

Patrick Willis
Federal Contractor

**United States Department of Agriculture (USDA)
National Agricultural Statistics Service (NASS)
Research and Development Division (RDD)
Spatial Analysis Research Section (SARS)**

Illinois Land Cover Mapping: The USDA-NASS Cropland Data Layer

ILGISA Spring Conference – Champaign, 2009



NASS Overview

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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Browse NASS by Subject

- Crops and Plants
- Demographics
- Economics
- Environmental
- Livestock and Animals
- Charts and Maps
- Education and Outreach
- Statistics by State

Select a State

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 revisions. 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

NASS Home | USDA.gov | FEDSTATS | Economics Statistics System (ESS) | Site Map
FOIA | Accessibility Statement | Privacy Policy | Non-Discrimination Statement | Information Quality | FirstGov | White House

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 and geese during 2001, translates 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.

Maryland 2001 Crop Loss from Deer

Region	Crop	Acres Harvested	Harvested Yield (bushels)	Average Yield Loss (bushels)	Production Loss (bu)	Economic Loss (\$)
Western Maryland	Corn	5,500	124,9	7.4	40,700	83
	Soybeans	300	36.7	9.9	1,202,250	2,419
	Wheat	200	45.2	2.3	460	1
Central Maryland	Corn	114,200	2,624	3.9	360,780	1,479
	Soybeans	94,200	34.2	3.3	126,290	319
	Wheat	38,300	63.3	3.3	126,290	319
Southern Maryland	Corn	25,800	132.9	4.9	146,200	299
	Soybeans	43,200	39.0	3.1	142,260	314
	Wheat	16,000	57.0	0.3	14,400	36
Upper Shore	Corn	157,200	159.2	5.1	800,700	1,241
	Soybeans	232,000	39.8	2.4	186,800	2,262
	Wheat	84,800	64.0	1.1	99,120	213

USDA 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 FORECASTS RECORD-SETTING CORN CROP FOR 2007

Washington, Aug. 10, 2007 – U.S. history in 2007, according to the United States Department of Agriculture's National Agricultural Statistics Service, is that the nation's corn crop is projected to reach 13.1 billion bushels, 10.6 percent more than the 11.8 billion bushels harvested in 2006.

Based on conditions as of August 10, 2007, the average yield per acre, up 3.7 bushels from last year, will result in a record-setting crop of 13.1 billion bushels, or 160.4 bushels per acre for grain, up 3.7 bushels from the 156.7 bushels per acre harvested in 2006.

Yield forecasts are higher than last year's forecasts for the Delta. Meanwhile, hot, dry conditions in the Southeast and eastern Corn Belt, Ohio Valley and parts of the Midwest are expected to reduce yields in those areas.

WISCONSIN AGRICULTURAL STATISTICS SERVICE
P.O. Box 8034 Madison, WI 53708-8034
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 few years according to a survey conducted by the Wisconsin Agricultural 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.

2002 Census of Agriculture - SVG Interactive Mapping - United States - 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:

County Total:

Download data as CSV | XML | PDF

Help Print Return to

Legend

Scale: National | Zero or Data Withheld

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

- <= 20,000
- 20,001 to 40,000
- 40,001 to 60,000
- 60,001 to 80,000
- 80,001 to 100,000
- 100,001 >=

Comparisons: 6

Color: Green

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.

All Milk Price, Wisconsin Annual Average, 1985 - 2002 1/

Wisconsin Dairy Herds by Herd Size

Milk cow herd size	May 2002 herds	May 2007 herds (projected) 1/	Change 2007/2002
Number			Percent
1 - 29	2,800	1,440	-45
30 - 49	4,700	3,440	-27
50 - 99	7,400	5,600	-24
100 - 199	1,900	2,080	+10
200 - 499	700	600	-14
500+	200	440	+120
Total	17,500	15,900	-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.

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

Herds	Keep same herd size	Increase herd size	Discontinue milking
Number			Percent
2,600	47	17	58
4,700	71	9	20
7,400	63	19	18
1,900	53	37	10
700	33	59	8
200	22	78	0
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.

Percent of Herds by Size Group 2007 Projection



























1-29
30-49
50-99
100-199
200-499
500+



Land Cover Categories

(Ordered by Decreasing Acreage)

Agriculture

 Corn	 Potatoes
 Soybeans	 Rice
 Pasture/Grass	 Sunflowers
 W. Wht./Soy. Dbl. Crop.	 Rye
 Winter Wheat	 Other Small Grains
 Fallow/Idle Cropland	 Peas
 Alfalfa	
 Sorghum	
 Misc. Veggies. & Fruits	
 Seed/Sod Grass	
 Dry Beans	
 Other Crops	
 Oats	
 Clover/Wildflowers	
	Non-Agriculture
	 Woodland
	 Urban/Developed
	 Water
	 Wetlands
	 Barren
	 Shrubland



Purpose of the Cropland Data Layer (CDL) Program

- “Census by Satellite”
 - Without area duplication
 - Major corn and soybean regions
- Provide timely, accurate, useful independent estimates
 - Measurable error
 - County and state level
- Output crop specific Cropland Data Layer
 - Distribute free to public
 - Publish accuracy statistics & metadata
 - County and state level

History of the Illinois CDL Program

- Began in 1999 as a interagency collaboration

The Illinois Interagency Landscape Classification (IILC) Project

- National Agricultural Statistics Service (NASS)
 - Provide supplemental acreage estimates for the state's major commodities.
- Illinois Department of Natural Resources (IDNR)
 - On a recurring basis, update the Land Cover of Illinois statewide inventory published by IDNR in 1996.
- Illinois Department of Agriculture (IDA)
 - Locate, quantify, and track changes in various land classes within the State of Illinois.

Current Data Partnerships

- Foreign Ag Service
 - Satellite Image Archive
- Farm Service Agency
 - Common Land Unit
- USGS/MRLC
 - National Land Cover Dataset

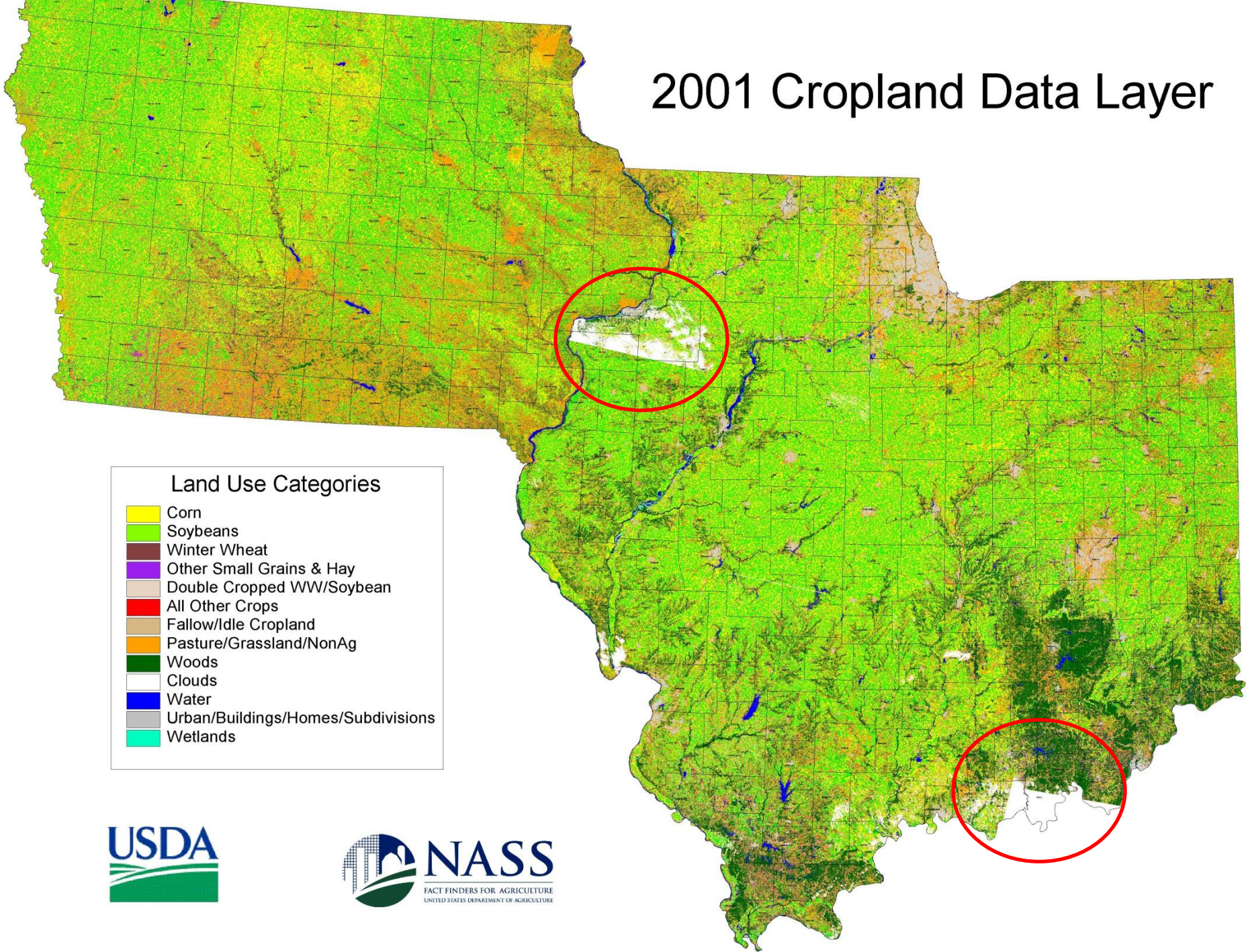


Inputs & Methodology

1999 - 2005

- 30 meter ground resolution (Landsat Sensor)
 - 16 day revisit (cloud & coverage issues)
- Agricultural ground truth (June Area Survey)
 - Data preparation was very time and labor intensive
- In-house software (Peditor)
 - Legacy software with inherited technical limitations
 - Not user friendly

