USDA–FSA-APFO

Storage provisioning within a Geospatial Data Warehouse

USDA Imagery Planning and Coordination

December 5, 2006

David A. Nabity
Aerial Photography Field Office
USDA – Farm Service Agency
Agenda

• APFO’s role within USDA
• Geospatial Data Warehouse
  • Storage and Archiving aerial imagery
• Spatial Data Provisioning System
• Web Order Entry System
APFO’s role for USDA

- APFO is the primary source of aerial imagery for the U.S. Department of Agriculture
- Data Stewards for NAIP, MDOQ and historical aerial photography collected for USDA dating back to 1955.
- Provide data warehousing and archive capabilities for CLU.
- Support the implementation and use of GIS in the Service Centers by acquiring imagery and delivering in a format that is ready to use.
Who We Support

• USDA
  • FSA - Compliance and Ortho Imagery
  • NRCS – Conservation
  • USFS – Resource Management
• Federal, State and Local Governments
  • Land Management Agencies
  • Emergency Management and Response
• Commercial
  • Planning
  • Litigation
  • Environmental
  • Development
Data Access and Delivery

• Access and delivery of geospatial data to service center offices, internal, and external customers in support of business needs encompasses four major ideas:
  – Data warehousing
  – Data selection
  – Packaging
  – Delivery
What is the Geospatial Data Warehouse (GDW)?

• Technical architecture, infrastructure, and data management processes through which SCA tabular and spatial data is developed, managed, and distributed to the 2700+ county offices and other authorized users

• Component of USDA Service Center Modernization Initiative
Geospatial Data Warehouse
How the GDW Supports FSA Farm Programs

- Provides authoritative data sets
- A means for identifying current crop growing conditions for compliance
- Disaster assessment prior to and after an event
- Base information for maintaining CLU boundaries and farm records
- An intuitive base map for interacting with customers
What the GDW Provides:

- Web service access to national NAIP and MDOQ imagery for SCA offices.
- APFO in-house NAIP inspection process.
- Data distribution via APFO Data Provisioning System.
- Support for a national CLU layer for FSA via replication of the CLU from the field service centers.
Distribution of GDW Data Resources

http://gos2.geodata.gov/wps/portal/gos

http://datagateway.nrcs.usda.gov/

APFO Provisioning System

http://customerstatement.usda.gov/

ARCIMS Services
gdw.apfo.usda.gov
Accessing the GDW Web Services Hosted at APFO

- Add GIS Server
  http://gdw.apfo.usda.gov
GDW NAIP Preliminary 2006 QQ’s
Combined 1 and 2 meter imagery
GDW Disaster Response Web Service

http://gdw.apfo.usda.gov/hurricane
Accessing USDA Geospatial Data Warehouse ArcIMS Web Services
GDW NAIP ArcIMS Web Service
http://gdw.apfo.usda.gov/naip/viewer/viewer.htm
GDW MDOQ ArcIMS Web Service

http://gdw.apfo.usda.gov/mdoq/viewer/viewer.htm
Aerial Photography Field Office
Data Provisioning System
APFO Data Provisioning System

- Provides a “view” into your data holdings
  - Provisioning is the process of creating custom derivative raster products from an archive of source imagery.
    - Most Current Data
    - Historical Archive
- Catalogs
  - MDOQ, NAIP, and Digital Photography
  - Approximately 4-5 years of data will be on line
- Integrated with the GDW infrastructure
### Input File Format (Ingest)

