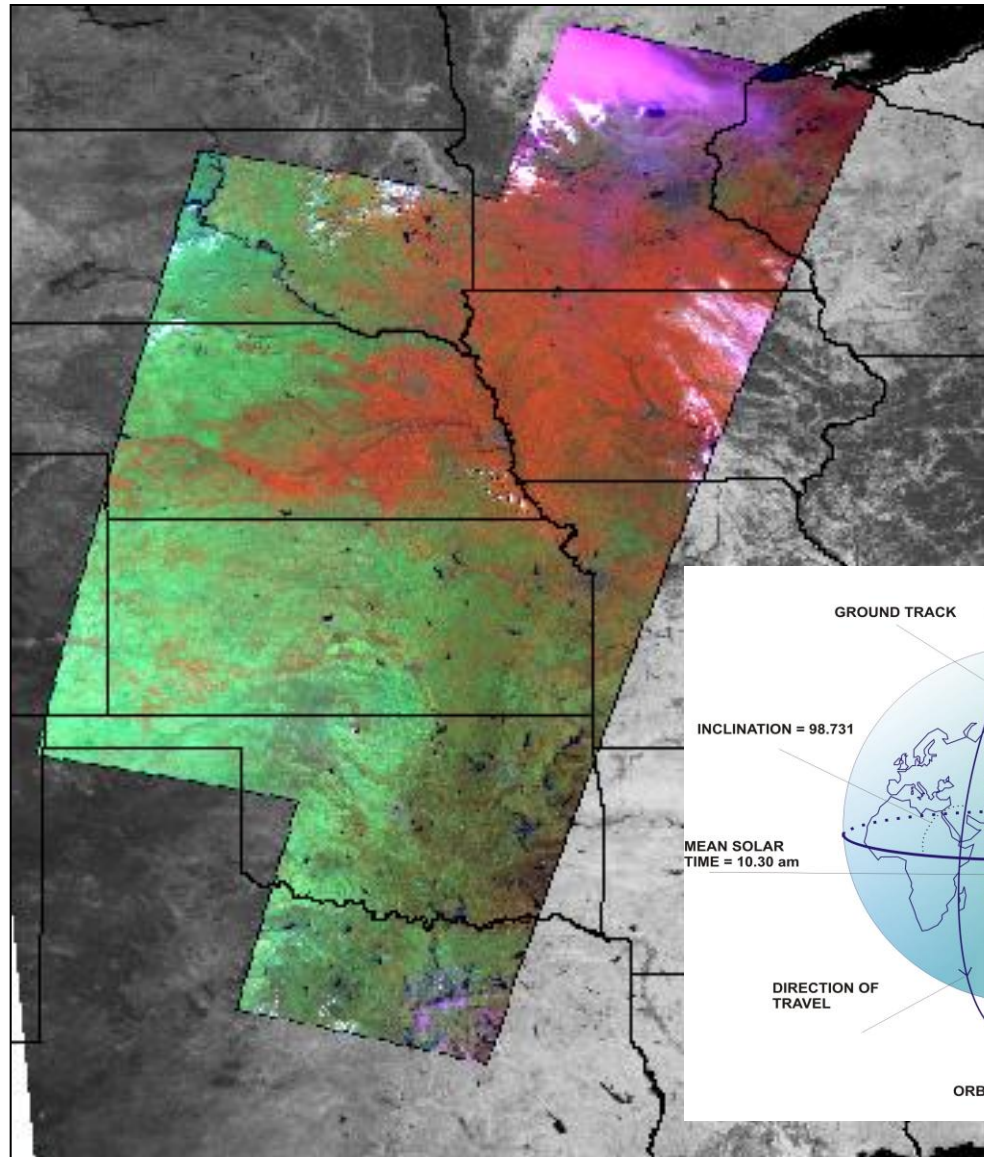
5-day revisit

4 spectral bands

- B2: 0.52 - 0.59
- B3: 0.62 - 0.68
- B4: 0.76 - 0.86
- B5: 1.55 - 1.7

56 m nadir/70 m field edges

Data provided through USDA
Foreign Agricultural Service (FAS),
Satellite Image Archive

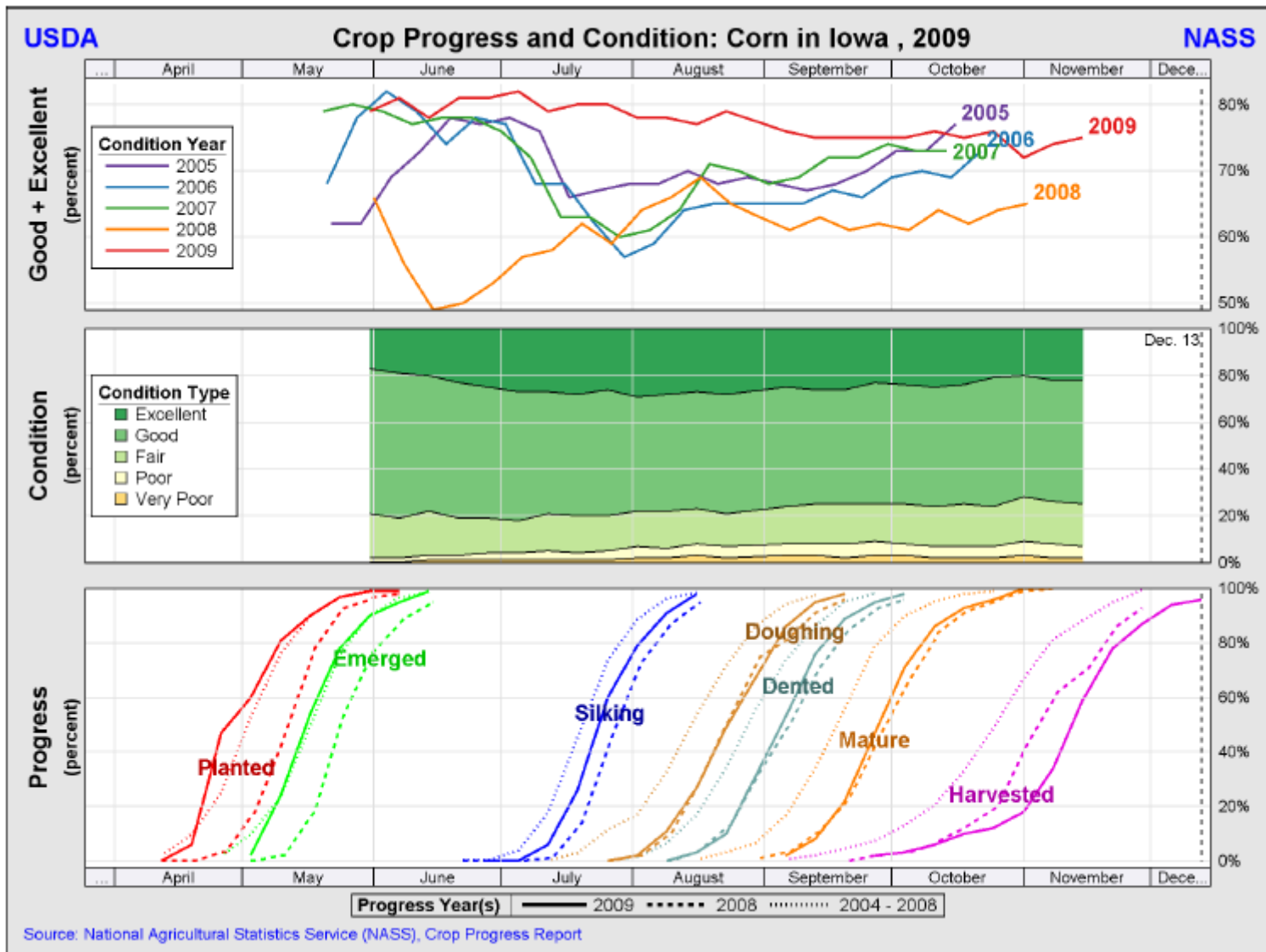
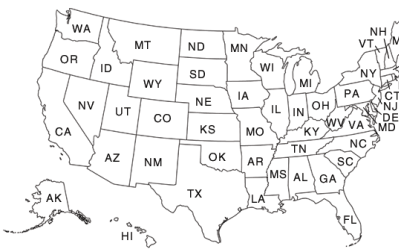


