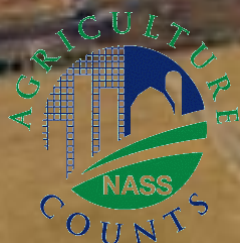


*An Evaluation of Single Crop Planting Intensity
and Crop Rotation Patterns
in
Nebraska, Iowa and Illinois
2004-2008*

**Claire Boryan, Mike Craig,
Patrick Willis
USDA/NASS**



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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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

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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, 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 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	174	7.4	40,700	83
	Soybeans	300	36.7	12.2	3,670	14
	Wheat	200	45.2	2.3	460	2
Central Maryland	Corn	124,200	98.4	9.9	1,230,200	2,413
	Soybeans	92,000	34.2	3.3	305,750	1,479
	Wheat	38,300	63.3	3.3	126,390	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	16
Upper Shore	Corn	157,000	159.2	3.1	800,700	1,411
	Soybeans	33,000	38.8	3.3	114,400	513
	Wheat	10,000	22.2	0.2	22,200	45

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 of 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 conditions in the Midwest and eastern Corn Belt, Ohio

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: County Total:

Download data as CSV | XML | PDF

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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 | 40,001 to 60,000 | 60,001 to 80,000 | 80,001 to 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	+40
200-499	700	900	+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.

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
0	2,600	47	17	58
50	4,700	71	9	20
99	7,400	65	19	18
199	1,900	53	37	10
499	700	33	59	8
499	200	22	78	0
Total	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.

Percent of Herds by Size Group 2007 Projection

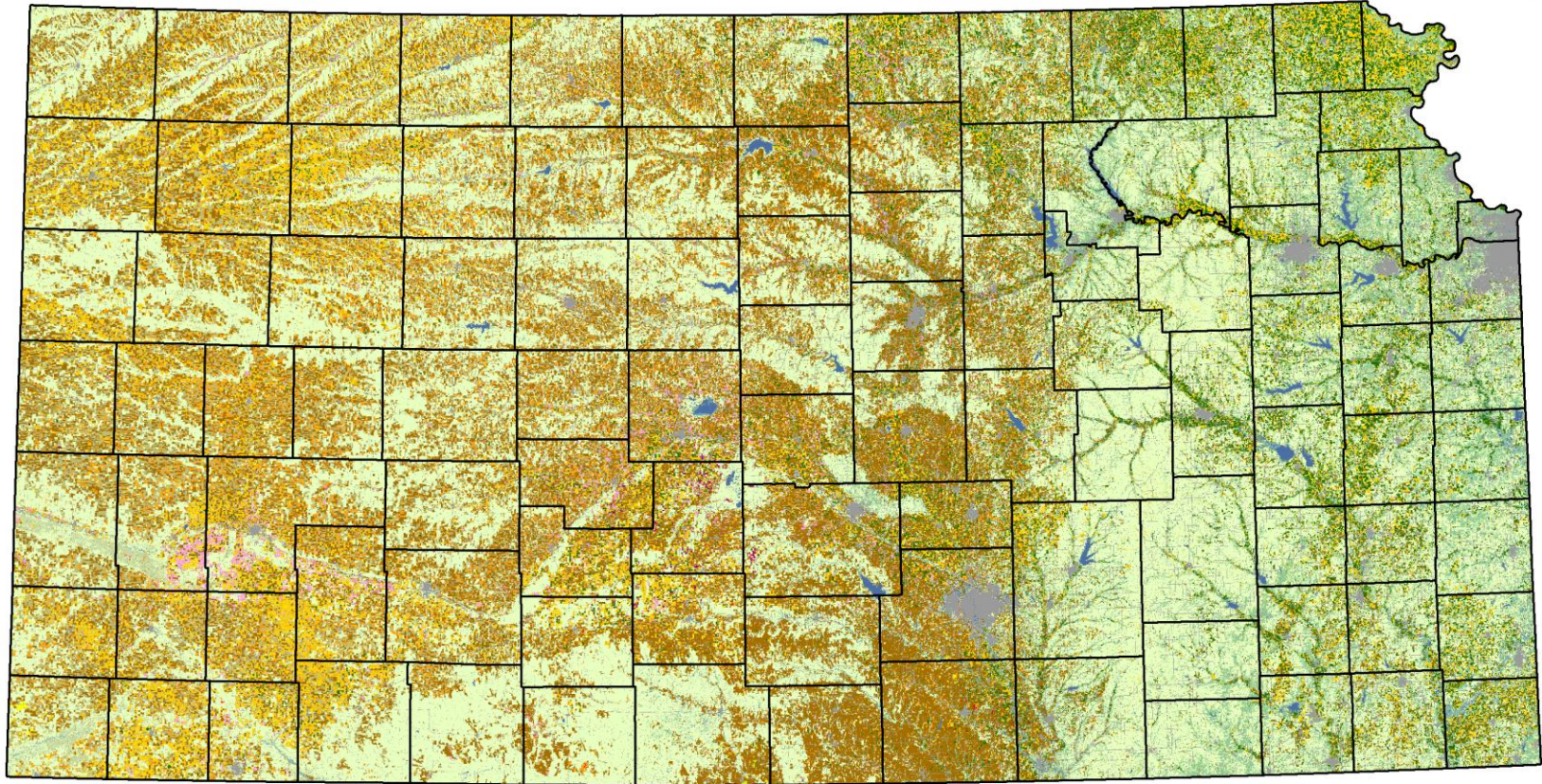


Remote Sensing Acreage Estimation Program Objectives

- “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 to public at the cost of reproduction
 - [NRCS Geospatial Data Gateway](#)
 - Publish accuracy statistics/metadata
 - County and state level



Land Cover Categories

(Ordered by Decreasing Acreage)

Agricultural

- Winter Wheat
- Corn
- Sorghum
- Soybeans
- Alfalfa
- W. Wht./Soy. Dbl. Crop.
- Sunflowers
- Rye

