Who is NASS?

- Each year, the USDA's National Agricultural Statistics Service (NASS) conduct hundreds of surveys and prepares reports covering virtually every facet of U.S. agriculture.

- Traditional NASS crop acreage estimates are based primarily on mailing, telephone, and face-to-face surveys of producers and agribusiness who voluntarily provide information on a confidential basis.
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. This translates to Maryland farmers losing 7.7 percent of the crop value to deer and geese. Soybeans accounted for the greatest economic loss, totaling $9.1 million, 11 percent. Corn losses were $6.6 million, 5.8 percent and wheat $1.3 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 totaled 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 was greater on the Eastern Shore. Corn yield losses of 96.9 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 losses of 6.1 bushels per acre.

Sixty-two percent of farms reported deer or geese damage to one or more crop. Damage was reported on 61 percent of farms raising corn, 58 percent of farms growing soybeans and 27 percent of farms with wheat.

### Maryland 2001 Crop Loss from Deer

<table>
<thead>
<tr>
<th>Region</th>
<th>Crop</th>
<th>Acres Harvested</th>
<th>Harvested Yield (bu/acre)</th>
<th>Average Yield Loss (bu/acre)</th>
<th>Production Loss (bu)</th>
<th>Economic Loss ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Maryland</td>
<td>Corn</td>
<td>5,500</td>
<td>101.9</td>
<td>7.4</td>
<td>40,700</td>
<td>83,435</td>
</tr>
<tr>
<td></td>
<td>Soybeans</td>
<td>300</td>
<td>30.0</td>
<td>2.9</td>
<td>460</td>
<td>1,220</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>200</td>
<td>45.0</td>
<td>2.3</td>
<td>460</td>
<td>1,220</td>
</tr>
</tbody>
</table>

### Wisconsin Dairy Producer Opinion Survey

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 Agricultural 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 60 to 99 cows.

### Wisconsin Dairy Herds by Herd Size

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 29</td>
<td>2,600</td>
<td>1,440</td>
<td>-46</td>
</tr>
<tr>
<td>30 - 49</td>
<td>4,700</td>
<td>3,440</td>
<td>-27</td>
</tr>
<tr>
<td>50 - 99</td>
<td>7,400</td>
<td>5,640</td>
<td>-24</td>
</tr>
<tr>
<td>100 - 199</td>
<td>1,900</td>
<td>2,080</td>
<td>+8</td>
</tr>
<tr>
<td>200 - 499</td>
<td>700</td>
<td>900</td>
<td>+20</td>
</tr>
<tr>
<td>500+</td>
<td>200</td>
<td>240</td>
<td>+40</td>
</tr>
<tr>
<td>Total</td>
<td>17,500</td>
<td>13,900</td>
<td>-26</td>
</tr>
</tbody>
</table>

### Wisconsin Dairy Farmer Plans for May 2007 1/1 by Herd Size

<table>
<thead>
<tr>
<th>Milk cow herd size</th>
<th>Herds</th>
<th>Keep same herd size</th>
<th>Increase herd size</th>
<th>Discontinue milking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 29</td>
<td>2,600</td>
<td>47</td>
<td>17</td>
<td>36</td>
</tr>
<tr>
<td>30 - 49</td>
<td>4,700</td>
<td>71</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>50 - 99</td>
<td>7,400</td>
<td>53</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td>100 - 199</td>
<td>1,900</td>
<td>53</td>
<td>37</td>
<td>10</td>
</tr>
<tr>
<td>200 - 499</td>
<td>700</td>
<td>33</td>
<td>59</td>
<td>8</td>
</tr>
<tr>
<td>500+</td>
<td>200</td>
<td>22</td>
<td>78</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>17,500</td>
<td>60</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

### Percent of Herds by Size Group 2007 Projection

- 1 - 29: 2,600 (47%)
- 30 - 49: 4,700 (71%)
- 50 - 99: 7,400 (53%)
- 100 - 199: 1,900 (53%)
- 200 - 499: 700 (33%)
- 500+: 200 (22%)

