

A map of North Carolina showing various cropland layers. The map is color-coded, with green representing forested areas, yellow and orange representing cropland, and blue representing water bodies. The text "USDA/NASS Cropland Layer Program" is overlaid on the map.

USDA/NASS Cropland Layer Program

Rick Mueller

Head - Spatial Analysis Research



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 National Agricultural Statistics Service

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

Home About NASS Newsroom Publications Data and Statistics Census Surveys Help Contact Us

You are here: Home / Data and Statistics

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 or 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 yield 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 58 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	9,500	124,919	7.4	40,100	83
	Soybeans	300	36.7	9.9	1,201,250	2,413
	Wheat	200	45.2	2.0	460.2	1
Central Maryland	Corn	114,200	98.4	3.9	360,750	1,479
	Soybeans	92,800	34.2	3.3	126,250	399
	Wheat	38,200	63.3	3.3	126,250	399
Southern Maryland	Corn	29,800	132.9	4.9	146,200	299
	Soybeans	43,200	39.0	3.0	142,250	394
	Wheat	16,000	57.0	0.9	14,400	16
Upper Shore	Corn	197,200	159.2	5.1	800,700	1,211
	Soybeans	232,000	39.8	2.4	186,800	2,212
	Wheat	88,800	64.0	1.1	99,150	213

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. corn production is expected to reach a record 13.1 billion bushels, 10.6 percent above the 2006 crop of 11.8 billion bushels. Based on conditions as of August 10, 2007, the average yield per acre is expected to be 160.4 bushels per acre, up 3.7 bushels from last year's 156.7 bushels per acre. Behind the 160.4 bushels per acre is the 160.4 bushels per acre for grain, up 3.7 bushels from last year's 156.7 bushels per acre. Yield forecasts are high for the Delta. Meanwhile, hot, dry conditions in the Southeast and eastern Corn Belt, Ohio Valley and the Great Lakes region are expected to reduce yields in those areas.

WISCONSIN AGRICULTURAL STATISTICS SERVICE

P.O. Box 8034 Madison, WI 53708-8034

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 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.

<http://www.nass.usda.gov/0800> - 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)

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)

Comparisons: 6 | 20,000 | 40,000 | 60,000 | 80,000 | 100,000 | 100,001 +

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

Wisconsin Dairy Herds by Herd Size

Milk cow herd size	May 2002 herds	May 2007 herds (projected) %	Change 2007/2002
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	+4
200 - 499	700	600	-29
500+	200	440	+120
Total	17,500	19,900	+20

1/7 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

Wisconsin Dairy Farmer Plans for May 2007 by Herd Size

Herds	Keep same herd size	Increase herd size	Discontinue milking
2,800	47	17	36
4,700	71	9	20
7,400	65	19	16
1,900	53	37	10
700	35	59	8
200	22	78	0
17,500	62	29	20

1/7 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.

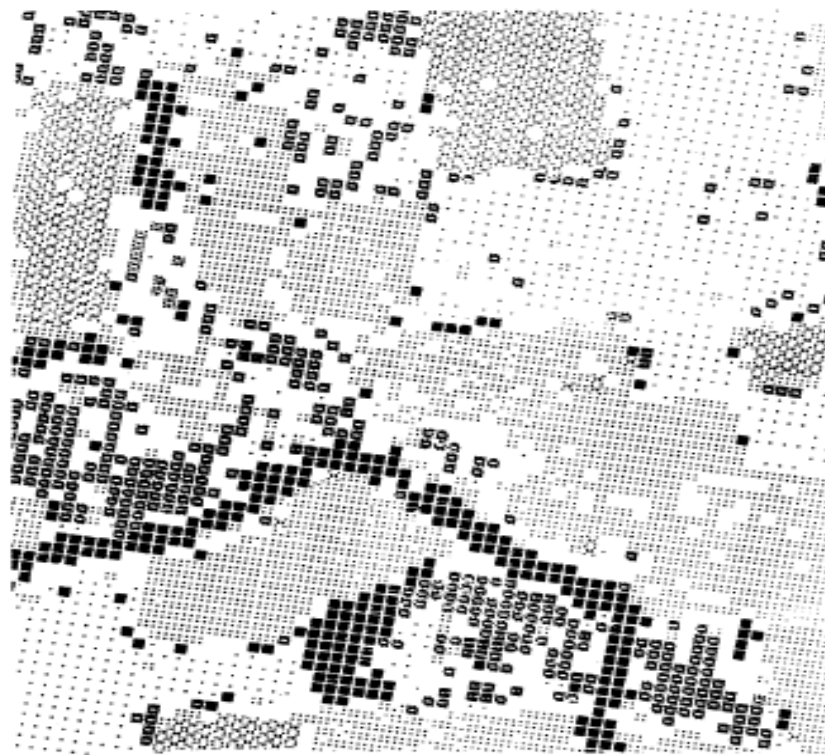
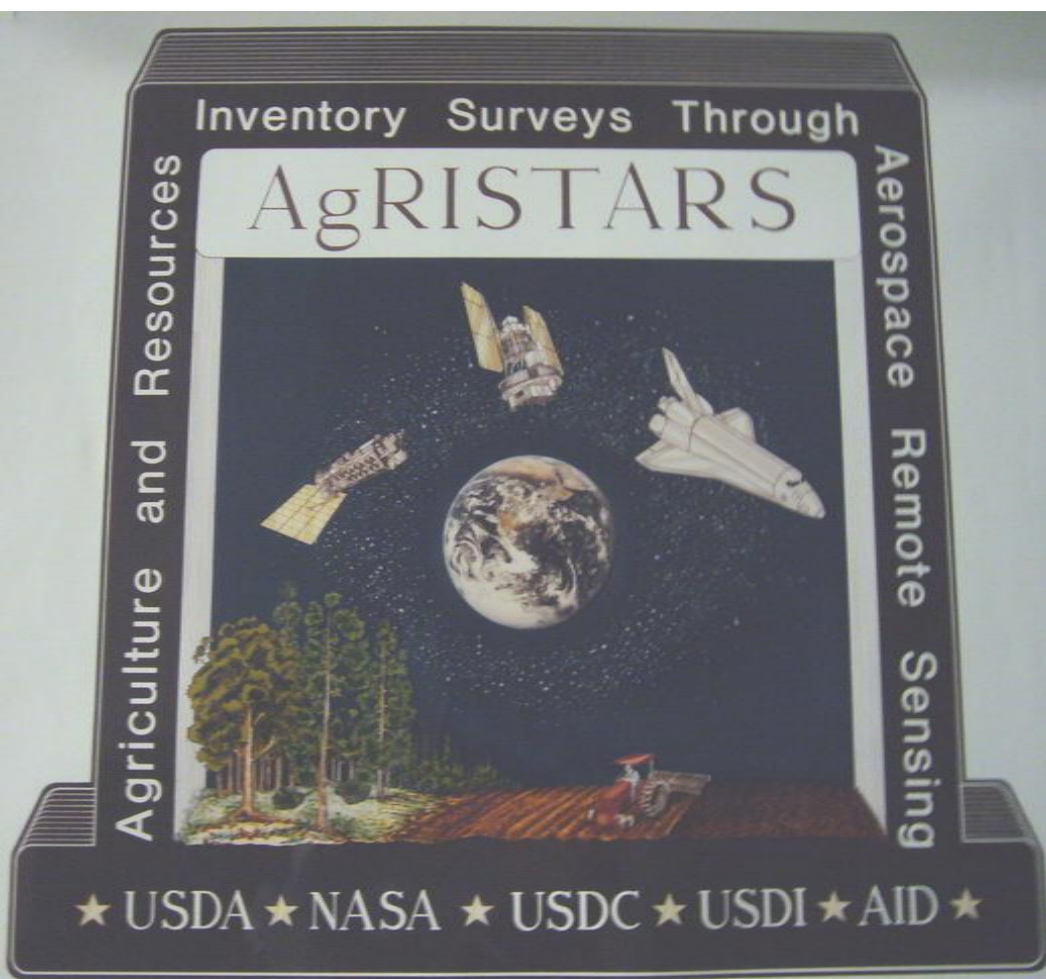
Remote Sensing Mission

- Provide updates on current events
 - Crop condition/acreage/yield
- Area frame stratification and sampling
- Produce annual land use/land cover classification
 - Derive acreage estimates
- Create derivative change products



Cropland Data Layer (CDL) Discussion

- Legacy program
 - Issues: Budget/Satellites/Agency Support/Technology



Portion of Crop - Odds Map with $P(c/X_1) \geq .75$.

- Small Grains
- Other Crops
- 0000000- Rice
- 00000000 Hay
- >0000000 Permanent Plantings
- 00000000 Pasture
- 00000000 Non-Agricultural Land

Cropland Data Layer (CDL) Discussion

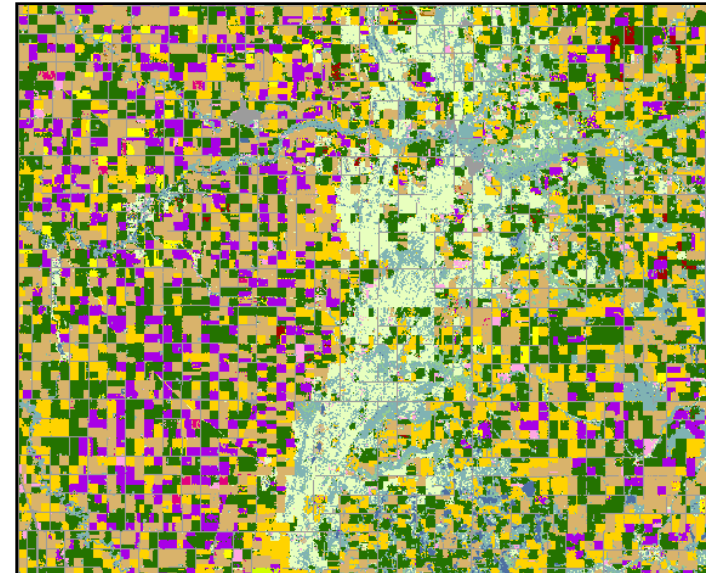
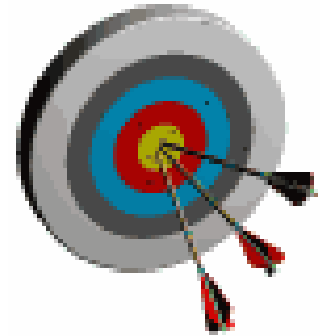
Operational Paradigm

- Deliver in-season acreage estimates
 - Multiple times during growing season
- Increase program scope/coverage
 - “Manifest Destiny”
- Public domain crop specific
 - Land Use/Land Cover Classification
 - Creation of derivative analysis products



CDL Program Objectives

- **“Census by Satellite”**
 - Annually cover major producing corn and soybean regions
 - Indications reflect actual location of the crops
 - Not address on record via survey
- **Provide timely, accurate, useful indications**
 - Measurable error
 - Unbiased/independent estimator
 - State, County, Agricultural Statistics Districts
- **Operationalize indications delivery**
 - For June, August, and October
 - Agricultural Statistics Board
 - Field Offices
 - Update planted area
- **Output crop specific CDL**
 - Distribute to public at the cost of reproduction
 - [NRCS Geospatial Data Gateway](#)



CDL Production Schedule

January

27	28	29	30	31
8:●	15:○	22:○	30:○	

February

23	24	25	26	27	28	29
6:●	13:○	20:○	28:○			

March

23	24	25	26	27	28	29
30	31					
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	
11	12	13	14	15	16	
18	19	20	21	22	23	
25	26	27	28	29	30	
1:●	8:○	16:○	23:○	30:○		