13 Aug 2007

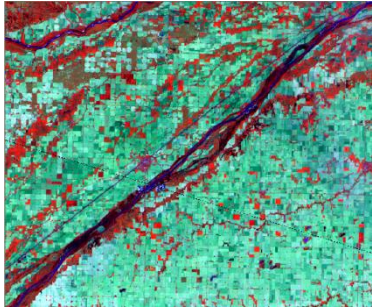


Department of Space
Indian Space Research Organisation

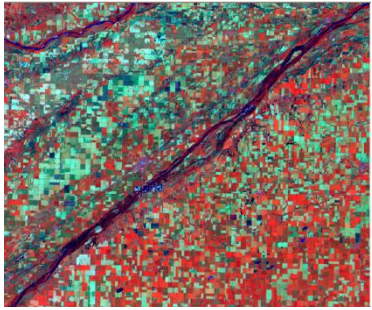
Crop Progress and Condition



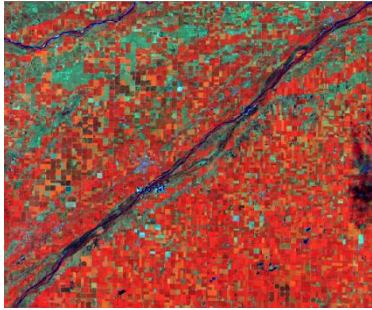
AWiFS Imagery Time Series



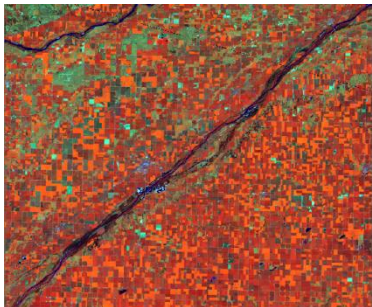
May 18



