

# ***Crop Specific Mapping Techniques with Landsat and AWiFS***

Global Agricultural Monitoring:  
Domestic and International



Rick Mueller  
USDA/National Agricultural Statistics Service



# The great corn gold rush

The price of America's most important crop has just doubled, and farmers have ethanol to thank for the jackpot, reports Fortune's Jon Birger. But are they now sitting on a 'dot-corn' bubble?

By **Jon Birger**, Fortune Magazine senior writer  
March 30 2007: 10:37 AM EDT

FORTUNE

## Corn Growers Responding to Market, NCGA Says Million Acres

The National Corn Growers Association (NCGA) says the planting report released by USDA March 30 indicates corn growers are responding to market demands by intending to plant 90.5 million acres in 2007. Last year, corn growers planted 78.6 million acres.

"Strong demand for corn in all market sectors -- exports, livestock and ethanol -- has put corn in the spotlight as producers get planting underway," says Ken McCauley, NCGA president. "We're confident corn farmers will produce another big crop given good weather."

OAR IN 21

argest Plant

March 31, 2007, Saturday

By ANDREW MARTIN (NYT); Business/Financial Desk

Late Edition - Final, Section C, Page 1, Column 2, 1020 words

demand, U

more corn acres in 2007, according to the *Prospective Plantings* report released today by the U.S. Department of

## Prospective Plantings Recap

Categories: [Farm Bill](#)

A U.S. Department of Agriculture news release from yesterday stated that, "Driven by growing ethanol demand, U.S. farmers intend to plant 15 percent more corn acres in 2007, according to the Prospective Plantings report released today by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS). Producers plan to plant 90.5 million acres of corn, the largest area since 1944 and 12.9 million acres more than in 2006, 88 million acres, up 1.3 million acres -- or 10.3 percent -- from 2006."

DISPLAYING ABSTRACT - With demand for ethanol pushing corn prices to \$4 a bushel or higher, it was not a surprise that farmers intended to plant a lot more corn this season. What was surprising about the Agriculture Department report released yesterday was just how much they intended to plant -- a ...

ces fueled by increased demand from

## USDA Prospective Plantings: Corn 90.5M 88M (2007 intended plantings up 15%)

- Corn intended plantings at highest level since 1944
- Soybeans 67.1M, lowest since 1996
- Wheat 60.3M
- Cotton 10.1M

## Corn: The inflation crop

The U.S. is set to report a jump in acreage planted as farmers feed the ethanol machine. One byproduct: rising food prices.

By **Jeff Cox**, CNNMoney.com contributing writer  
March 28 2007: 7:20 AM EDT

NEW YORK (CNNMoney.com) -- It's no secret that the rush to ethanol and other alternative fuels has made corn the rock star of the Farm Belt.

That newfound prominence has big implications for the nation's economy, experts say. Soaring corn prices are pushing up the tab for everything from candy to corn flakes, moribund land values have jumped in many Midwestern farming communities and the crop has become the lynchpin for the budding \$40 billion ethanol industry.



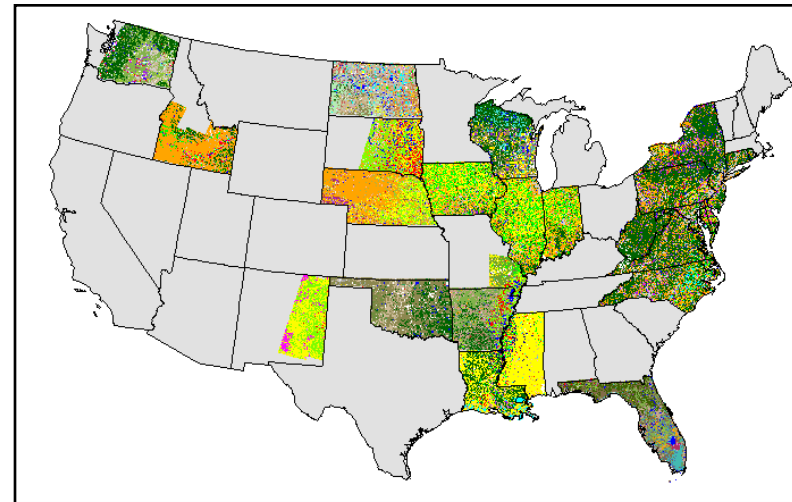
Prices for corn have doubled during the last two years, a trend that's pushing food prices higher.