Crop Production Report
CDL all crops

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

October

Su	Mo	Tu	We	Th	Fr	Sa
7:○	14:○	21:○	28:○			

November

Su	Mo	Tu	We	Th	Fr	Sa
5:○	13:○	19:○	27:○			

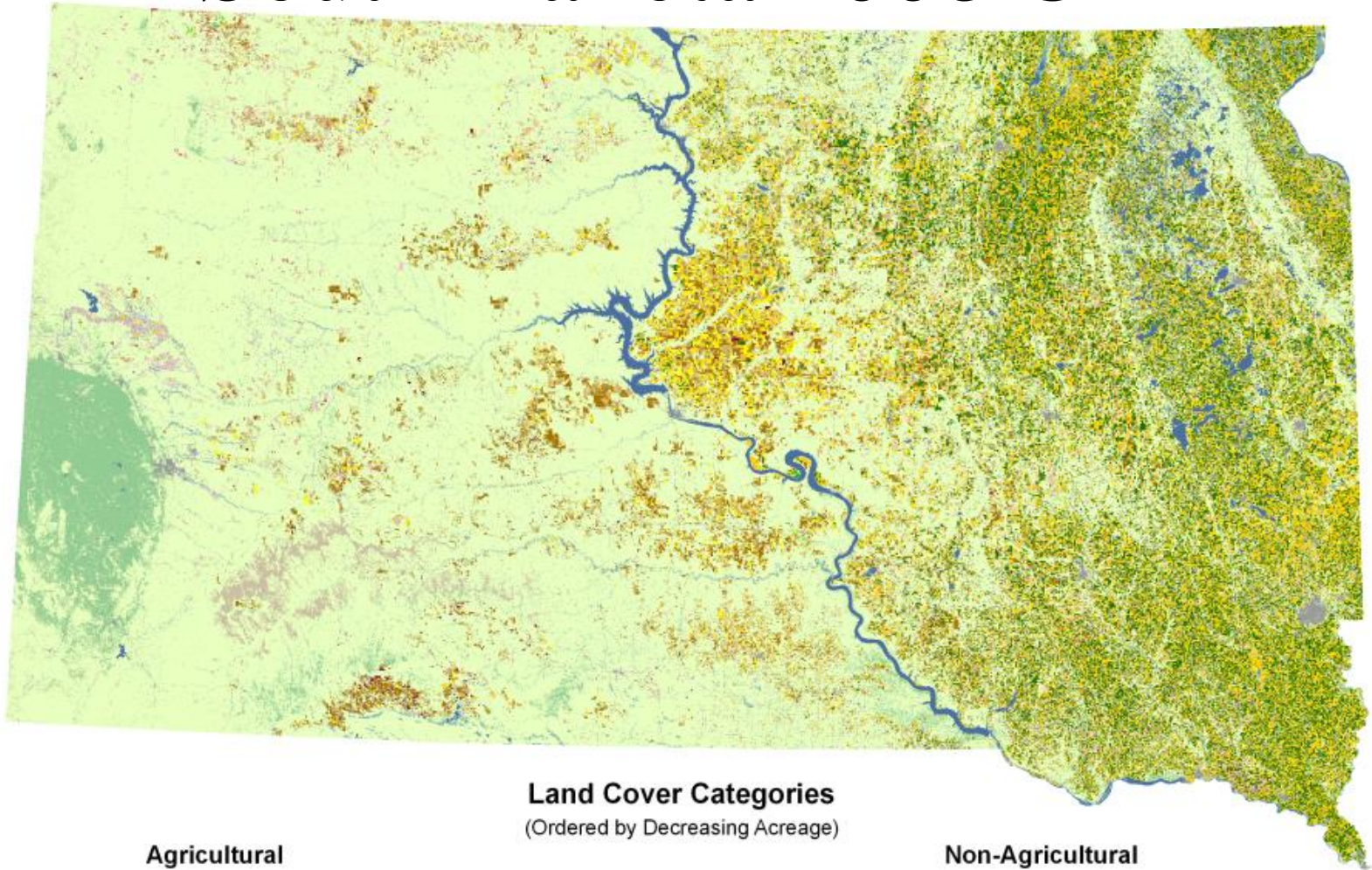
December

Su	Mo	Tu	We	Th	Fr	Sa
5:○	12:○	19:○	27:○			

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

Crop Production Report
CDL all crops

South Dakota 2008 CDL











Land Cover Categories

(Ordered by Decreasing Acreage)

Agricultural

 Corn	 Oats	 Rye
 Soybeans	 Barley	 Flaxseed
 Winter Wheat	 Peas	 Lentils
 Spring Wheat	 Other Crops	 Clover/Wildflowers
 Alfalfa	 Dry Beans	 Sugarbeets
 Sunflowers	 Safflower	 W. Wht./Soy. Dbl. Crop.
 Millet	 Durum Wheat	 Misc. Veggies. & Fruits
 Sorghum	 Other Small Grains	

Non-Agricultural

 Grass/Pasture/Non-Ag
 Woodland
 Urban/Developed
 Water
 Wetlands
 Barren
 Shrubland
 Fallow/Idle Cropland

Current CDL Coverage

Commodity	CDL States	US Total Acres (mill)	% US Total
Corn	18	78,177	92
Soybeans	18	74,374	91
Cotton	14	7,755	66
Wheat	13	40,252	70
Rice	5	2,924	82



CDL Program



- Inputs
 - Resourcesat-1 AWiFS imagery
 - Farm Service Agency – Common Land Unit
 - JAS segment boundaries & summaries
 - Ancillary data
 - Commercial software suite
- Outputs
 - Acreage Estimates
 - Cropland Data Layer

IRS Resourcesat-1 A WiFS Imagery

340 km swath per head
740 km combined

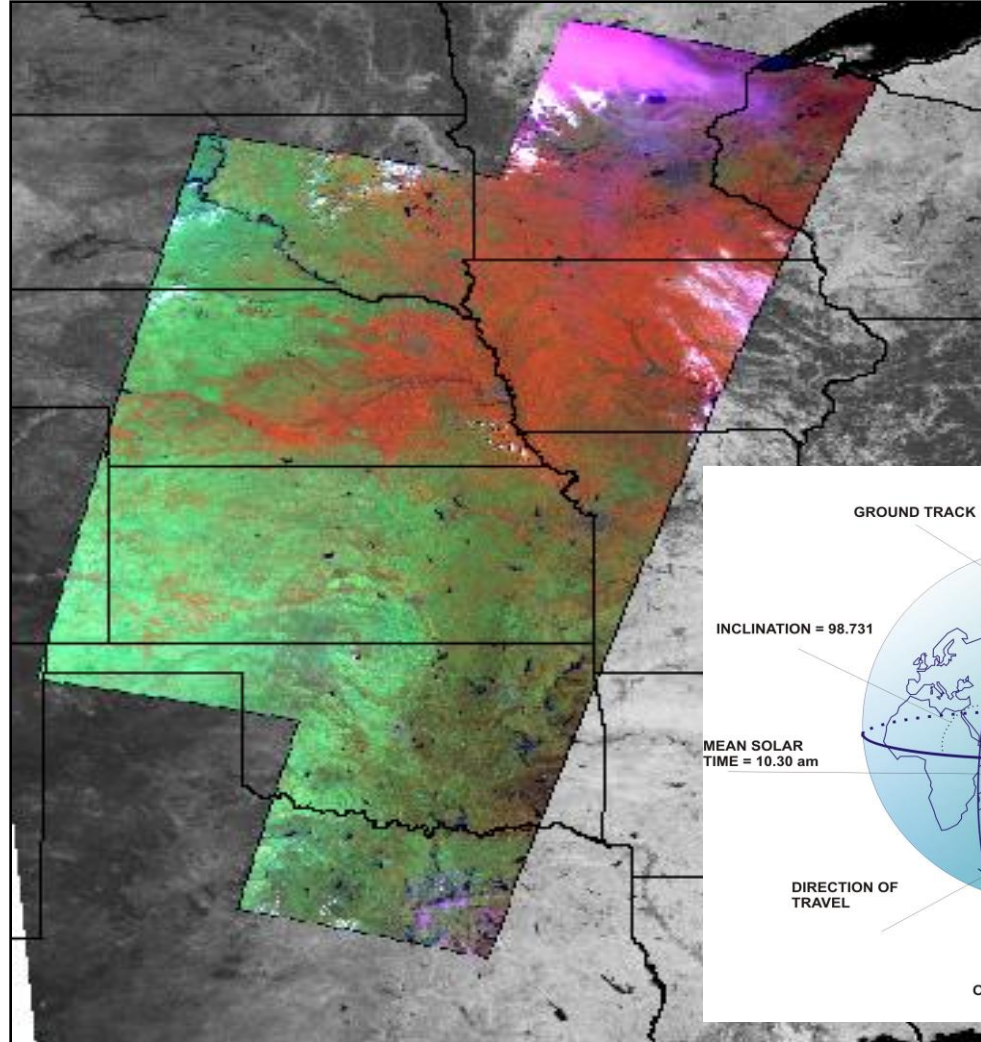
5-day revisit

4 spectral bands

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

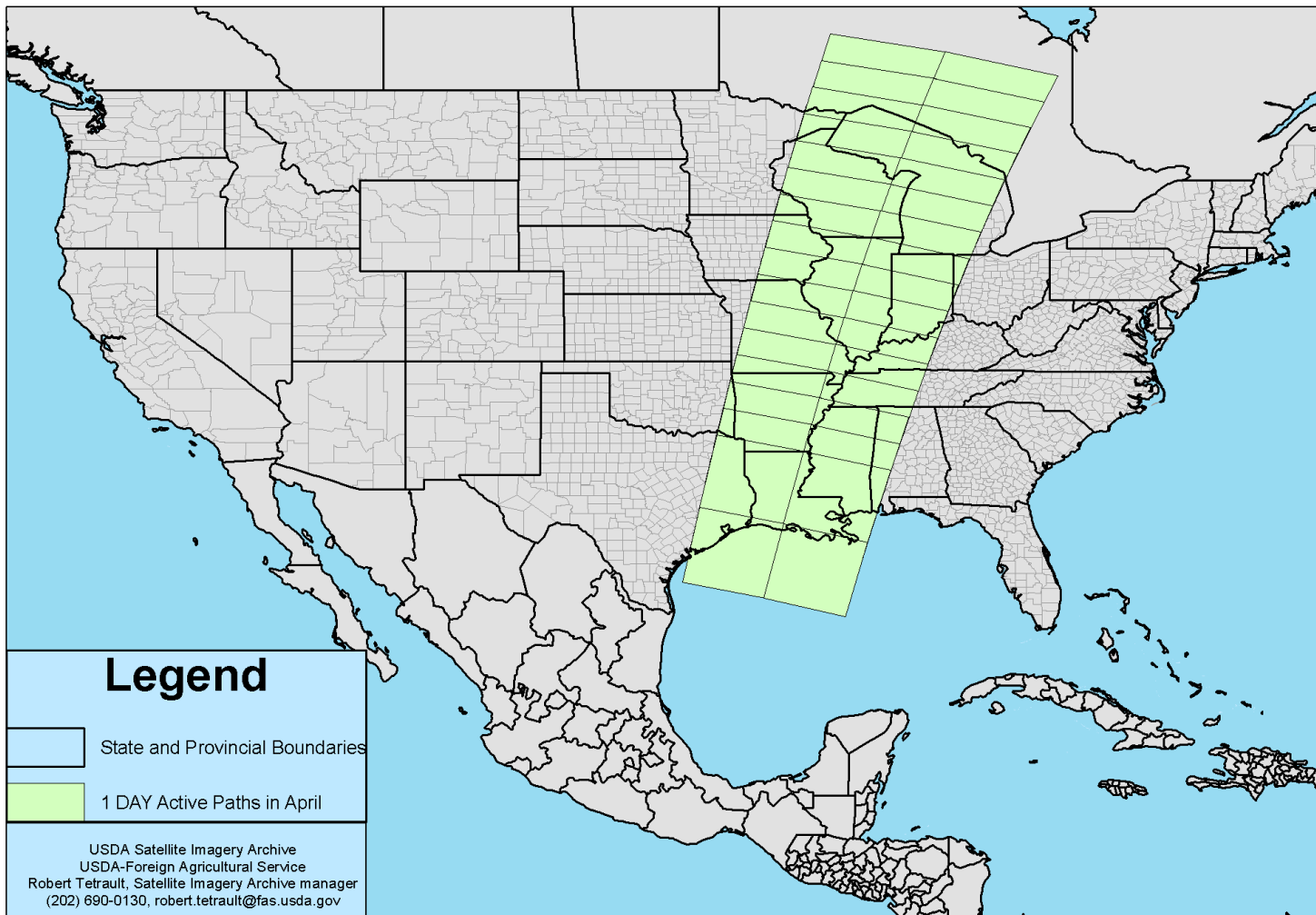
56 m nadir/70 m field edges

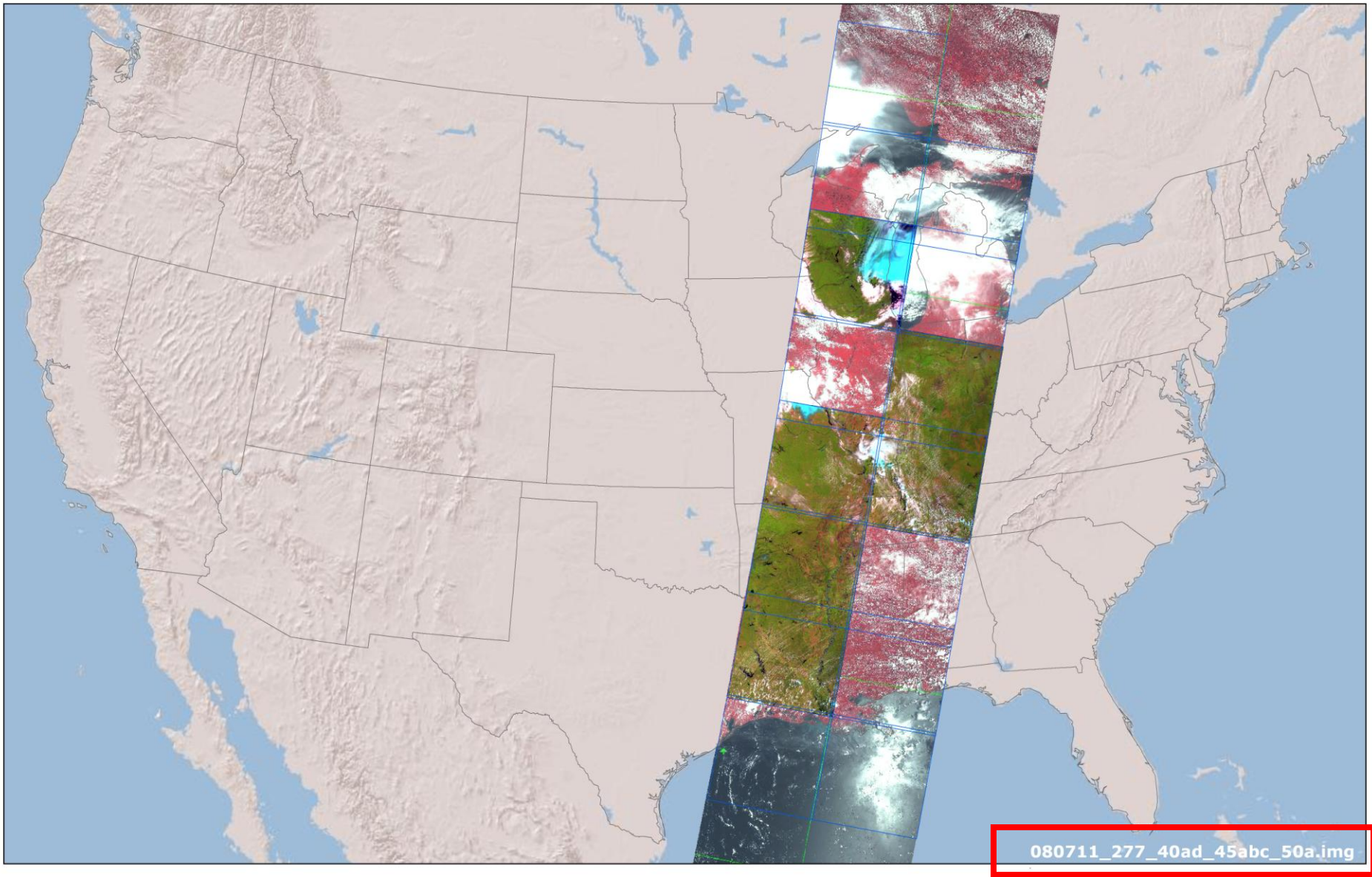
Data provided by Arctic Slope
Regional Corporation