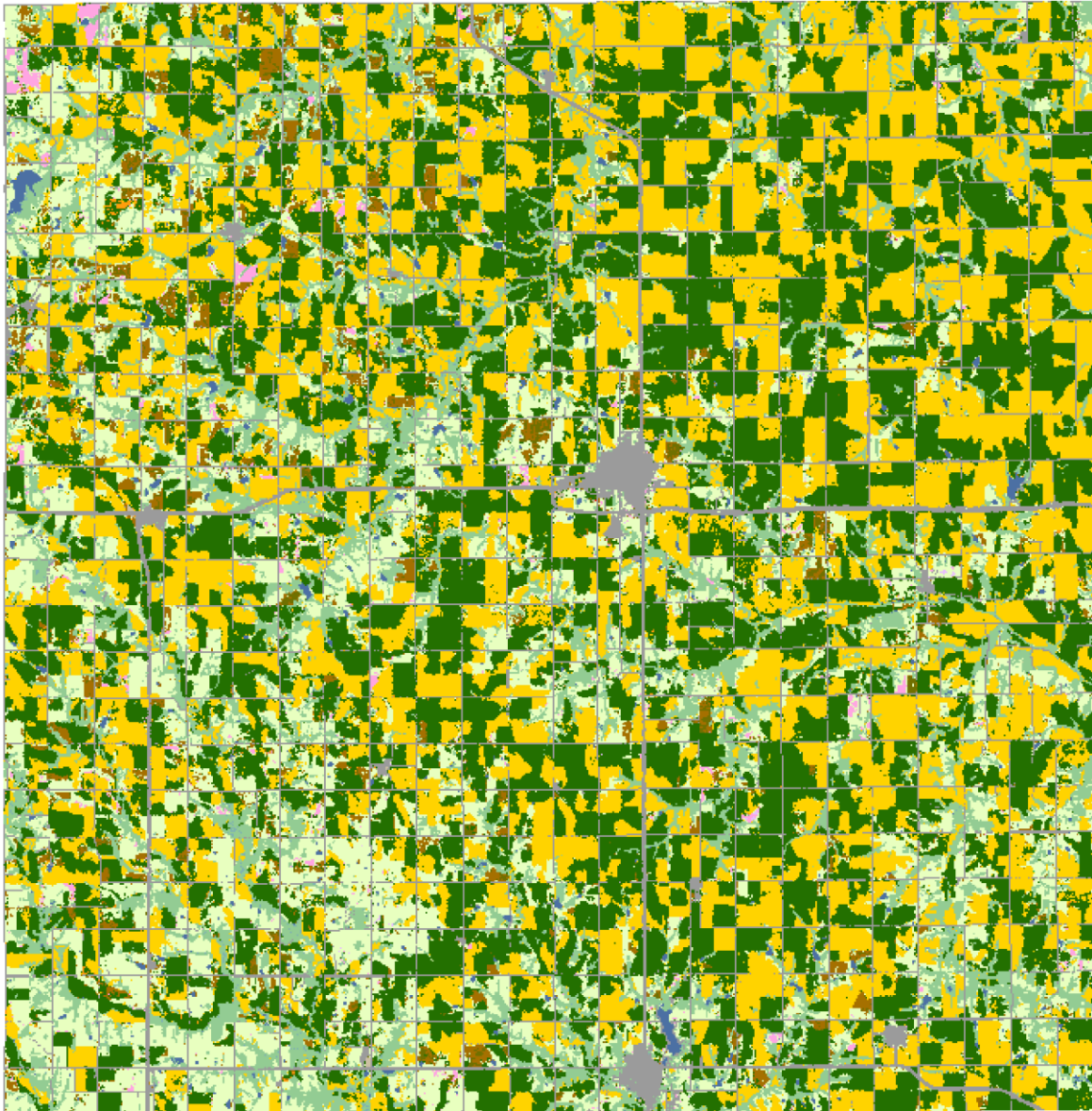
- Cotton
- Other Small Grains
- Clover/Wildflowers
- Oats
- Potatoes
- Seed/Sod Grass
- Canola
- Millet

- Other Crops
- Barley
- Other Tree Nuts
- Peas
- Apples
- Misc. Veggies. & Fruits

Non-Agricultural

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
















Brown County, Kansas 2008 Cropland Data Layer











Land Cover Categories

(Ordered by Decreasing Acreage)

Agricultural

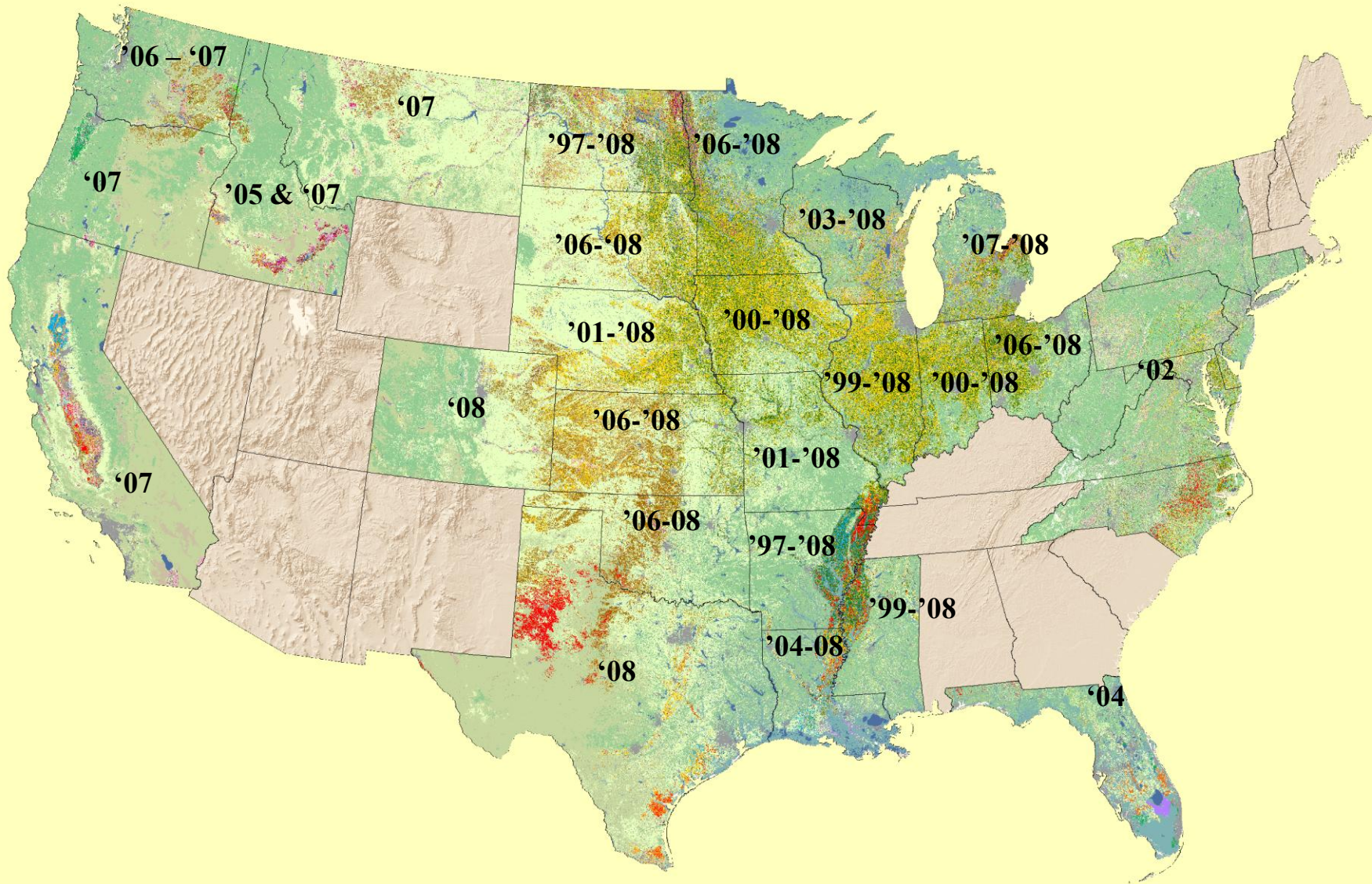
-  Soybeans
-  Corn/Sweet Corn
-  Winter Wheat
-  Alfalfa
-  Win. Wht./Soyb. Dbl. Cropped
-  Sorghum
-  Clover/Wildflowers
-  Other Crops/Grass Seed/Sod
-  Other Small Grains
-  Sunflowers
-  Oats
-  Cotton
-  Barley
-  Seed/Sod Grass
-  Other Tree Nuts

Non-Agricultural

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



Cropland Data Layers 1997 - 2008



Cropland Data Layer Program



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

Goals of 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 patterns in Nebraska, Iowa and Illinois



