NASS Remote Sensing Ag Monitoring Activities

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Cropland Data Layer (CDL) Continental US Land Cover Categories (by decreasing acreage)

Agriculture
- Pasture/Grass
- Corn
- Soybeans
- Winter Wheat
- Fallow/Idle Cropland
- Other Hay/Non Alfalfa
- Alfalfa
- Cotton
- Winter Wheat
- Sorghum
- Dbil Crop Win/Wht/Soybeans
- Rice
- Barley
- Oranges
- Oats
- Sunflower
- Dry Beans
- Peanuts
- Durum Wheat
- Sugarbeets
- Potatoes
- Canola
- Sugarcane
- Almonds
- Sod/Grass Seed
- Grapes
- Apples
- Rye
- Peas
- Millet
- Walnuts
- Lentils
- Peanuts
- Dbil Crop Win/Wht/Cotton
- Dbil Crop Win/Wht/Sorghum
- Sweet Corn
- Aquaculture
- Clover/Alfalfawhite
- Other Crops
- Dbil Crop Win/Wht/Com
- Cherries
- Tricale
- Citrus
- Sunflower
- Pistachios
- Blueberries
- Christmas Trees
- Dbil Crop Barley/Soybeans
- Tomatoes
- Onions
- Flaxseed
- Dbil Crop Oats/Com
- Pop or Or Corn
- Herbs
- Misc Vgts & Fruits
- Olives
- Other Tree Crops
- Dbil Crop Corn/Soybeans
- Sweet Potatoes
- Peaches
- Cranberries
- Tobacco
- Cantaloupes
- Prunes
- Dbil Crop Barley/Com
- Dbil Crop Soybeans/Cotton
- Peas
- Lettuce
- Dbil Crop Oats/Sorghum
- Watermelons
- Switchgrass
- Asparagus
- Carrots
- Strawberries
- Pumpkins
- Squash
- Cauliflower
- Peppers
- Dbil Crop Soybeans/Oats
- Hops
- Mint
- Pomegranates

Non-Agriculture
- Forest
- Shrubland
- Developed
- Wetlands
- Water
- Barren
- Perennial Ice/Snow

Barren
Perennial Ice/Snow

NASS
USDA
Cropland Data Layer
Disseminated via CropScape

http://nassgeodata.gmu.edu/CropScape

National land cover mapping product last 6 years
Agricultural specific classification
Satellites: Landsat, Resourcesat-1 AWiFS, and Disaster Monitoring Constellation
CA CDL Fallow/Idle Land Project
Category 61 in CDL

<table>
<thead>
<tr>
<th>In Season CDL Iterations</th>
<th>June</th>
<th>August</th>
<th>September</th>
<th>October</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Pixels</td>
<td>573,585</td>
<td>639,383</td>
<td>677,913</td>
<td>714,388</td>
</tr>
<tr>
<td>Total Acreage</td>
<td>127,562</td>
<td>142,195</td>
<td>150,764</td>
<td>158,875</td>
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<tr>
<td>Producer Accuracy</td>
<td>75.0%</td>
<td>79.4%</td>
<td>82.7%</td>
<td>78.2%</td>
</tr>
<tr>
<td>User Accuracy</td>
<td>66.6%</td>
<td>69.9%</td>
<td>71.1%</td>
<td>67.6%</td>
</tr>
</tbody>
</table>

Pixels – 30 meter pixels = 0.2223 acres
Producer Accuracy/Omission – relates to the probability that a ground truth pixel will be correctly mapped; occurs when a pixel is excluded from the correct category.
User Accuracy/Commission – indicates the probability a pixel from the classification matches the ground truth data; occurs when a pixel is included in an incorrect category.
VegScape Portal

- Crop vegetative condition
- 14-year history
- Interactive visualization
- Daily, weekly, biweekly
- Quantitative analytics

http://nassgeodata.gmu.edu/VegScape
Remote Sensing Yield

Relationship between crop

- Biomass, vigor, “greenness”, NDVI
- Land surface temperature
  - Resulting crop yield

- Utilize NASA MODIS data to obtain biomass and temperature variables

- National, State, Ag Statistics Districts and County
  - Corn and Soybeans only
  - “Speculative” region only
    - i.e. Corn Belt
A future ag crop monitoring model expert decision support system vision

- **Weather Data**
  - NWS Seasonal Forecast

- **Cropland Data Layer**

- **Crop Simulation Models**

- **Crop Phenology Critical stages**

- **Yield Forecast from Crop Simulation Models**

- **Remote Sensing Indicators**
  - VegScape
  - Crop Moisture Index
  - Evaporative Stress Index
  - Drought Monitor Maps
  - Soil Moisture
  - VegDRI

**Yield Forecast**
Scene of a large hailstorm

Reality check