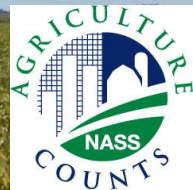


A NASS Cropland Data Layer based stratification tool for use in NASS Area Sampling Frame construction

Claire G. Boryan, Geographer
USDA\NASS\Research and Development Division
Fairfax, VA



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

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

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 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 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 27 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	Yield (bushels)	Average Yield Loss (bushels)	Production Loss (bu)	Economic Loss (\$)
Western Maryland (Central & West)	Corn	9,500	124.9	7.4	40,100	83
	Soybeans	300	36.7	3.9	1,200	2,475
	Wheat	200	45.2	2.0	460	1
Central Maryland	Corn	114,200	98.4	9.6	1,100,200	2,475
	Soybeans	92,800	34.2	3.9	360,750	1,475
	Wheat	38,300	63.3	3.3	126,390	339
Southern Maryland	Corn	29,800	132.9	4.9	146,200	295
	Soybeans	43,200	39.0	3.1	142,260	594
	Wheat	16,900	57.0	0.9	14,400	16
Upper Shore	Corn	157,200	139.2	5.1	800,700	1,241
	Soybeans	232,000	39.8	2.4	856,000	2,262
	Wheat	88,800	64.0	1.1	99,240	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. corn production is expected to reach a record 13.1 billion bushels, 10.6 percent higher than the 11.8 billion bushels harvested in 2006. Based on conditions as of August 1, 2007, the average yield per acre, up 3.7 bushels from last year, will produce 13.1 billion bushels, or 160.4 bushels per acre, from the 81.7 million acres of corn for grain. Yield forecasts are higher than last year's forecasts in 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 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.

2002 Census of Agriculture - USG 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)

Comparisons: 6 | 20,001 to 40,000

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
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	+0
200-499	700	600	+29
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.

Percent of Herds by Size Group 2007 Projection

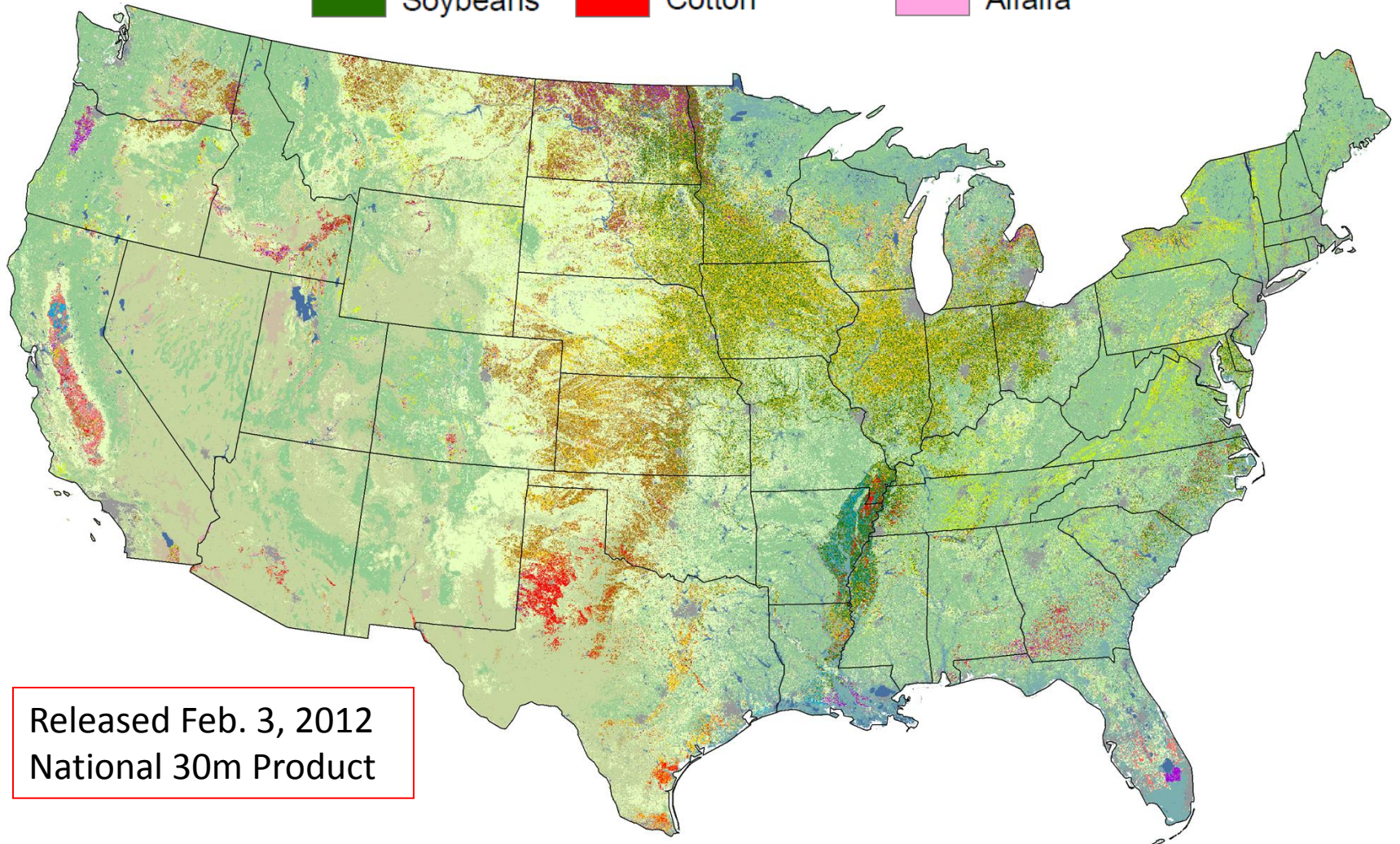
Small Dairy Farmer Plans for May 2007 1/ by Herd Size

Herds	Keep same herd size	Increase herd size	Discontinue milking
2,800	47	17	36
4,700	71	9	20
7,400	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.

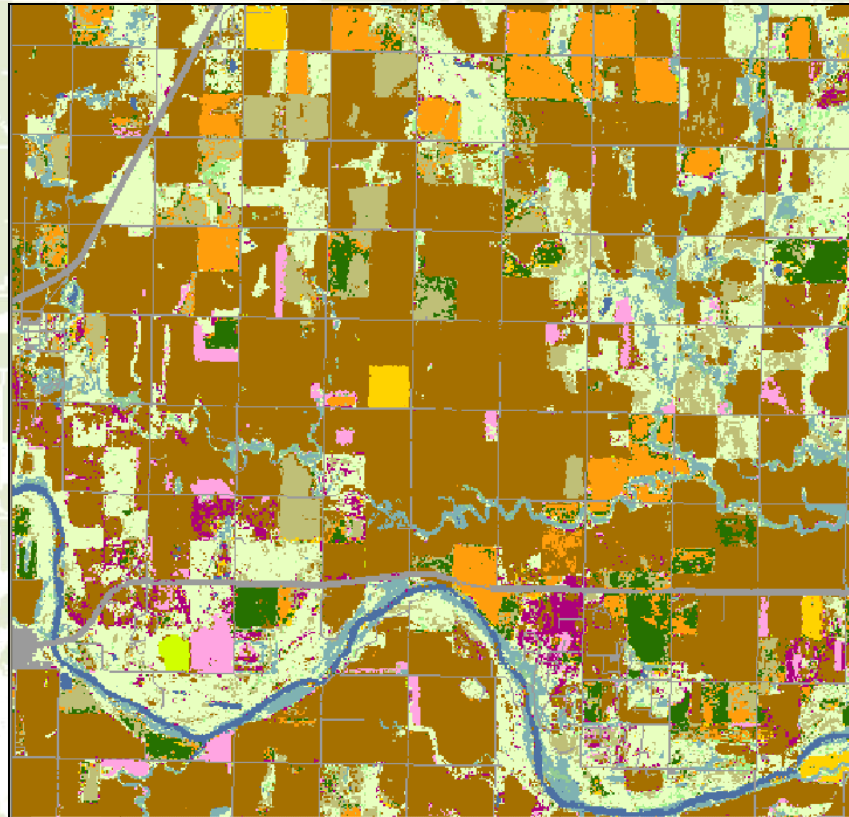
What is the Cropland Data Layer (CDL)?

The Cropland Data Layer product is a raster-formatted, geo-referenced, crop specific, land cover product.



Released Feb. 3, 2012
National 30m Product

Total crop mapping accuracies for historic CDLs range from 85% to 95% for the major crops



CropScape Portal



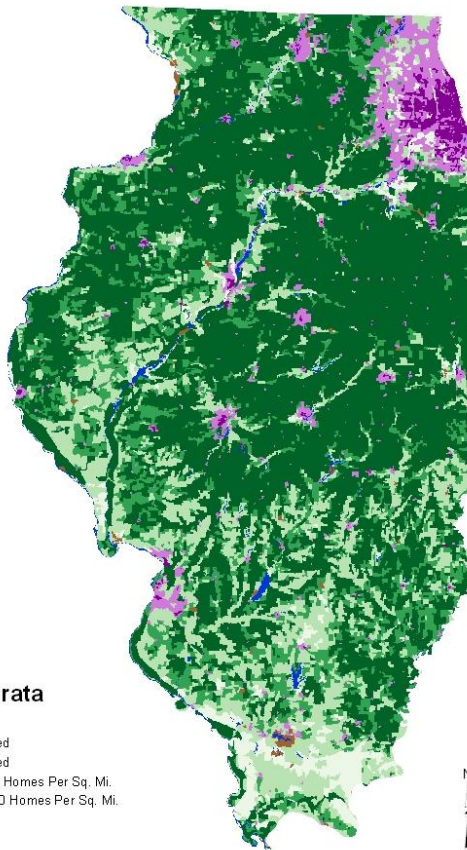
Recent Release:
2008 & 2011 national coverage
Map Printing
Change detection

Future portal upgrade:
Cultivated masks



NASS has used area frames for agricultural surveys since 1954

Stratification of Illinois 2006



Land Use Strata

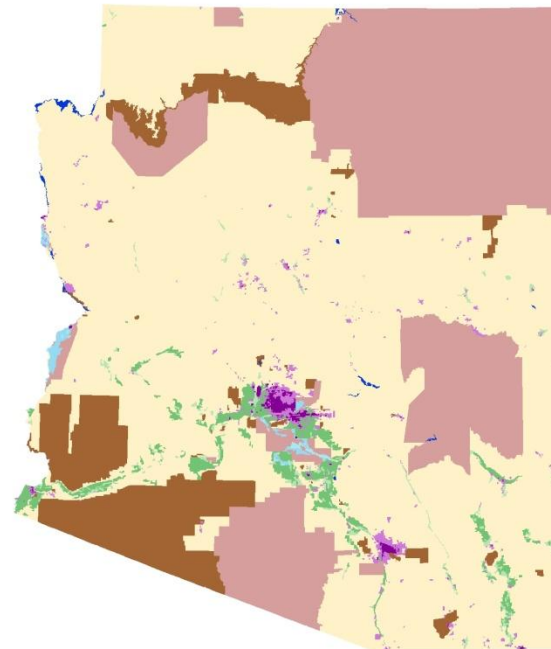
- > 75% Cultivated
- 51 - 75% Cultivated
- 25 - 50% Cultivated
- Agri-Urban: > 100 Homes Per Sq. Mi.
- Commercial: > 100 Homes Per Sq. Mi.
- < 25% Cultivated
- Non-Agriculture
- Water