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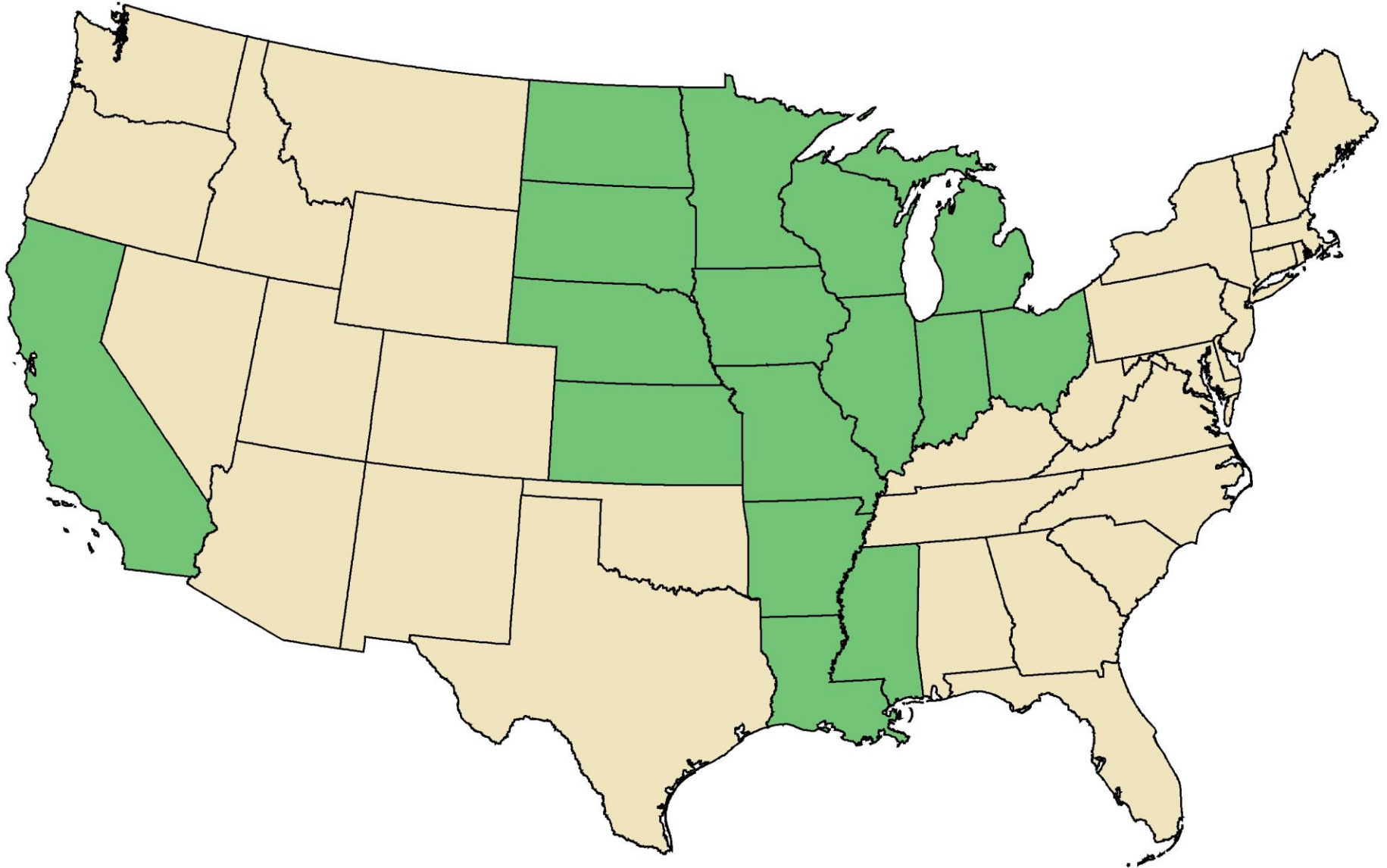
# NASS' Satellite Acreage Program

- Produce remote sensing based indications
  - State level in October
  - End of year for county estimates
- Unbiased statistical estimator
  - Quality a must!
- Cropland Data Layer (CDL)
  - Public domain

“Census by Satellite”



# 2007 Cropland Data Layer Coverage



# Cropland Data Layer Components

- AWiFS sensor
- Common Land Unit/578 Admin Data
  - USDA/Farm Service Agency
- ERDAS Imagine/See5
  - Image Processing/Classification