1/1The 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.
Purpose of the USDA-NASS Cropland Data Layer (CDL)

- Combine remote sensing imagery and NASS survey data to produce *supplemental* acreage estimates for the state's major commodities

- Production of a crop-specific digital land cover data layer for distribution in industry standard "GIS" format
Cropland Data Layer States

Cooperative partnerships & year implemented
NASS Methodology

1. Hundreds of farms throughout each state are visited annually by enumerators as part of the USDA/NASS June Agricultural Survey (JAS).
Cropland Data Layer Background

- National Agricultural Statistics Service

  June Agricultural Survey (JAS) – National in Scope
  - 41,000 farms visited
  - 11,000 one-square mile sample area segments visited
  - Most states contain between 150 – 400 segments
  - Planted acreage estimate

Cropland Data Layer depends on the JAS data
  - Unbiased statistical estimator of crop area
    - State and county level estimates
Area Sampling Frame

- Stratify based on percent cultivated land
- Subdivide strata into primary sampling units or PSU's
  - Selected PSU's divided into secondary sampling units or segments
NASS Methodology

1 sq. mi. JAS segment annotated by enumerator on a 1:8,000-scale NAPP photo
JAS Questionnaire

- Enumerators account for all land usage in segment
  - Draw off field location by direct observation
  - Directly link questionnaire to segment photo

---

**SECTION D - CROPS AND LAND USE ON TRACT**

How many acres are inside this blue tract boundary drawn on the photo (map)?

Now I would like to ask about each field inside this blue tract boundary and its use during 2000.

<table>
<thead>
<tr>
<th>FIELD NUMBER</th>
<th>01</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total acres in field</td>
<td>828</td>
<td>828</td>
<td>828</td>
<td>828</td>
<td>828</td>
</tr>
<tr>
<td>2. Crop or land use. [Specify]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Occupied farmstead or dwelling</td>
<td>843</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Waste, unoccupied dwellings, buildings and structures, roads, ditches, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Woodland</td>
<td>831</td>
<td>831</td>
<td>831</td>
<td>831</td>
<td>831</td>
</tr>
<tr>
<td>6. Pasture</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent (not in crop rotation)</td>
<td>842</td>
<td>842</td>
<td>842</td>
<td>842</td>
<td>842</td>
</tr>
<tr>
<td>Cropland (used only for pasture)</td>
<td>856</td>
<td>856</td>
<td>856</td>
<td>856</td>
<td>856</td>
</tr>
<tr>
<td>8. Idle cropland - idle all during 2000</td>
<td>857</td>
<td>857</td>
<td>857</td>
<td>857</td>
<td>857</td>
</tr>
</tbody>
</table>
1. Several hundred farms throughout the state are visited annually by enumerators as part of the USDA/NASS June Agricultural Survey (JAS).

2. The land use and acreage information is entered into a database and the field boundaries are digitized.
Each field is digitized by the NASS field office staff through direct interpretation of the enumerator’s annotated NAPP photo of the JAS segment onto an enlarged Landsat TM image.
Satellite Specs
Landsat 5 (TM) and Landsat 7 (ETM+)

Spatial Resolution:
- One picture element (pixel) represents an area of 30 meters by 30 meters,
  185 kilometer swath width
- 43 Scenes used for the 2002 Mid-Atlantic Cropland Data Layer

Temporal Resolution:
- 16 day repeat coverage (two satellites in 2002 = once every 8 days)
- NASS uses 2 dates for our classification process (Spring & Summer)

Spectral Resolution:
- 3 Visible Bands @ 30m
- 1 Near Infrared (IR) Band @ 30m
- 2 Shortwave IR Bands @ 30m
- 1 Thermal IR Band (TM @ 120m, ETM @ 60m)
- 1 Panchromatic Band @ 15m res. (ETM only)
NASS Methodology

1. Several hundred farms throughout the state are visited annually by enumerators as part of the USDA/NASS June Agricultural Survey (JAS).