Satellite Acquisition Strategy

Active Paths for P6-AWiFS CONUS





AWiFS Acquisitions 7/6/08-7/11/-08

Background on the USDA-Satellite Imagery Archive (USDA-SIA)

Operated by the Foreign Agricultural Service:

- Provides shared access to satellite imagery purchased by USDA for participating agencies
- Cost-sharing program to maximize the cost effectiveness of Department expenditures on satellite imagery
- Reduces per-image price paid
- Leverages the power of a single USDA purchasing body
- RMA provided additional funding for Pasture/Range/Forage year round collections



Crop Progress and Condition



Crop Progress: Corn in South Dakota, 2008
 _____ 2008, - - - - 2003-2007 Average

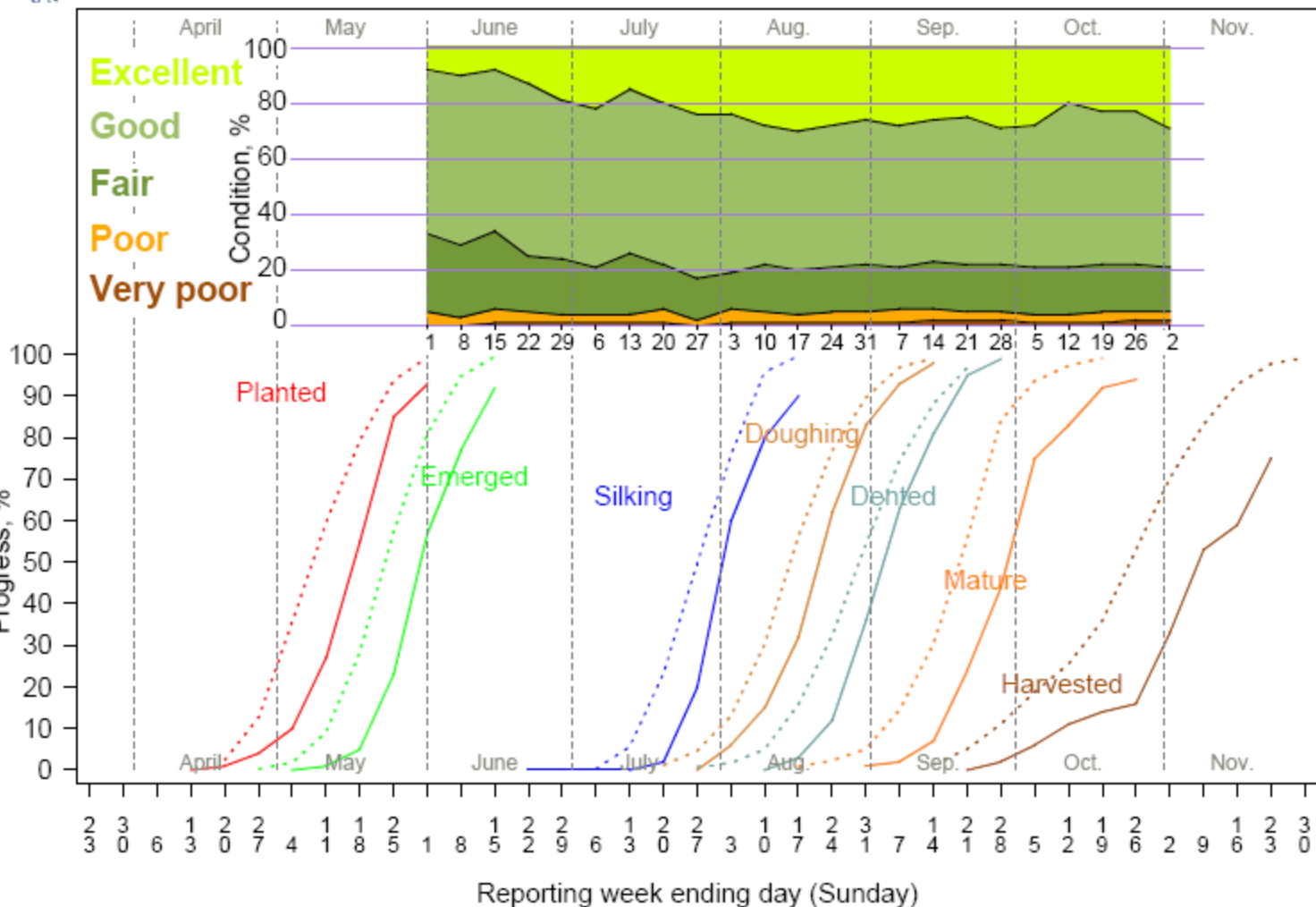


You are here: [Home](#) / [Charts and Maps](#) /

Charts and Maps

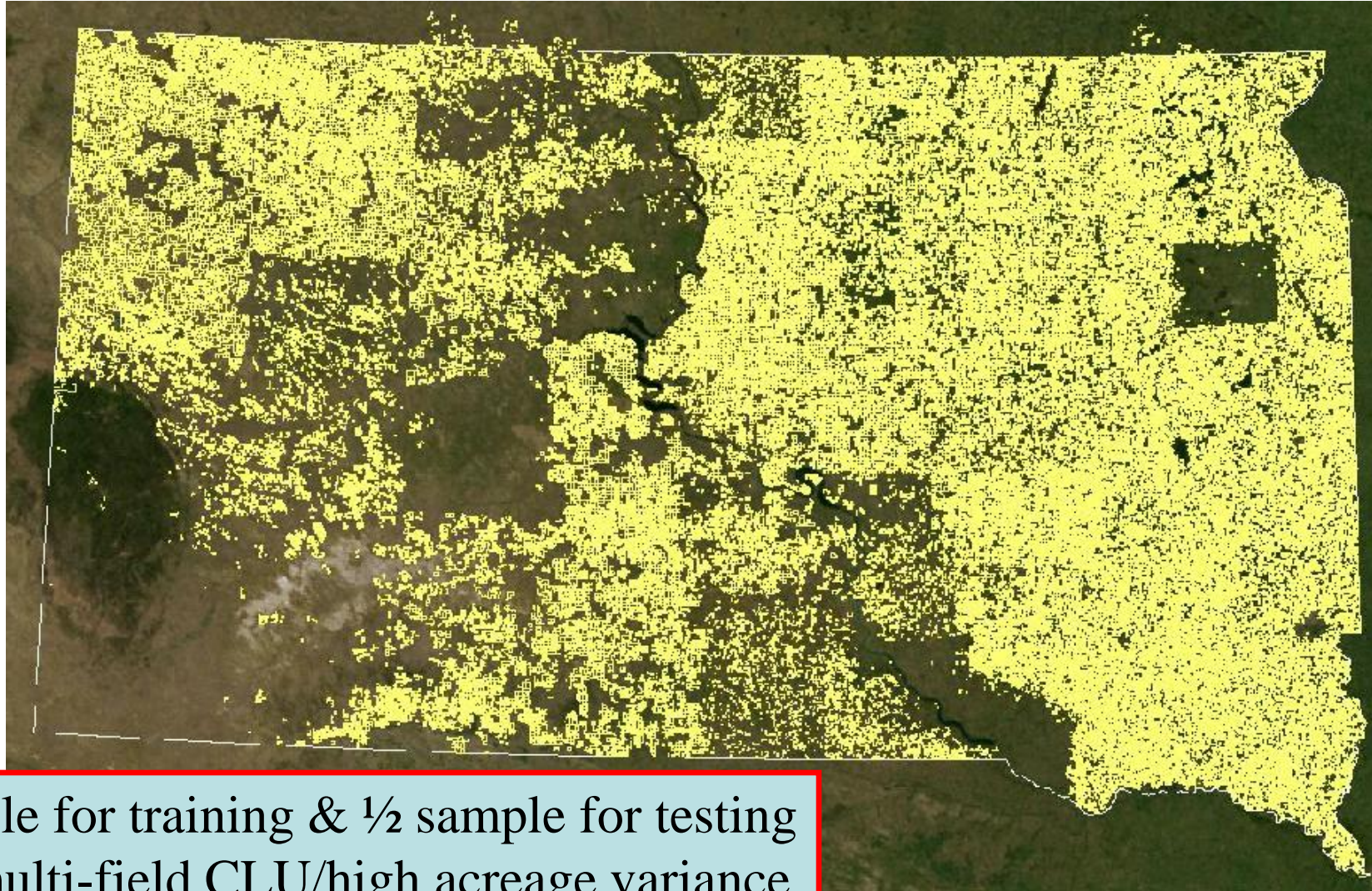
2008 Crop Progress and Condition

Select the State from the map or filter



Agricultural Ground Truth

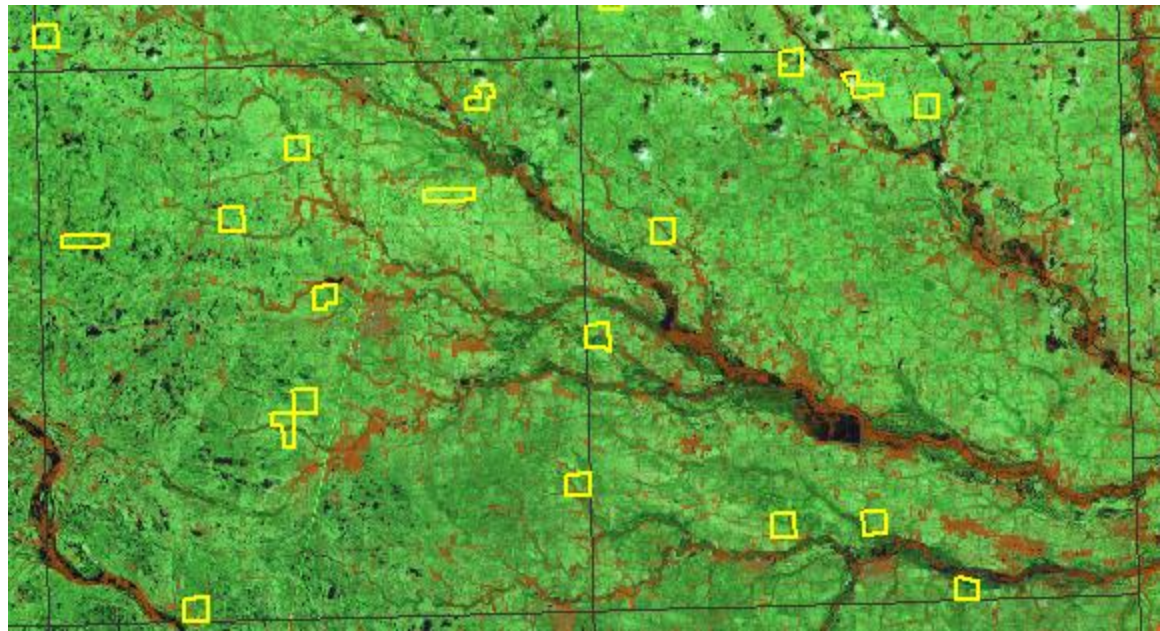
FSA Common Land Unit



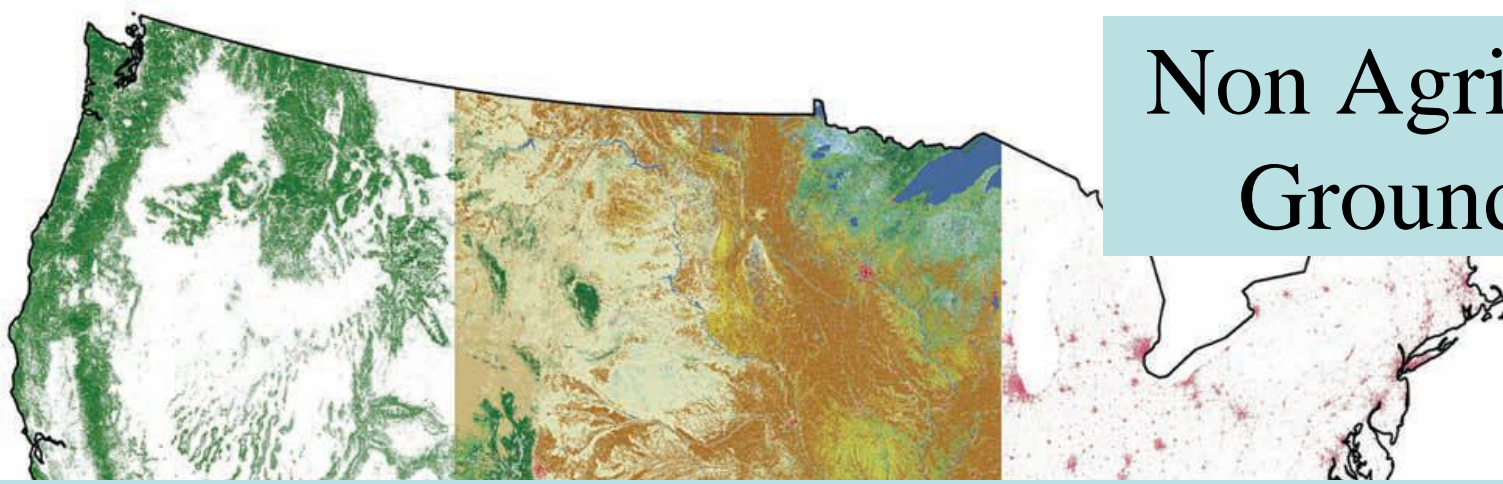
1/2 sample for training & 1/2 sample for testing
Filter multi-field CLU/high acreage variance
Comprehensive **program crop** coverage