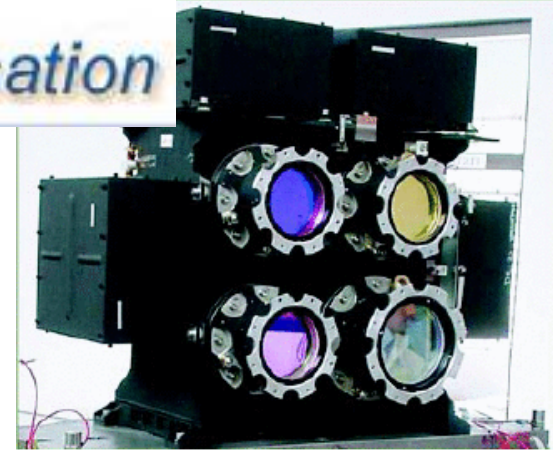


# Resourcesat-1 AWiFS sensor

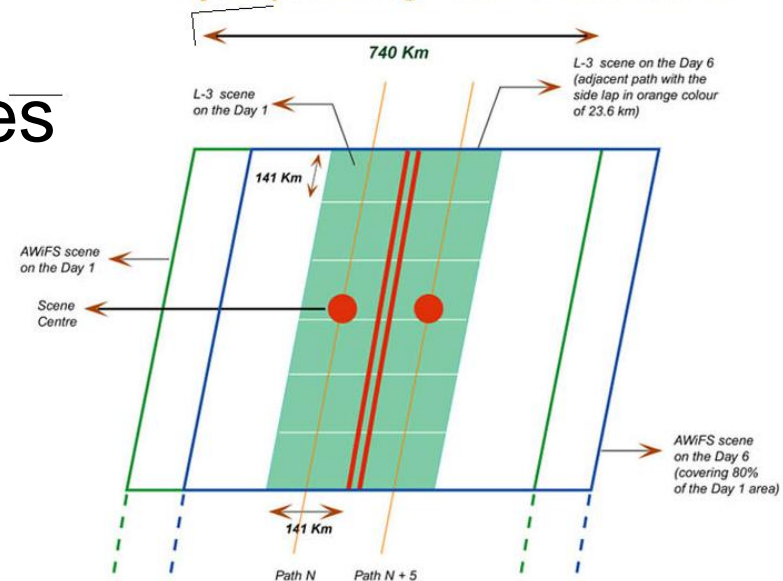


Department of Space  
Indian Space Research Organisation

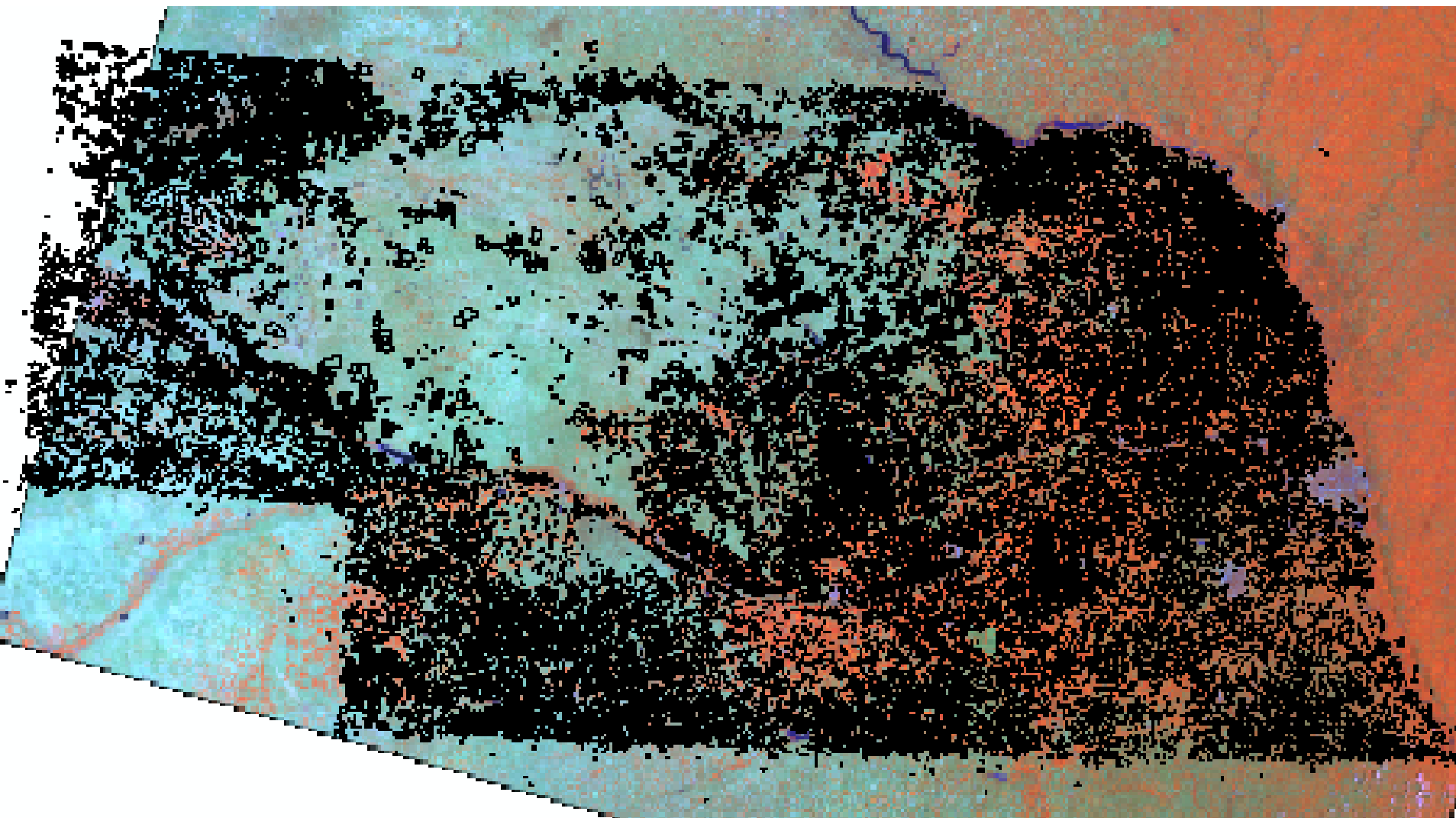
- 370 km swath per quad
- 740 km combined
- 56 m resolution at nadir
- 70 m resolution at scene edges
- Launched 2003
- 5 day repeat cycle