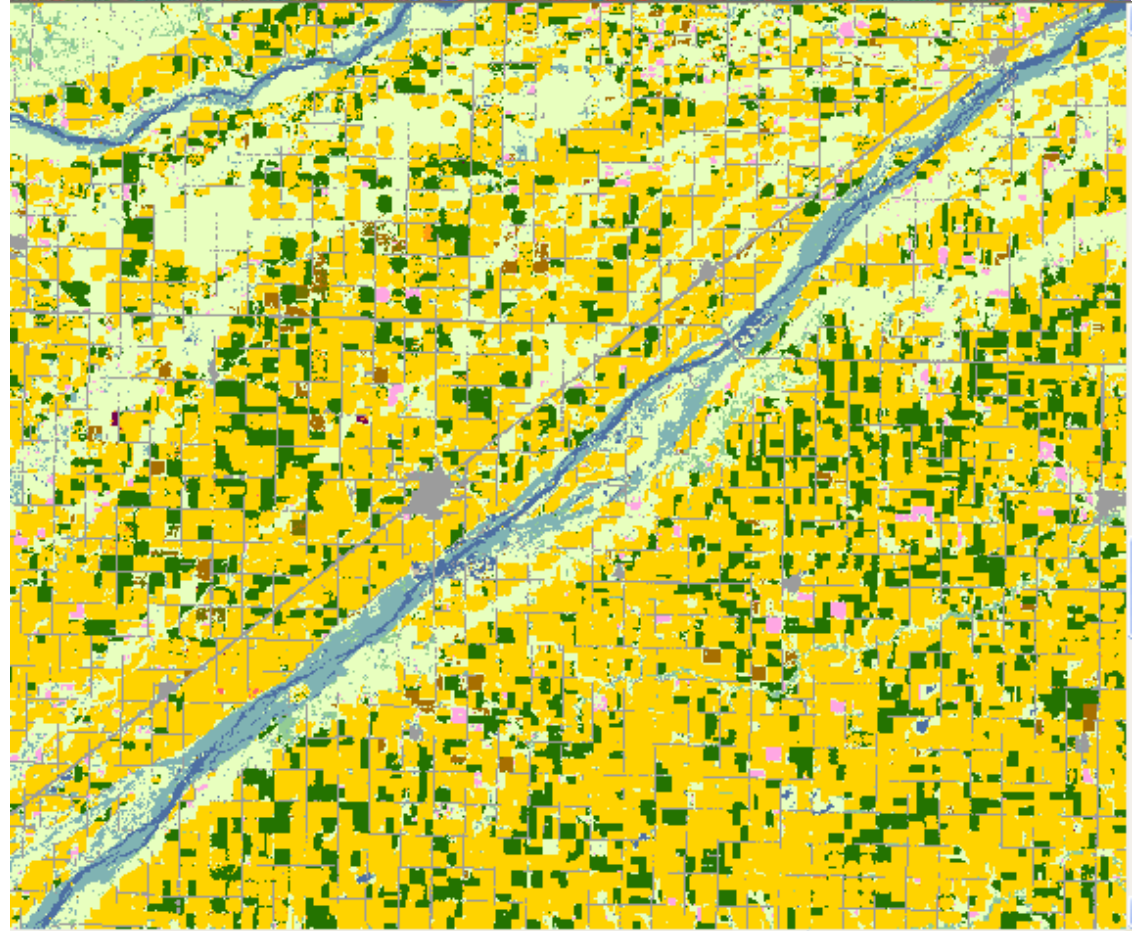
June 21



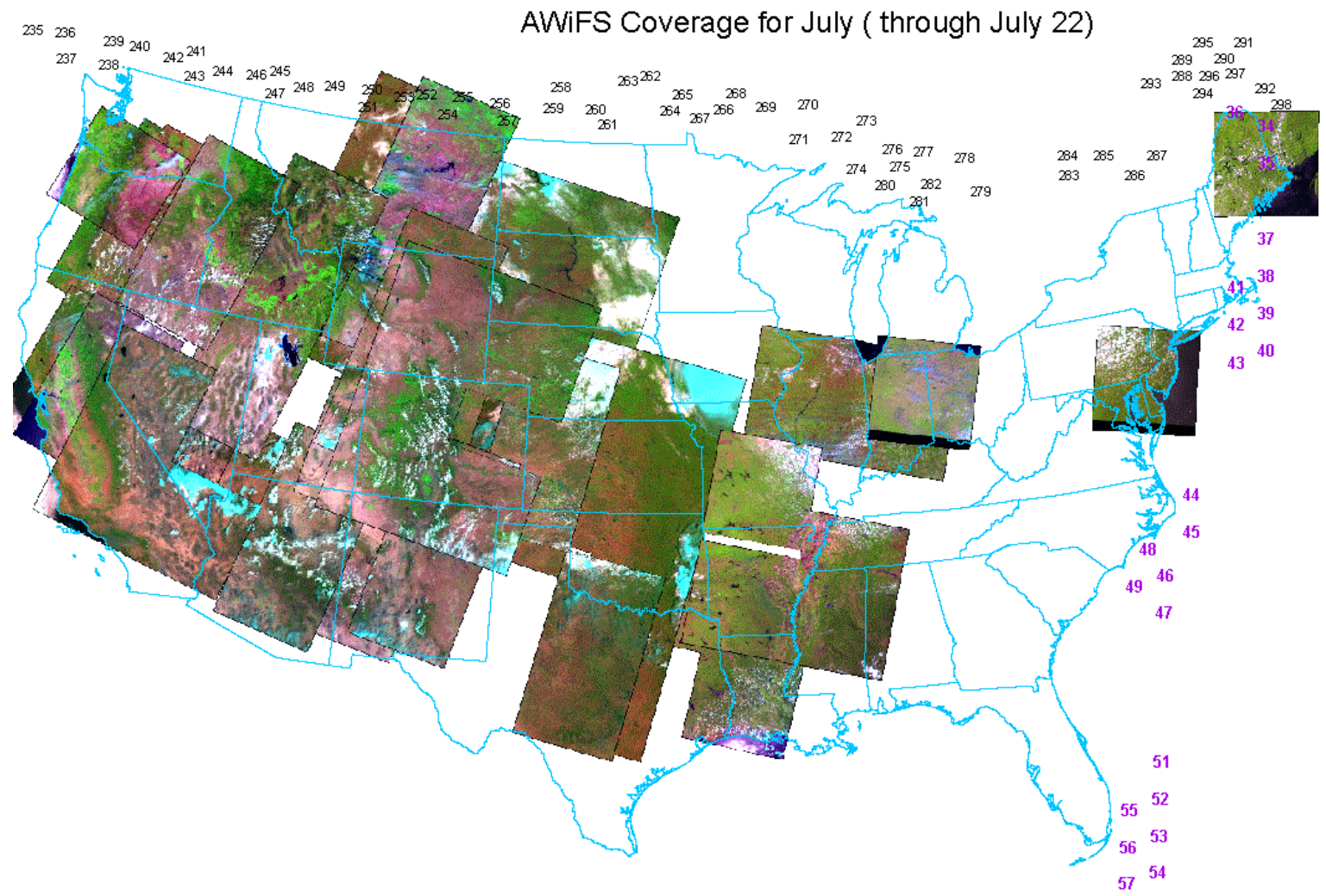
July 15



Aug 27

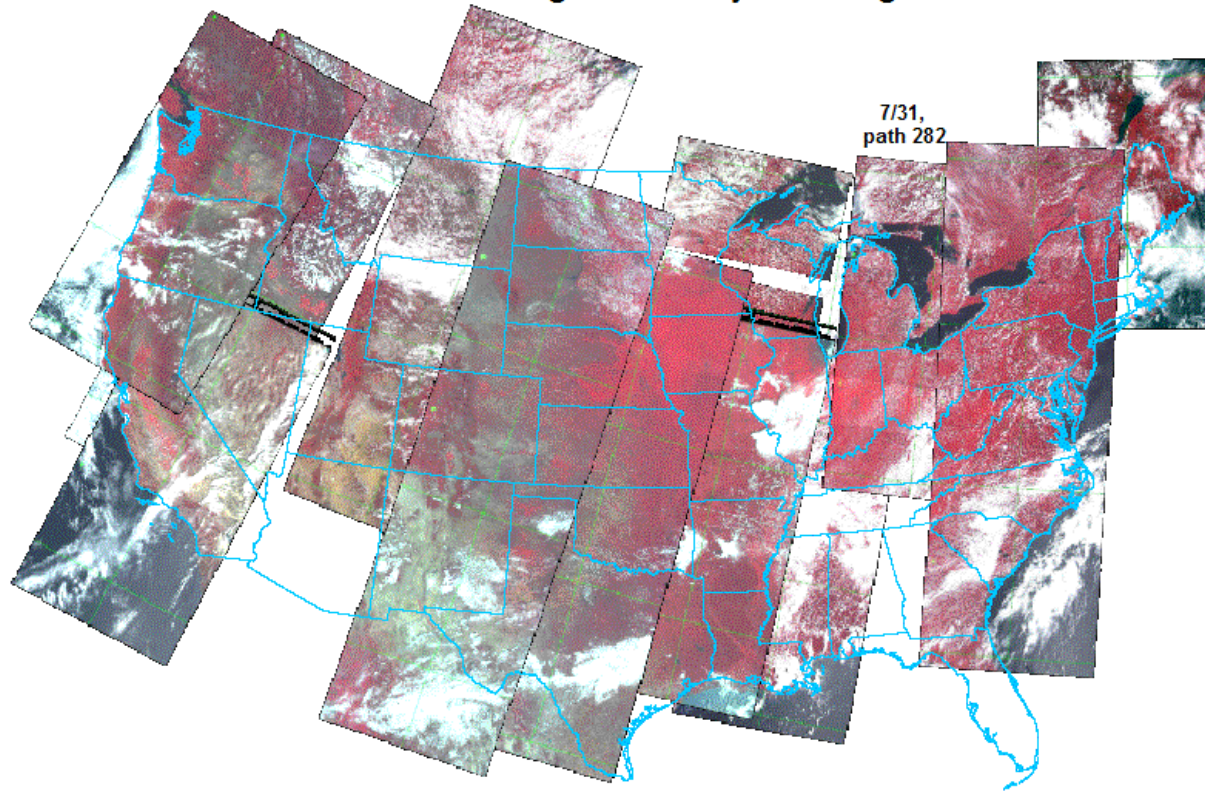


July AWiFS Collection Drought



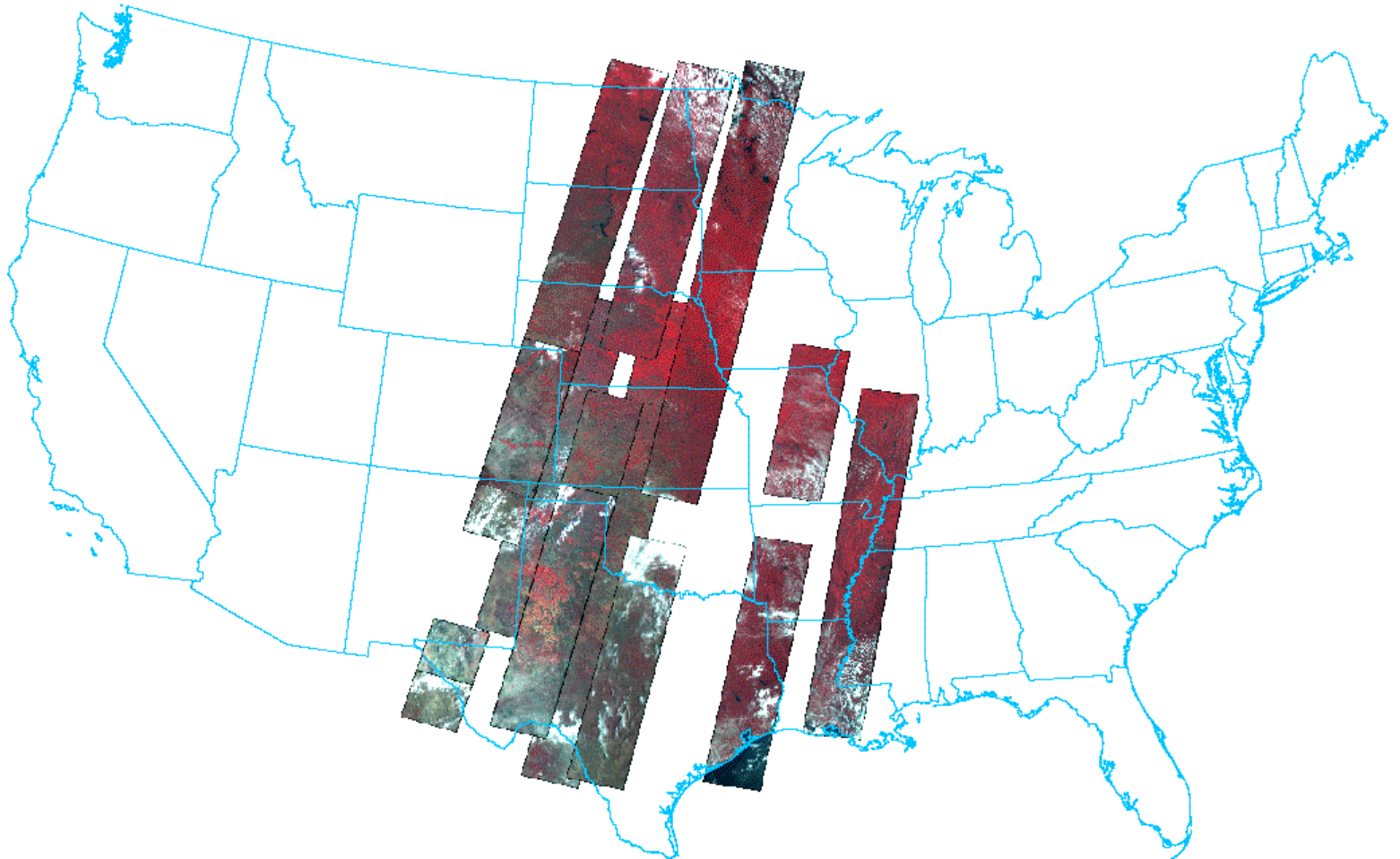
AWiFS Mid-Summer Acquisitions

AWiFS Coverage after July 29 - August 3



Landsat to the Rescue

Landsat Coverage