NASS June Ag Survey

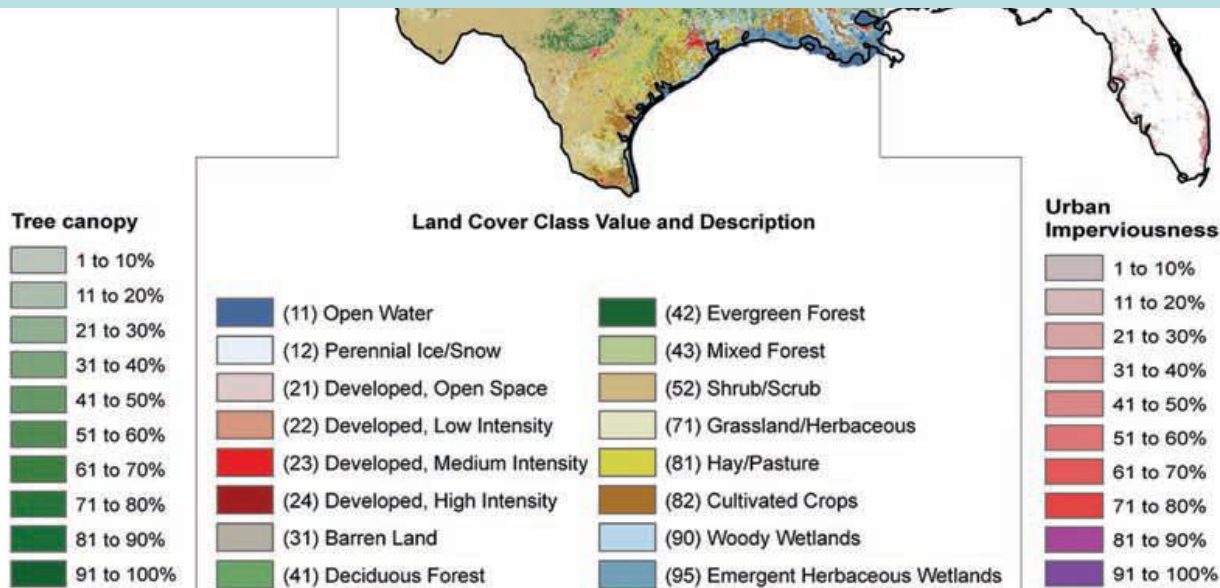
- Probability based
- Area frame stratification based on land use
- Sample units one square mile



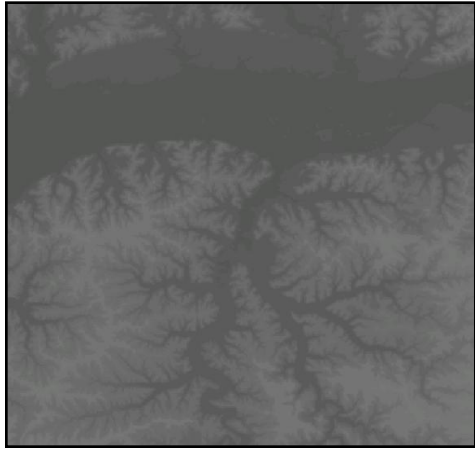
Non Agricultural - Ground Truth



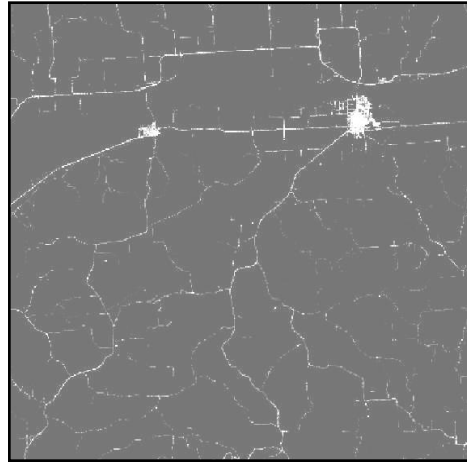
- Proportional sampling
- 2001 National Land Cover Dataset from USGS
- Improve CDL coverage of non-ag classes



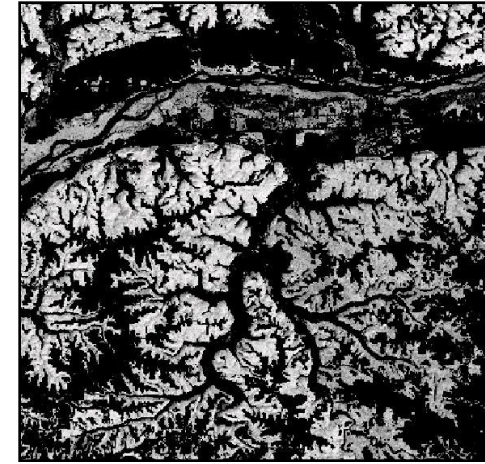
Ancillary Data – USGS/NASA Products



Elevation

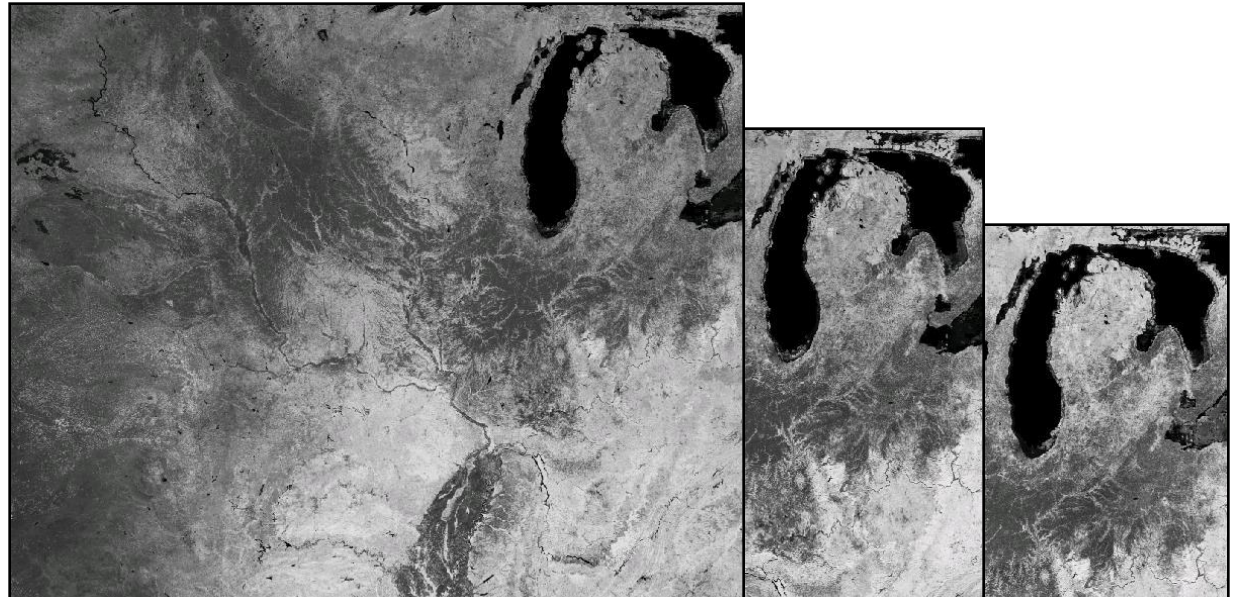


Imperviousness



Forest Canopy

NASA MODIS Terra
(16-day NDVI composite)



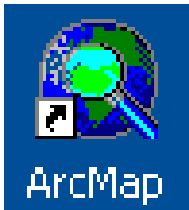
Commercial Software Suite



- Imagery Preparation
 - ERDAS Imagine



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



- Ground Truth Preparation
 - ESRI ArcGIS



- Acreage Estimation
 - SAS/IML workshop

Classification – See5 Decision Tree

The screenshot displays the See5 [network version] interface. The main window shows a project named 'combined_samples_2000000' with various files listed, including 'class and attribute definitions', 'training cases', 'test cases', 'misclassification costs', 'decision tree classifier', 'ruleset classifier', and 'output file'. Overlaid on this is the 'NLCD Mapping Tool' dialog box, which contains several buttons: 'Percent Calculation...', 'NLCD Sampling Tool...', 'Cubist Classifier...', 'See5 Classifier...', 'Accuracy Assessment...', 'Smart Eliminate...', 'Cubist Info', 'See5 Info', and 'Close'. To the right, the 'Classifier Construction Options' dialog box is open, showing settings for 'Winnow attributes' (checked), 'Rulesets' (unchecked), 'Sort by utility' (unchecked), 'Boost' (checked, set to 10 trials), 'Subsets of values' (unchecked), 'Use sample of' (unchecked), 'Lock sample' (unchecked), 'Cross-validate' (unchecked), 'Ignore costs file' (unchecked), 'Advanced options' (unchecked), 'Fuzzy thresholds' (unchecked), 'Global pruning' (checked), 'Pruning CF' (set to 25%), and 'Minimum' (set to 2 cases). The background shows a decision tree structure with nodes and branches.

- Capable of handling large and complex data sets
- Able to incorporate missing and non-continuous data
- NLCD Mapping Tool acts as an interface between Imagine and See5

Crop-specific covers only	*Correct	Accuracy	Error	Kappa
OVERALL ACCURACY	2306428	87.51%	12.49%	0.8416

Accuracy Statistics

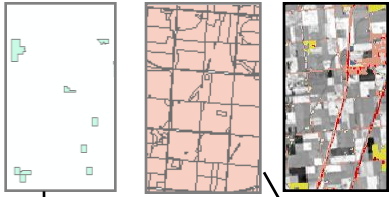
Cover Type	Attribute Code	*Correct Pixels	Producer's Accuracy	Omission Error	Kappa	User's Accuracy	Commission Error	Cond'l Kappa
Corn	1	803251	94.29%	5.71%	0.9342	95.78%	4.22%	0.9513
Sorghum	4	9047	46.40%	53.60%	0.4630	79.16%	20.84%	0.7909
Soybeans	5	707383	95.03%	4.97%	0.9439	97.72%	2.28%	0.9741
Sunflowers	6	107195	85.99%	14.01%	0.8572	92.15%	7.85%	0.9199
Sweet corn	12	0	0.00%	100.00%	0.0000	n/a	n/a	n/a
Popcorn	13	627	64.77%	35.23%	0.6477	94.86%	5.14%	0.9486
Barley	21	1995	25.85%	74.15%	0.2582	64.17%	35.83%	0.6412
Durum wheat	22	280	13.53%	86.47%	0.1352	57.49%	42.51%	0.5748
Spring wheat	23	255912	86.02%	13.98%	0.8537	91.04%	8.96%	0.9060
Winter wheat	24	310316	84.53%	15.47%	0.8368	94.00%	6.00%	0.9363
Other grains	25	92	4.75%	95.25%	0.0475	64.79%	35.21%	0.6478
WW / Soybeans	26	10	3.66%	96.34%	0.0366	100.00%	0.00%	1.0000
Rye	27	126	6.71%	93.29%	0.0671	78.26%	21.74%	0.7825
Oats	28	2799	14.85%	85.15%	0.1479	58.23%	41.77%	0.5810
Millet	29	12879	49.50%	50.50%	0.4936	74.76%	25.24%	0.7465
Flaxseed	32	150	17.69%	82.31%	0.1769	66.37%	33.63%	0.6637
Safflower	33	212	14.89%	85.11%	0.1488	57.30%	42.70%	0.5729
Rape seed	34	0	0.00%	100.00%	0.0000	n/a	n/a	n/a
Alfalfa	36	56603	56.37%	43.63%	0.5593	90.69%	9.31%	0.9054
Beets	41	14	8.86%	91.14%	0.0886	93.33%	6.67%	0.9333
Dry beans	42	827	51.02%	48.98%	0.5101	94.19%	5.81%	0.9419
Other crops	44	8	13.33%	86.67%	0.1333	42.11%	57.89%	0.4210
Misc. vegetables	47	0	0.00%	100.00%	0.0000	n/a	n/a	n/a
Watermelon	48	0	n/a	n/a	n/a	0.00%	100.00%	0.0000
Lentils	52	253	87.54%	12.46%	0.8754	99.61%	0.39%	0.9961
Peas	53	950	35.26%	64.74%	0.3525	88.29%	11.71%	0.8828
Herbs	57	639	78.21%	21.79%	0.7821	98.61%	1.39%	0.9861
Clover / Wildflowers	58	27	13.24%	86.76%	0.1323	93.10%	6.90%	0.9310
Seed / Sod Grass	59	319	18.07%	81.93%	0.1807	89.86%	10.14%	0.8986
Idle / Fallow	61	34514	56.97%	43.03%	0.5668	82.73%	17.27%	0.8257
Apples	68	0	0.00%	100.00%	0.0000	n/a	n/a	n/a