2. The land use and acreage information is entered into a database and the field boundaries are digitized.

3. A modified supervised classification is performed using the digitized segments as training samples. NASS uses software developed and maintained in-house.
Program Resources

Hardware

Computational intensive jobs (i.e. cluster/classify)
  Windows XP
Digitizing/editing
  Windows XP

Software

Image processing PEDITOR
  Developed internally
Digitizing/editing
  Remote Sensing Project
  Developed internally
Batch job processing
  XLNT – Commercial software
NASS Methodology

1. Several hundred farms throughout the state are visited annually by enumerators as part of the USDA/NASS June Agricultural Survey (JAS).

2. The land use and acreage information is entered into a database and the field boundaries are digitized.

3. A modified supervised classification is performed using the digitized segments as training samples. NASS uses software developed and maintained in-house.

4. All the categorized scenes comprising a state are stitched together to produce a statewide land cover classification map (GIS layer).
2001 Maryland Cropland Data Layer (Pilot Project) Queen Anne's County
NASS Methodology

1. Several hundred farms throughout the state are visited annually by enumerators as part of the USDA/NASS June Agricultural Survey (JAS).

2. The land use and acreage information is entered into a database and the field boundaries are digitized.

3. A modified supervised classification is performed using the digitized segments as training samples. NASS uses software developed and maintained in-house.

4. All the categorized scenes comprising a state are stitched together to produce a statewide land cover classification map (GIS layer).

5. This land cover data layer is then used to produce state and county-level crop estimates using a regression estimator and/or raw pixel counts.
Program Summary

Raw Satellite Image → Area Sampling Frame → Segment Boundaries → JAS Questionnaire → Mosaicked CDL → Categorized Images → Estimates
Importance of Land Cover Data

Agricultural Business Planning
Land Use Summary by Unit Area
Farmland Conversion
Resource Management
  - Soil Erosion Rates
  - Acres of Crops in Prime Farmland
Woodland Management
Hydrologic Modeling Input

CDL Customers
Farmers, farm org, seed companies, fertilizer & pesticide companies, farm equipment dealers, grain transit/storage companies, farm real estate, global change, water quality, soils, & environmental assessment, crop insurance, universities, federal, state, & county gov, value added RS/GIS resellers, agribusinesses
Limitations of NASS Land Cover Data

- 30 m x 30 m ground resolution
- Emphasis on agricultural land cover
- Classification limitations
- Potential cloud cover
- Dependent upon continued health of the Landsat 5 satellite
  - USDA stopped purchasing Landsat 7 ETM in 2004
Benefits of NASS Land Cover Data

- Low Cost for CD-Rom
- Spatially Referenced
- Attributed
- Updated Annually
- Statewide Coverage
- Quality Control for Other Data
- Generate Summary Analysis Quickly
# Cropland Data Layer CD-ROM Order Form

If you experience difficulties submitting this form, call 1-800-727-9540. For technical questions about this product, call the Spatial Analysis Research Section, USDA NASS (703) 877-8000.

## Mosaicked Precision Registered Final

### Arkansas:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)
- [ ] 1999/2000 ($25)

*mosaicked but not precision registered

### Illinois:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)
- [ ] 1999/2000 ($25)

### Indiana:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)

### Iowa:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)

### Mississippi:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)
- [ ] 1999/2000 ($25)

### Missouri:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)

*boot heel only*

### Nebraska:
- [ ] 2002/2003 ($35)
- [ ] 2001+/2002+ ($25)

*2001 is southeast only*

### North Dakota:
- [ ] 2002/2003 ($35)
- [ ] 2001/2002 ($25)
- [ ] 2000/2001 ($25)
- [ ] 1999/2000 ($25)

### Wisconsin:
- [ ] 2003 ($35)