downloaded August 18, 2009



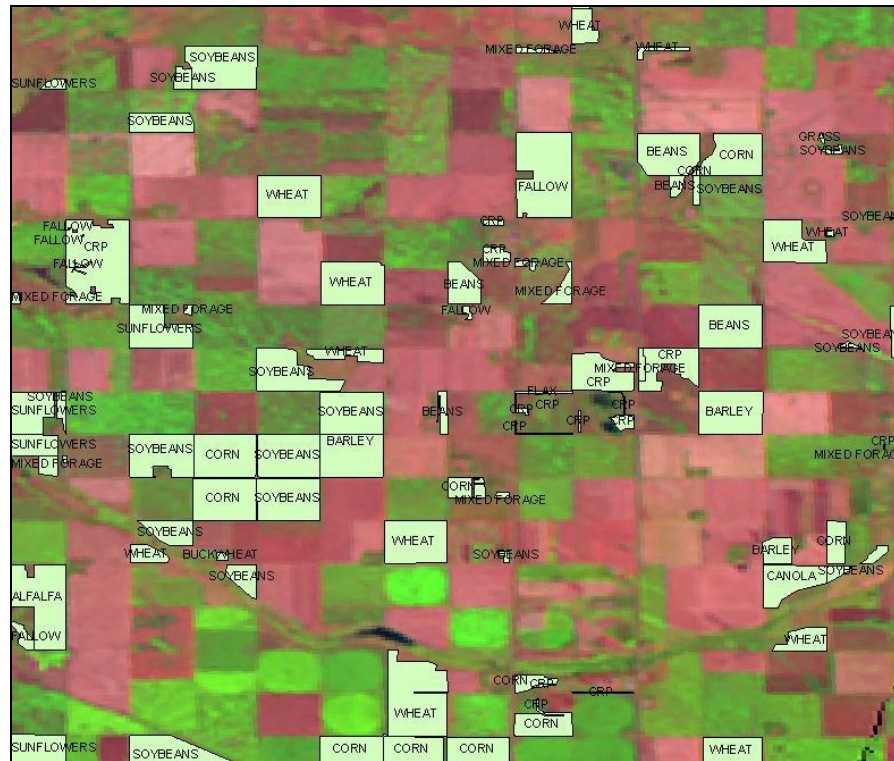
Agricultural Ground Truth FSA Common Land Unit



Agricultural Ground Truth



- Common Land Unit (CLU)
- 578 attributed reporting data



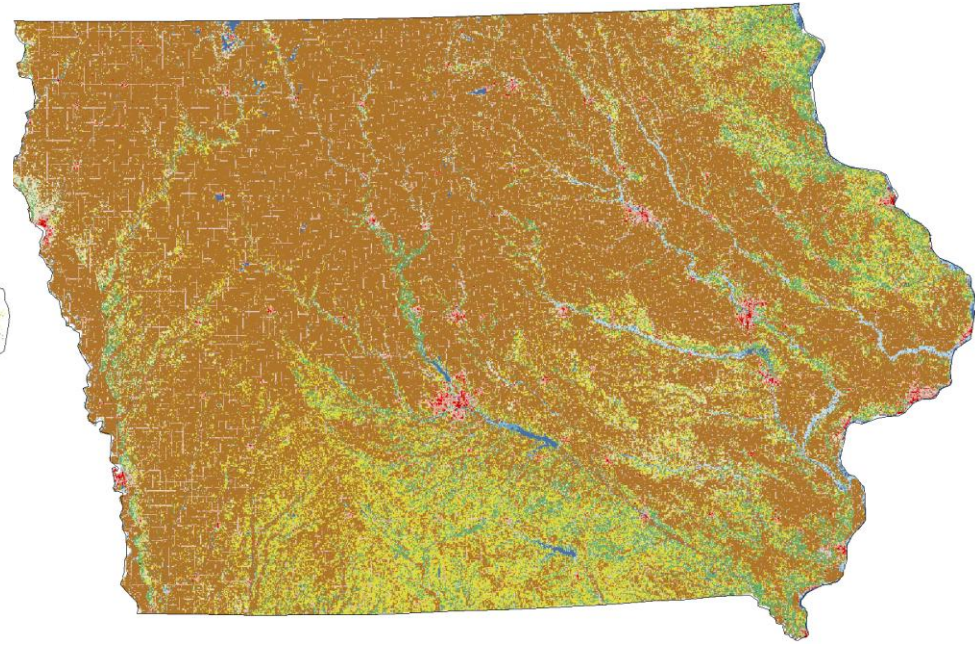
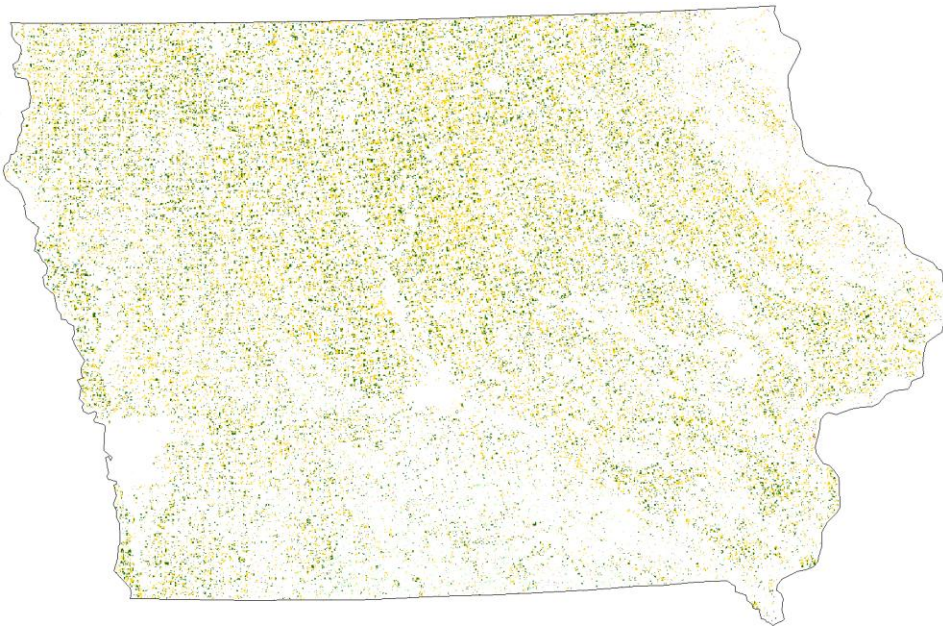
Ground Truth – Land Cover