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

Cropland Data Layer and Acreage Estimation Processing Flow

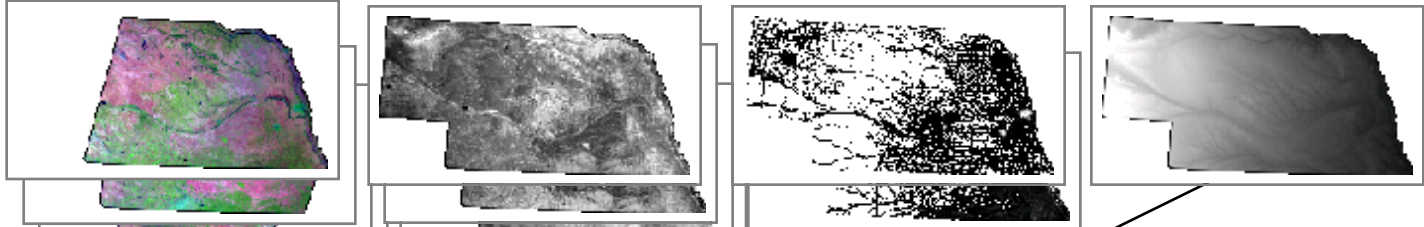
Input Vector Data

NASS JAS segments FSA CLU USGS NLCD



Input Raster Data

IRS Resourcesat-1 raw AWiFS summer time series NASA Terra MODIS 16-day NDVI prior fall and summer time series USGS NLCD 2001 Impervious & Canopy USGS NED Elevation



Tabular Data

JAS eData FSA 578

STATE	FSA	ACRES	PERCENT
01	001	10000	100.0
01	002	10000	100.0
01	003	10000	100.0
01	004	10000	100.0
01	005	10000	100.0
01	006	10000	100.0
01	007	10000	100.0
01	008	10000	100.0
01	009	10000	100.0
01	010	10000	100.0
01	011	10000	100.0
01	012	10000	100.0
01	013	10000	100.0
01	014	10000	100.0
01	015	10000	100.0
01	016	10000	100.0
01	017	10000	100.0
01	018	10000	100.0
01	019	10000	100.0
01	020	10000	100.0
01	021	10000	100.0
01	022	10000	100.0
01	023	10000	100.0
01	024	10000	100.0
01	025	10000	100.0
01	026	10000	100.0
01	027	10000	100.0
01	028	10000	100.0
01	029	10000	100.0
01	030	10000	100.0
01	031	10000	100.0
01	032	10000	100.0
01	033	10000	100.0
01	034	10000	100.0
01	035	10000	100.0
01	036	10000	100.0
01	037	10000	100.0
01	038	10000	100.0
01	039	10000	100.0
01	040	10000	100.0
01	041	10000	100.0
01	042	10000	100.0
01	043	10000	100.0
01	044	10000	100.0
01	045	10000	100.0
01	046	10000	100.0
01	047	10000	100.0
01	048	10000	100.0
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01	050	10000	100.0
01	051	10000	100.0
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01	053	10000	100.0
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01	071	10000	100.0
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01	073	10000	100.0
01	074	10000	100.0
01	075	10000	100.0
01	076	10000	100.0
01	077	10000	100.0
01	078	10000	100.0
01	079	10000	100.0
01	080	10000	100.0
01	081	10000	100.0
01	082	10000	100.0
01	083	10000	100.0
01	084	10000	100.0
01	085	10000	100.0
01	086	10000	100.0
01	087	10000	100.0
01	088	10000	100.0
01	089	10000	100.0
01	090	10000	100.0
01	091	10000	100.0
01	092	10000	100.0
01	093	10000	100.0
01	094	10000	100.0
01	095	10000	100.0
01	096	10000	100.0
01	097	10000	100.0
01	098	10000	100.0
01	099	10000	100.0
01	100	10000	100.0

Non-agricultural Ground truth



Agricultural Ground truth



Derives decision tree-based classification rules



Generated rule set

Manages and visualizes datasets




Extract JAS intersecting pixels

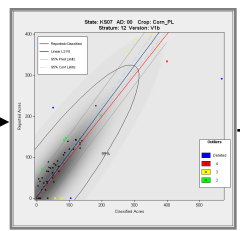


Link and assess data sets

Estimation

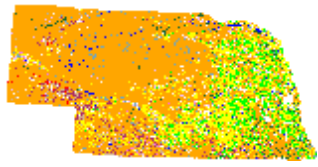


Customized for acreage estimation



Pixel count vs. reported acreage

-- Cropland Data Layer --




State and county crop acreage statistics

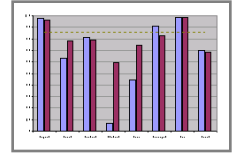
NASS Internal Only

Output

Confidence Layer

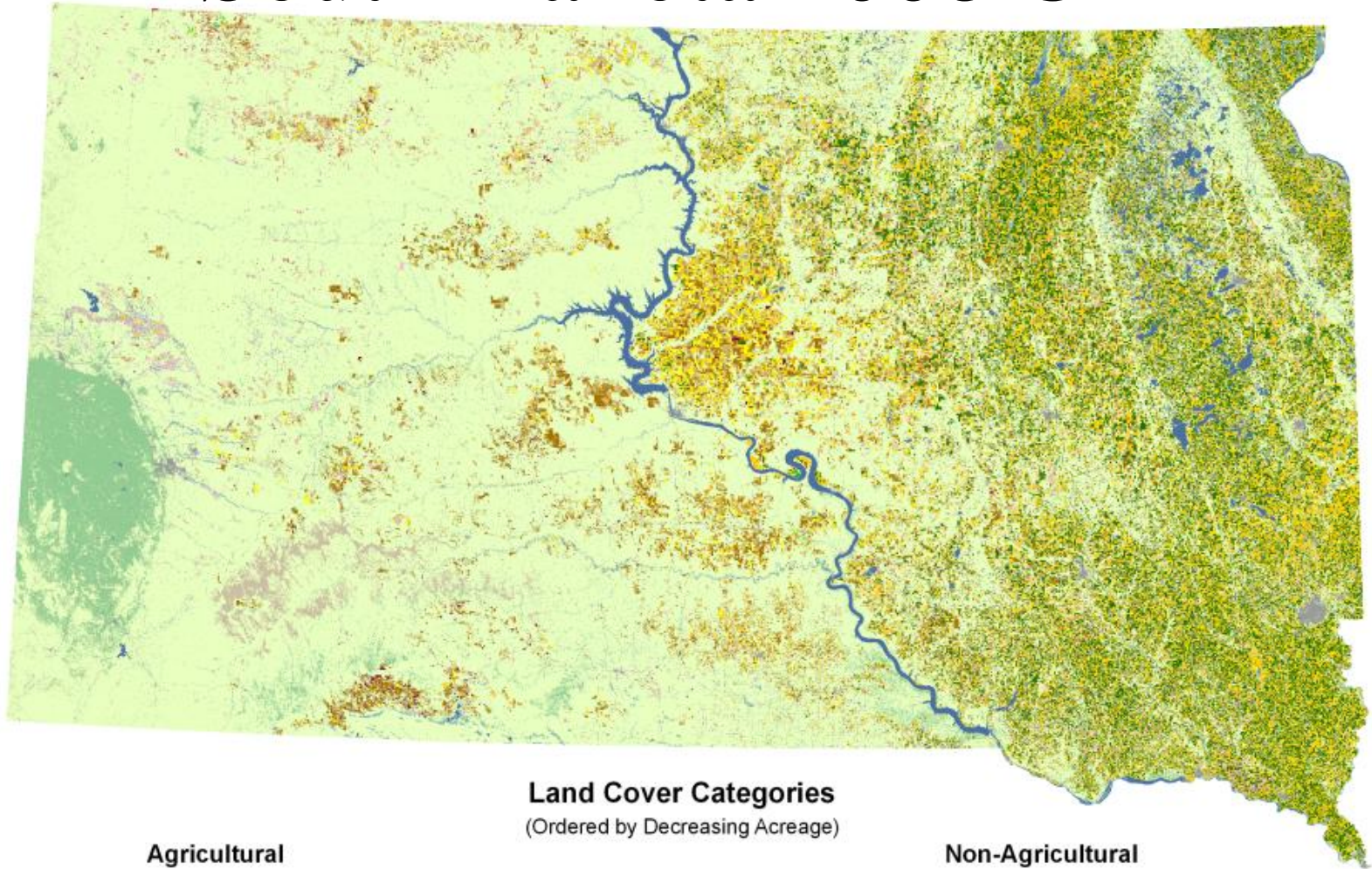


Accuracy Assessment



Diagnostics

South Dakota 2008 CDL











Land Cover Categories

(Ordered by Decreasing Acreage)

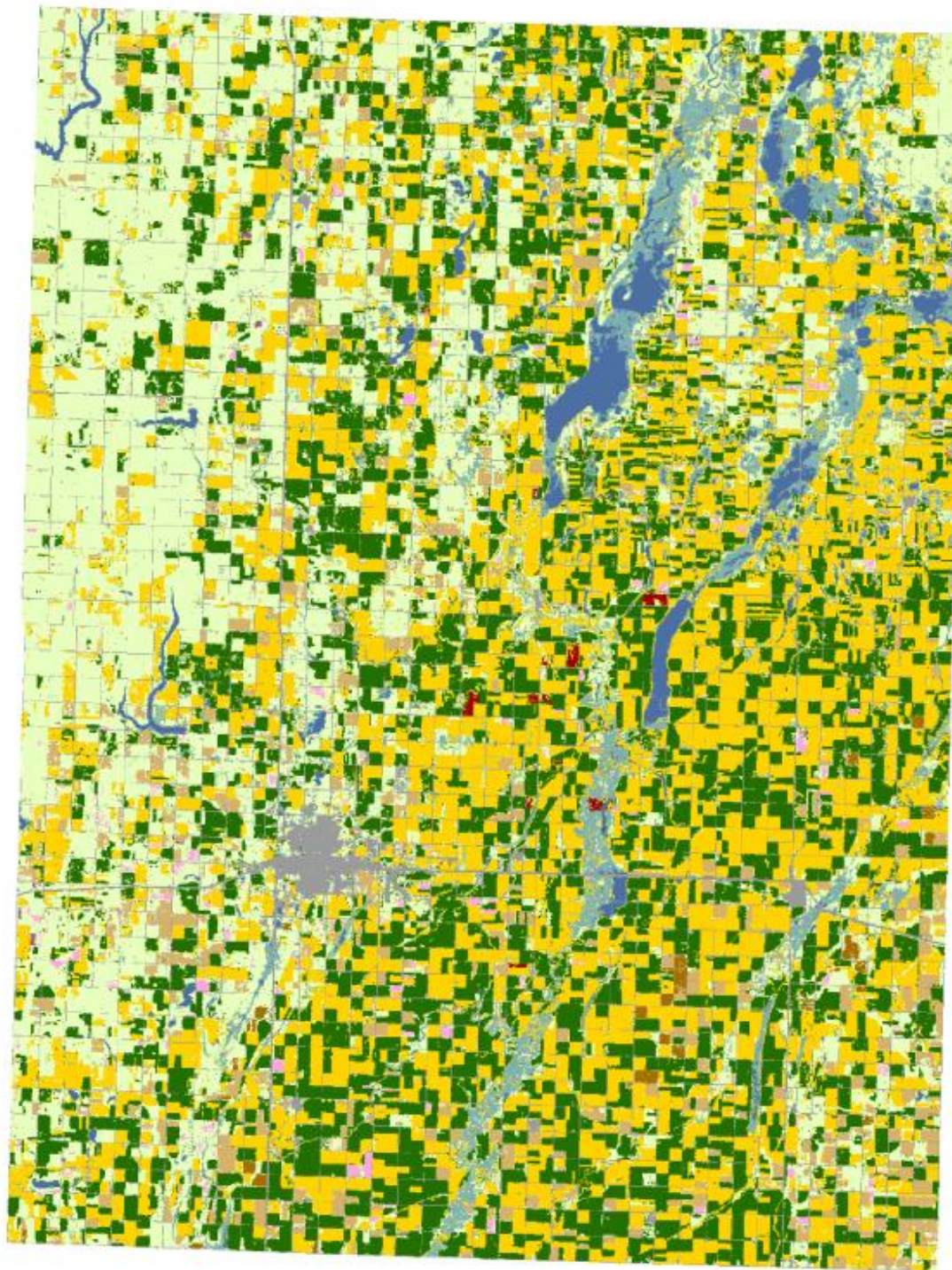
Agricultural

 Corn	 Oats	 Rye
 Soybeans	 Barley	 Flaxseed
 Winter Wheat	 Peas	 Lentils
 Spring Wheat	 Other Crops	 Clover/Wildflowers
 Alfalfa	 Dry Beans	 Sugarbeets
 Sunflowers	 Safflower	 W. Wht./Soy. Dbl. Crop.
 Millet	 Durum Wheat	 Misc. Veggies. & Fruits
 Sorghum	 Other Small Grains	

