NASS Overview

Provider of timely, accurate, and useful statistics in service to U.S. agriculture
Cropland Data Layer (CDL) Discussion

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

[Image: Diagram showing various agencies involved in satellite data collection and analysis]
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 and watershed level

- Operationalize indications delivery
  - For June, August, and October
    - Ag Statistics Board

- Output crop specific CDL
  - Distribute to public at the cost of reproduction
    - NRCS Geospatial Data Gateway
  - Publish accuracy statistics/metadata
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
AWiFS Imagery Time Series

May 18
June 21
July 15
Aug 27
Image Timing

http://www.nass.usda.gov/Charts_and_Maps/Crop_Progress_%26_Condition/
Ground Truth - Agriculture

- Farm Service Agency (FSA)
- Common Land Unit (CLU)
- 578 attributed reporting data

NASS June Agricultural Survey (JAS) data still used for acreage estimation
Matching CLU’s used for sampling (i.e., testing/training)  

CDL Classification
Ground Truth – Non Agricultural

- Proportional sampling
- 2001 National Land Cover Dataset from USGS
- Improve CDL program 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](http://www.rulequest.com)

- Ground Truth Preparation
  - ESRI ArcGIS

- Acreage Estimation
  - SAS/IML workshop
Non Ag NLCD Updates (urban sprawl)
Non Ag NLCD Updates
(forest clearing)
Accuracy Statistics

USDA, National Agricultural Statistics Service, 2007 California Cropland Data Layer

Metadata:
- Identification Information
- Data Quality Information
- Spatial Data Organization Information
- Spatial Reference Information
- Entity and Attribute Information
- Distribution Information
- Metadata Reference Information

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Correct</th>
<th>Accuracy</th>
<th>Error</th>
<th>Kappa</th>
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</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>43</td>
<td>96.08%</td>
<td>3.92%</td>
<td>0.9608</td>
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<tr>
<td>Other Crops</td>
<td>44</td>
<td>45.87%</td>
<td>54.13%</td>
<td>0.4587</td>
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<tr>
<td>Misc Veggies &amp; Fruits</td>
<td>47</td>
<td>54.10%</td>
<td>45.90%</td>
<td>0.5410</td>
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<tr>
<td>Watermelon</td>
<td>48</td>
<td>77.42%</td>
<td>22.58%</td>
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<tr>
<td>Peas</td>
<td>53</td>
<td>72.59%</td>
<td>27.41%</td>
<td>0.7258</td>
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<tr>
<td>Clover/Wildflowers</td>
<td>58</td>
<td>36.21%</td>
<td>63.79%</td>
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<tr>
<td>Fallow/Idle Cropland</td>
<td>61</td>
<td>69.78%</td>
<td>30.22%</td>
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<tr>
<td>Peaches</td>
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<td>36.00%</td>
<td>64.00%</td>
<td>0.3600</td>
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<td>Other Tree Nuts &amp; Fruit</td>
<td>71</td>
<td>33.82%</td>
<td>66.18%</td>
<td>0.3382</td>
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</tbody>
</table>

*Correct Pixels represents the total number of independent validation pixels correctly identified in the error matrix.
Confidence Map
Cropland Data Layer Future

- Expand geographic scope
  - Cotton, Winter, Durum and Spring Wheat
- Derivatives
  - Change detection
  - Crop rotation patterns
- National program
  - Leverage resource partnerships
Program Summary

- **Cropland Data Layer Method**
  - AWiFS imagery
  - FSA CLU dataset
  - Commercial software
  - Ancillary data

- **CDL Stakeholder Distribution**:
  - Annually after county estimates published
  - Metadata/accuracies/confidence layer

- **Access**: