

## **Geospatial Segment Conceptual Target Architecture**

Increasingly, USDA is using geospatial science and data to support its efforts to lead a rapidly evolving food, agricultural, forests, and natural resources. The geospatial segment architecture ensures alignment of mission and technology in critical areas such as improving housing, utilities and infrastructure in rural America, reducing the prevalence of food borne hazards, and managing and protecting America's public and private lands.

The key to improved geospatial performance and accountability is to manage the specific operational and developmental requirements of USDA's diverse agencies within a USDA-wide baseline of technology, services, and data assets. Coordination of the business and technical geospatial resources at the enterprise level would provide the oversight necessary to guide the evolution of geospatial data and services from the current baseline to the target state.

An Alternatives Analysis was done to identify high-level requirements. The heart of this alternatives analysis and architecture is to facilitate data sharing in order to lower costs and improve services. Goals to this end are enhancing the communication of the business value of geospatial services, consolidating the primary infrastructure, instituting Master Data Management, and using new technologies of virtualization, webservices, and innovative approaches to data sharing.

The general components of the conceptual target architecture are:

- Consolidating infrastructure in a Geospatial Center of Excellence and Enterprise Data Center and using virtualization techniques to reduce management and facilities' overhead.
- Managing and distributing Master Data Sets for USDA's cartographic, analytical, and application needs.
- Developing webservices and other Service Oriented Architecture technologies to facilitate sharing common and interoperable data.
- Using other innovations such as cloud computing and Web 2.0 tools to provide better service and enhance collaboration.
- Acquiring software and data through SmartBuys, Enterprise License Agreements, and Blanket Purchase Agreements to decrease overall application development and data costs.
- Establish common standards and procedures – aligned with those established or endorsed by the Federal Geographic Data Committee -- for collecting mission driven data through geocoding, digitizing, or the Global Positioning System.

The overarching concept of the segment is to serve USDA's variety of citizens and Customer Groups and other Centers of Excellence through a sound foundation of products and services. With the collaboration and support of other Federal agencies, USDA will offer services for infrastructure, hosting, data, data management and other functions. The complementary guidance and functions of the Federal Geographic Data Committee and the Geospatial Line of Business are vital to the success of this effort.

Below is a graphic of the networks of resources and stakeholders involved with and affected by the success of the Geospatial Enterprise Data Center and that of the Geospatial Segment Architecture in general.



A Center of Excellence with innovative and sharable capabilities and components can offer agile services to many customers inside and outside USDA. USDA has existing interoperable data services available and can readily expand the infrastructure for this data center. Innovations in geospatial technology and allied strategic tools create new vistas of combining efficiency, collaboration, and information sharing.

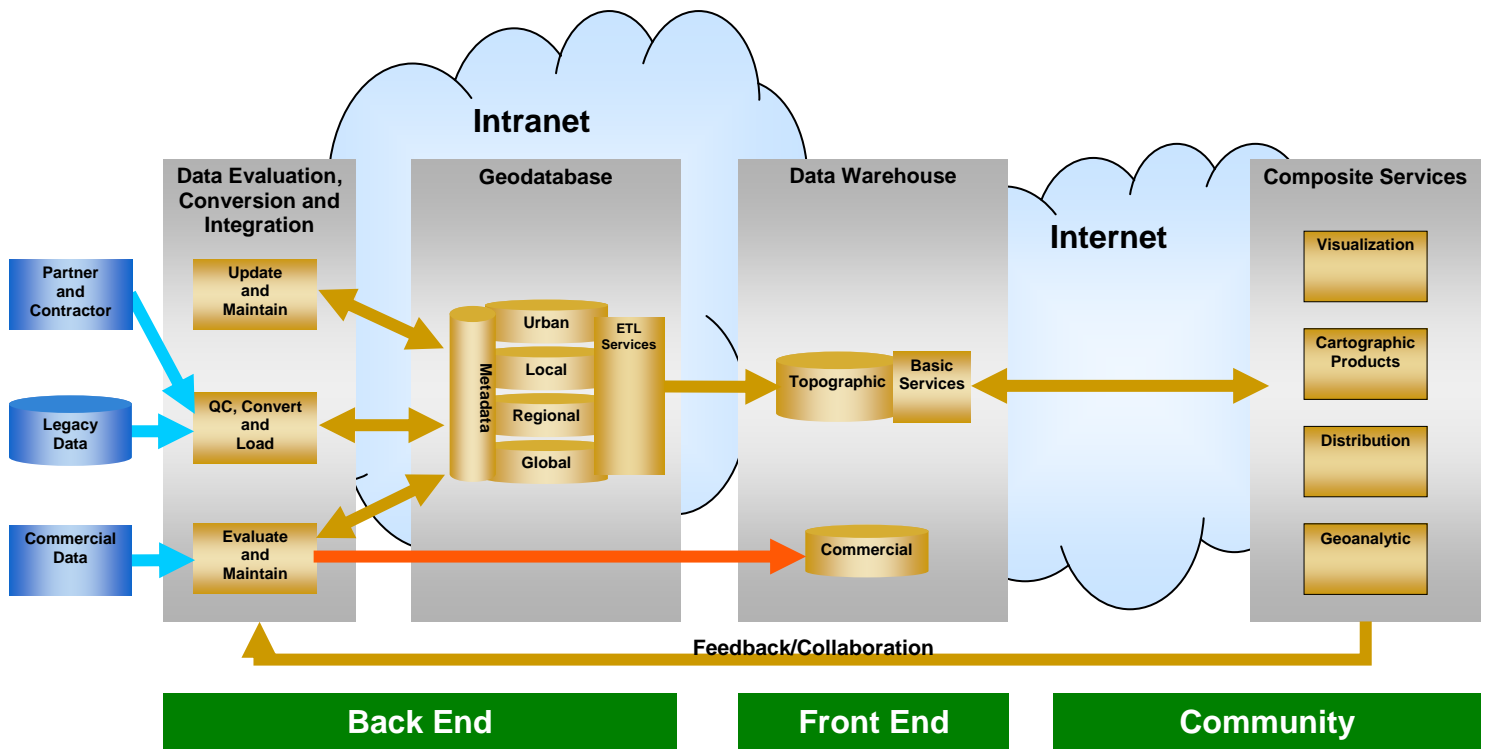
In general, the case for a transition to service-based capabilities can be summarized the following way. There are two major viewpoints that need to be taken into account

