Exploring and Disseminating U.S. Croplands to Support Decision Making

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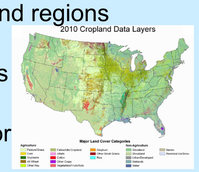
Introduction

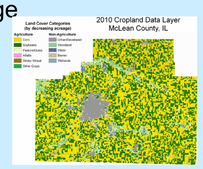
National Agricultural Statistics Service (NASS) provides timely, accurate and useful statistical information of U.S. agriculture in a variety of formats. The Spatial Analysis Research Section (SARS) within Research and Development Division of NASS has produced a yearly Cropland Data Layer (CDL) product based on mid-resolution satellite data and high quality ground truth annually since 1997. This agricultural geospatial data is a crop-specific land cover classification encompassing the entire contiguous United States, and is extensively used by policy and decision makers, scientists, educators, and farm producers for land cover monitoring, agricultural sustainability, crop acreage and yield estimation, disaster assessment, food security, and researches which are of vital importance to American agriculture and economy. Previously, this valuable product was disseminated to users via paper thematic maps, copies of CD/DVDs, or zipped files from SARS website or U.S. Department of Agriculture (USDA) Geospatial Data Gateway. Obviously, these inefficient and costly data dissemination channels could not meet the demanding needs of the agricultural community and general public any more. A fast, open and interoperable data accessing and dissemination channel with online data navigation, visualization, and analytics capabilities is badly needed to distribute historical and current CDL data easily and efficiently. Therefore, a Web service-based and Open Geospatial Consortium (OGC) standard-compliant rich internet application, named CropScape (***http://nassgeodata.gmu.edu/CropScape/***), is developed to distribute, visualize and exploit CDL data at any geographic level in an open geospatial context. CropScape not only offers online functionalities of interactive map operations, data customization and downloading, crop acreage statistics, charting and graphing, and changes analysis as well in an interoperable manner, but also provides Web geoprocessing services such as automatic data delivery and on-demand crop statistics for uses in other applications. This system significantly improves user experiences with its comprehensive capabilities in an open geospatial context, and facilitates open geospatial cropland information delivery and analysis for decision support and various research endeavors.

Google: **CropScape** or **Cropland Data Layer**

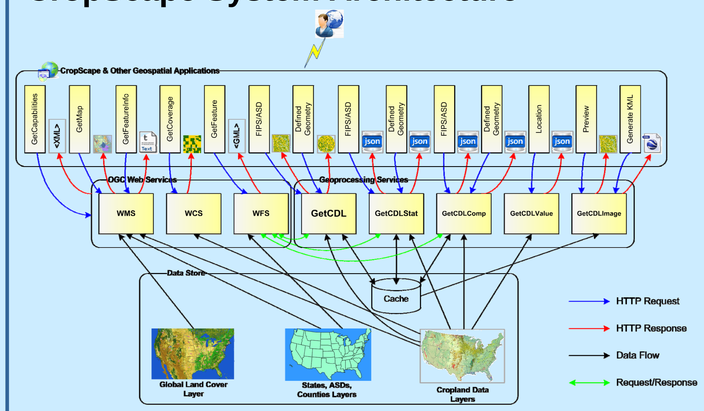
Cropland Data Layer

- "Census by Satellite"
  - Annually cover major program crops and regions
  - Crops accurately geo-located
- Provide timely, accurate, useful estimates
  - Measurable error
  - Unbiased/independent/robust estimator
  - State, District, County
- Deliver in-season remote sensing acreage estimates
  - NASS Official Reports
  - Update planted area
  - Reduce respondent burden



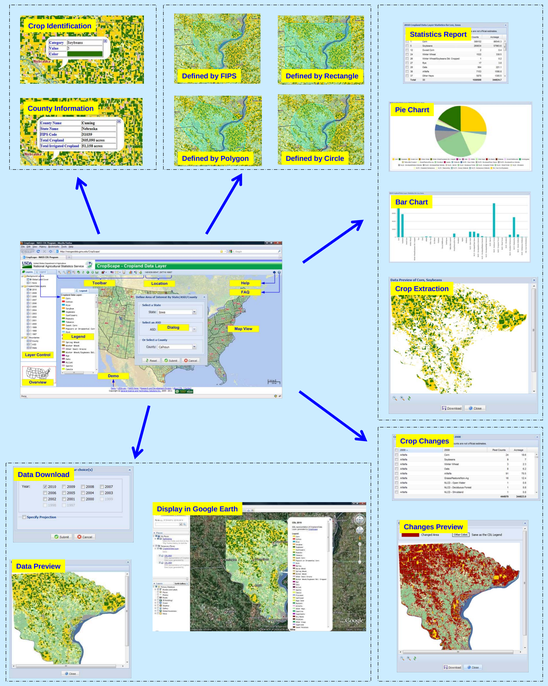


CropScape System Architecture



- Service Oriented Architecture
- Cross-browser and Ajax-enabled Web application
- OGC Standards (WCS, WFS, WMS and GML) compliant
- Online CDL data access and visualization
- On-the-fly geospatial data query, and analysis
- On-the-demand CDL data customization and download
- Interactive geospatial data analytics
- Web service based automatic data delivery and analysis
- Drive increased flexibility of cropland related application
- Work best for CDL data exploration and delivery

Demonstration



Open Web Service

URL: http://nassgeodata.gmu.edu:8080/axis2/services/CDLService?wsdl

- GetCDLValue
  http://nassgeodata.gmu.edu:8080/axis2/services/CDLService/GetCDLValue?year=2010&x=1551459.363&y=1909201.537
- GetCDLFile
  http://nassgeodata.gmu.edu:8080/axis2/services/CDLService/GetCDLFile?year=2009&fips=19015
- GetCDLImage
  http://nassgeodata.gmu.edu:8080/axis2/services/CDLService/GetCDLImage?files=http://nassgeodata.gmu.edu/nass_data_cache/CDL_2009_clip_20110701164738_313955401.tif&format=png
- GetCDLStat
  http://nassgeodata.gmu.edu:8080/axis2/services/CDLService/GetCDLStat?year=2010&bbox=130783.786503,2203171.19972,153923.584713,2217961.586205&format=JSON
- GetCDLComp
  http://nassgeodata.gmu.edu:8080/axis2/services/CDLService/GetCDLComp?year1=2008&year2=2009&fips=19015&format=CSV

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