Corn



Soybeans

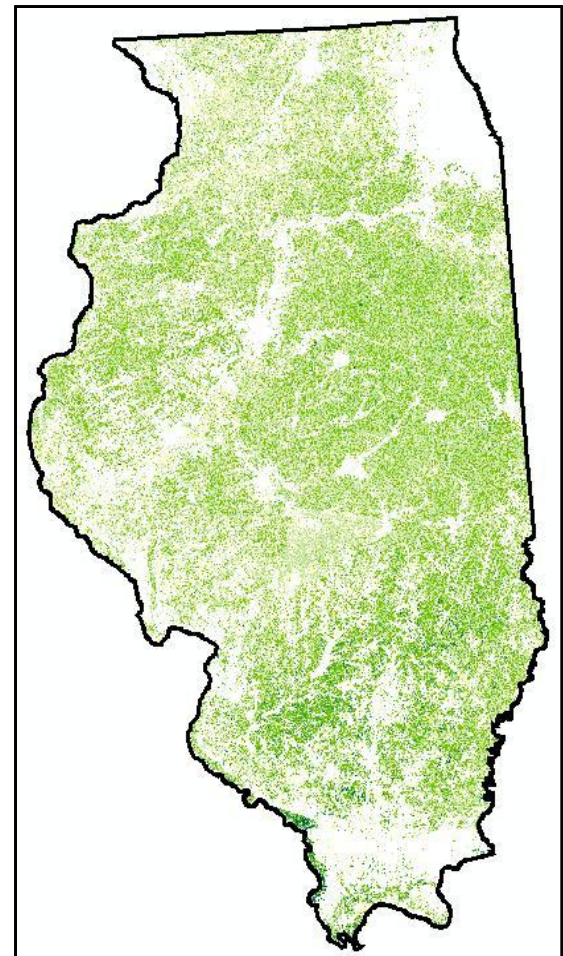
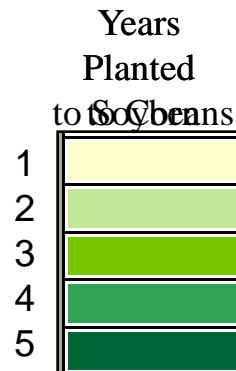
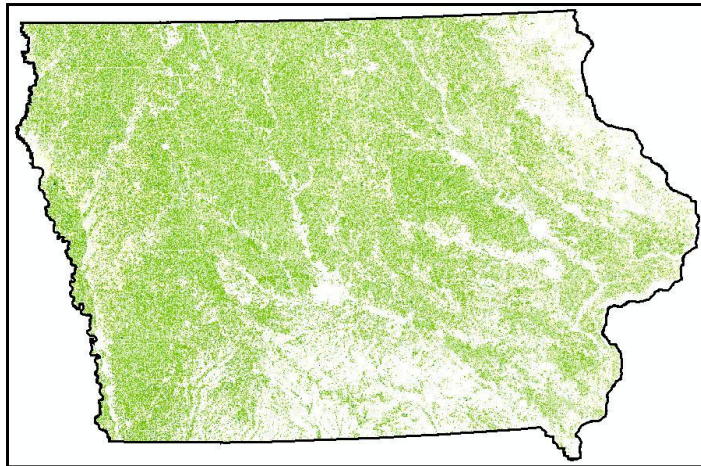
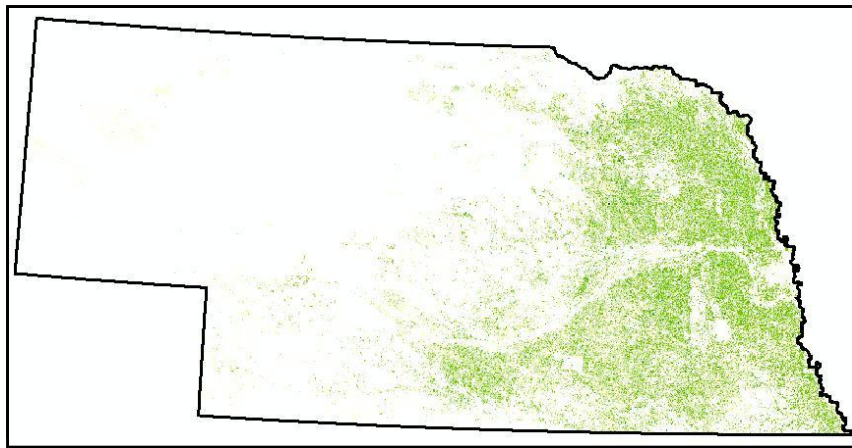
Single Crop Planting Intensity Methodology



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

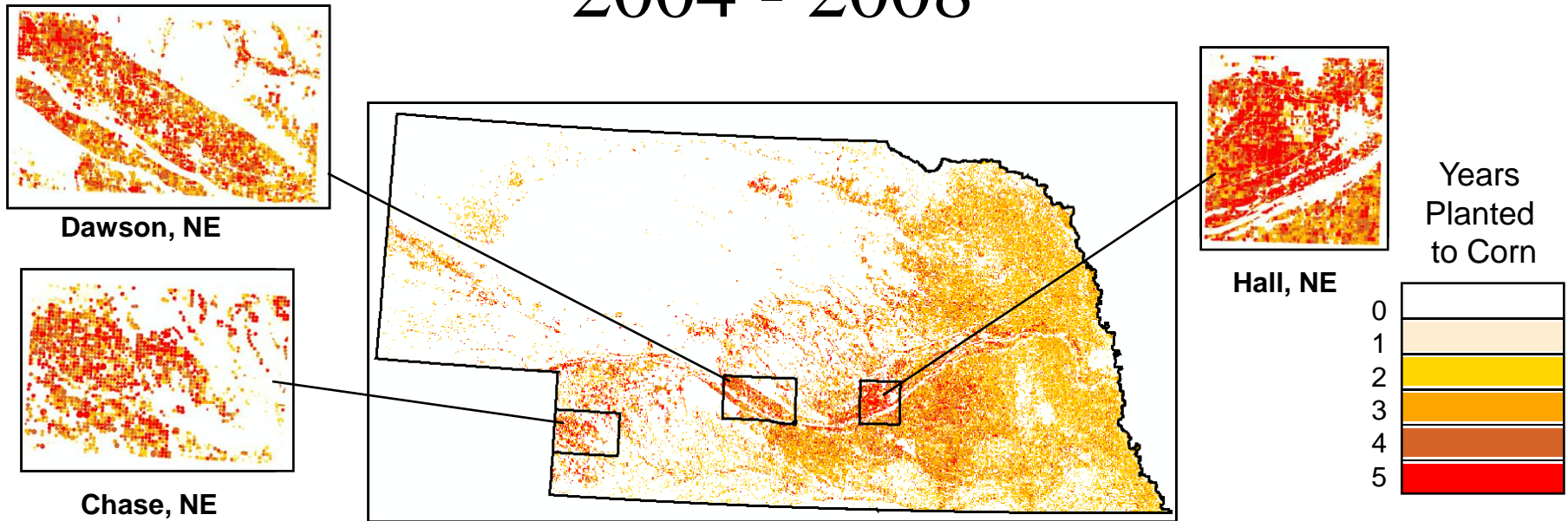
Single Crop Planting Intensity, 2004 - 2008