Repetivity & Coverage Pattern of Resourcesat - 1



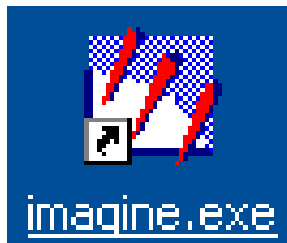
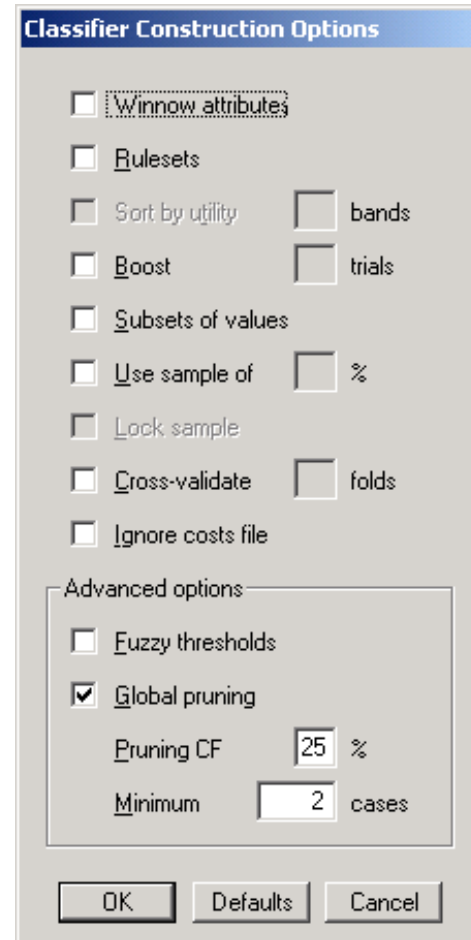
# Common Land Unit/578 Admin Data