Agricultural Ground Truth

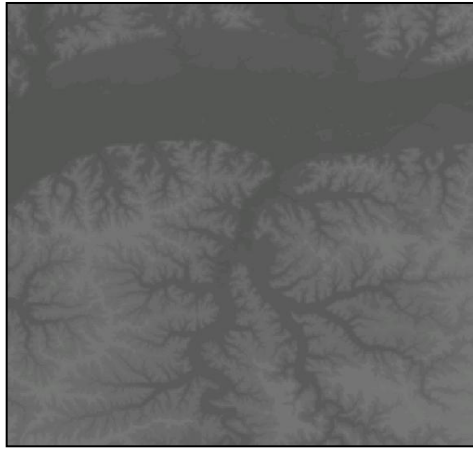
- Provided by FSA
- Id's known fields and crops
- Divide known fields into 2 sets
 - $\frac{1}{2}$ used for training software
 - $\frac{1}{2}$ used for validating results

Non-Agricultural Ground Truth

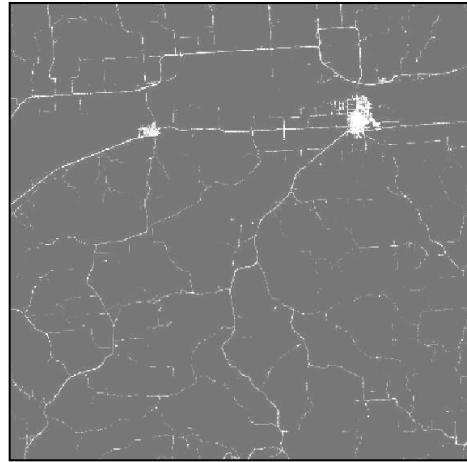
- USGS National Land Cover Dataset
- Identifies urban infrastructure and non-agriculture land cover
 - Forest, grass, water, cities



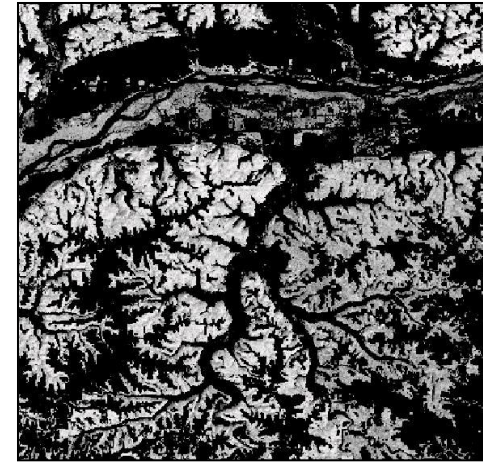
Ancillary Data – USGS/NASA Products



Elevation

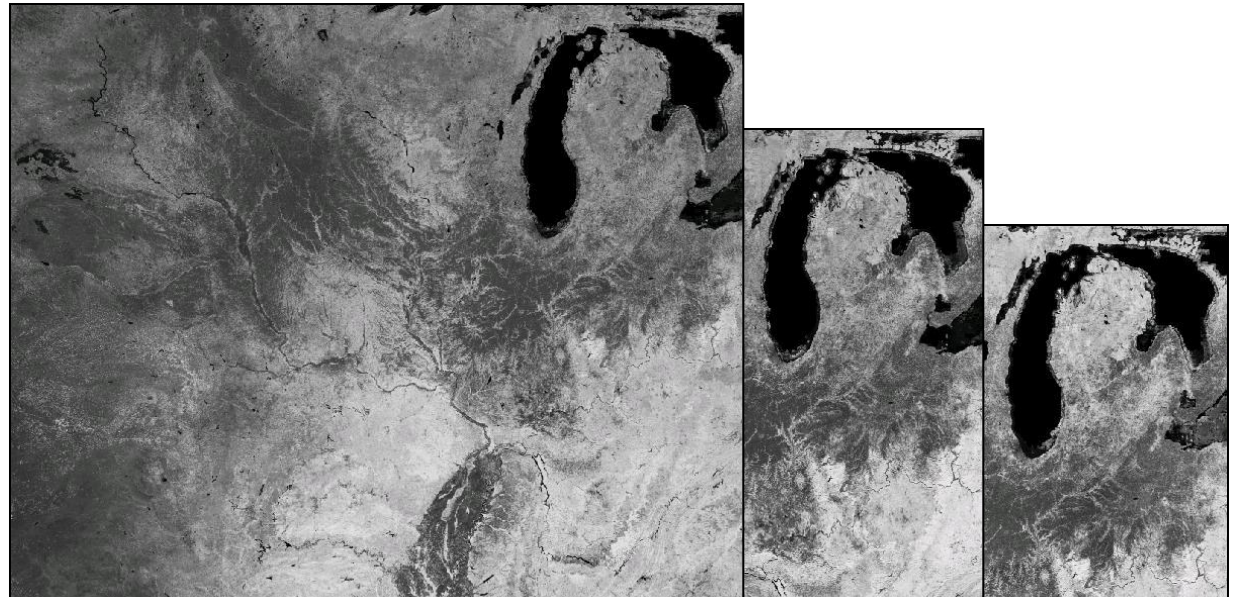


Imperviousness



Forest Canopy

NASA MODIS Terra
(16-day NDVI composite)



Data Partnerships



- Foreign Agricultural Service

- Resourcesat-1 AWiFS



- Farm Service Agency

- Common Land Unit “ground truth”