Projection: NAD 1983, UTM Zone 16

Prepared by Area Frame Section, 2006

Stratification of Arizona 1984



Land Use Strata

- >50% Cultivated
- >50% Cultivated--Native American
- Commercial: >20 Homes/Sq Mi
- Agri-Urban: >20 Homes/Sq Mi
- 15-50% Cultivated
- 15-50% Cultivated--Native American
- Native American
- Public/Private Lands
- Non-Agricultural
- Water



Projection: Geographic Latitude and Longitude

Prepared by Area Frame Section, 2006

NASS Area Sampling Frames

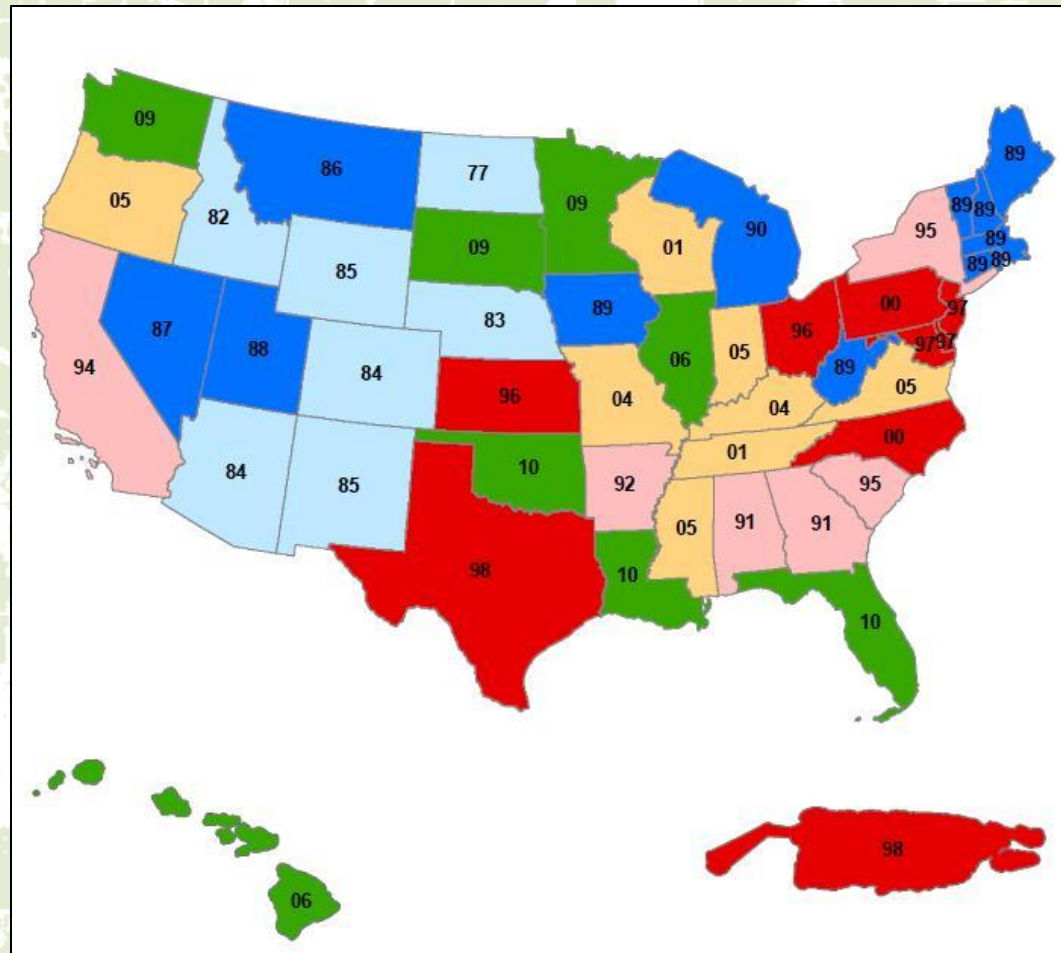
Area Sampling Frames (ASF) have been used as the primary mechanism for conducting agricultural surveys since 1954 and are considered the backbone to the agricultural statistics program of the NASS.

The NASS ASFs are based on a stratification of land cover in the U.S. by percent cultivated cropland, and are the statistical foundation for providing estimates with complete coverage of U.S. agriculture.

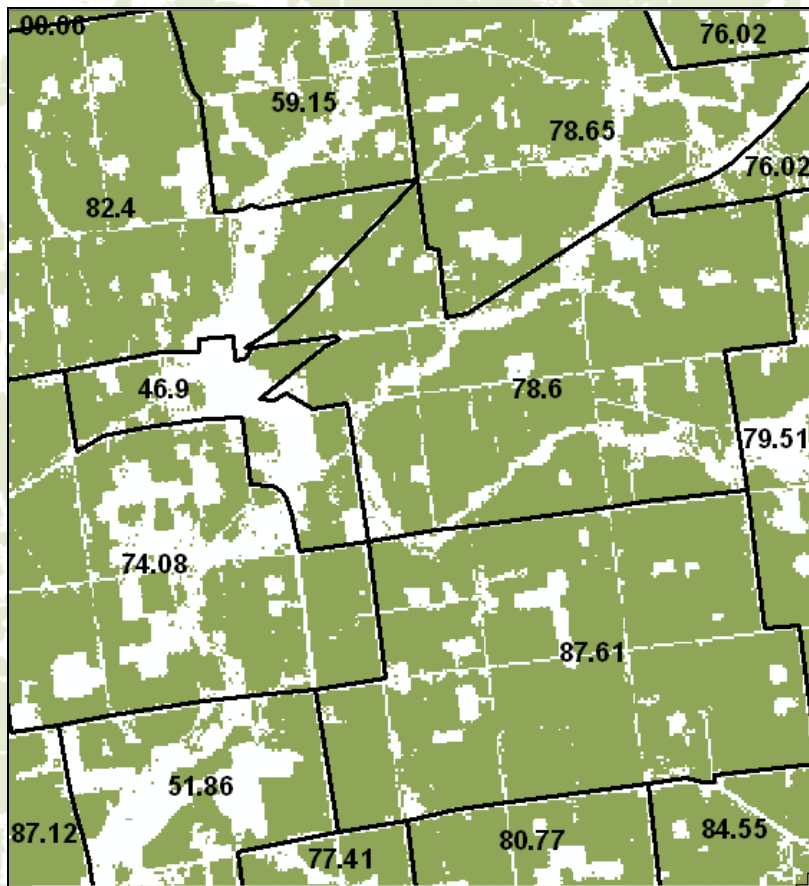
General land-use stratification codes and definitions represented in the NASS Area Sampling Frames