Non-Agricultural

 Grass/Pasture/Non-Ag
 Woodland
 Urban/Developed
 Water
 Wetlands
 Barren
 Shrubland
 Fallow/Idle Cropland

Brown County, SD '08



Land Cover Categories (Ordered by Decreasing Acreage)

Agricultural

- Corn
- Soybeans
- Spring Wheat
- Alfalfa
- Winter Wheat
- Dry Beans
- Sunflowers
- Oats
- Millet
- Sorghum
- Barley
- Rye
- Other Crops

Non-Agricultural

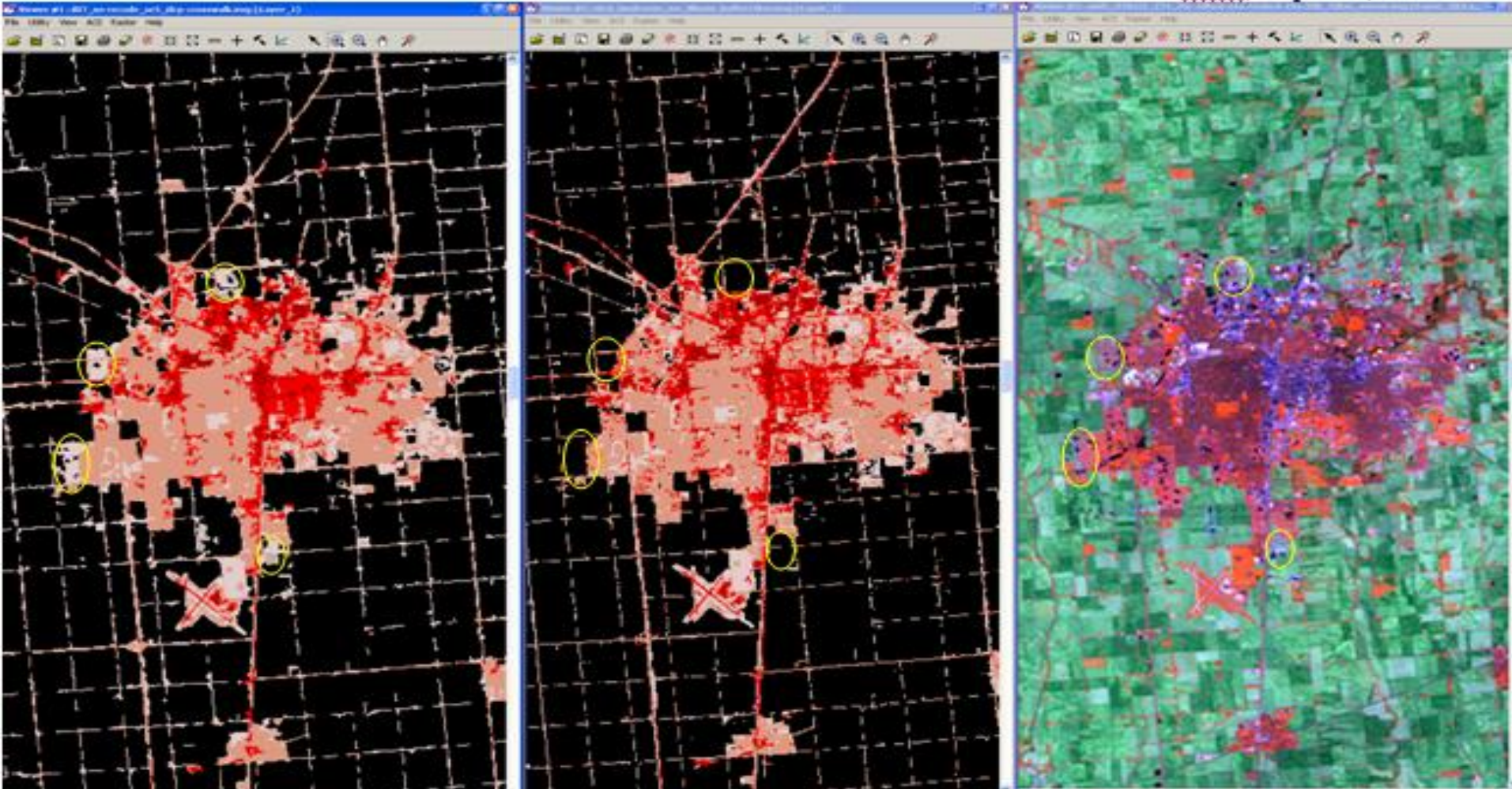
- Grass/Pasture/Non-Ag
- Urban/Developed
- Wetlands
- Water
- Woodland
- Fallow/Idle Cropland
- Barren
- Shrubland

Non Ag NLCD Updates (urban sprawl)

IL07 CDL

NLCD 2001

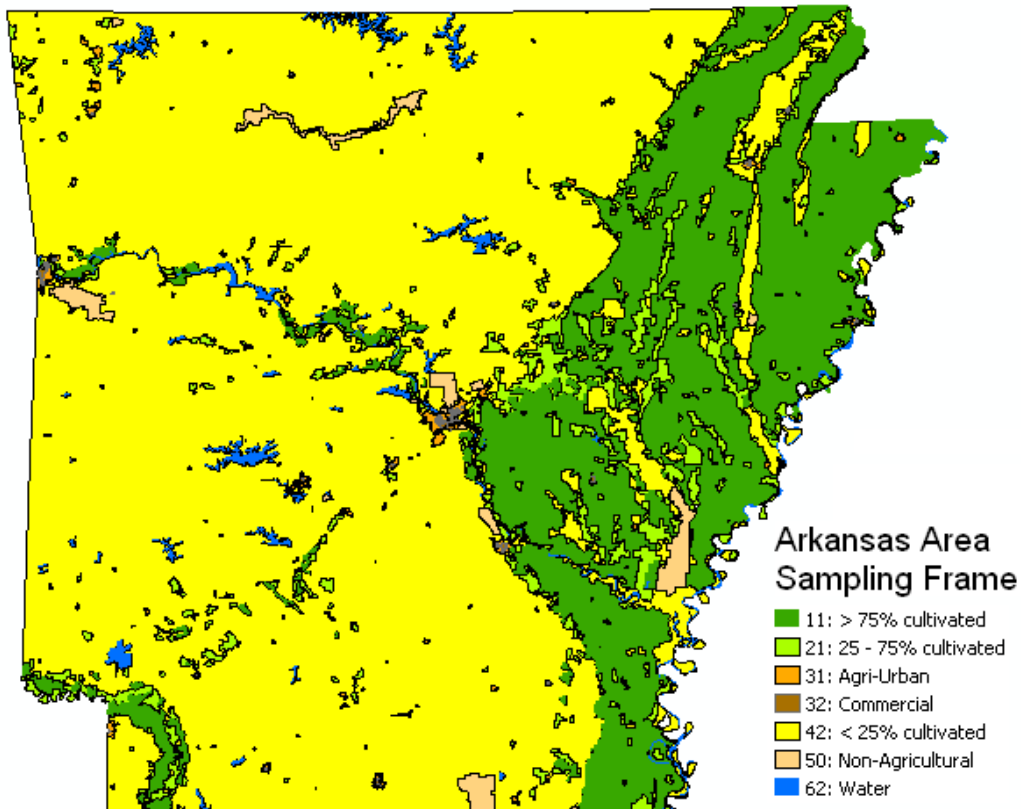
Avifs - April 21, 2007



Remote Sensing Regression Estimation



Acreage: South Dakota



SECTION D - CROPS AND LAND USE ON TRACT

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	
1.	Total acres in field	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
6.	Pasture	Permanent (not in crop rotation)	842	842
			856	856

**Estimation Components:
Area Sampling Frame+
June Ag Survey+
Questionnaire**

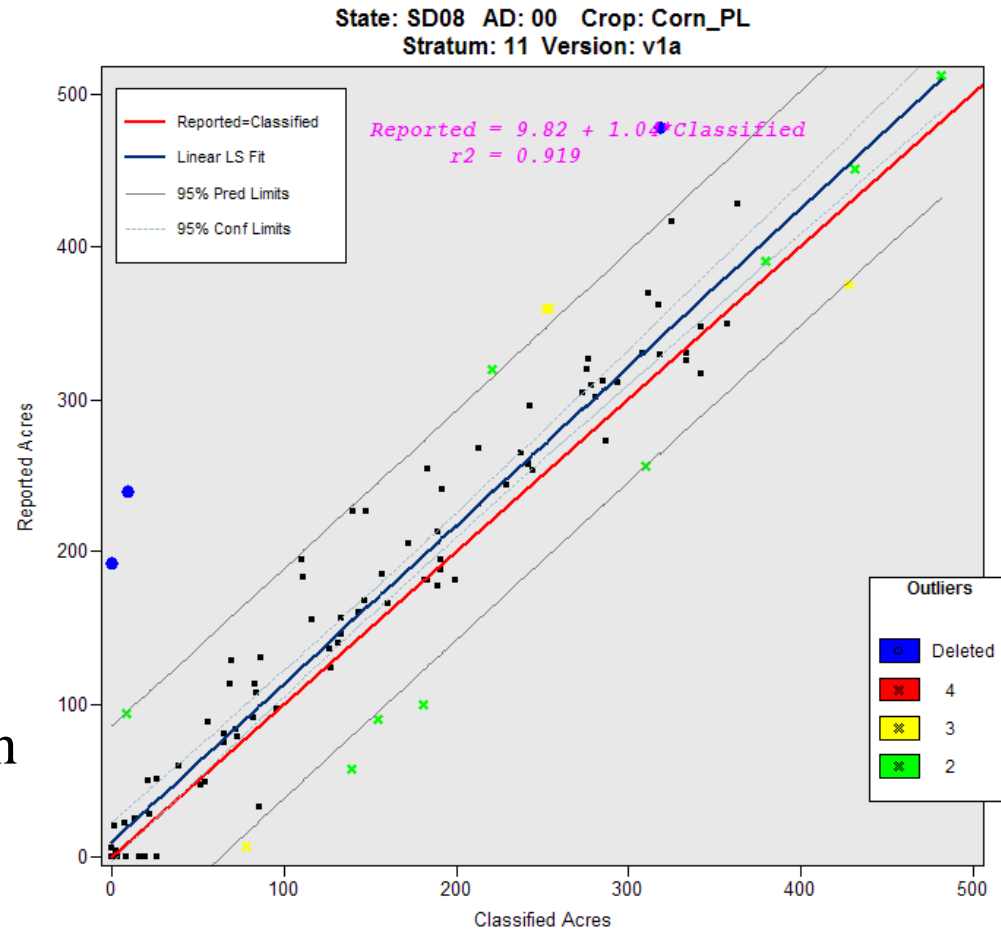
Regression-based Acreage Estimator

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 - removal from regression analysis



IMG file description: _080922_

Acreage not just about counting pixels

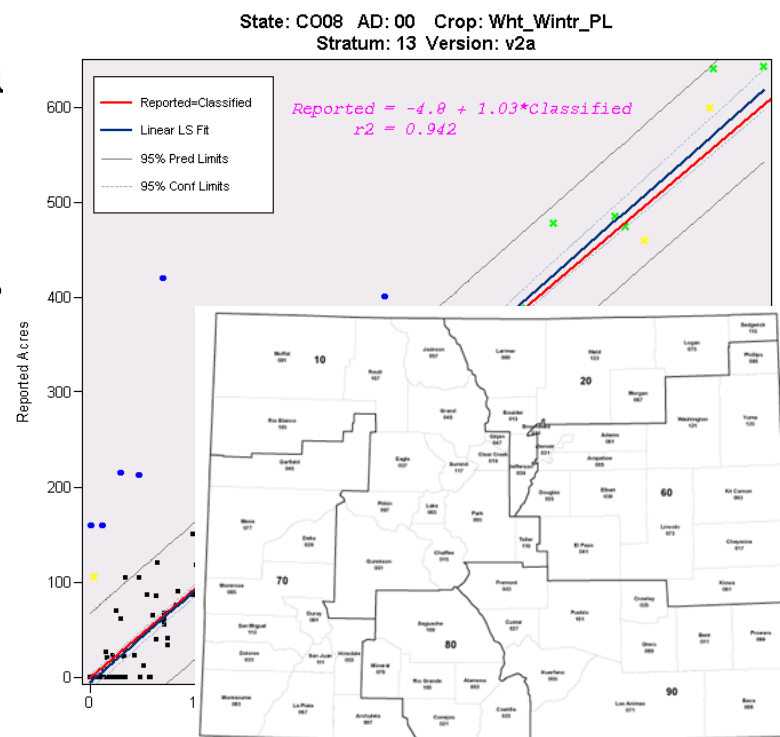
CDL Program Estimation

■ State level/large domain

- Classification accuracy
- Apply regression equations to population level classified pixel counts within area frame land use strata
- Sum across strata