Nebraska, Iowa and Illinois



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

Corn Planting Intensity in Nebraska 2004 - 2008



Hall County	Chase County	Dawson County	State Total
5 years in a row planted to corn: 43%	5 years in a row planted to corn: 28%	5 years in a row planted to corn: 21%	5 years in a row planted to corn: 7%
4 out of 5 years planted to corn: 22%	4 out of 5 years planted to corn: 21%	4 out of 5 years planted to corn: 29%	4 out of 5 years planted to corn: 13%

Corn Planting Intensity, 2004 - 2008

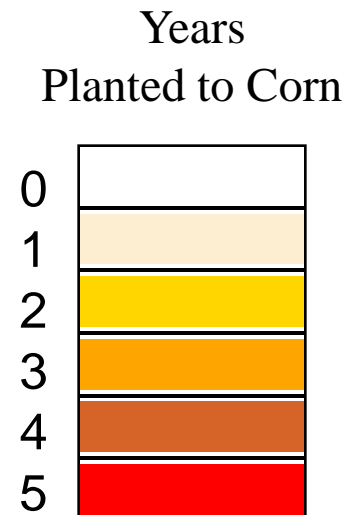
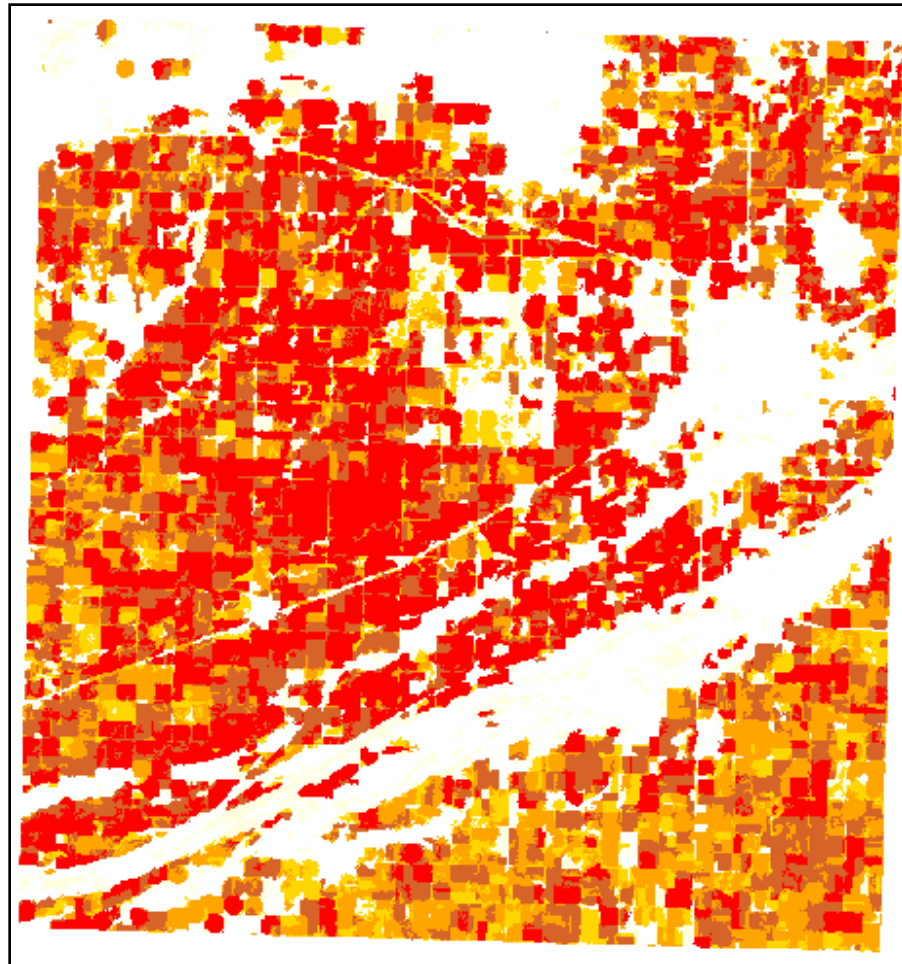
Hall County, Nebraska

Hall County

5 years in a row planted to corn: **43%**
(5% > than 2003-2007)

4 out of 5 years planted to corn: **22%**
(2% < than 2003-2007)

AWiFS 8/13/2007
Bands 3/4/2
Red/Green/Blue



Percentages derived from total acreage in corn production

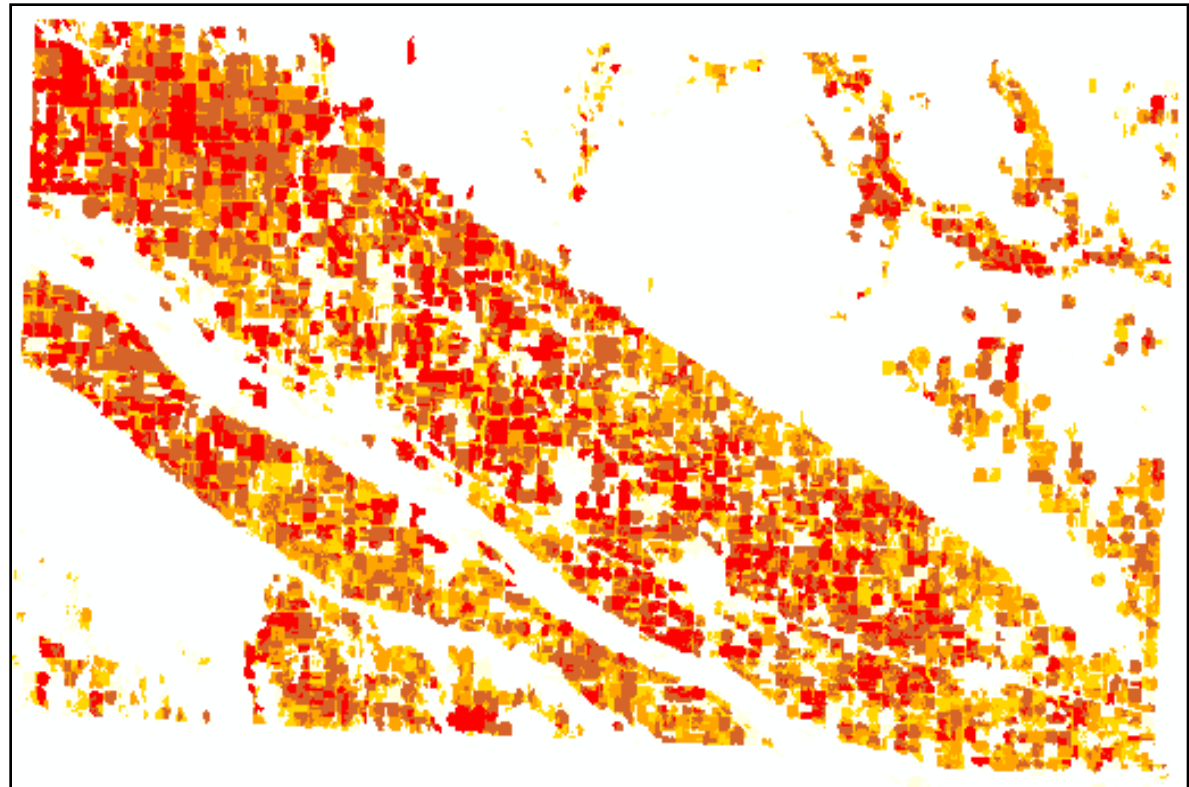
Corn Planting Intensity, 2004 - 2008

Dawson County, Nebraska

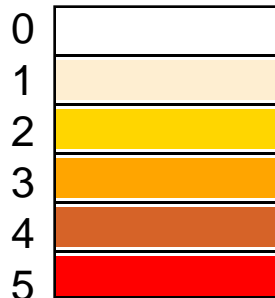
Dawson County

5 years in a row planted to corn: **21%**
(1% > than 2003-2007)