- US Geological Survey

- National Land Cover Dataset



- US Geological Survey/ NASA

- Landsat TM 5 & 7
- MODIS





www.epa.gov/ecology

ECOSYSTEMS SERVICES RESEARCH PROGRAM
BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

Mapping and the National Atlas of Ecosystem Services (NAtl-ES)

Office of Research and Development
US EPA

Through Interagency Agreement:

Supported NASS Creation of Cropland Data Layers
For the 21 Non-Operational States

Validating CDLs

Measures CDL Accuracy

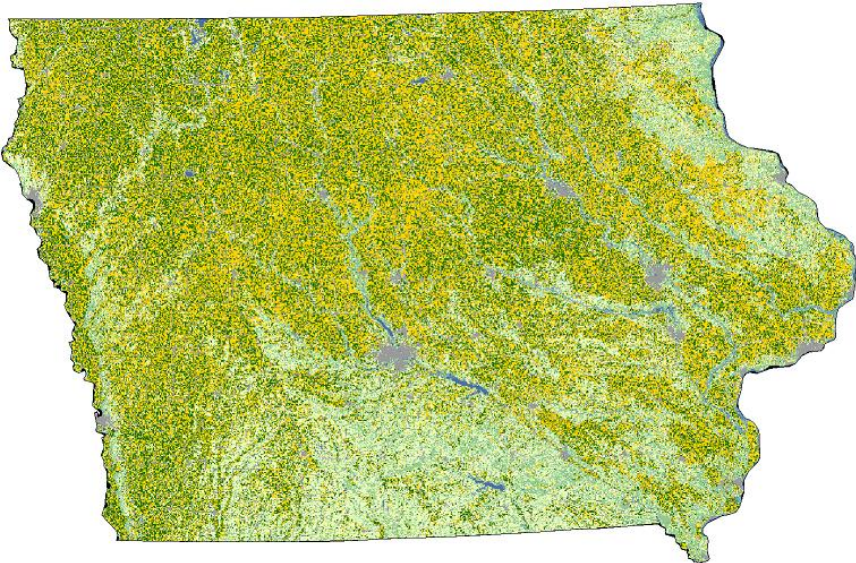
■ Compare

- Classified pixels from CDL
- Known pixels, not used for classifying imagery, from FSA

■ Track

- Producer Accuracy & Errors of Omission - % of pixels from CDL that match groundtruth
- User Accuracy & Errors of Commission - % of pixels from CDL that don't match groundtruth

Cropland Data Layer



Groundtruth – ½ saved for validation



versus

Accuracy Assessments

	Cover Type	Attribute Code	*Correct Pixels	Producer's Accuracy	Omission Error	Kappa	User's Accuracy	Commission Error	Cond'1 Kappa
IA	Corn	1	2197719	96.58%	3.42%	0.9226	97.86%	2.14%	0.9509
	Soybeans	5	1471094	96.24%	3.76%	0.9392	95.78%	4.22%	0.9320
IL	Corn	1	2258219	98.06%	1.94%	0.9527	98.58%	1.42%	0.9650
	Soybeans	5	1339089	96.36%	3.64%	0.9438	97.96%	2.04%	0.9681
NE	Corn	1	1856422	97.29%	2.71%	0.9605	97.32%	2.68%	0.9608
	Soybeans	5	849249	95.83%	4.17%	0.9513	96.95%	3.05%	0.9643
SD	Corn	1	803251	94.29%	5.71%	0.9342	95.78%	4.22%	0.9513
	Soybeans	5	707383	95.03%	4.97%	0.9439	97.72%	2.28%	0.9741

	Crop-specific covers only	*Correct	Accuracy	Error	Kappa
IA	OVERALL ACCURACY	3688803	95.74%	4.26%	0.9145
IL	OVERALL ACCURACY	3730093	97.05%	2.95%	0.9426
NE	OVERALL ACCURACY	3071960	94.05%	5.95%	0.8981
SD	OVERALL ACCURACY	2306428	87.51%	12.49%	0.8416

State level accuracies are very high

Producer's Accuracy: relates to the probability that a ground truth pixel will be correctly mapped and measures errors of omission.

Errors of Omission: occur when a pixel is excluded from the correct category.

User's Accuracy: indicates the probability that a pixel from the classification actually matches the ground truth data and measures errors of commission.

Errors of Commission: occur when a pixel is included in an incorrect category.

Kappa Coefficient: A statistics measure of agreement, beyond chance, between two maps.

Regression-based Acreage Estimator

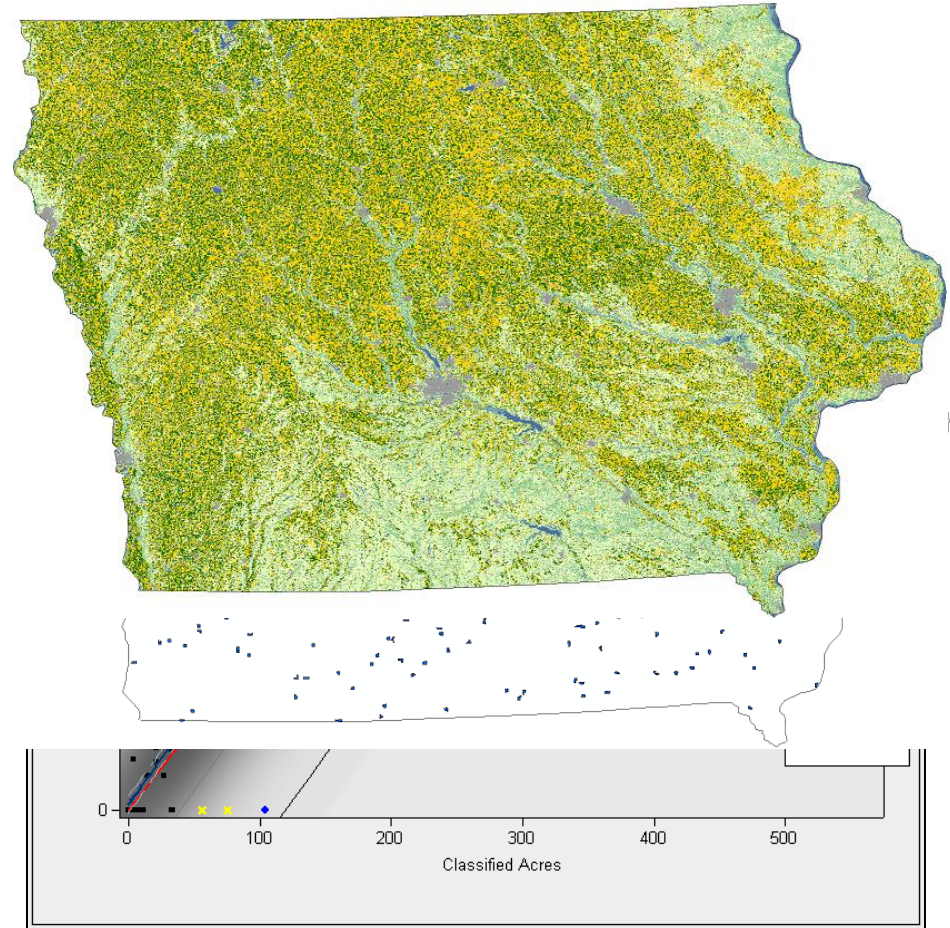
Simple Linear Regression

Regression used to relate categorized pixel counts to the ground reference data

- (X) – Cropland Data Layer (CDL) classified acres
- (Y) – June Agricultural Survey (JAS) reported acres