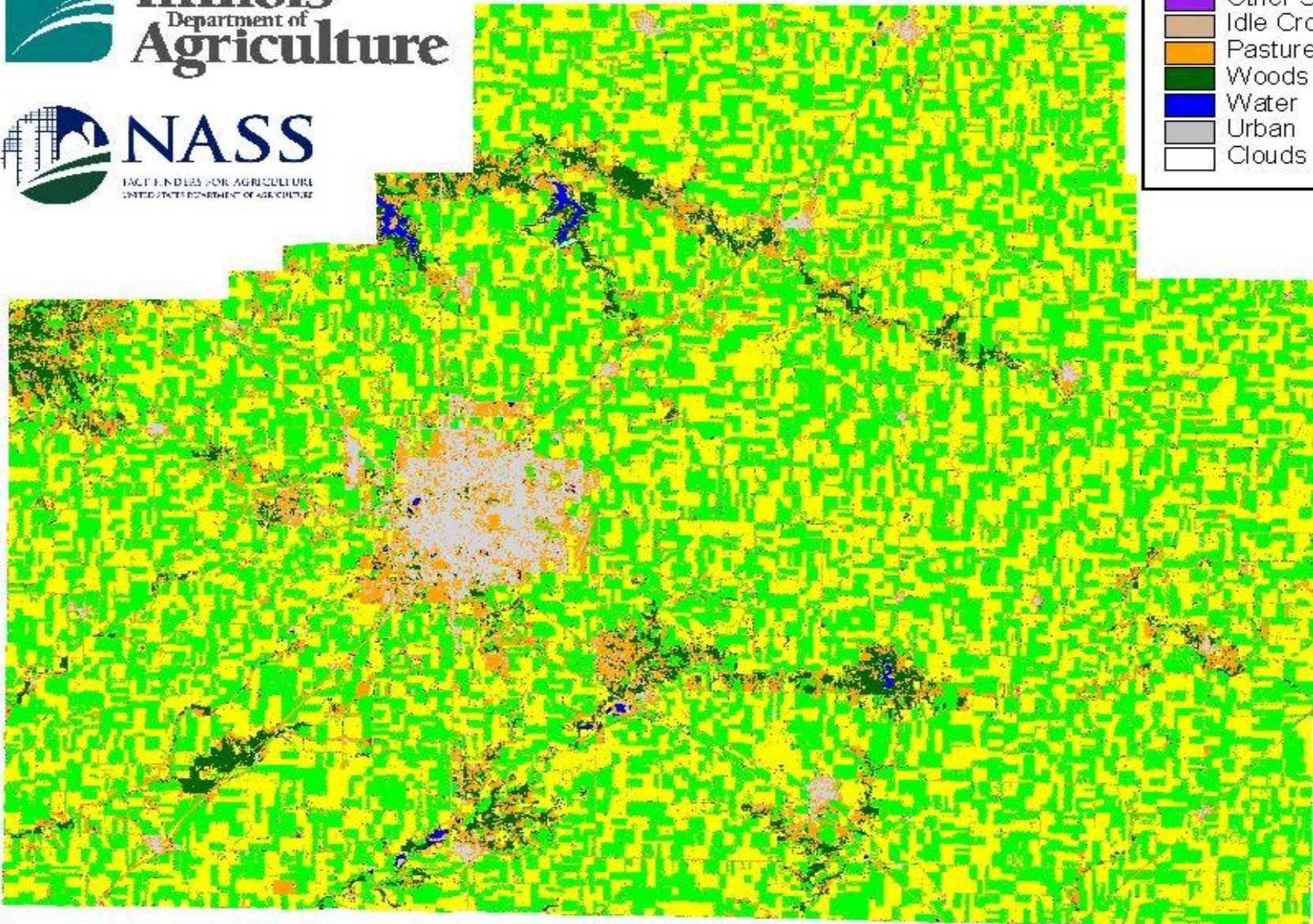
2001 Cropland Data Layer



2001 McLean County, Illinois Categorized Image

Categories

- Corn
- Soybeans
- Other Crops
- Winter Wheat
- Other Small Grains
- Idle Cropland
- Pasture/Non Ag/CRP
- Woods
- Water
- Urban
- Clouds



New Inputs & Methodology

2006 - Current


- New satellite sensor (AWiFS)
 - 56 meter
 - 5 day revisit
- New ground truth
 - Ag: USDA, Farm Service Agency, Common Land Unit
 - Nonag: USGS, 2001 National Land Cover Dataset
- New commercial software suite
 - Switched from a Maximum Likelihood Classifier to a Decision-Tree Classifier

The Landsat Data Gap

Landsat 7 ETM+



Landsat 5 TM



USGS
science for a changing world

News Release

November 30, 2005 Ron Beck [REDACTED]

Landsat 5 Experiencing Technical Difficulties

On November 26, 2005, the back-up solar array drive on Landsat 5 began exhibiting unusual behavior. The solar array drive maintains the proper pointing angle between the solar array and the sun. The rotation of the solar array drive became sporadic and the solar array was not able to provide the power needed to charge the batteries. Maintaining power to the batteries is critical to sustain proper operation of the spacecraft. The primary solar array drive failed under similar circumstances last January. As a result of this current situation, imaging operations will be suspended for at least the next two weeks or until attempts to solve the problem have been resolved.

Source: USGS, Landsat Project:

http://landsat.usgs.gov/slc_enhancements/slc_off_level1_standard.php

New Satellite Sensor

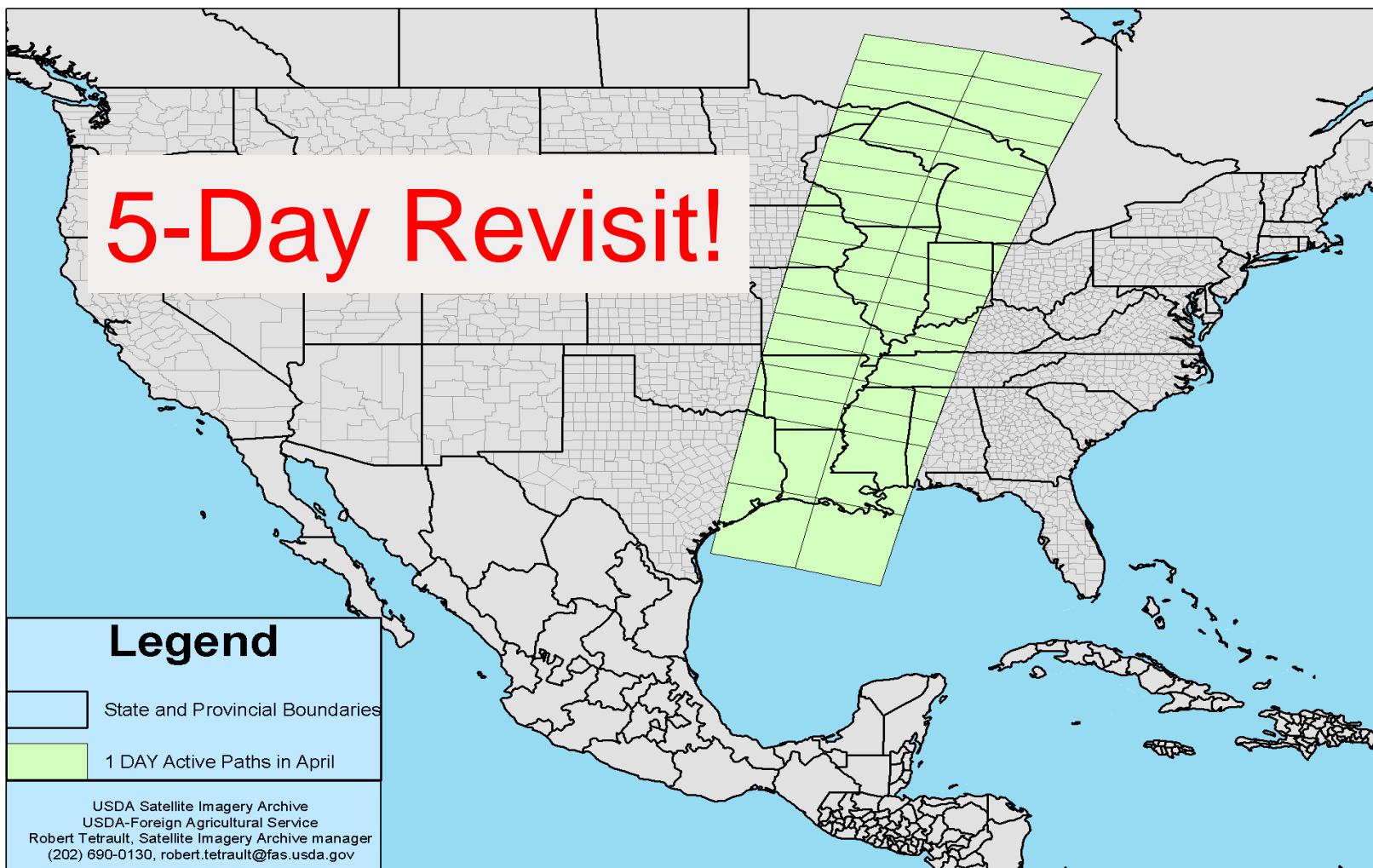
1999 - 2005

2006 - Current

	<u>TM</u>	<u>AWiFS</u>
Altitude	705 km	817 km
Equatorial crossing time	9:45 ± 15 minutes	10:30 ± 5 minutes
Temporal Resolution	16 days	5 days
Spatial Resolution	30 x 30 m (reflective) 120 x 120 m (thermal)	56 x 56 m
Radiometric Resolution	8 bit (256)	10 bit (1024)
Spectral Resolution	6 (B, G, R, NIR, SWIR, MIR) + Thermal IR	4 (G, R, NIR, SWIR)
Swath wide	185 km	737 km
Scene size	184 x 152 km	370 x 370 km

USDA Satellite Image Archive

Active Paths for P6-AWiFS CONUS



New Ground Truth

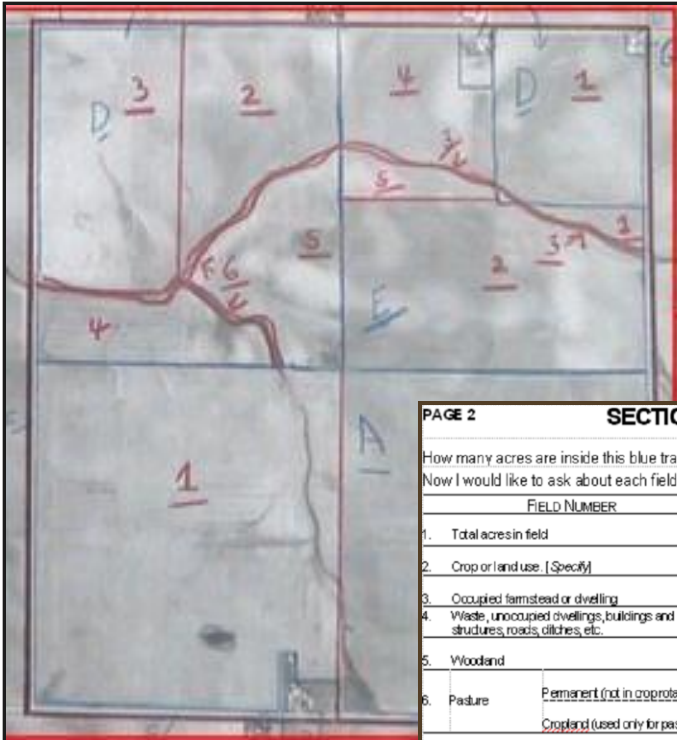
- Agricultural Training & Validation
 - Farm Service Agency (FSA) Common Land Unit (CLU) Program
 - ½ used for training
 - ½ used for validation
- Non-Agricultural Training & Validation
 - USGS National Land Cover Dataset (NLCD) 2001
 - Sampled proportionate to the amount of agricultural training data

