Introduction of the Cropland Data Layer Program

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Operational Paradigm

• Deliver annual in-season acreage estimates
  – Multiple times during growing season
• Increase program scope/coverage
  – Leverage resource partnerships
• Derivative products
Cropland Data Layer (CDL) Project

• Legacy program
  – Issues: Budget/Satellites/Agency Support/Technology
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, ASD

- **Operationalize indications delivery**
  - For June, August, and October
    - Ag 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

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<th>January</th>
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- **Crop Production Report CDL all crops**
- **Crop Production Annual Summary CDL all crops/county estimates**
- **Small Grains Annual Summary CDL small grains**
- **Crop Acreage Report CDL winter wheat**
- **Historical:**
  - Crop Production Annual Summary CDL all crops/county estimates
CDL Program

• Inputs
  – Resourcesat-1 AWiFS imagery
  – Farm Service Agency – Common Land Unit
  – Ancillary data
  – Commercial software suite

• Outputs
  – Acreage Estimates
  – Cropland Data Layer
IRS Resourcesat-1 AWiFS 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

13 Aug 2007
Satellite Acquisition Strategy

Active Paths for P6-AWiFS CONUS

Legend
- State and Provincial Boundaries
- 1 DAY Active Paths in April

USDA Satellite Imagery Archive
USDA-Foreign Agricultural Service
Robert Tetrault, Satellite Imagery Archive manager
(202) 990-0130, robert.tetrault@fas.usda.gov
The USDA-Satellite Imagery Archive

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
• Cooperative partners have open access
Agricultural Ground Truth

FSA Common Land Unit

½ sample for training & ½ sample for testing
Filter multi-field CLU/high acreage variance
Comprehensive program crop coverage
- Proportional sampling
- 2001 National Land Cover Dataset from USGS
- Improve CDL coverage of non-ag classes
Commercial Software Suite

- Imagery Preparation
  - ERDAS Imagine

- Image classification
  - Decision tree software
    - See5.0 [www.rulequest.com](http://www.rulequest.com)

- Ground Truth Preparation
  - ESRI ArcGIS

- Acreage Estimation
  - SAS/IML workshop
Derivative Products

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

1 2 3 4 5

Years Planted to Corn

1 2 3 4 5 6 7 8 9

2003-2007

1999-2007
Cropland Data Layer Future

- Expand geographic scope
  - Target speculative NASS crops
    - Cotton, Winter, Durum and Spring Wheat

- Derivatives
  - Change detection
  - Crop rotations

- National program
  - Leverage resource partnerships