4 out of 5 years planted to corn: **29%**
(1% > than 2003-2007)



Years Planted to Corn

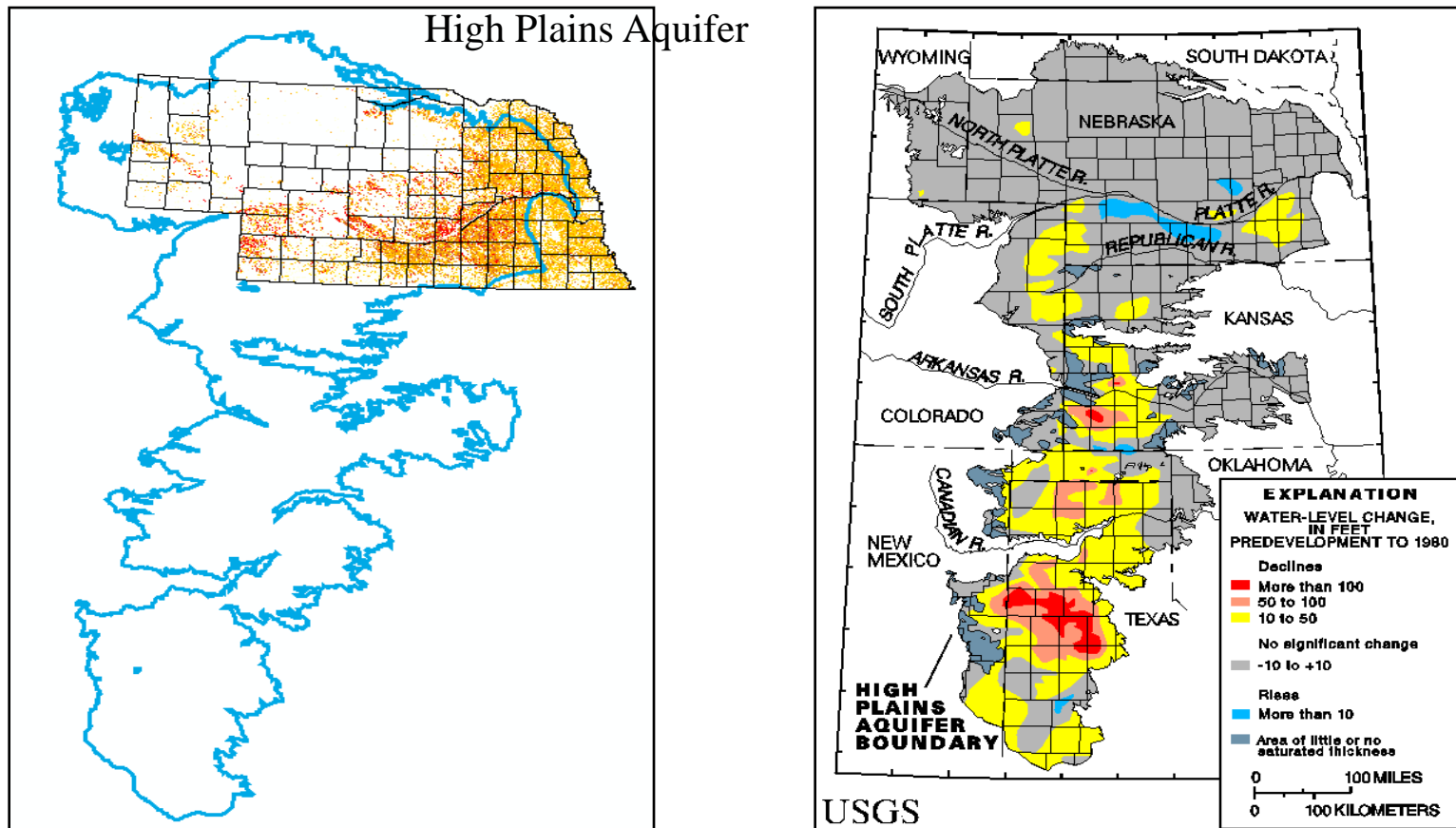


Percentages derived from total acreage in corn production

AWiFS 8/13/2007
Bands 3/4/2
Red/Green/Blue

Why is the continuous cropping of corn sustainable in Nebraska?

Irrigation from the High Plains Aquifer



Corn Planting Intensity in Iowa

2004 - 2008

Delaware County

5 years in a row planted to corn: **19%**

4 out of 5 years planted to corn: **25%**

Hamilton County

5 years in a row planted to corn: **9%**

4 out of 5 years planted to corn: **16%**

Dubuque County

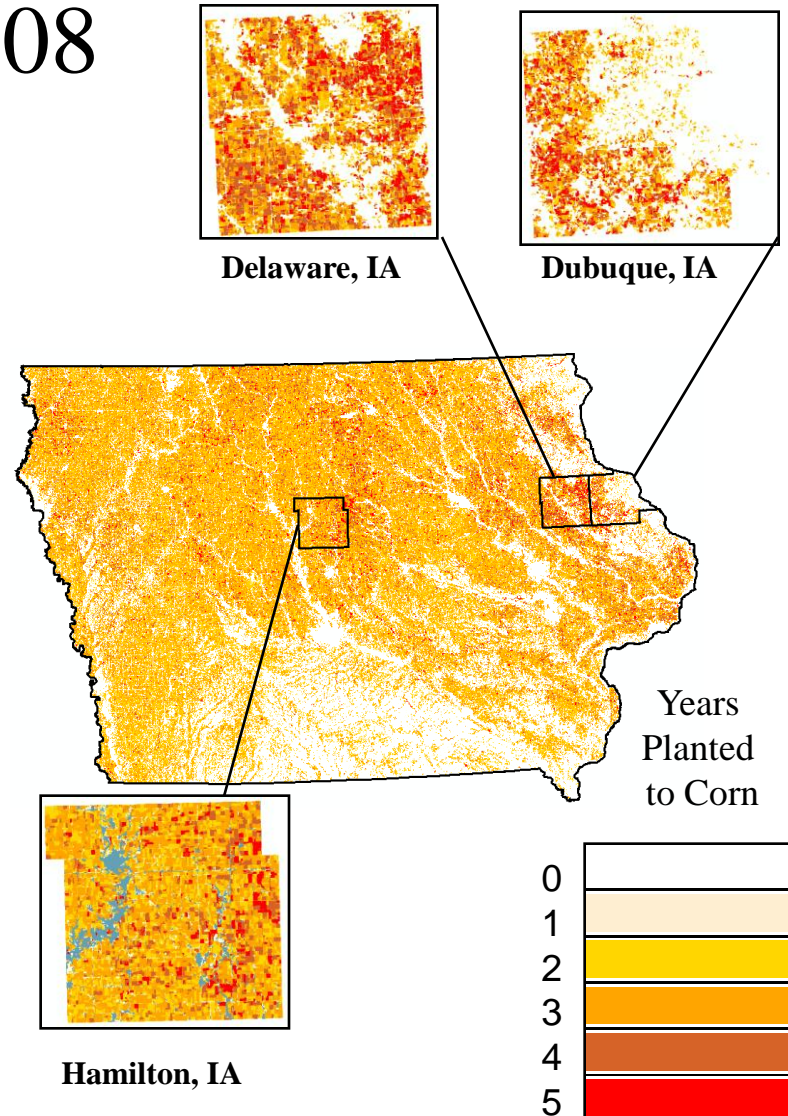
5 years in a row planted to corn: **16%**