Old Ground Truth

June Agricultural Survey (JAS) – National in Scope

- 41,000 farms visited, 11,000 one-square mile sample area segments

- Illinois ~ 400 segments statewide

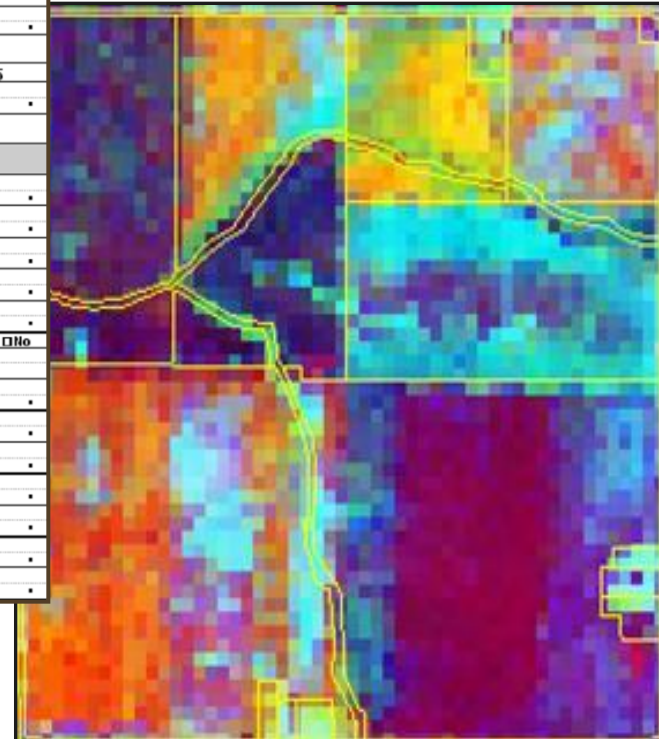


PAGE 2 SECTION D - CROPS AND LAND USE ON TRACT 17

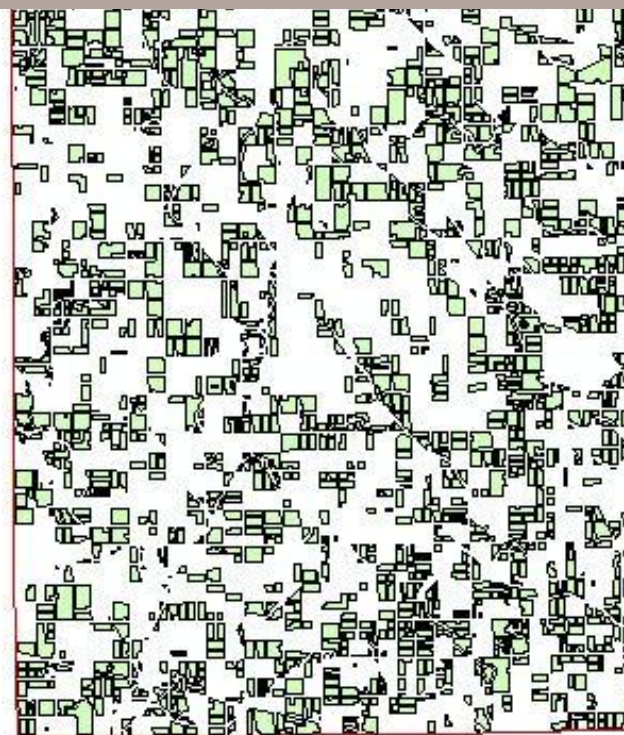
How many acres are inside this blue tract boundary drawn on the photo (map)?

Now I would like to ask about each field inside this blue tract boundary and its use during 2000.

FIELD NUMBER	01	02	03	04	05
1. Total acres in field	828	828	828	828	828
2. Crop or land use. (Specify)					
3. Occupied farmstead or dwelling	843				
4. Waste, unoccupied dwellings, buildings and structures, roads, ditches, etc.	---	---	---	---	---
5. Woodland	831	831	831	831	831
6. Pasture	842	842	842	842	842
Permanent (not in crop rotation)	856	856	856	856	856
Cropland (used only for pasture)	857	857	857	857	857
8. Idle cropland - Idle all during 2000					
9. Two crops planted in this field or two uses of the same crop.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
[Specify second crop or use]					
Acres	844	844	844	844	844
10. Acres left to be planted	810	810	810	810	810
11. Acres irrigated and to be irrigated. [If double cropped, include acreage of each crop irrigated]	620	620	620	620	620
16. Winter Wheat (include cover crop)					
Planted	540	540	540	540	540
For grain or seed	541	541	541	541	541
18. Rye (include cover crop) [Exclude ryegrass]					
Planted	547	547	547	547	547
For grain or seed	548	548	548	548	548



No



FSA CLU Training

- USDA
- Progra
- GIS-re

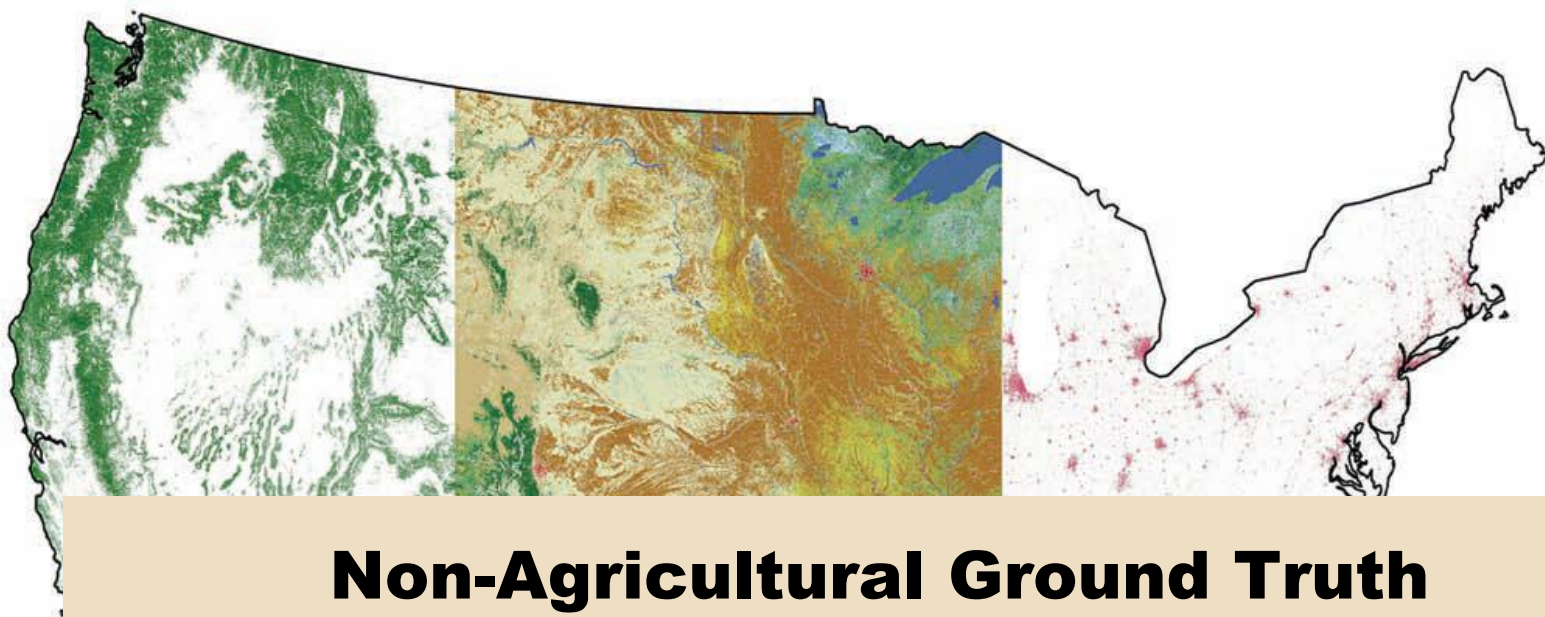
United States Department of Agriculture
 National Agricultural Statistics Service
 Research and Development Division
 Spatial Analysis Research Section



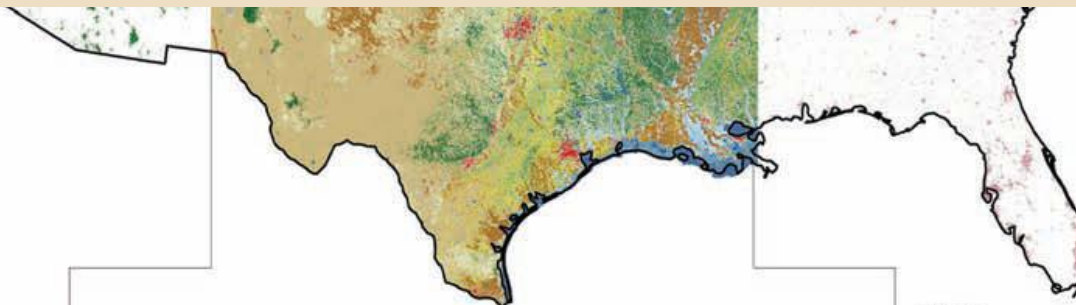
Classification

- (ops)