Land-Use Strata Codes and Definitions Stratum	Definition
11	General Cropland, greater than 75% cultivated.
12	General Cropland, 51-75% cultivated
20	General Cropland, 15-50% cultivated.
31	Ag-Urban, less than 15% cultivated, more than 100 dwellings per square mile, residential mixed with agriculture.
32	Residential/Commercial, no cultivation, more than 100 dwellings per square mile.
40	Less than 15% cultivated
50	Non-agricultural,
62	Water

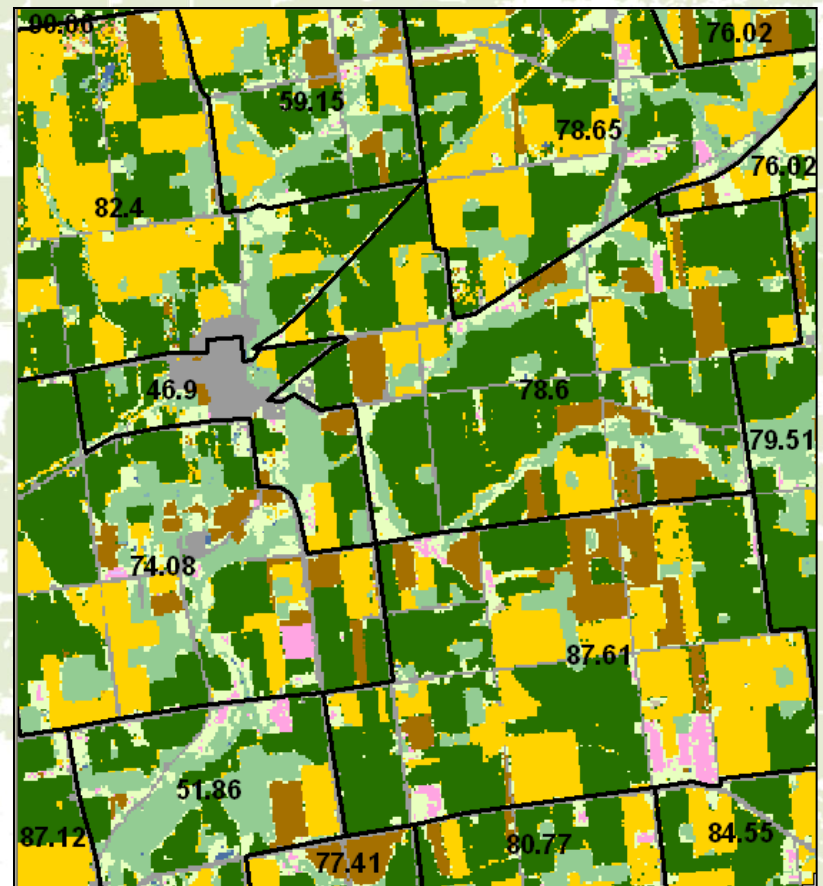
US map illustrating the implementation years of current NASS Area Sampling Frames



A new automated stratification method has been developed to utilize the NASS Cropland Data Layer in the construction of the NASS Area Sampling Frame

