Geographic Information Systems (GIS) Data Collection and Storage

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WSS Seminar
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NASS Overview

Provider of timely, accurate, and useful statistics in service to U.S. agriculture
NASS Uses of GIS

• Sampling Frames
• Integrate GIS & Remote Sensing
  – Area Estimation
• Geostatistical Analysis & Mapping
• Address Geocoding/Logistics
• Disaster Monitoring
Area Sampling Frame

- GIS provides
  - Higher quality digital survey data
  - Reduce burden on data suppliers
  - Better estimates for data users
  - Centralized geodatabase & optimized workflow
  - Potential to integrate additional layers
    - Soils & climate
Area Sampling Frame

- June Area Survey
- Agriculture Coverage Evaluation Survey (ACES)
- State Equine and Turf Surveys
- Additional sampling frames
  - Grain stocks
  - Farm Service Agency/Common Land Unit
Integrate GIS & Remote Sensing

• Cropland Data Layer (National)
  – “Census by Satellite”
  – Annually cover major program crops
  – Crops accurately geo-located

• Deliver in-season remote sensing acreage estimates to ASB
  – June, July, August, September, and October Official Reports
  – Update planted area
  – Reduced respondent burden

• Provide timely, accurate, useful estimates
  – Measurable error
  – Unbiased/independent estimator
  – State, District, County
What is the Cropland Data Layer (CDL)?
CDL Program

• Inputs
  – Resourcesat-1 AWiFS imagery
  – Farm Service Agency – Common Land Unit
  – NASS June Ag Survey
  – Ancillary data
    • NLCD & derivative products

• Outputs
  – Acreage Estimates
  – Cropland Data Layer

• Process
  – Commercial software
Geostatistical Analysis & Mapping

• Mapping/data mining of NASS statistical data
  – County Estimates
  – Agricultural Census
  – Cropland Data Layer
  – Ad-hoc requests

• Trajectory analysis
  – Crop rotation, change detection, predictive forecasting
1999 CDL
First year in production

Land Cover Change
Location: Champaign-Urbana, Illinois
2000 CDL
Walmart built a new store near the airport
2001 CDL
Walmart is done with construction and farming returns to a small patch of land next to the store
GIS Mapping Applications

County Estimates
Agricultural Census
Corn for Grain 2008
Production by County and Location of Ethanol Plants

Corn Production (Bushels)
- Not Estimated
- < 1,000,000
- 1,000,000 - 4,999,999
- 5,000,000 - 9,999,999
- 10,000,000 - 14,999,999
- 15,000,000 - 19,999,999
- 20,000,000 +

Ethanol Plants
- Construction
- Producing
- Not producing

U.S. Department of Agriculture, National Agricultural Statistics Service

Bioenergy Queries
Value of Crops Sold for Counties within 500 Miles of St. Louis, Missouri: 2007

U.S. Department of Agriculture, National Agricultural Statistics Service

Total ($1,000) for Counties within 500 Miles of St. Louis, MO
$62,643,353

Dollars ($1,000)
- Less than 20,000
- 20,000 - 59,999
- 60,000 - 99,999
- 100,000 - 199,999
- 200,000 or more

Confidential data withheld
Address Geocoding/Logistics

• Geocoding List Frame records using TeleAtlas geospatial data
  – More cost efficient surveys and estimators
  – Aid in sample design and allocation
  – Data editing and imputation

• Route optimization for area survey enumeration
  – Visit 11,000 segment sample sites within two weeks
Summary

GIS Uses
- Sampling Frames
- Integrate GIS & Remote Sensing
- Geostatistical Analysis & Mapping
- Address Geocoding/Logistics
- Disaster Monitoring

Agency Support
- Technological leadership
- Cooperative partnerships
Thank You!