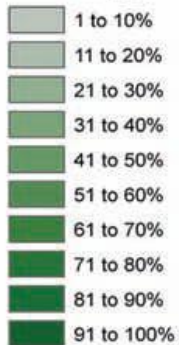




Non-Agricultural Ground Truth USGS, National Land Cover Dataset 2001



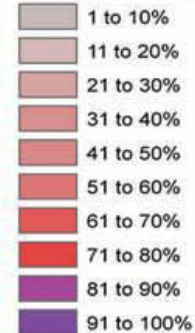
Tree canopy



Land Cover Class Value and Description



Urban Imperviousness



New Commercial Software Suite

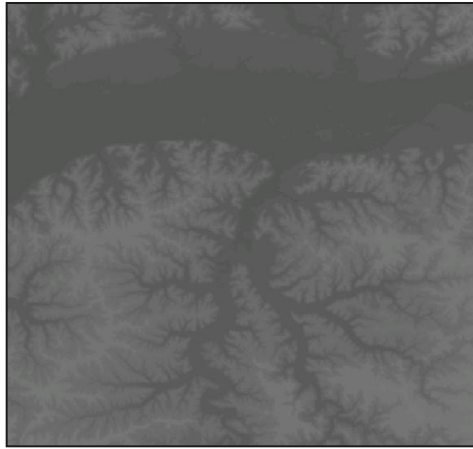
- Imagery Preparation
 - Leica Geosystems ERDAS Imagine
- Image classification
 - See5.0 www.rulequest.com
 - Decision tree software
- Ground Truth Preparation
 - ESRI ArcGIS
- Acreage Estimation
 - SAS/IML workshop



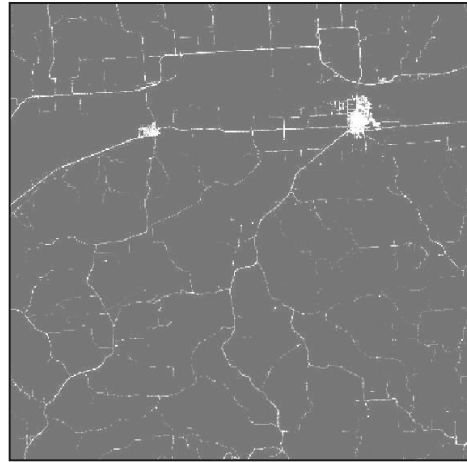
New Commercial Software Suite

- User-friendly
- Allows unlimited classification inputs
 - Peditor software was limited to two dates

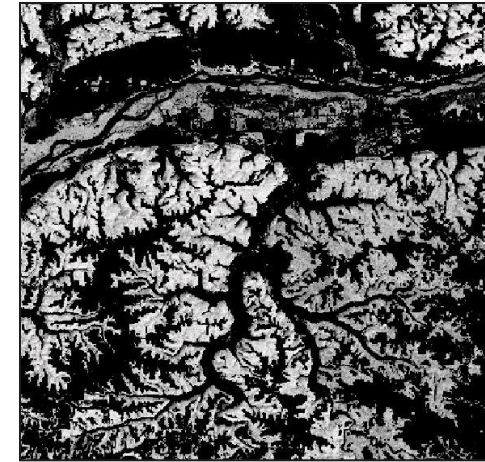
Ancillary Data – USGS & NASA Products



Elevation

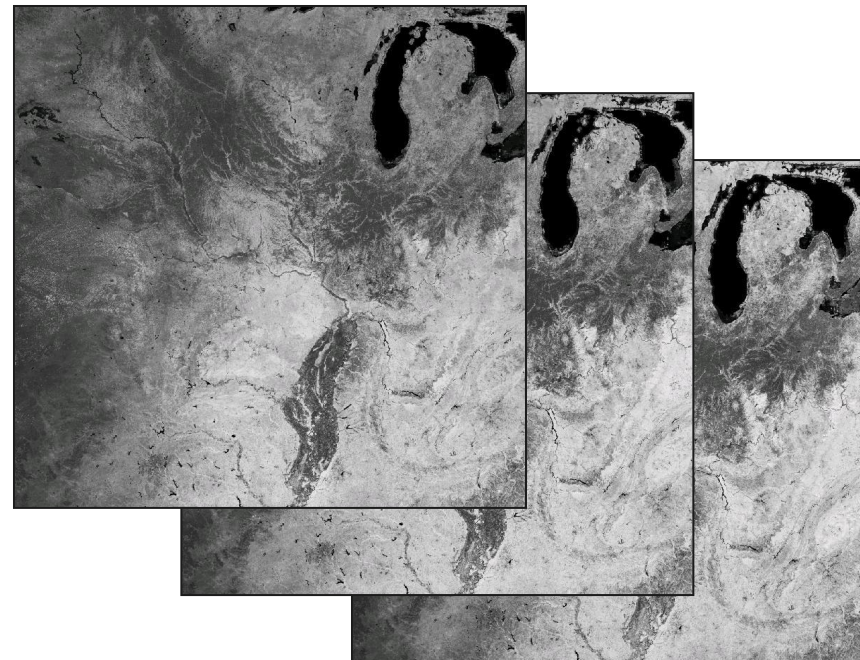


Imperviousness



Forest Canopy

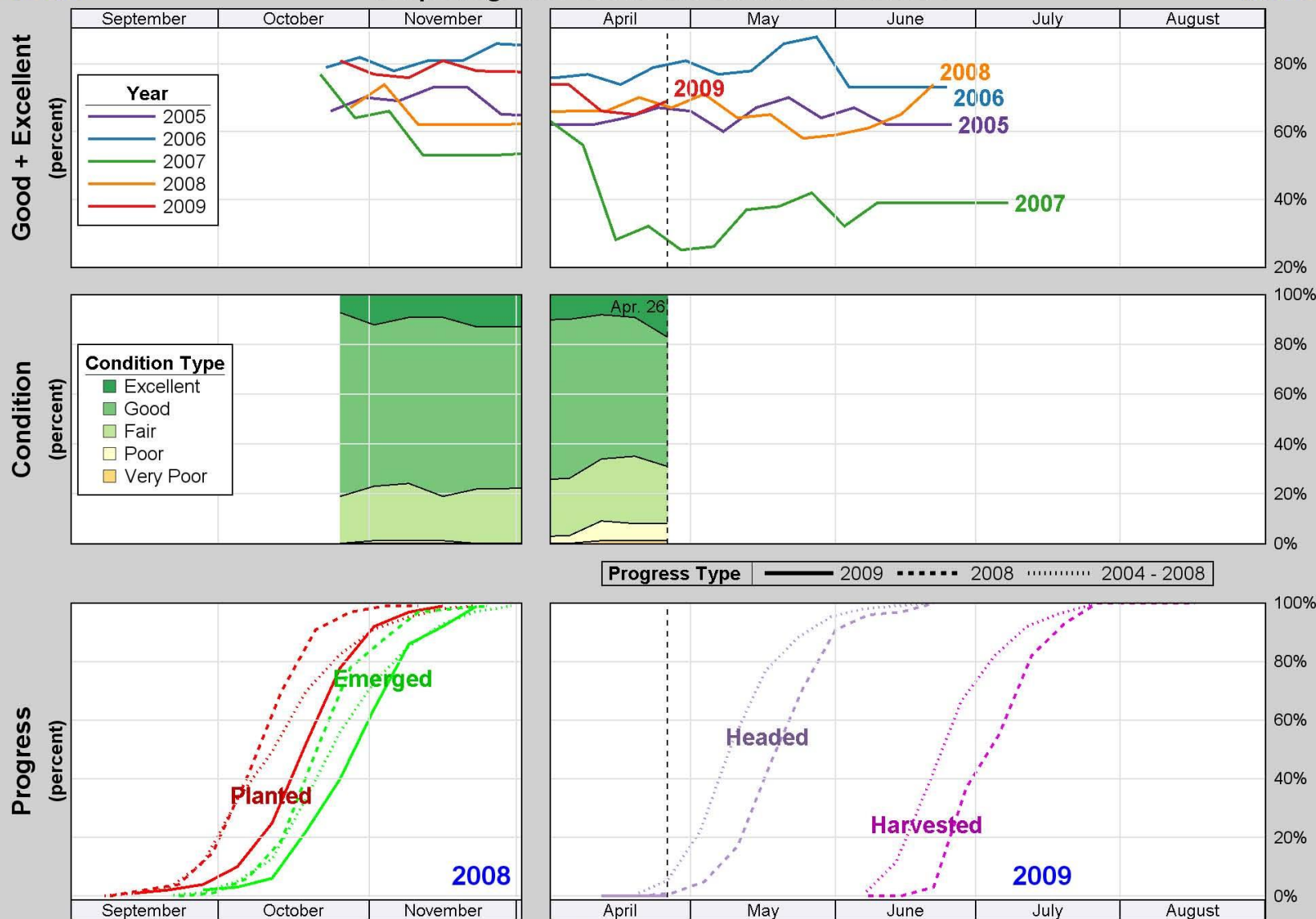
- **NASA MODIS 16-day 250m NDVI composites**
- **Start in fall of previous year for winter wheat**



USDA

Crop Progress: Winter Wheat in Illinois , 2009

NASS



Source: National Agricultural Statistics Service (NASS), Crop Progress Report

2008 Illinois
CDL Inputs

15 Awifs scenes

12 Modis NDVI
scenes

3 Ancillary data
layers

> 3 million acres
of FSA training
data

CLASSIFICATION INPUTS:

AWIFS DATE 20080415 PATH 274 ROW(S)&QUADRANT(S) 40BD 45BD 50B
AWIFS DATE 20080504 PATH 273 ROW(S)&QUADRANT(S) 40BD 45BD 50B
AWIFS DATE 20080528 PATH 273 ROW(S)&QUADRANT(S) 35D 40BD
AWIFS DATE 20080616 PATH 272 ROW(S)&QUADRANT(S) 39ACD 40BD 50BD
AWIFS DATE 20080621 PATH 273 ROW(S)&QUADRANT(S) 40BD 45B
AWIFS DATE 20080701 PATH 275 ROW(S)&QUADRANT(S) 35D 40BD 45D 50B
AWIFS DATE 20080706 PATH 276 ROW(S)&QUADRANT(S) 35D 40BD 45BD
AWIFS DATE 20080710 PATH 272 ROW(S)&QUADRANT(S) 40D 45D
AWIFS DATE 20080715 PATH 273 ROW(S)&QUADRANT(S) 35CD 40ABCD 45ABD 50B
AWIFS DATE 20080716 PATH 278 ROW(S)&QUADRANT(S) 40C 45ABC
AWIFS DATE 20080720 PATH 274 ROW(S)&QUADRANT(S) 40ACD 45ABCD 50B
AWIFS DATE 20080804 PATH 277 ROW(S)&QUADRANT(S) 35D 40C 45ABCD 50A
AWIFS DATE 20080823 PATH 276 ROW(S)&QUADRANT(S) 40D 45B
AWIFS DATE 20080827 PATH 272 ROW(S)&QUADRANT(S) 35D 40BD
AWIFS DATE 20080901 PATH 273 ROW(S)&QUADRANT(S) 35D 40BD 45B