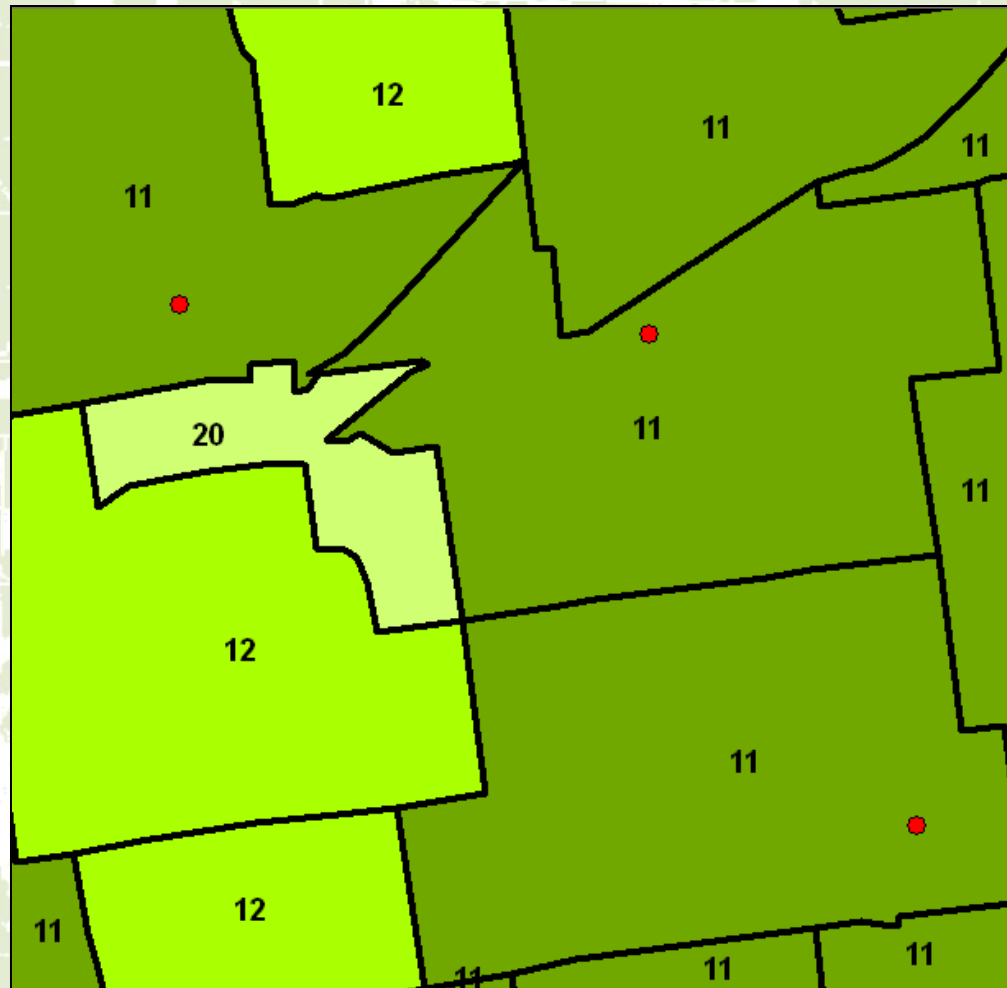


Primary Sampling Units with
CDL percent cultivation



Primary Sampling Units with CDL percent
cultivation, overlaying a 2010 CDL image
product

Cropland Data Layer (CDL) based stratification of a NASS Area Sampling Frame (ASF)



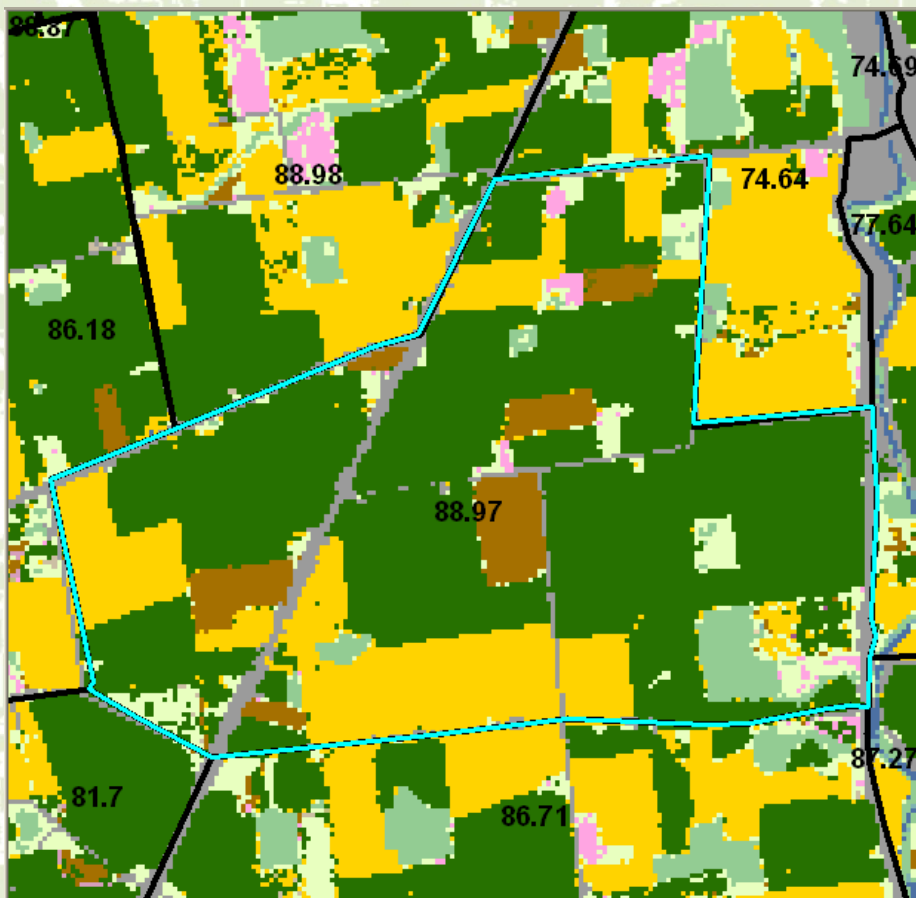
Red dots are location points of in situ validation collected during the 2010 June Area Survey

Objective

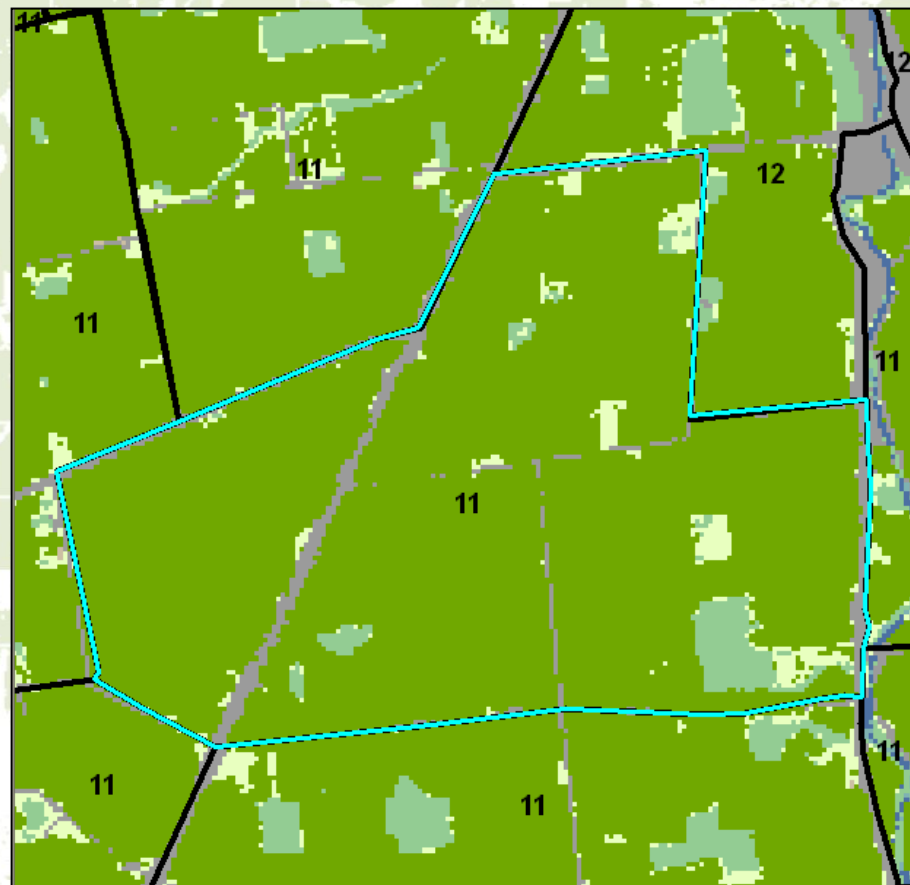
The objective of this investigation was to determine the utility of the automated Cropland Data Layer (CDL) based stratification method for use in Area Sampling Frame (ASF) construction.