Outlier segment detection - removal from regression analysis

Using regression results in estimates reduces error rates over using JAS alone

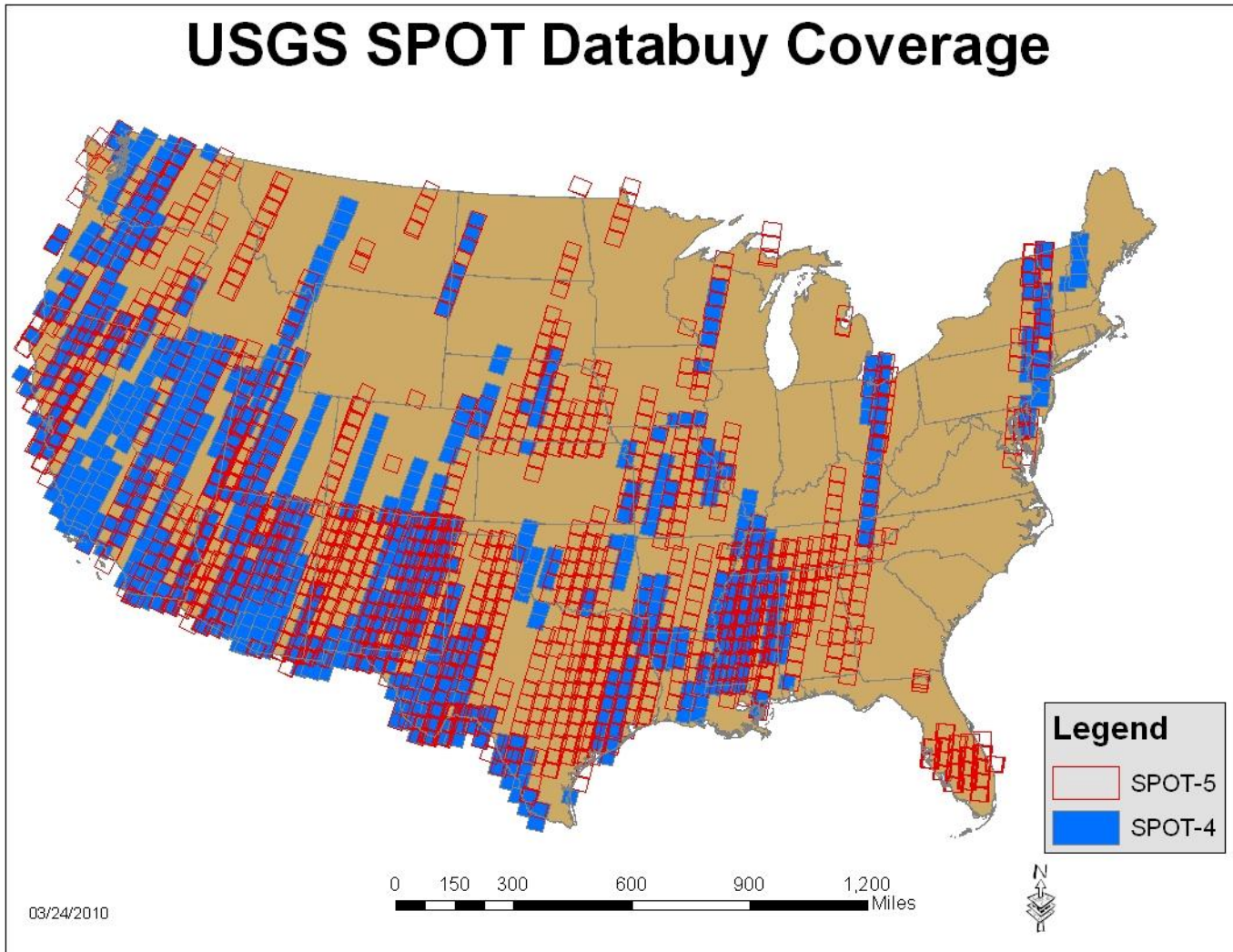


Acreage not just about counting pixels

CDL Satellite Future

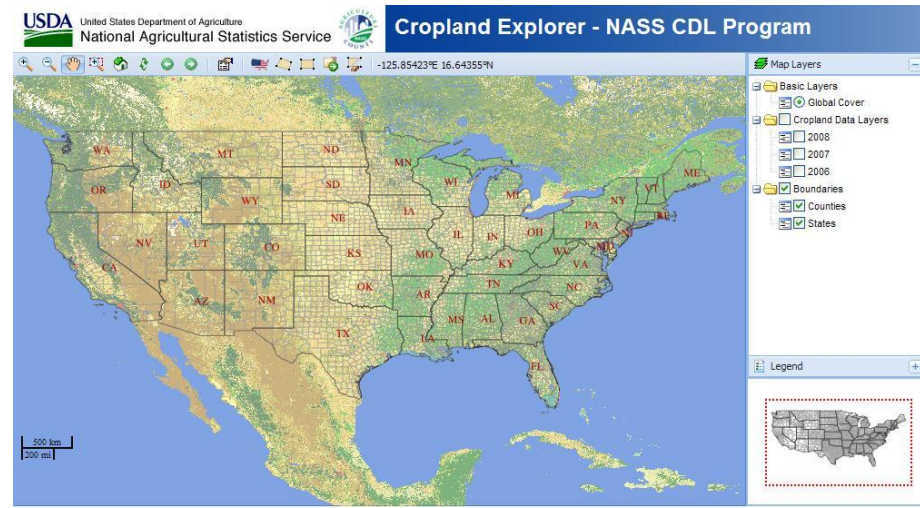
- Aging satellite fleet
 - Landsat 5 (1984)
 - Landsat 7 SLC-off (1999)
 - Indian Resourcesat-1/AWiFS (2003)
- Future
 - Resourcesat-2 (operational ~late 2010)
 - Landsat Data Continuity Mission (LDCM) ~2013
 - French Spot 4/5