MODIS 16 DAY NDVI COMPOSITE DATE 20071016
MODIS 16 DAY NDVI COMPOSITE DATE 20071101
MODIS 16 DAY NDVI COMPOSITE DATE 20071117
MODIS 16 DAY NDVI COMPOSITE DATE 20080406
MODIS 16 DAY NDVI COMPOSITE DATE 20080422
MODIS 16 DAY NDVI COMPOSITE DATE 20080508
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MODIS 16 DAY NDVI COMPOSITE DATE 20080609
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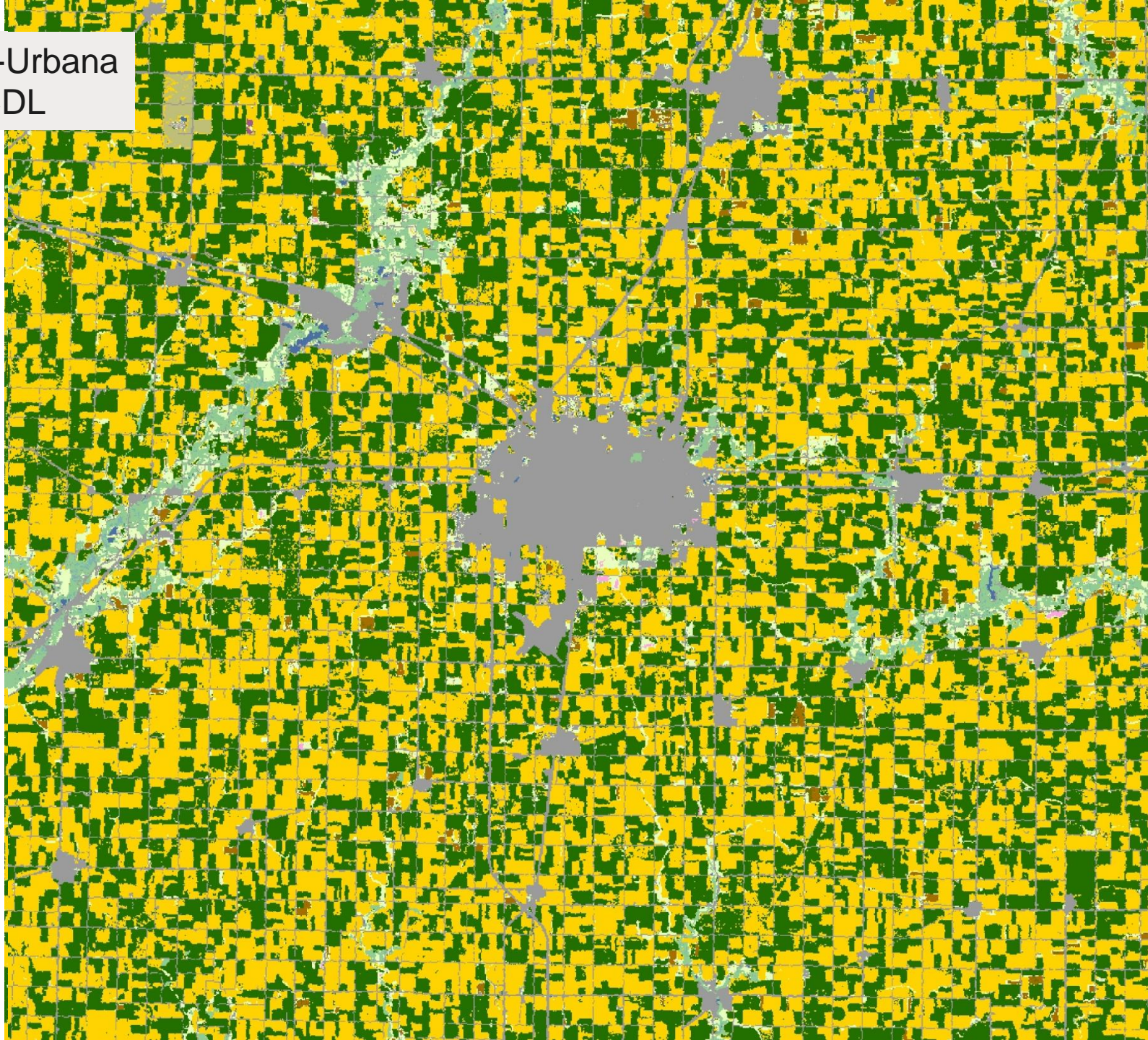
USGS, NATIONAL ELEVATION DATASET ELEVATION
USGS, NATIONAL LAND COVER DATASET 2001 TREE CANOPY
USGS, NATIONAL LAND COVER DATASET 2001 IMPERVIOUSNESS

TRAINING AND VALIDATION:

USDA, FARM SERVICE AGENCY 2008 COMMON LAND UNITS
USGS, NATIONAL LAND COVER DATASET 2001

NOTE: The final extent of the CDL is clipped to the state boundary even though the raw input data may encompass a larger area.

Champaign-Urbana
2008 CDL



USDA, National Agricultural Statistics Service, 2008 Illinois Cropland Data Layer
STATEWIDE AGRICULTURAL ACCURACY REPORT

Crop-specific covers only	*Correct	Accuracy	Error	Kappa
OVERALL ACCURACY	3730093	97.05%	2.95%	0.9426

Cover Type	Attribute Code	*Correct Pixels	Producer's Accuracy	Omission Error	Kappa	User's Accuracy	Commission Error	Cond'1 Kappa
Corn	1	2258219	98.06%	1.94%	0.9591	97.29%	2.71%	0.9433
Rice	3	30	75.00%	25.00%	0.7500	14.42%	85.58%	0.1442
Sorghum	4	2454	89.99%	10.01%	0.8997	36.62%	63.38%	0.3658
Soybeans	5	1339089	96.36%	3.64%	0.9467	96.07%	3.93%	0.9426
Sunflowers	6	49	85.96%	14.04%	0.8596	25.65%	74.35%	0.2565
Tobacco	11	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Sweet corn	12	612	85.36%	14.64%	0.8535	52.09%	47.91%	0.5208
Popcorn	13	3748	95.01%	4.99%	0.9500	62.59%	37.41%	0.6256
Barley	21	0	0.00%	100.00%	0.0000	0.00%	100.00%	0.0000
Spring wheat	23	0	0.00%	100.00%	0.0000	0.00%	100.00%	0.0000
Winter wheat	24	25086	82.73%	17.27%	0.8258	67.41%	32.59%	0.6719
Other grains	25	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
WW / Soybeans	26	95845	90.49%	9.51%	0.9025	87.32%	12.68%	0.8701
Rye	27	39	92.86%	7.14%	0.9286	14.18%	85.82%	0.1418
Oats	28	157	79.70%	20.30%	0.7969	19.36%	80.64%	0.1936
Millet	29	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Speltz	30	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Alfalfa	36	2898	78.81%	21.19%	0.7876	25.61%	74.39%	0.2555
Dry beans	42	28	60.87%	39.13%	0.6086	4.69%	95.31%	0.0469
Potatoes	43	3	60.00%	40.00%	0.6000	4.41%	95.59%	0.0441
Other crops	44	58	79.45%	20.55%	0.7945	11.55%	88.45%	0.1155
Misc. vegetables	47	932	87.35%	12.65%	0.8734	55.31%	44.69%	0.5530
Watermelon	48	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Peas	53	0	0.00%	100.00%	0.0000	0.00%	100.00%	0.0000
Herbs	57	49	66.22%	33.78%	0.6621	17.13%	82.87%	0.1713
Clover / Wildflowers	58	163	82.32%	17.68%	0.8232	13.38%	86.62%	0.1338
Seed / Sod Grass	59	609	91.58%	8.42%	0.9158	29.51%	70.49%	0.2950
Idle / Fallow / Flooded**	61	25	2.44%	97.56%	0.0239	1.19%	98.81%	0.0117
Peaches	67	0	0.00%	100.00%	0.0000	0.00%	100.00%	0.0000
Apples	68	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Grapes	69	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Christmas trees	70	0	n/a	n/a	n/a	0.00%	100.00%	0.0000

*Correct Pixels represents the total number of independent validation pixels correctly identified in the error matrix.

**In the 2008 Illinois Cropland Data Layer, category 61 represents drowned/flooded cropland in addition to idle and fallow cropland.

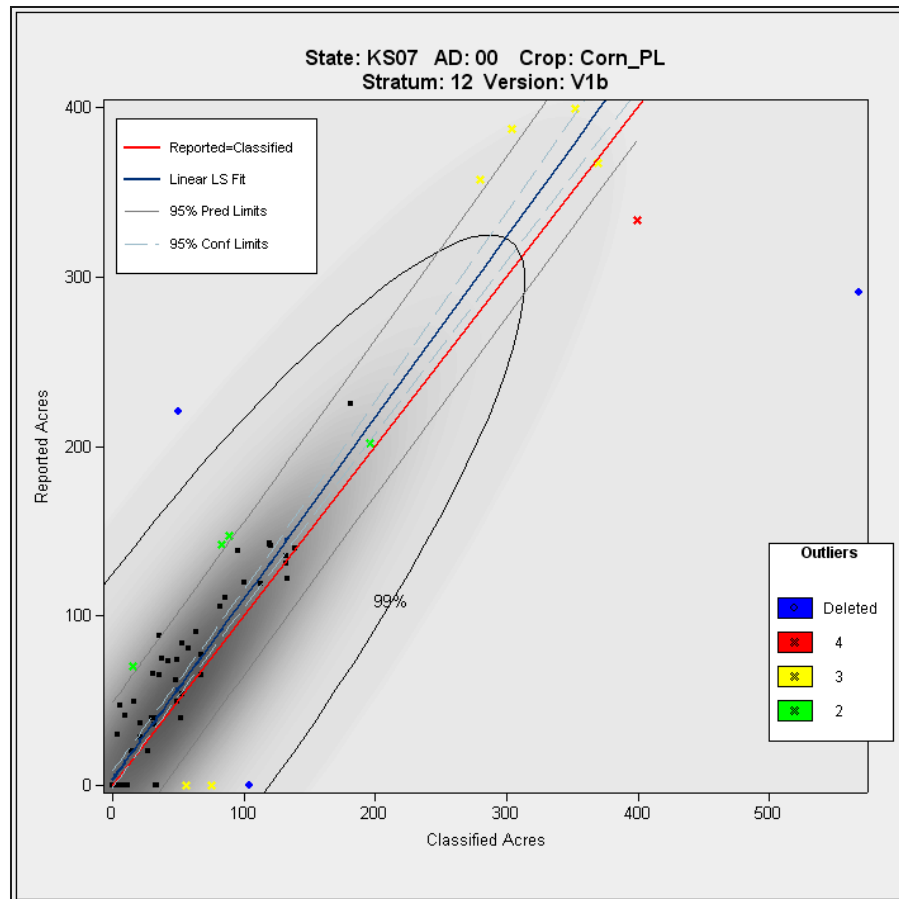
Regression-based Acreage Estimator

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

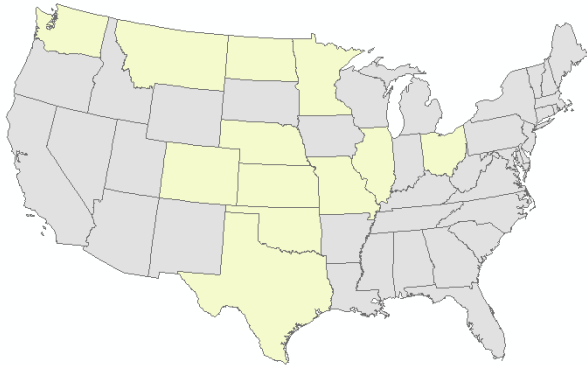
Using both CDL and JAS acreage results in estimates with reduced error rates over JAS alone