4 out of 5 years planted to corn: **16%**

Iowa State Totals

5 years in a row planted to corn: **3%**

4 out of 5 years planted to corn: **9%**



Percentages derived from total acreage in corn production

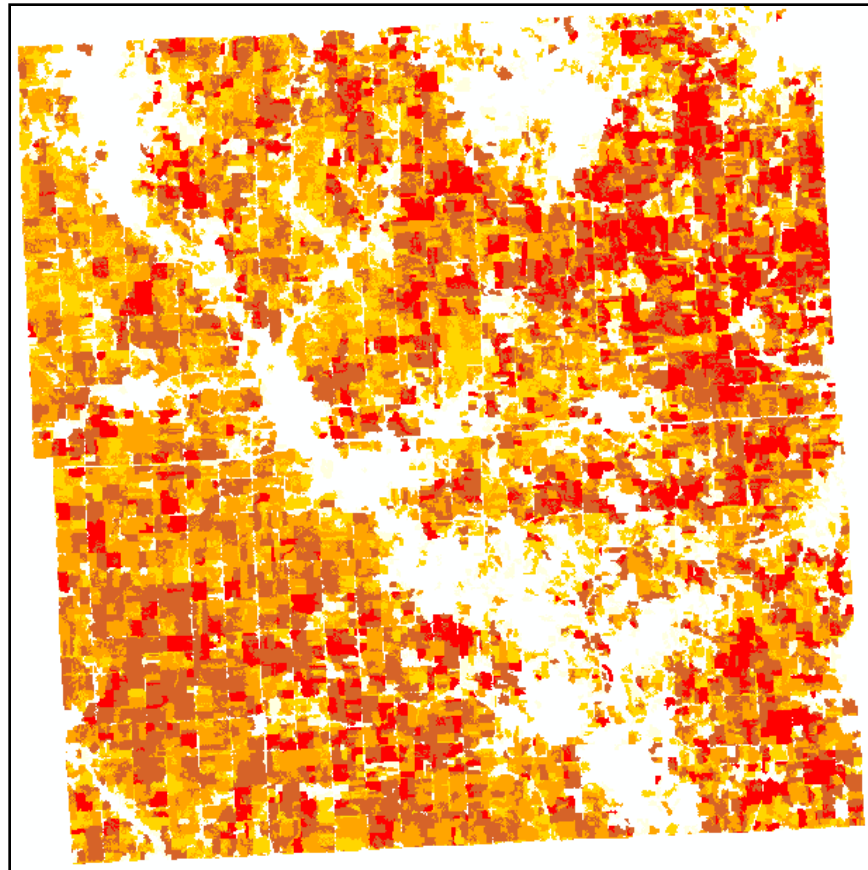
Corn Planting Intensity, 2004 - 2008

Delaware County, Iowa

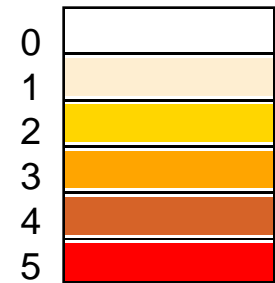
Delaware County, IA

5 years in a row planted to corn: **19%**
(4% > than 2003-2007)

4 out of 5 years planted to corn: **25%**
(3% < than 2003-2007)



Years
Planted to Corn



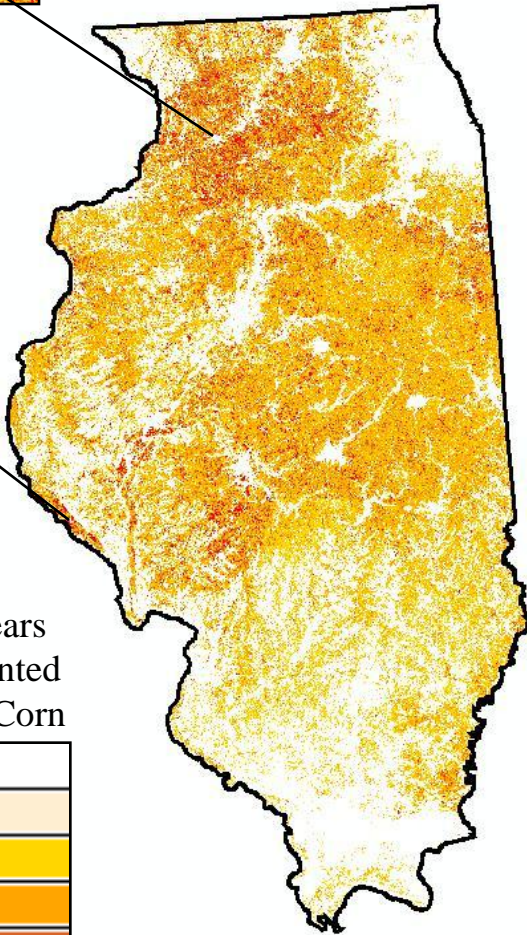
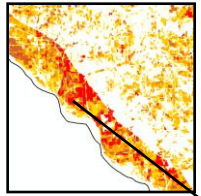
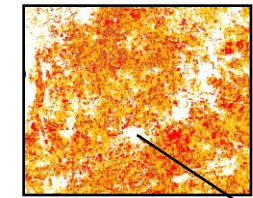
AWiFS 8/10/2007
Bands 3/4/2
Red/Green/Blue

Percentages derived from total acreage in corn production

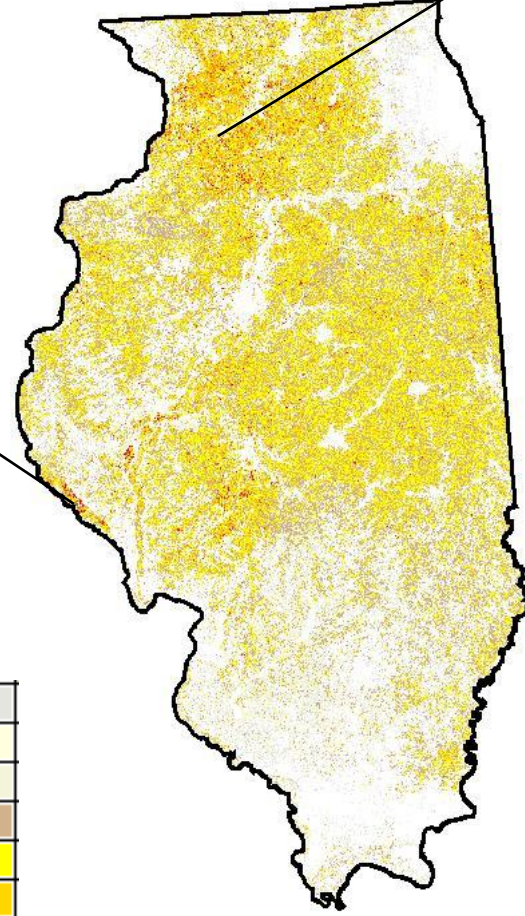
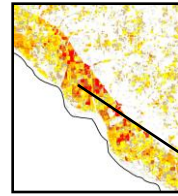
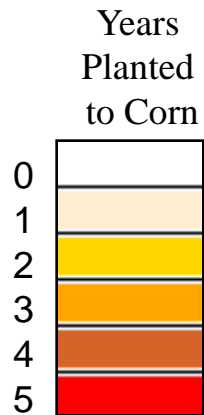
Corn Planting Intensity