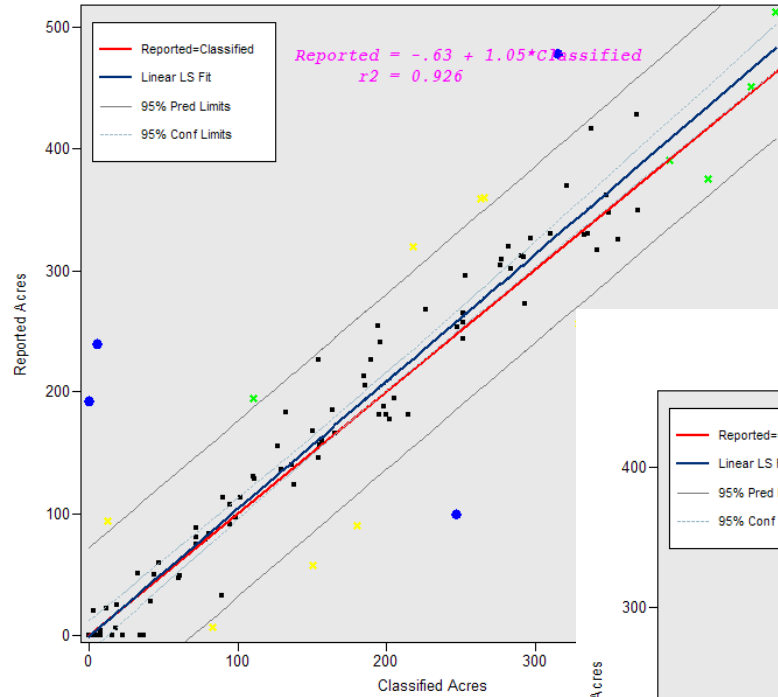
■ County level/small domain

- Battese-Fuller approach
 - Incorporate an additional term that accounts for
- Pixel count ~ biased
 - Not subject to sampling error
 - Nonsampling error due to pixel misclass

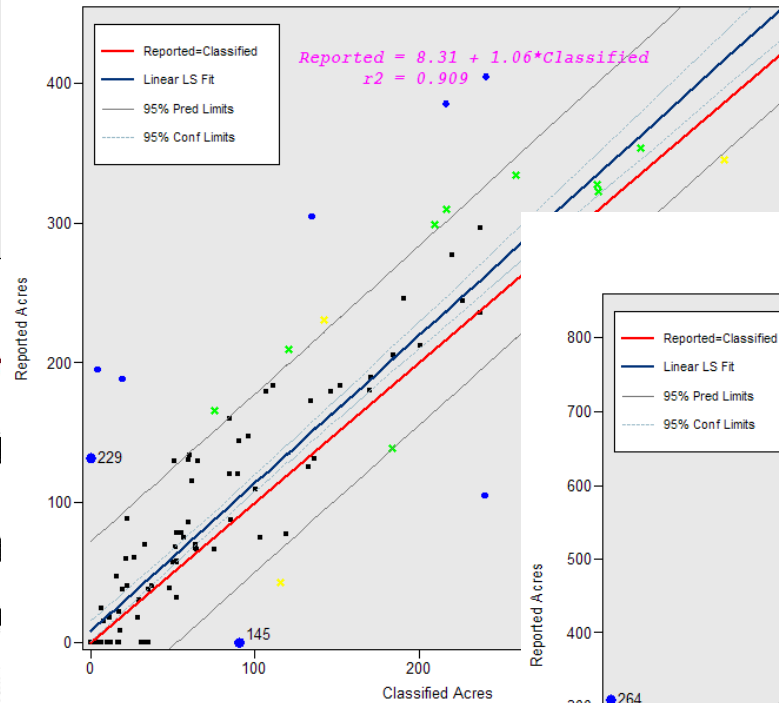


South Dakota '08 Corn/Planted Regression

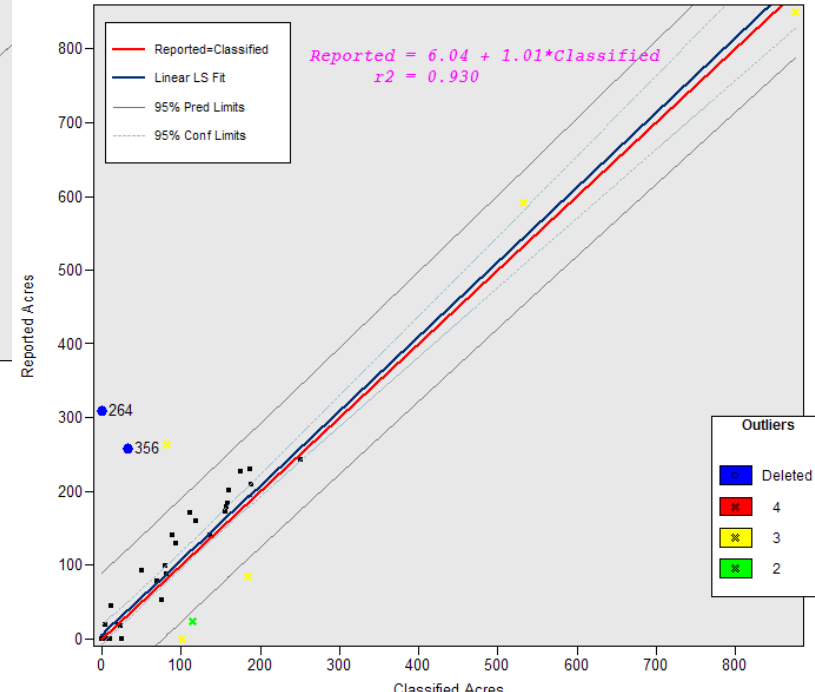
State: SD08 AD: 00 Crop: Corn_PL
Stratum: 11 Version: v2a



State: SD08 AD: 00 Crop: Corn_PL
Stratum: 12 Version: v1a



State: SD08 AD: 00 Crop: Corn_PL
Stratum: 20 Version: v2a



IMG file description: _080924_

$$\hat{Y}_{ca(reg)} = \sum_{h=1}^{H_a} N_{ah} [\bar{y}_{cah} + \hat{b}_{cah} (\bar{x}_{cah} - \bar{X}_{cah})]$$

N_{ah} = Number of frame units in strat

\bar{y}_{cah} = mean acres per segment from

\bar{x}_{cah} = mean categorized pixel count

\hat{b}_{cah} = coefficient from regression of acres on pixel counts

\bar{X}_{cah} = mean categorized pixel count (scenes)

IMG file description: _080922_

c = crop

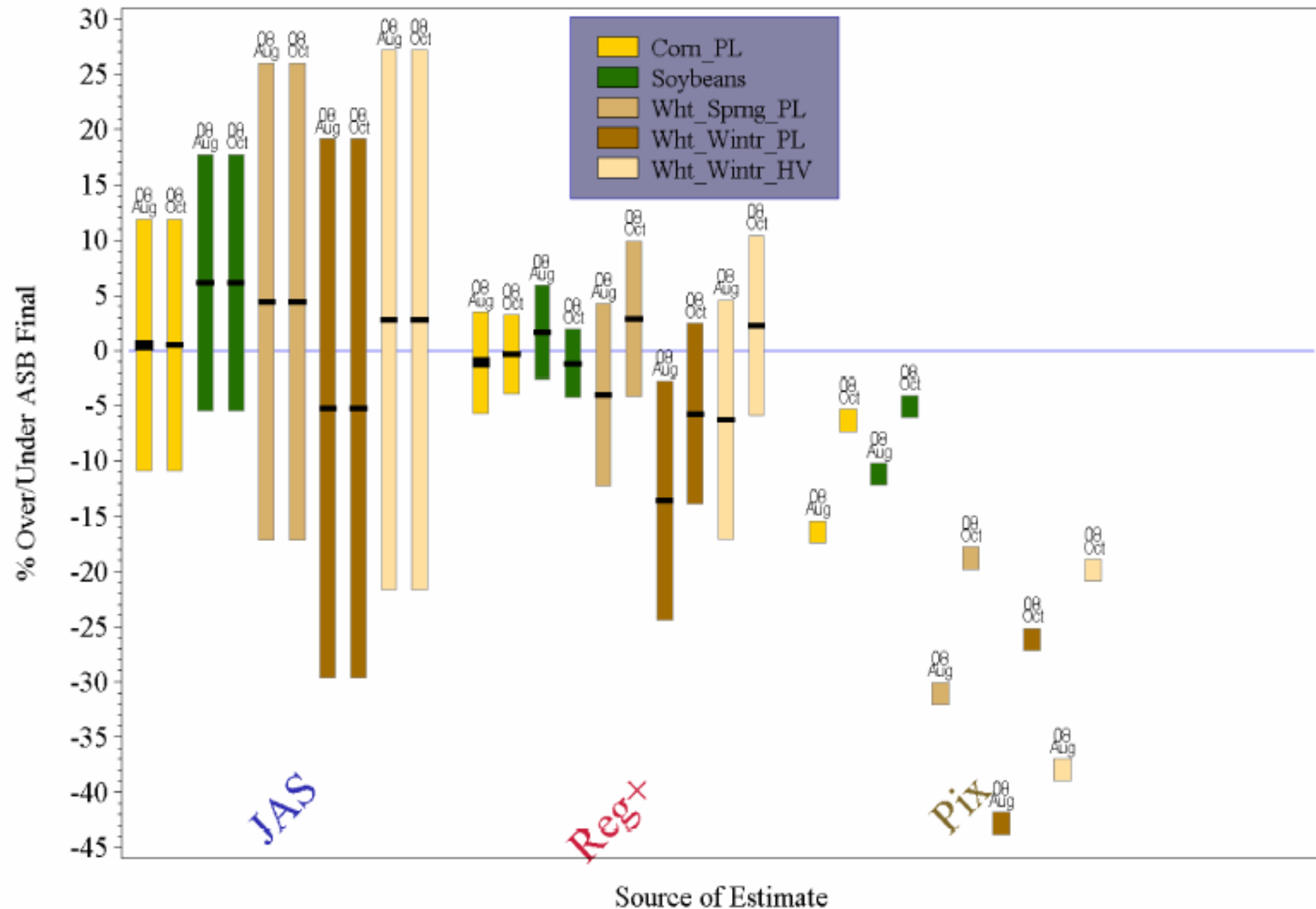
a = analysis region

h = stratum

Outliers

- Deleted
- 4
- 3
- 2

SD v2a Estimate and Variance, '08, +/- 2% CVs



CDL Acreage Summary

STATE-LEVEL

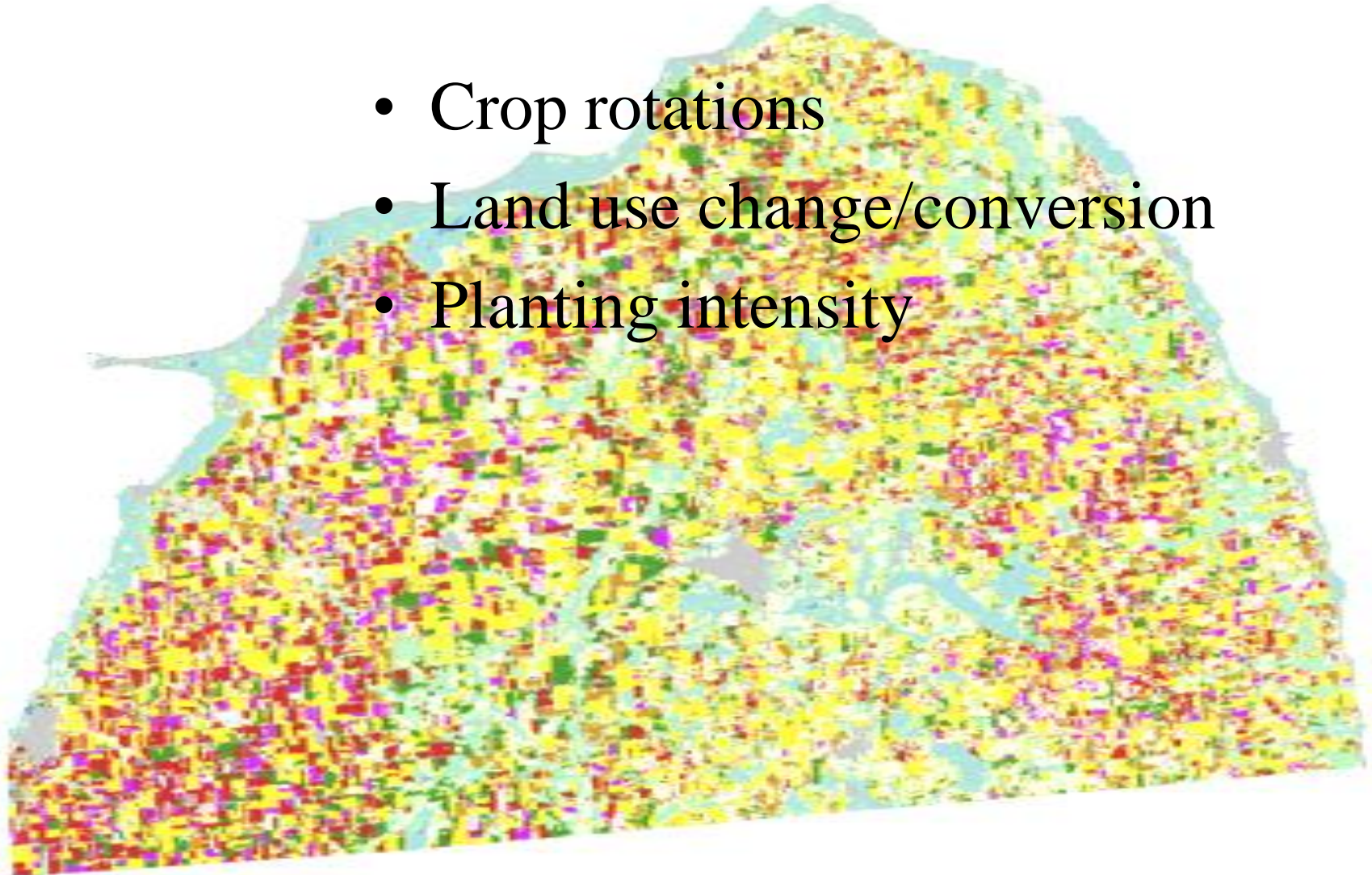
- CDL indications are as good or better than survey-based indicators
- Timeliness meets survey deadlines
- Accuracy & consistency have been improved, and further research improvements are ongoing