Outlier segment detection - correction or removal from regression analysis

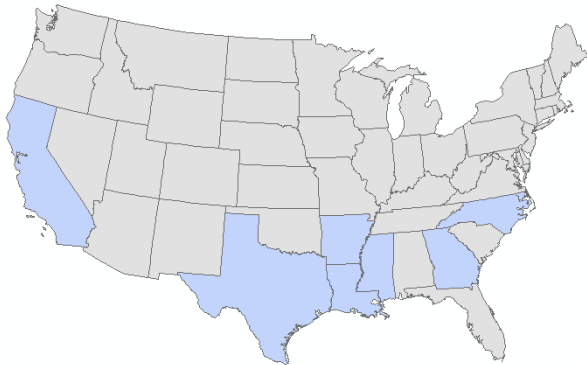


Acreage not just about counting pixels

Future of the CDL Program?



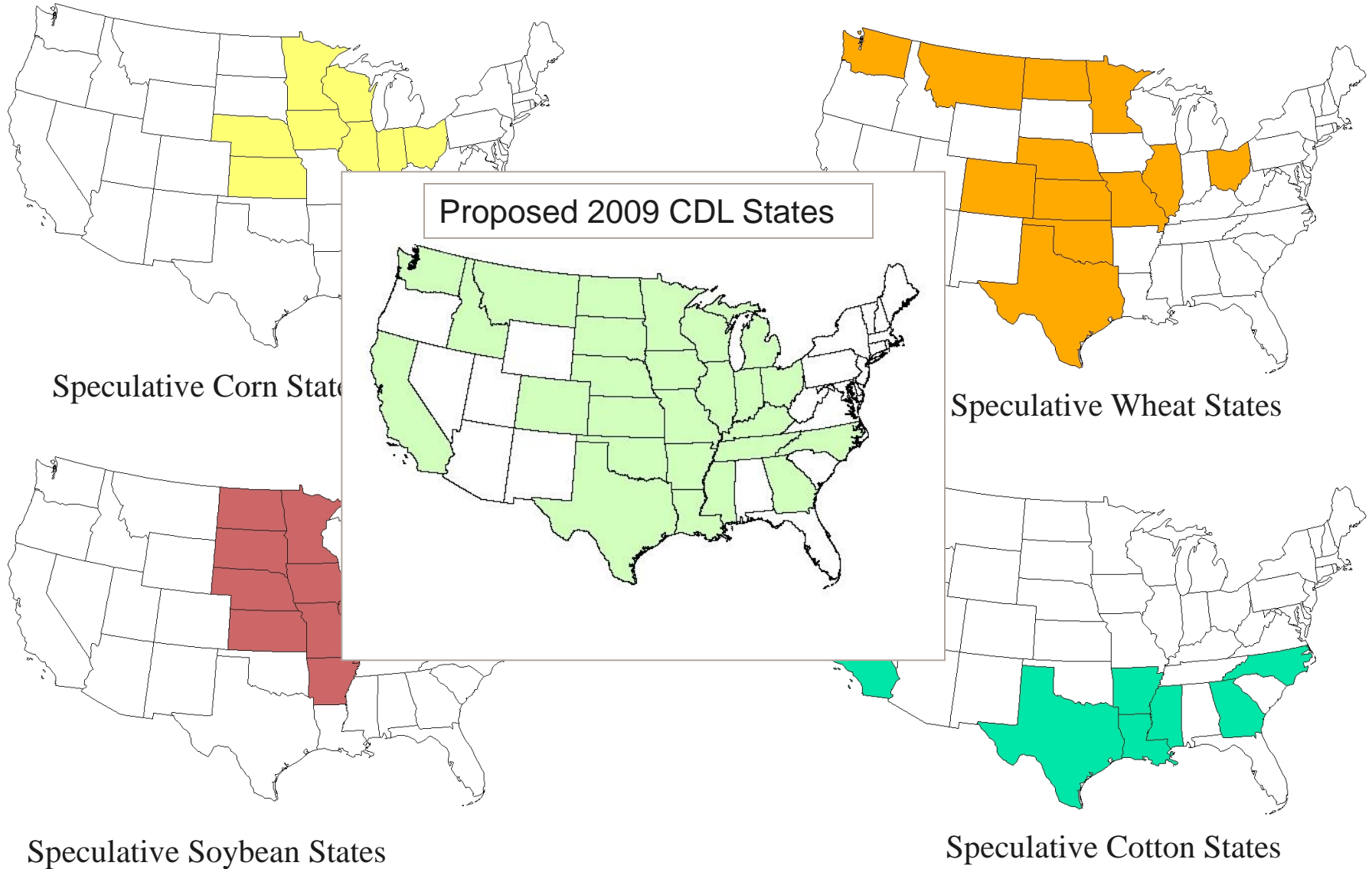
Primary Wheat States



Primary Cotton States

- Expand geographic scope?
 - Wheat states next priority
 - Mid-Atlantic region (often asked about)
- Improved categories?
 - Grassland
 - Pasture (chewed grass)
 - Hay (cut grass)
 - Natural (quasi-native)
- Imagery?
 - More frugal use of
 - Future sensors
 - Finer resolution
- Derivatives?
 - Change detection
 - Crop rotation patterns
- Other ancillary data?
 - Soils
 - Climate

Expanding CDL Program Priorities



CDL Production Schedule

January

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5

February

Su	Mo	Tu	We	Th	Fr	Sa
		1	2			

March

Su	Mo	Tu	We	Th	Fr	Sa
						1

8:● 15:○ 22:○ 30:○

6:● 13:○ 20:○ 28:○

7:● 14:○ 21:○ 29:○

April

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

5:● 12:○ 20:○ 28:○

May

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

5:● 11:○ 19:○ 27:○

June

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24				
29	30					

3:● 10:○

Crop Acreage Report
CDL winter wheat

July

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
						5

2:● 10:○ 18:○ 25:○

August

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
			4	5	6	7
						8
						9
						10
						11
						12
						13
						14
						15
						16
						17
						18
						19
						20
						21
						22
						23
						24
						25
						26
						27
						28
						29
						30

1:● 8:○ 16:○ 23:○ 30:○

September

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

7:○

Small Grains Annual Summary
CDL small grains

Crop Production Report
CDL all crops

October

Su	Mo	Tu	We	Th	Fr	Sa

7:○ 14:○ 21:○ 28:○

November

Su	Mo	Tu	We	Th	Fr	Sa

5:○ 13:○ 19:○ 27:○

December

Su	Mo	Tu	We	Th	Fr	Sa

5:○ 12:○ 19:○ 27:○

Crop Production Repo:
CDL all crops

Historical:
Crop Production Annual Summary
CDL all crops/county estimates

3	4	5	6
0	11	12	13
7	18	19	20
4	25	26	27
1			

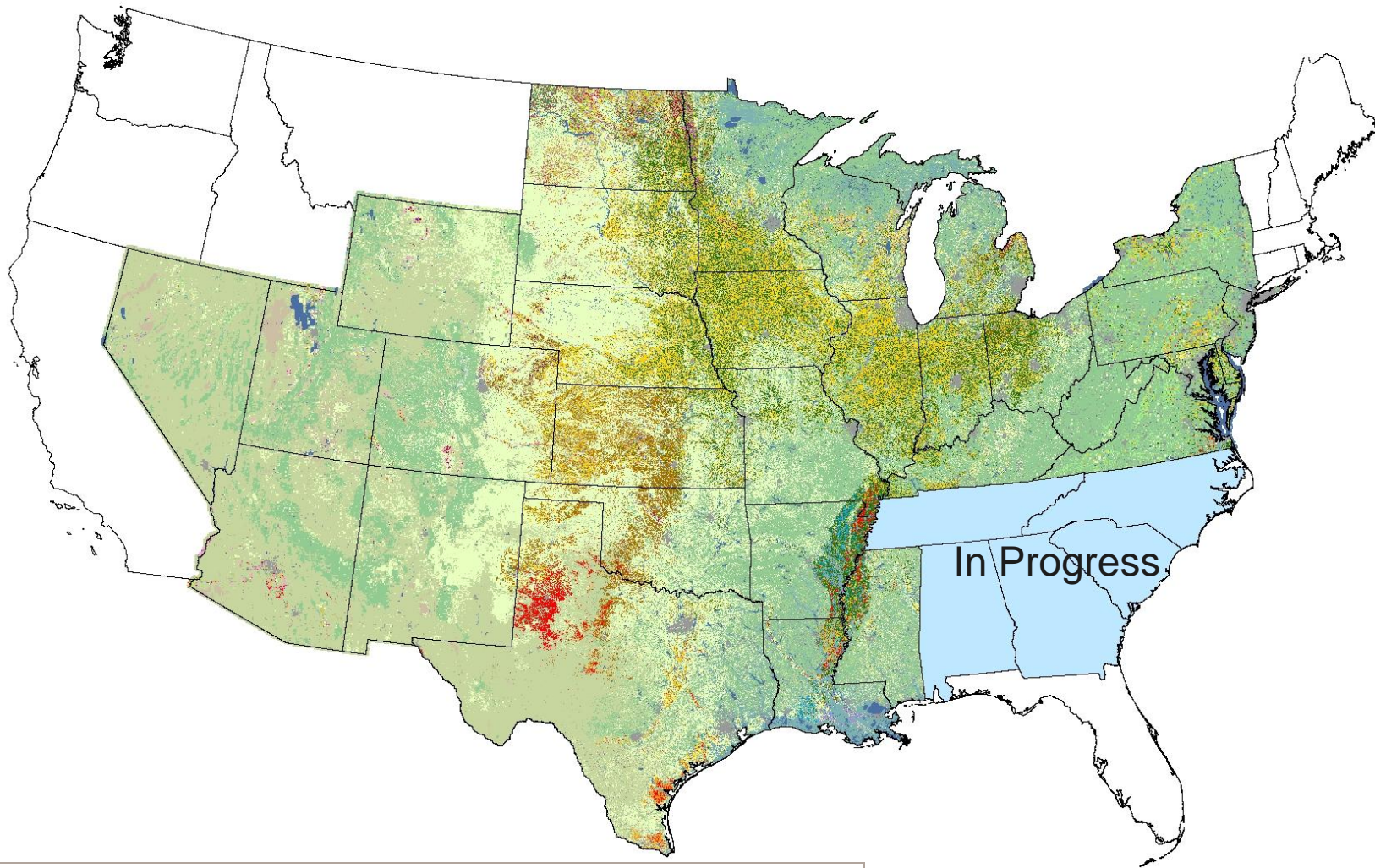
Free Downloadable Data

- The public release date starting in 2009
 - Mid-December of the same growing season
- Ortho-registered
- Consistent attribute codes
- Extensive metadata