5 years vs. 9 years

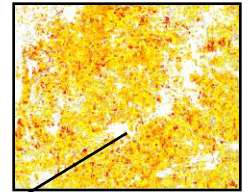
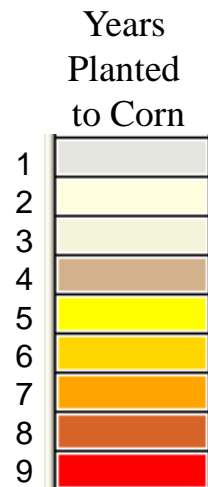
Illinois



2004-2008



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%**

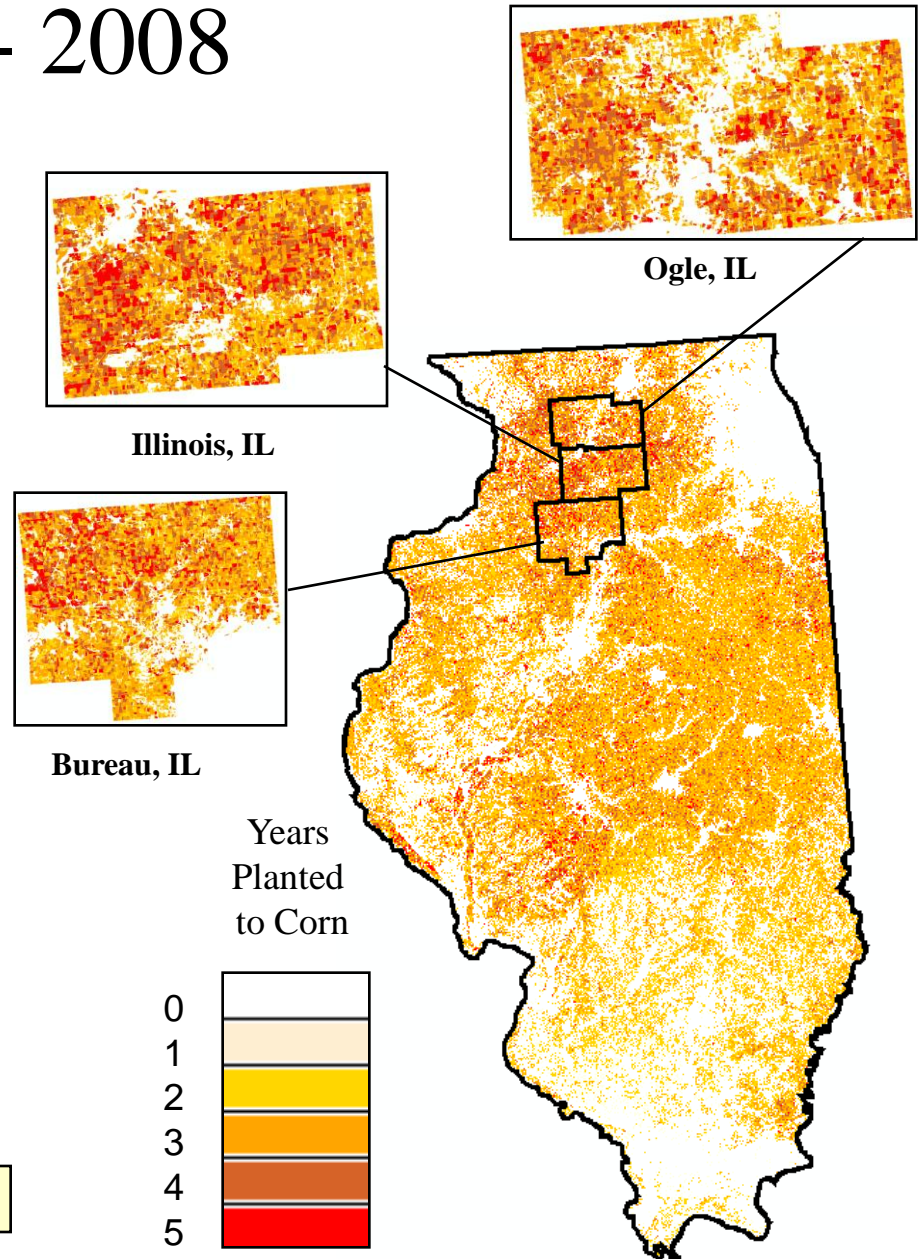
Ogle County

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%**

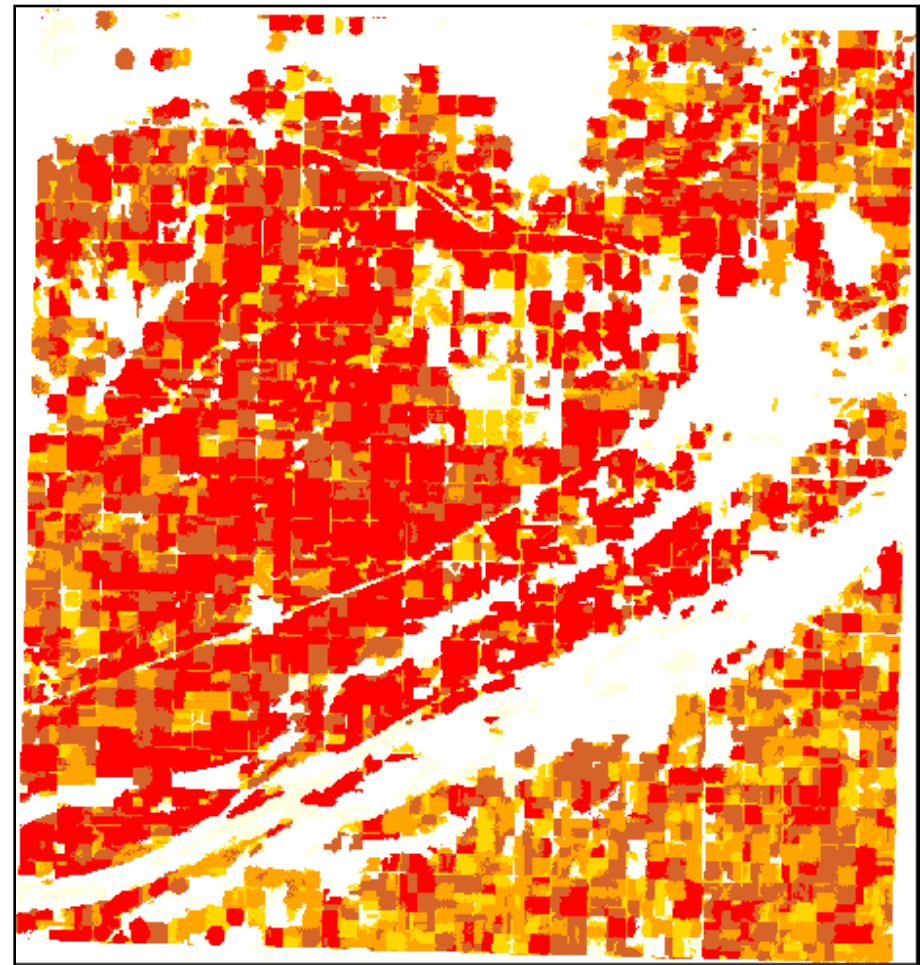
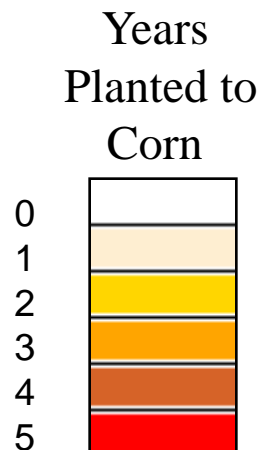
Percentages derived from total acreage in corn production