COUNTY-LEVEL

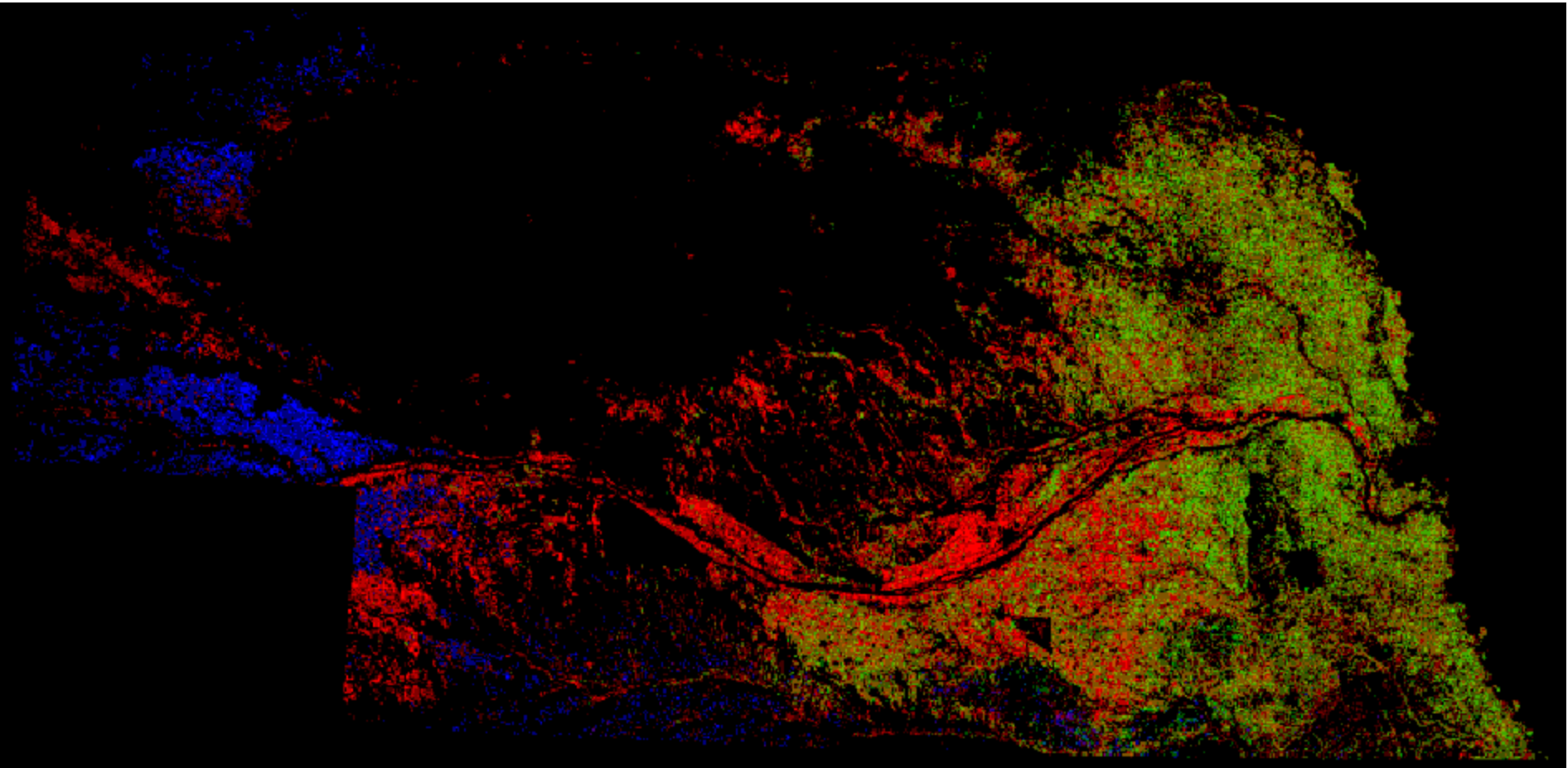
- Great majority of county indications are within 10% of Official Estimates
- Issues with non-program/specialty crop coverage
- CDL indications come with variance statistics

Derivative Products

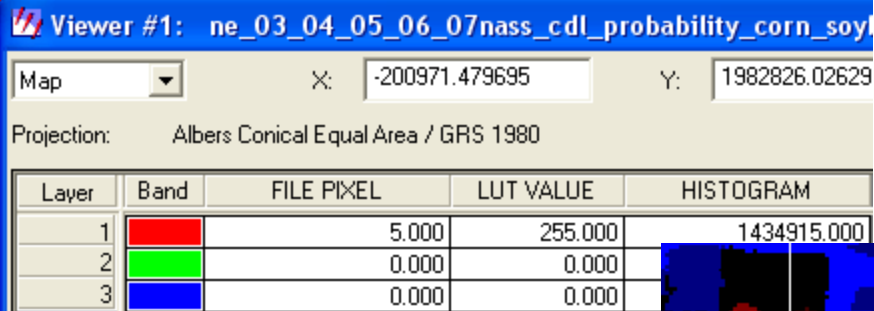
- Crop rotations
- Land use change/conversion
- Planting intensity



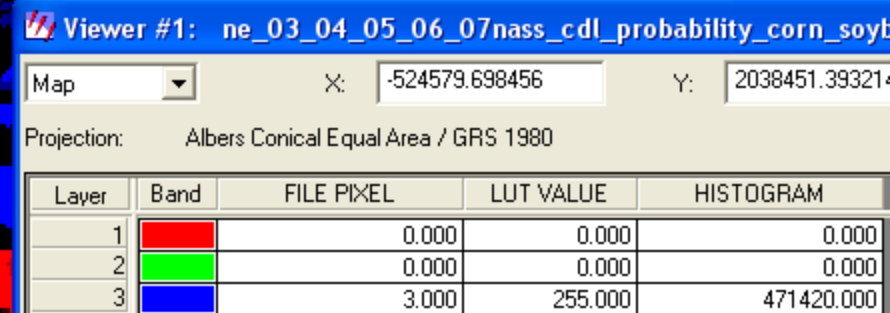
Crop Rotations



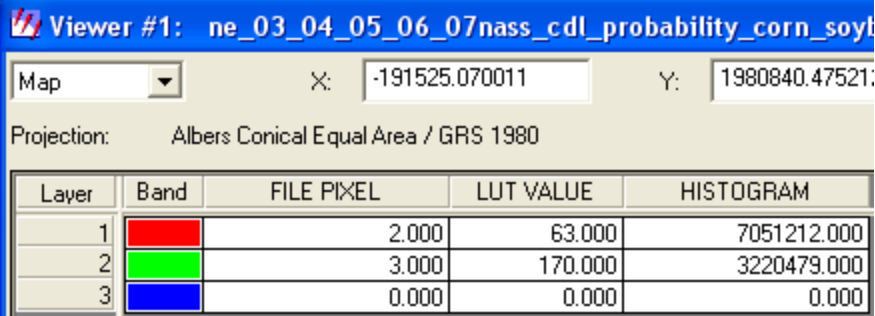
How many times was the same crop planted?



Corn



Winter Wheat



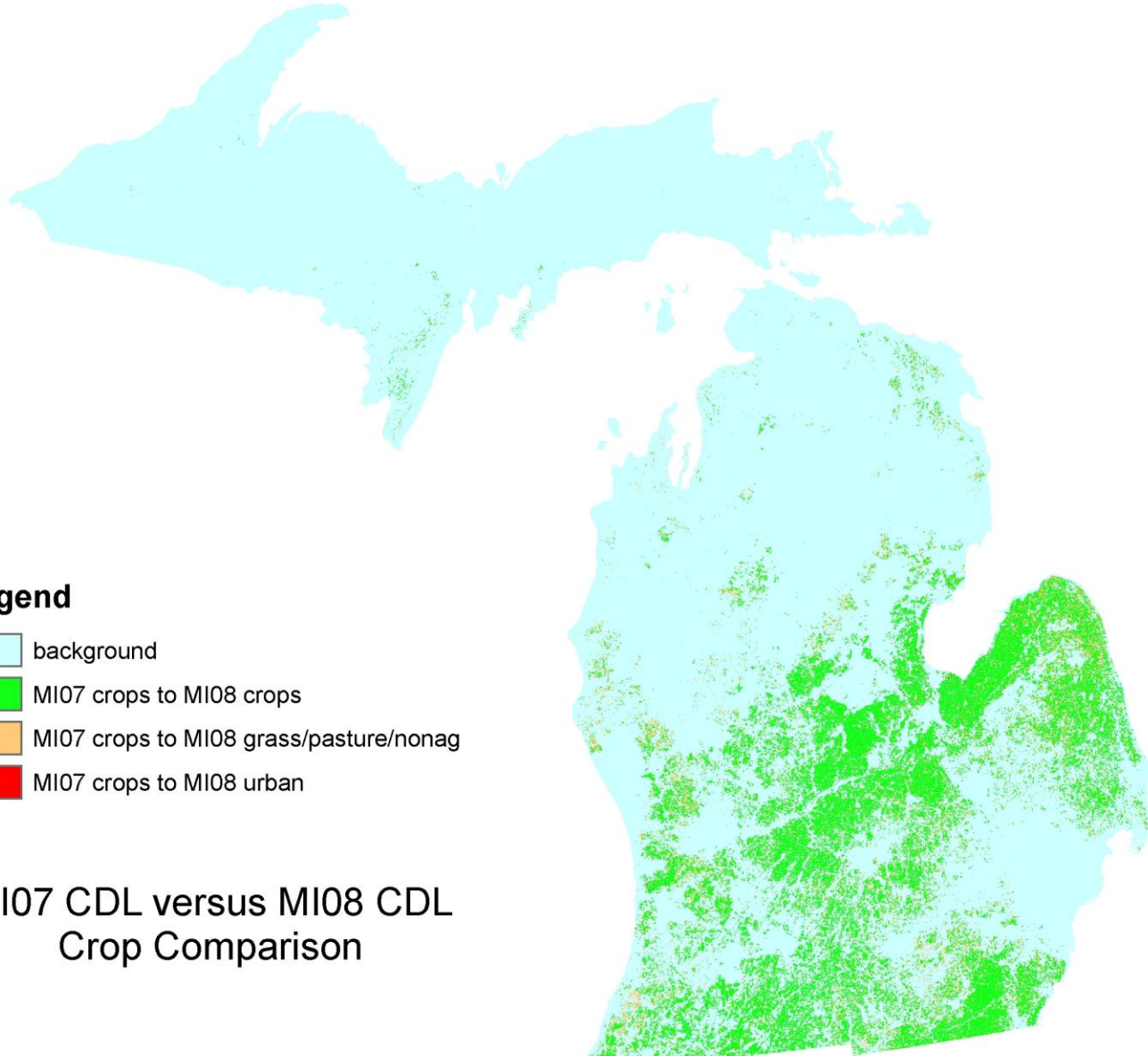
Soybeans

Land Use Change/Conversion

Legend

- background
- MI07 crops to MI08 crops
- MI07 crops to MI08 grass/pasture/nonag
- MI07 crops to MI08 urban

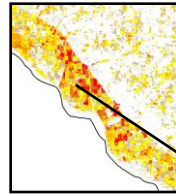
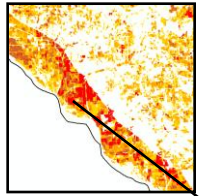
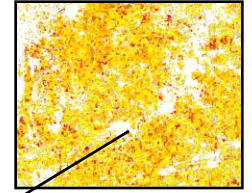
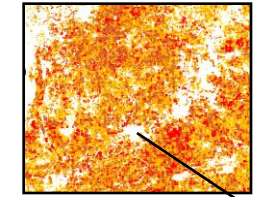
MI07 CDL versus MI08 CDL
Crop Comparison



Corn Planting Intensity

5 years vs. 9 years

Illinois

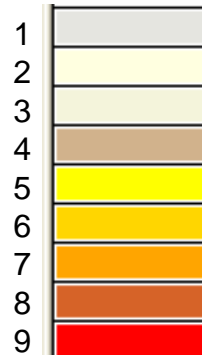


Years
Planted
to Corn



2003-2007

Years
Planted
to Corn



1999-2007

Thank you from the Spatial Analysis Research Section



September 2006