Current Coverage – SPOT 4 and 5

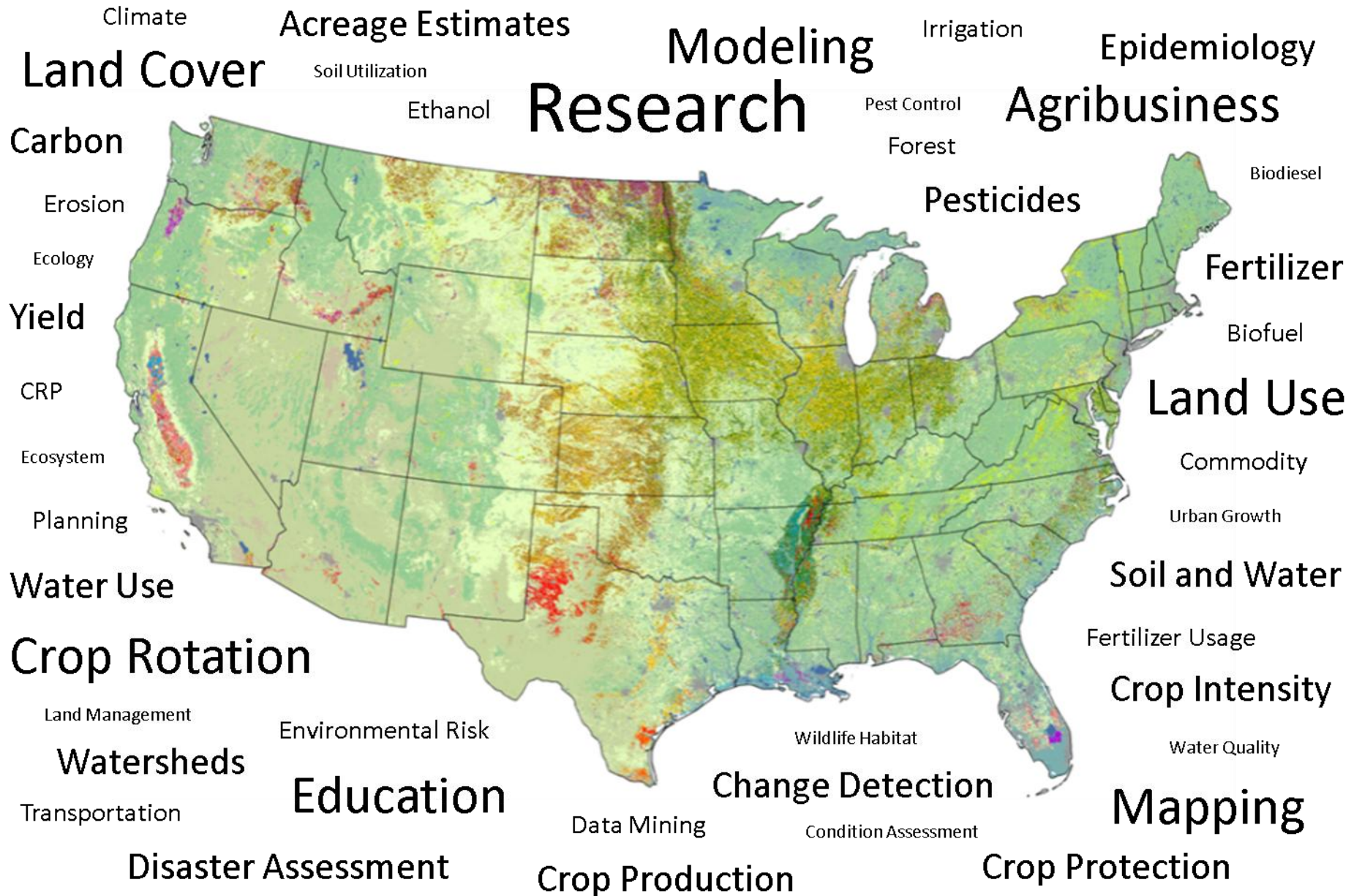


CDL Future

- National CDL crop year 2009
 - Funded in part by EPA released Jan 2010
- Fund Geospatial CDL portal
 - George Mason U/Center for Spatial Information Science and Systems
- National Commodity Crop Productivity Index
 - NRCS dynamic soils layer



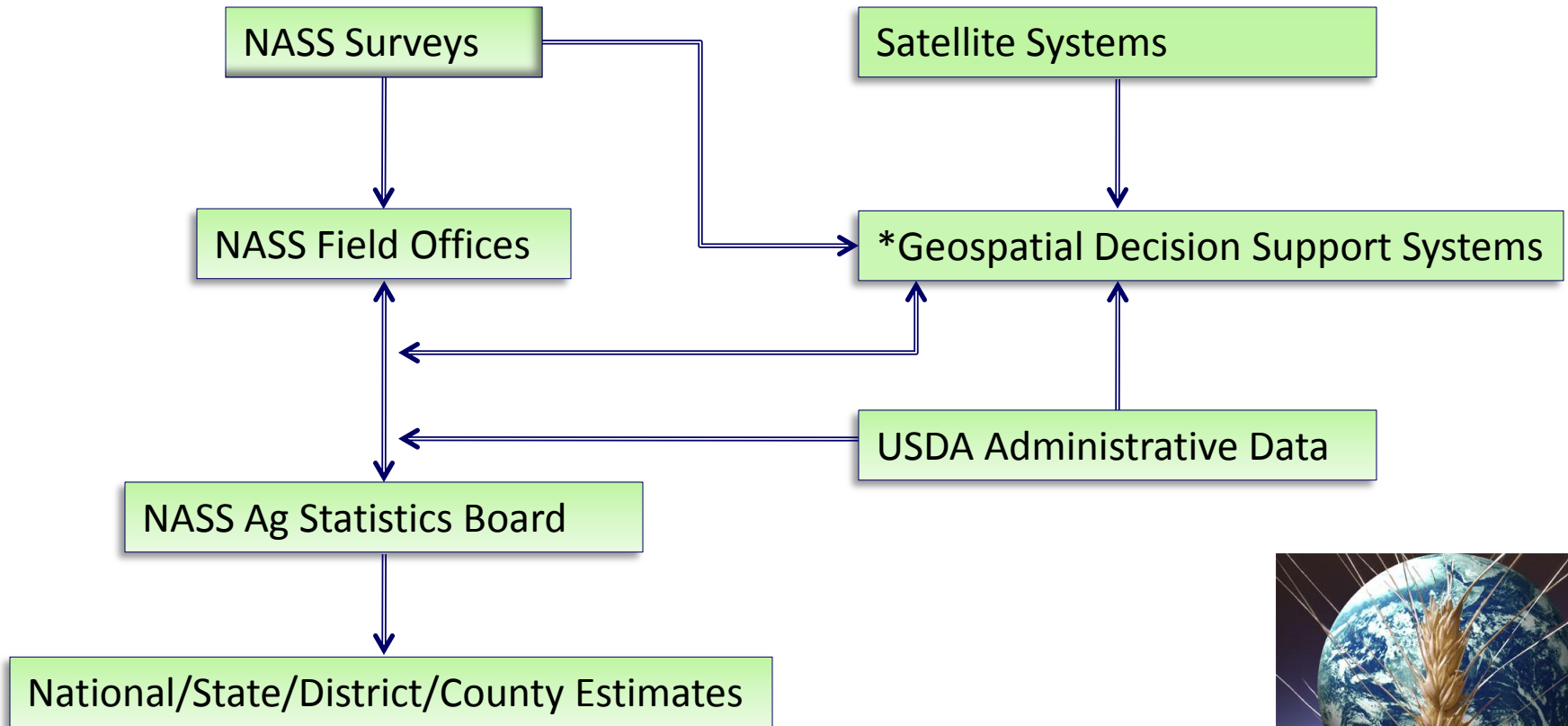
NASS Cropland Data Layer Applications



CDL Distribution & Information

- <http://datagateway.nrcs.usda.gov>
 - All CDL's and Metadata
 - Download by State (all years for that State)
- <http://www.nass.usda.gov/research/Cropland/SARS1a.htm>
 - Most current year only
- Rick Mueller, Head, Spatial Analysis Research Section, USDA/NASS, (703)877-8000 ext:111
 - Rick_Mueller@nass.usda.gov
- Mike Craig, Remote Sensing Analyst, MEC GeoStat Inc
 - MikeCraig42@live.com, (703)798-0073

NASS Estimation Systems



*NASS uses Geospatial Decision Support Systems to provide updated information to the Ag Statistics Board and data users.