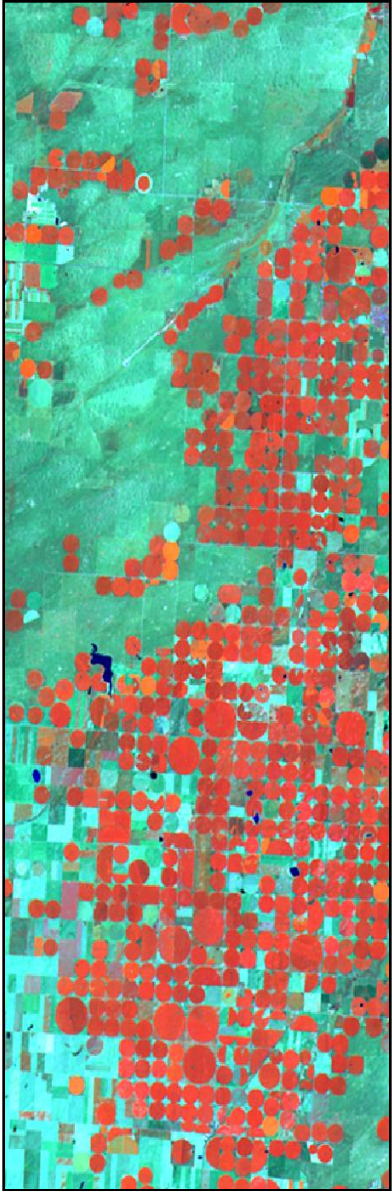
Trending toward increased levels of single crop planting to corn: 2004 - 2008

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%



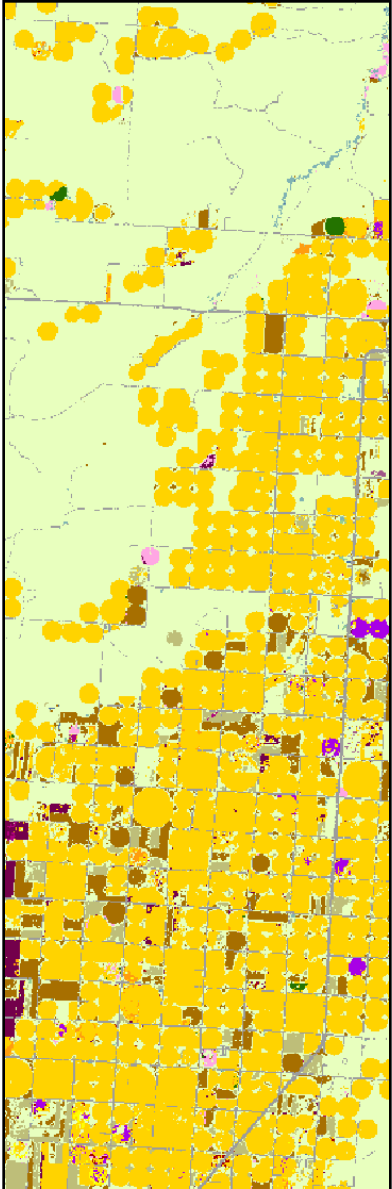
Crop Rotation Methodology



1. Inputs include: Cropland Data Layers (CDLs) for 2004 - 2008
2. CDLs are recoded to
2008: Corn: 1, Soy: 2, Other: 3
2007: Corn: 10, Soy: 20, Other: 30
2006: Corn: 100, Soy: 200, Other: 300
2005: Corn: 1,000, Soy: 2,000, Other: 3,000
2004: Corn: 10,000, Soybeans: 20,000, Other: 30,000
3. The recoded CDLs are added together using the ERDAS Imagine Modeler
4. The output is the Crop Rotation Image which is ready for evaluation

Crop Rotation Results Nebraska

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



Corn (04), Soy (05), Corn (06), Soy (07), Corn (08)	10.1%
Soy (04), Corn (05), Soy (06), Corn (07), Soy (08)	9.3%
Corn (04), Corn (05), Corn (06), Corn (07), Corn (08) (.3% < than 2003-2007)	7.5%
Additional acreage into corn production (07):	309,688 acres
Additional acreage into corn production (08):	503,221 acres

Total Cultivated Cropland derived from NASS' Nebraska 2008 CDL

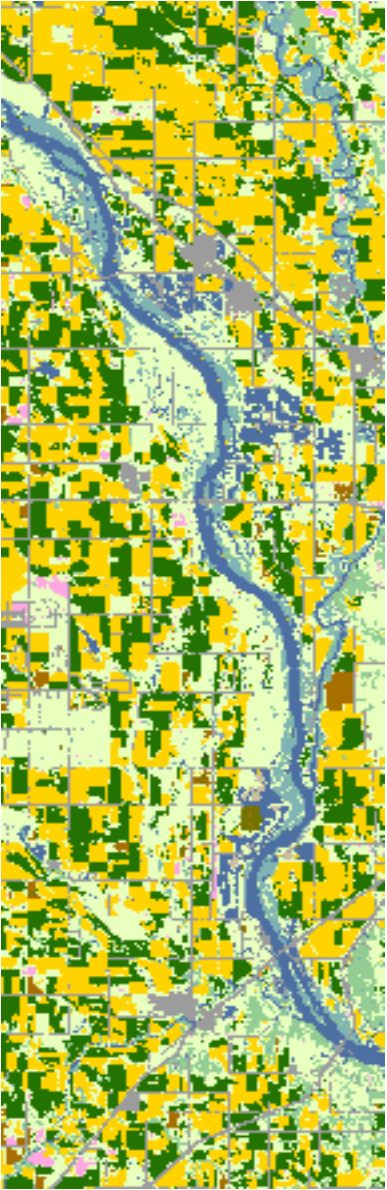
Crop Rotation Results

Iowa

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

Corn (04), Soy (05), Corn (06), Soy (07), Corn (08)	22.5%
Soy (04), Corn (05), Soy (06), Corn (07), Soy (08)	22.7%
Corn (04), Corn (05), Corn (06), Corn (07), Corn (08) <i>(.75% > than 2003-2007)</i>	3.8%
Additional acreage into corn production (07):	124,261 acres
Additional acreage into corn production (08):	200,580 acres

Total Cultivated Cropland derived from NASS' Iowa 2008 CDL



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

Conclusions

- Historic Cropland Data Layer image products (2004-2008) of Nebraska, Iowa and Illinois were utilized to evaluate continuous corn and soybean cropping patterns. Counties with high rates of continuous corn cropping were identified.
- Nebraska had the highest rates of corn cropping intensity fed by irrigation from the High Plains Aquifer.
- Analysis of crop rotation patterns indicate a predominant corn/soybean rotation in all three states with Nebraska experiencing the highest rate of continuous cropping to corn and adding the largest percentage of new acreage (over 500,000 acres) into corn production in 2008.



Thank You

Claire Boryan, Mike Craig and Patrick Willis

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