CropScape: An Online Standard-compliant System for Visualization, Customization, Dissemination, and Analysis of Cropland Data Layer

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Introduction

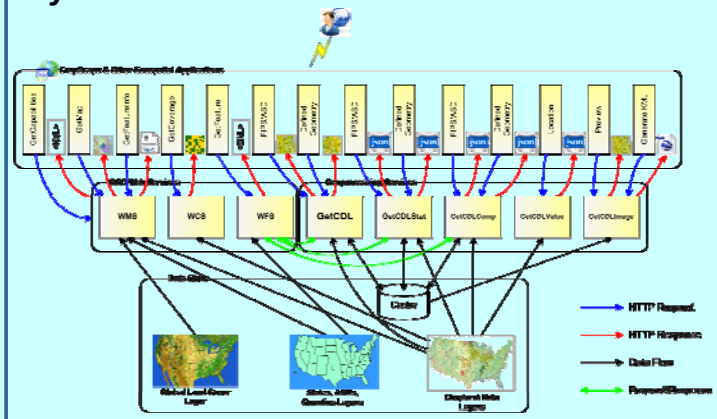
National Agricultural Statistics Service (NASS) provides timely, accurate and useful statistical information of U.S. agriculture in a variety of formats. The Spatial Analysis Research Section (SARS) of NASS Research and Development Division produces the annual Cropland Data Layer (CDL) product based on mid-resolution satellite data and high quality ground truth since 1997. The product 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 the agricultural industry for land cover monitoring, agricultural sustainability, crop acreage and yield estimation, disaster assessment, food security, and researches vital to the U.S. agriculture and economy. Previously, this valuable geospatial 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 are no longer able to meet the demanding of the agricultural community and general public. A fast, interoperable, user friendly data access and dissemination channel with online data navigation, visualization, and analytics capabilities is badly needed by the CDL user community. Therefore, we developed and is maintaining and operating a Web service-based and Open Geospatial Consortium (OGC) standard-compliant rich internet application, named CropScape (***http://nassgeodata.gmu.edu/CropScape/***), to distribute, visualize, and exploit CDL data for any geographic scale 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 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

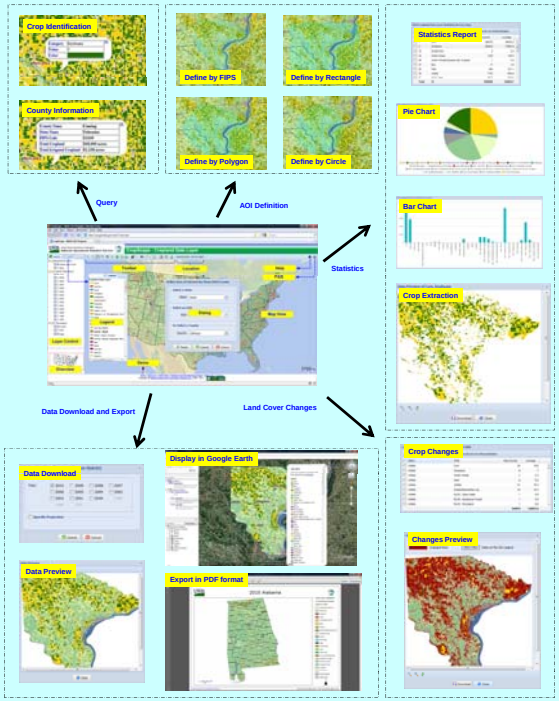
- Census by Satellites
  - Cover major crops and regions annually
  - Geo-locate crops accurately
- Timely, accurate, useful estimates
  - Measurable error
  - Unbiased/independent/robust estimator
  - State, Agricultural Statistical District, County
- In-season remote sensing acreage estimates
  - NASS Official Reports
  - Update planted area
  - Reduce respondent burden

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

Functionalities



Web Geoprocessing Services

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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