United States Department of Agriculture  
Farm Service Agency

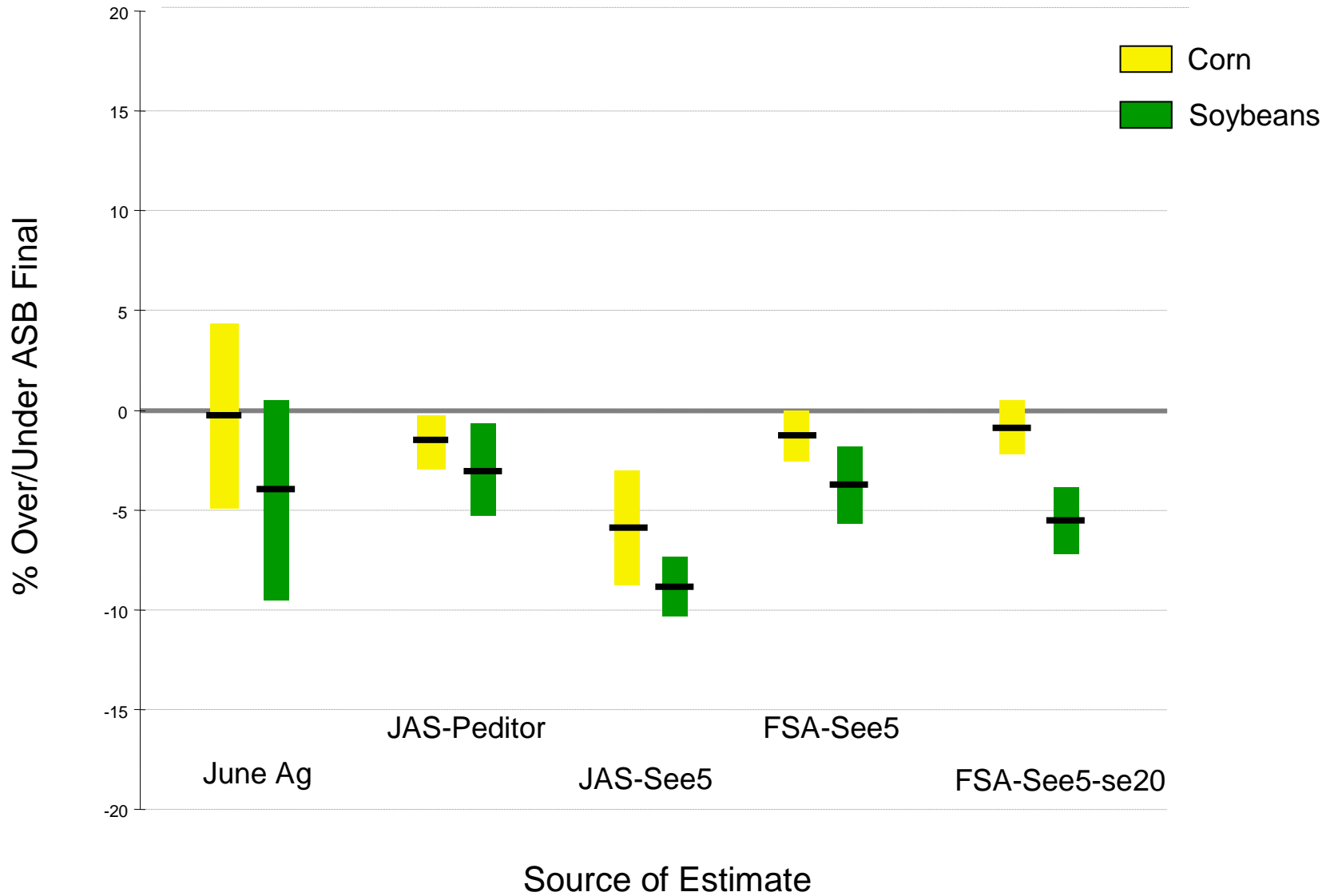
# ERDAS Imagine & See5

- Derivation of decision tree classification rules
  - Boosting & Smart Eliminate
- Sampling NLCD in non-ag areas
- Ancillary datasets
  - DEM & prior CDL
- Phenological profiles with AWiFS





# IA 2006 State Level Estimates +/- 2% CVs (Coefficient of Variation)



# Cropland Data Layer Uses

Study of climate effects on vegetation  
Global irrigated area mapping  
Aid in emergency operations, planning and recovery efforts for Mississippi  
Study hurricane damage  
Determine acres of crop type within conservation projects  
Crop density distribution for selecting research locations  
Environmental landscape analysis  
Land cover analysis  
Precision farming, land classification  
Habitat project planning  
Ecosystem Modeling  
Epidemiological research  
Soil erosion prediction  
Agribusiness Planning  
Modeling Support  
Research on future crop loss  
Analysis of deer habitat  
Demographic research  
Market data analysis for land sales and appraisals  
Overlay with health statistics to estimate pesticide exposures  
Risk assessment for pesticides/gene flow project  
Fertilizer usage/potential  
GIS reference layer  
Nutrient load in watershed modeling  
Crop rotation analysis  
Understand heterogeneity of AVHRR pixels  
Modeling environmental impacts of agriculture  
Carbon cycle research  
Water use estimates  
Environmental landscape analysis