CDL based stratification of NASS ASF Primary Sampling Units (PSUs) was successfully conducted for Arizona, Georgia, Ohio, Oklahoma, Virginia.

Area Frame manual stratification
matches
CDL based automated stratification



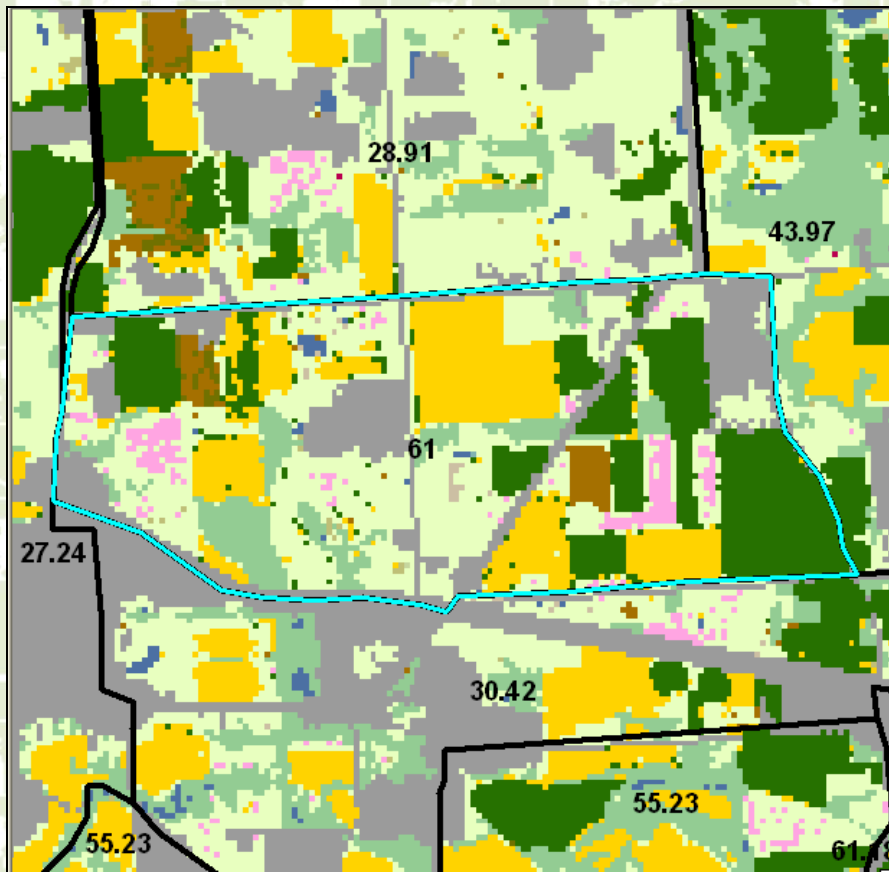
CDL percent cultivation – 88.97%



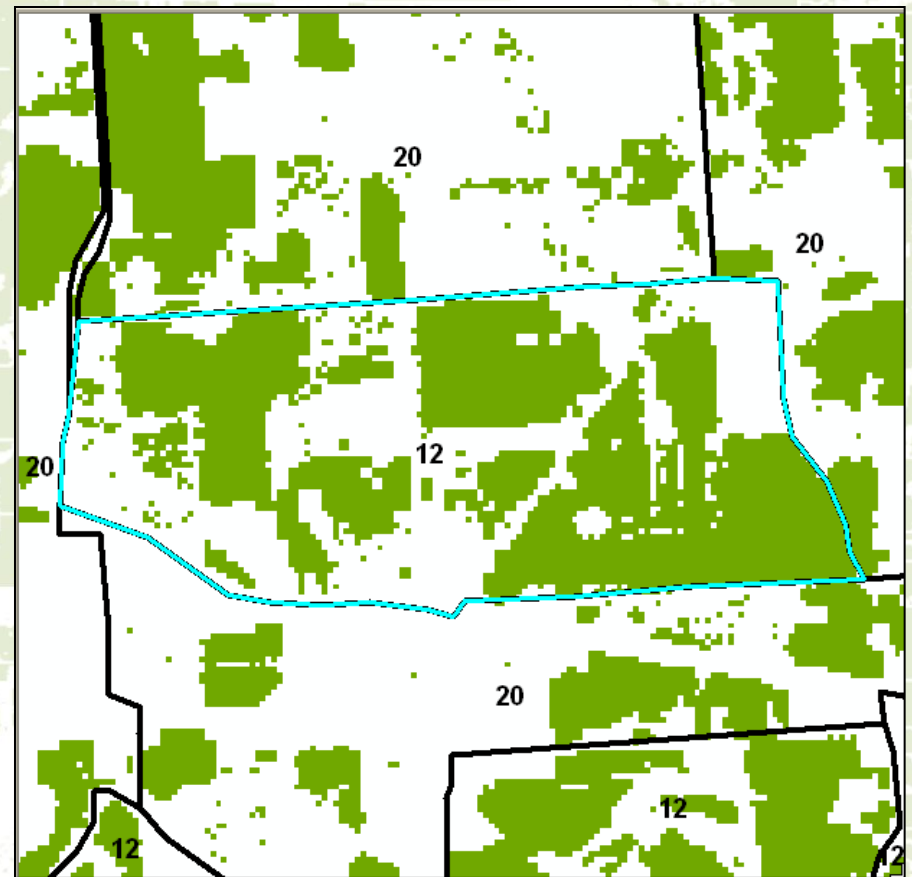
AF stratification – 11 (manual)
CDL stratification – 11 (automated)