Additional Information and **Free** Downloads:

<http://www.nass.usda.gov/research/>

2008 Cropland Data Layer Products



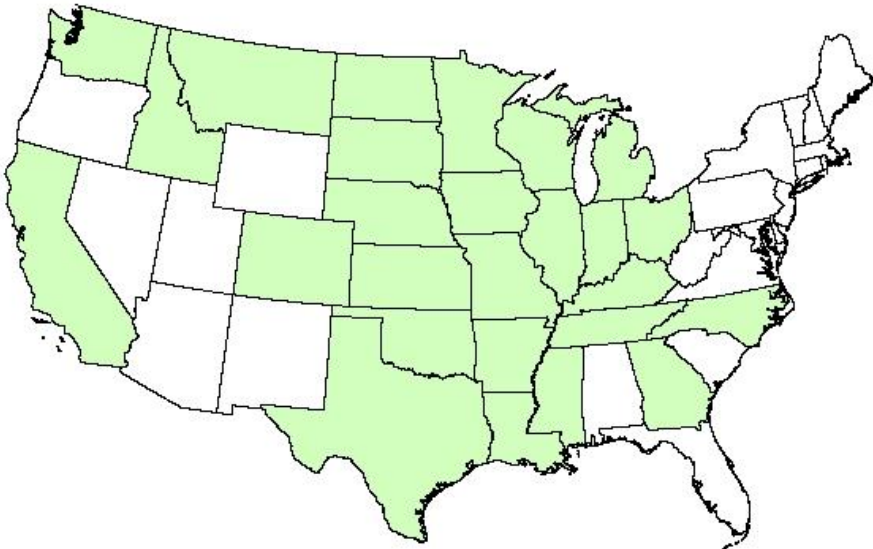
Additional Information and **Free** Downloads:

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Proposed 2009 CDL States



Single Crop Planting Intensity and Crop Rotation Assessment

To determine the specific counties with high percentages of single crop planting intensity and derive the predominant crop rotation

Research done by Claire Boryan, presented at the ASPRS 2009 Conference



Corn



Soybeans

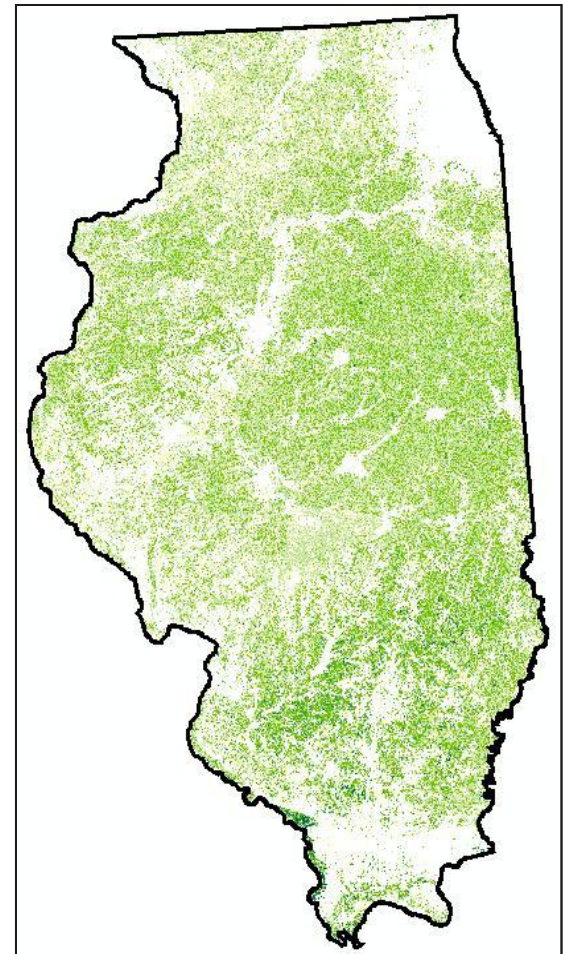
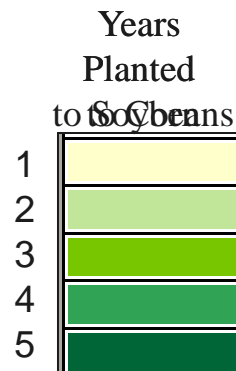
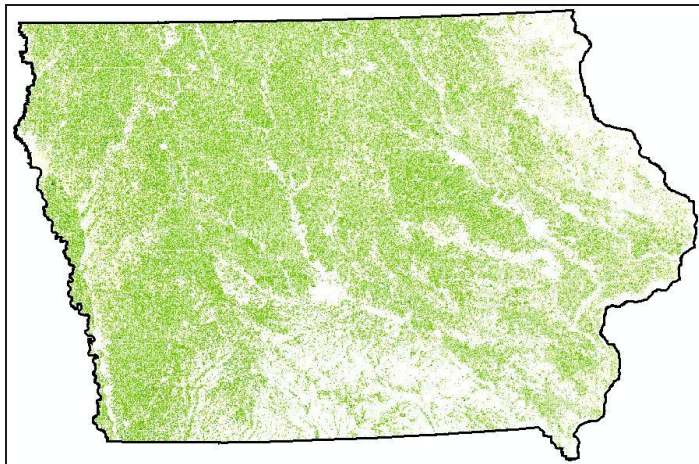
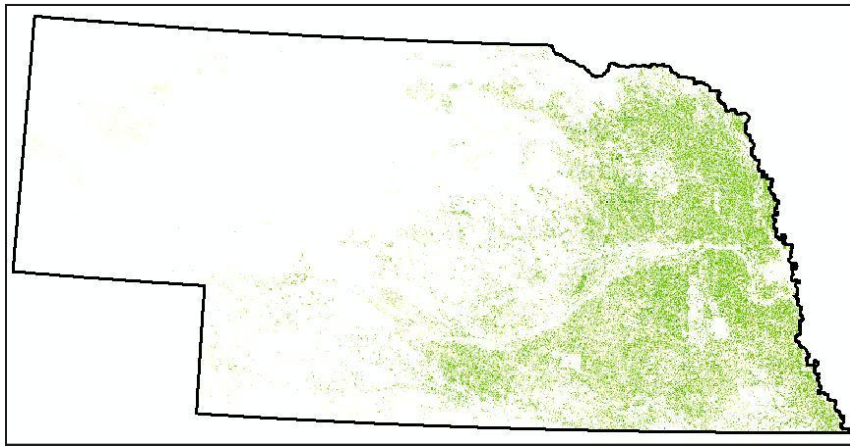
Single Crop Planting Intensity Methodology



1. Inputs include: Cropland Data Layers (CDLs) for 2004-2008
2. CDLs are recoded such that crop under evaluation = 1
3. The recoded CDL's are added together using the ERDAS Imagine Modeler
4. The output is the Crop Intensity Image which is ready for evaluation

Single Crop Planting Intensity, 2004 - 2008

Nebraska, Iowa and Illinois

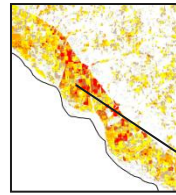
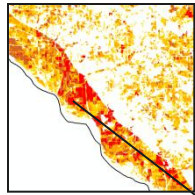
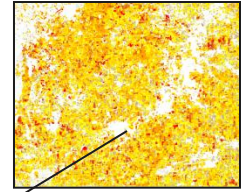
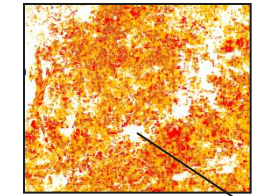


Cropland Data Layers (CDLs) utilized in assessment: 2004 - 2008

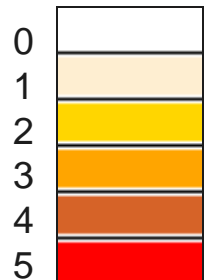
Corn Planting Intensity

5 years vs. 9 years

Illinois

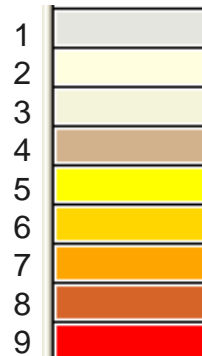


Years
Planted
to Corn



2004-2008

Years
Planted
to Corn



2000-2008

Corn Planting Intensity in Illinois

2004 - 2008

Bureau County

5 years in a row planted to corn: **14%**
4 out of 5 years planted to corn: **20%**

Illinois County

5 years in a row planted to corn: **16%**
4 out of 5 years planted to corn: **26%**