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>MrSID (.sid)</td>
</tr>
<tr>
<td>JPEG2000 with JGW Option</td>
</tr>
<tr>
<td>Landsat ETM, SRTM, BSQ</td>
</tr>
<tr>
<td>General Raster (BIL Interleave by Line)</td>
</tr>
<tr>
<td>General Raster (BSQ Interleave)</td>
</tr>
<tr>
<td>GeoTIFF – Strip, Strip Bands Separate</td>
</tr>
<tr>
<td>GeoTIFF (n-Band)</td>
</tr>
<tr>
<td>GeoJPEG2000</td>
</tr>
<tr>
<td>TIFF with TFW Option</td>
</tr>
<tr>
<td>JPEG with JGW Option</td>
</tr>
<tr>
<td>USGS DOQ - First Generation, New Labeled</td>
</tr>
<tr>
<td>NGA Formats (CIB, CADRG, ADRG)</td>
</tr>
<tr>
<td>NITF 2.0 and 2.1 RPC</td>
</tr>
<tr>
<td>MODIS HDF Level 1B</td>
</tr>
<tr>
<td><em>(only supported with the Copy Sources and Create Links actions)</em></td>
</tr>
<tr>
<td>Shuttle Radar Topography Mission (SRTM)</td>
</tr>
</tbody>
</table>
Supported Projection Types

- Albers Conical Equal Area
- Bonne
- Cassini
- Cylindrical Equal Area
- Eckert 4
- Eckert 6
- Geographic
- Van der Grinten
- Lambert Conformal Conic
- Mercator
- Miller Cylindrical

- Mollweide
- Orthographic
- Polar Stereographic
- Universal Polar Stereographic
- Polyconid
- Sinusoidal
- Transverse Mercator
- Transverse Cylindrical Equal Area
- Universal Transverse Mercator
Output File Format:

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPEG</td>
</tr>
<tr>
<td>TIFF</td>
</tr>
<tr>
<td>GeoTIFF-Tiled</td>
</tr>
<tr>
<td>GeoTIFF-Tiled Band Separate</td>
</tr>
<tr>
<td>GeoTIFF-Strip</td>
</tr>
<tr>
<td>GeoTIFF-Strip Band Separate</td>
</tr>
<tr>
<td>General Raster (BIL Interleave)</td>
</tr>
<tr>
<td>General Raster (BIP Interleave)</td>
</tr>
<tr>
<td>General Raster (BSQ Interleave)</td>
</tr>
<tr>
<td>ERDAS Imagine</td>
</tr>
<tr>
<td>GeoJPEG2000</td>
</tr>
<tr>
<td>ArcGrid-ASCII (Raw Elevation Only)</td>
</tr>
<tr>
<td>MrSID (mg2 and mg3)</td>
</tr>
</tbody>
</table>
Packaging and Delivery Methods

• Media
  • CD, DVD, Portable Hard Drive
  • Determined by system based on data set size

• Output Directory
  • FTP
  • Symbolic links to data files
    – OnCourse Delivery

• Media shipped most economical means
Data Provisioning Capabilities

- Raster Connect for ArcGIS
- Provision directly from the DPS into ArcGIS
Web Order Entry System

• The problem of:
  – Our current imagery distribution systems being restricted, underdeveloped, under publicized and inaccessible.

• Affects:
  – Our customers, our ability to comply with presidential and federal mandates and our ability to compete with other entities.

• The impact of which is:
  – Customers are dissatisfied and seek other means for acquiring the imagery they need, opportunities are lost because customers are unaware of what we have to offer.
Web Order Entry System

• APFO Goal
  – A streamlined, easy to use customer interface that supports presidential mandates and GOS objectives.

• APFO Objectives
  – Provide a means for our customers to easily order just the imagery they need.
  – Allow orders to be placed using a pre-defined AOI.
  – Account validation for ordering products.
  – Account management for registered users.
  – Ability to collect credit card information for billable orders.
Web Order Entry System

• Where we are at today
  – Contract has been awarded.
  – Initial requirements gathering phase is complete.
  – Initial development phase is under way.

• Implementation timeline
  – Early summer (June or July)
Web Order Entry System

• Initial customer base
  – Selected partners and Service Centers.

• Initial products available
  – NAIP CCM’s (2003 – 2006)
  – Digital Photo Indexes