Area Frame manual stratification
does not match

Cropland Data Layer based automated stratification



CDL percent cultivation – 61%



AF stratification – 11 (manual)
CDL stratification – 12 (automated)

Evaluation

Stratification accuracy was measured using in-situ data collected by enumerators during the 2010 June Area Survey (JAS) in the five states evaluated.

Accuracy measures were derived by comparing the strata definitions reported by JAS enumerators with the original ASF manual stratification and the CDL based automated stratification.

Evaluation

To determine if the percentage differences between the original Area Frame stratification method and the CDL based stratification method were statistically significant at a 95% confidence level, a two-tailed proportion test was used.

These tests were performed with Chi-Square and Fisher's Exact tests when the sample sizes were less than five

Evaluation

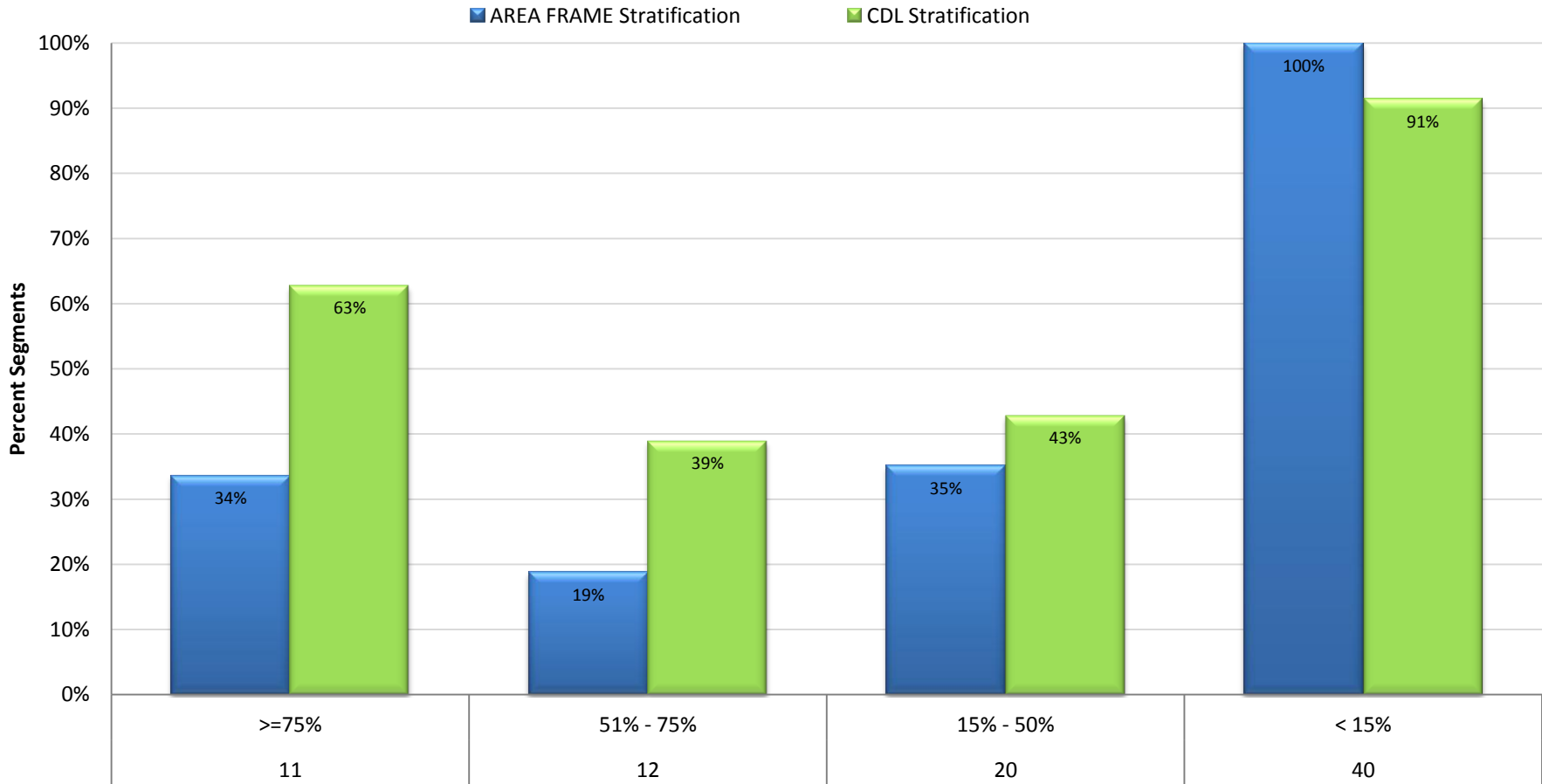
The hypotheses of the significance tests were $H_0: p_1 = p_2$ and $H_a: p_1 \neq p_2$. The null hypothesis stated that there was no difference in the results of the two stratification methods while the alternative hypothesis stated that the results of the two stratification methods were significantly different.

The tests were performed and p values were calculated for each state and each stratum with a confidential level of 95%.