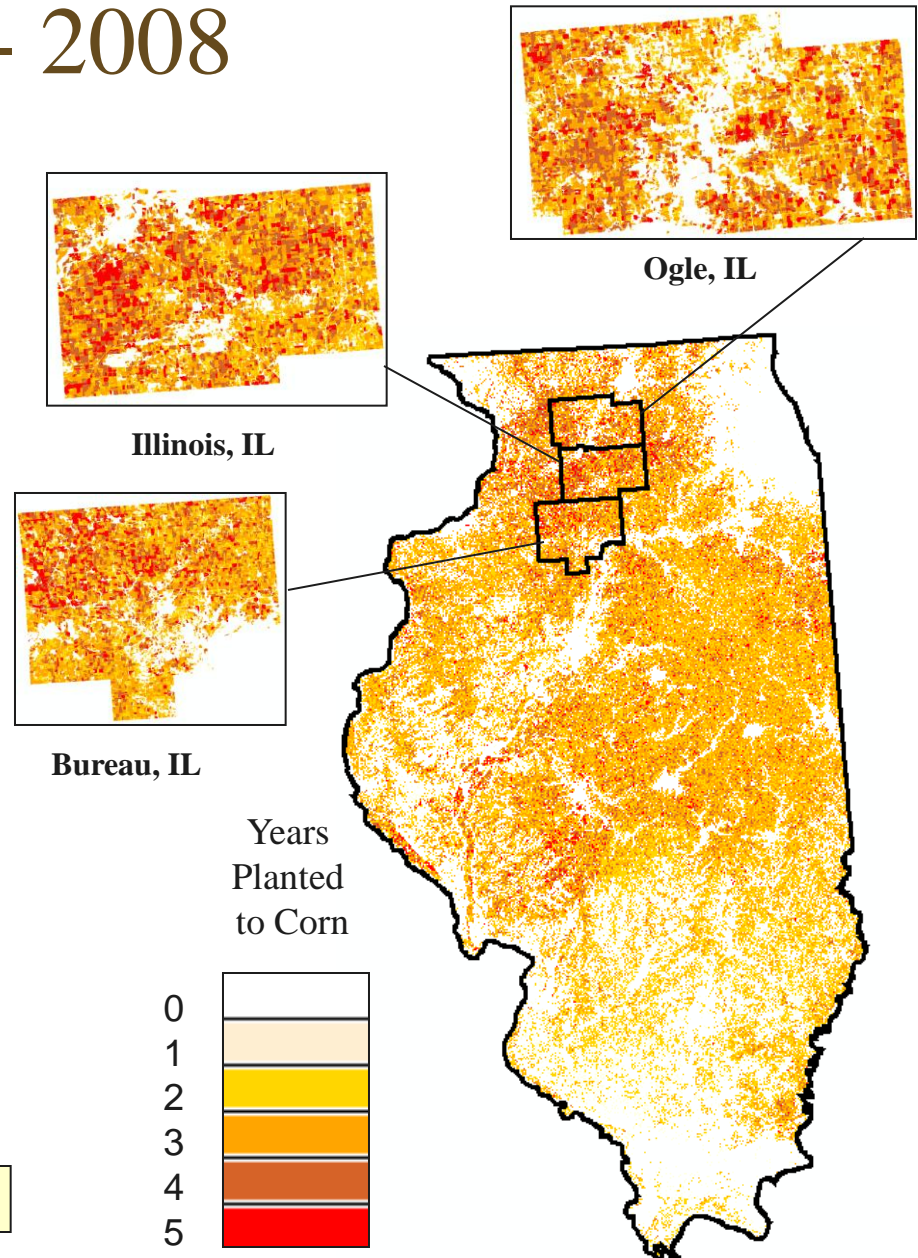
Ogle County

5 years in a row planted to corn: **13%**
4 out of 5 years planted to corn: **24%**

Illinois State Totals

5 years in a row planted to corn: **5%**
4 out of 5 years planted to corn: **10%**

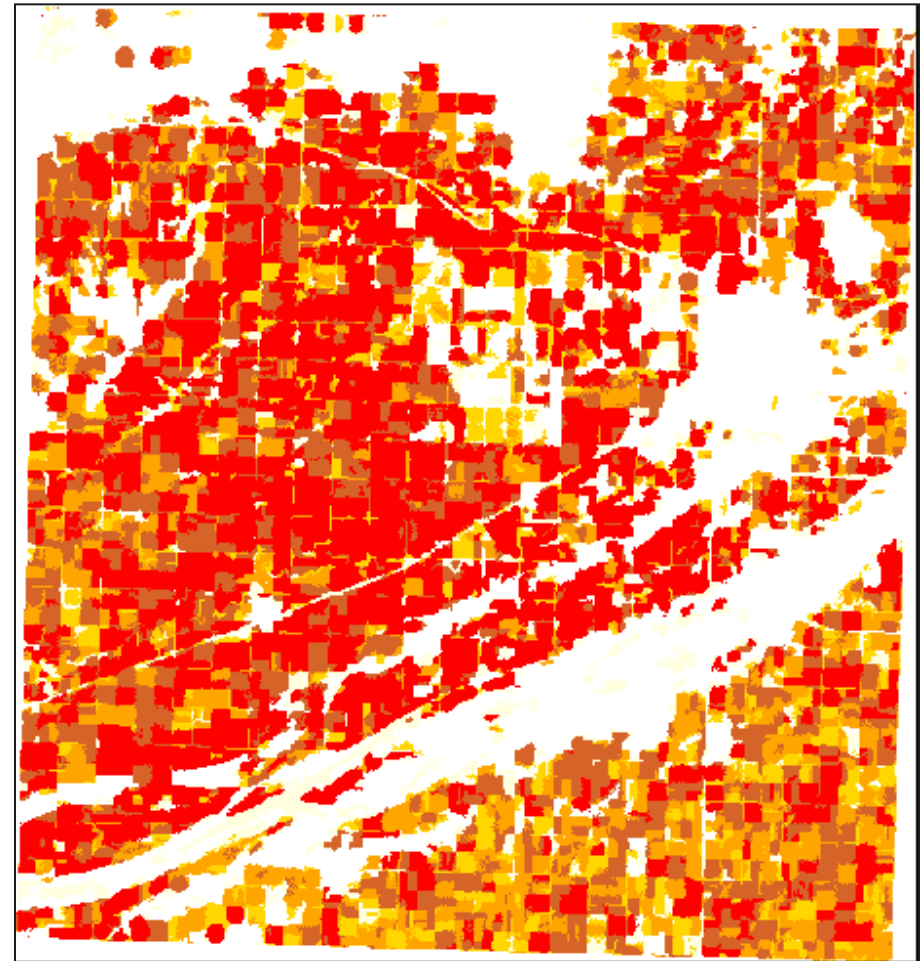
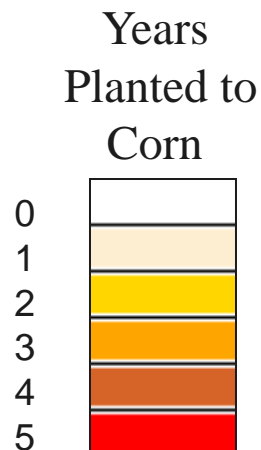
Percentages derived from total acreage in corn production

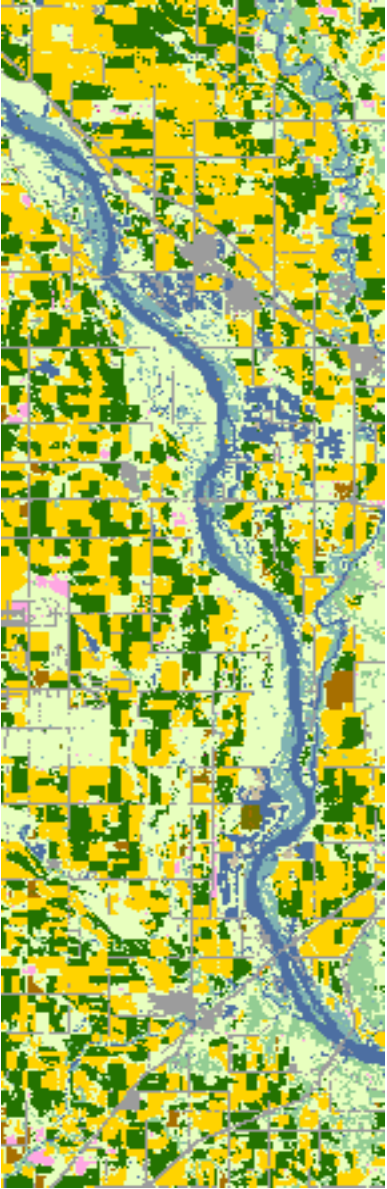


Trending toward increased levels of single crop planting to corn: 2004 - 2008

Percent increase - **5 years planted to corn**
from 2003-2007 assessment

- All States: 1%
- Nebraska:
 - Hall: 5%
 - Dawson: 1%
 - Chase: 2%
- Iowa:
 - Delaware: 5%
 - Hamilton: 1%
 - Dubuque: 2%
- Illinois:
 - Bureau: 3%
 - Illinois: 4%
 - Ogle: 3%





Crop Rotation Results Illinois

**Crop Rotation Patterns (Corn and Soybean) 04- 08
As Percentage of
Total Cultivated Cropland**

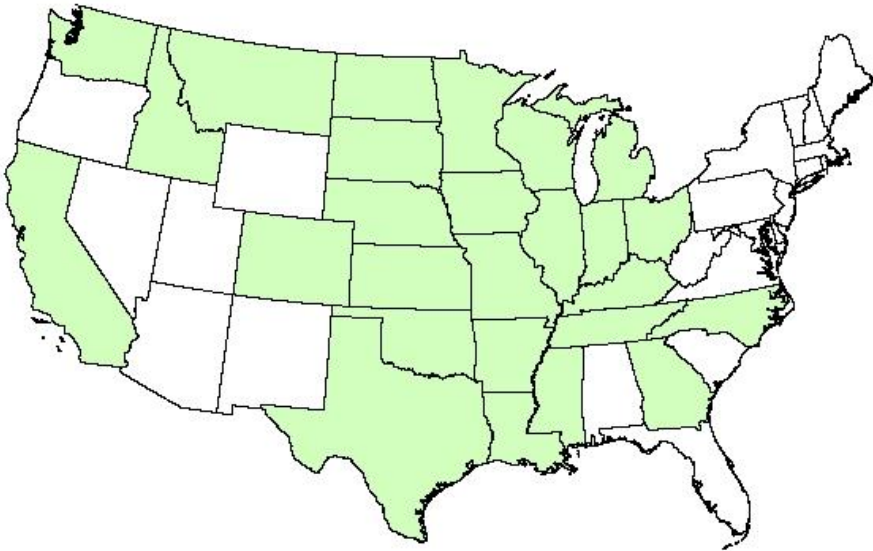
Corn (04), Soy (05), Corn (06), Soy (07), Corn (08)	16.7%
Soy (04), Corn (05), Soy (06), Corn (07), Soy (08)	16.5%
Corn (04), Corn (05), Corn (06), Corn (07), Corn (08) <i>(1.4% > than 2003-2007)</i>	5.26%
Additional acreage into corn production (07):	148,234 acres
Additional acreage into corn production (08):	112,758 acres

Total Cultivated Cropland derived from NASS' Illinois 2008 CDL

Additional Information and **Free** Downloads:

<http://www.nass.usda.gov/research/>

Proposed 2009 CDL States



Accuracy Measures



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

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