Area Frame vs. CDL Stratification Oklahoma 2010

		AREA FRAME Stratification			CDL Stratification			P-value
Stratum	Survey Ratio (% Cultivated)	Total Segments	Total Reported	Percentage (p ₁)	Total Segments	Total Reported	Percentage (p ₂)	Ha: p ₁ ≠ p ₂
11	≥75%	140	47	34%	43	27	63%	0.001
12	51% - 75%	48	9	19%	77	30	39%	0.024
20	15% - 50%	74	26	35%	98	42	43%	0.305
40	< 15%	61	61	100%	105	96	91%	0.027
Total		323			323			

Area Frame vs. CDL Stratification Oklahoma 2010



Stratum & Percent Cultivation

Area Frame vs. CDL Stratification

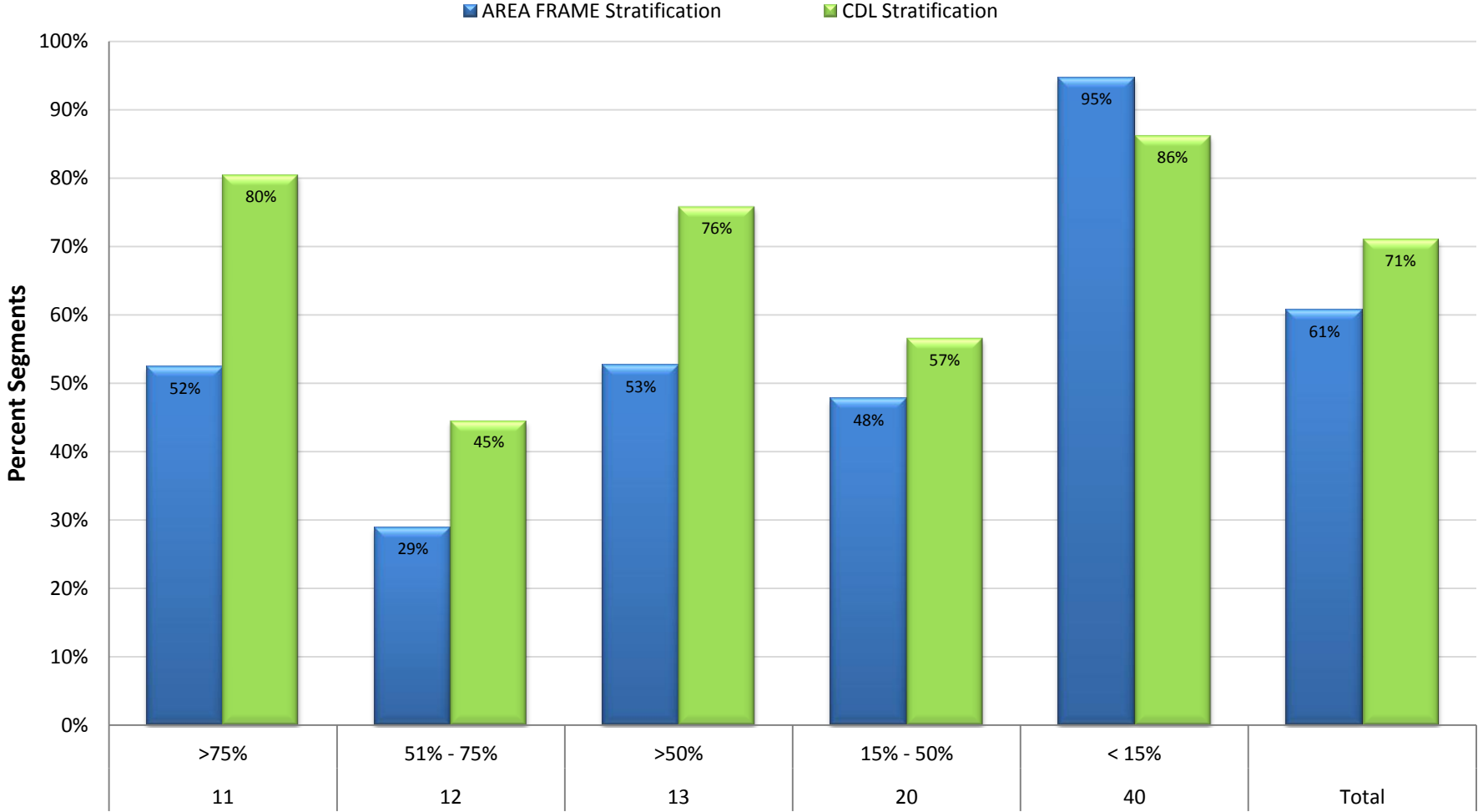
Five State - Strata Summary, 2010

Stratum	Survey Ratio (% Cultivated)	AREA FRAME Stratification			CDL Stratification			P-value
		Total Segments	Total Reported	Percentage (p ₁)	Total Segments	Total Reported	Percentage (p ₂)	Ha: p ₁ ≠ p ₂
11	>75%	250	131	52%	128	103	80%	0.000
12	51% - 75%	83	24	29%	119	53	45%	0.025
13	>50%	171	90	53%	91	69	76%	0.000
20	15% - 50%	371	177	48%	387	219	57%	0.000
40	< 15%	322	305	95%	472	407	86%	0.000
Total		1197	727	61%	1197	851	71%	0.000

Five State Analysis - Arizona, Georgia, Ohio, Oklahoma, Virginia.

Area Frame vs. CDL Stratification

Five State - Strata Summary 2010



Stratum & Percent Cultivation

Conclusion

Results of the five state analyses indicated that the new automated Cropland Data Layer (CDL) stratification method performed well in determining U.S. percent cultivation **in moderate to highly intensive cropped areas** and weaker in non agricultural areas.

The strength of the CDL product and the CDL based stratification method is the **objective and consistent identification of cultivated cropland.**

Conclusion

The Cropland Data Layer based stratification method can be used for

- *review of current Area Sampling Frames*
- *as a change detection technique*
- *as the primary method of stratification*

The Cropland Data Layer based automated stratification method should improve the efficiency, reduce the cost and improve the precision of the June Agricultural Survey estimates.

Thank you!
Questions?

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