- Logical Consolidation on Center of Excellence platform:
  - ❑ Dedicated storage and storage management
  - ❑ Inventory standardization enables improved asset management for product lifecycles, service levels, and Total Cost of Ownership
  - ❑ Pooled benefits of utilization, productivity, expansion, and snap-ins
- Physical Consolidation in Centers of Excellence:
  - ❑ Bandwidth management for high-volume work
  - ❑ Facility environment support and quality controls
  - ❑ Application server cost reduction, demand management, virtual partitioning, and load balancing
  - ❑ Capacity for legacy migration and disposition
  - ❑ Vendor management capabilities
  - ❑ Desktop support on rationalized solutions platform

A Center of Excellence data center can be defined as a professionally managed and operated, institutionally supported facility, providing convenient access to, manipulation of, and/or distribution of data (including supporting information and expertise) for a wide community of users. It has a long-term charter (not tied to the lifetime of a specific project) and is capable of hosting *systems that may be department-wide shared services* or agency-specific. Prior USDA memos state that an Enterprise Data Center facility must meet USDA specified physical standards and sustain USDA specified operational standards. USDA data centers must meet many standards for security, operation, and maintenance including Level IV Security Facility as set forth in the physical security classifications of the Department of Justice.

For distributing shared data, a high-level illustration of system components that would move USDA forward in this direction shows how backend infrastructure supports front-end interoperable services. USDA can produce data services to share geospatial data sets and ensure that common, or “master, “ data is used across USDA and by its customers.

Furthermore, once considered isolated ‘back-end’ functions and infrastructure, servers, databases, and networks can be repurposed as services themselves. This has the potential to reduce USDA’s expenses and to meet other Federal agencies needs for turn-key geospatial operations.



### Benefits of the Consolidated Approach

A major benefit is USDA’s ability to enforce data and technology standards in a single environment. In this case, “interoperability” could focus more on sharing data through a variety of data visualization and analysis tools. With data consolidated in a well defined environment, possible system incompatibilities can be overcome, thus eliminating the burden of maintaining heterogeneous system architectures. Operating from a single environment, capital planning for geospatial investments would be easier to control. In a consolidated environment, data and information security could be better defined and enforced.

A centralized data architecture would promote data integrity and transparency by allowing data to be shared and vetted by multiple sources rather than relying individual users to verify data integrity. Additionally, the creation and institutionalization of enterprise data standards and data stewards would also promote data quality.

## Data Requirements

USDA has done preliminary research on its data holdings and opportunities for information sharing internally to USDA and externally. All levels of government as well as the public and the private sector require that USDA's geospatial data is accurate, timely, secure, and assessable.

The volume of USDA's geospatial data is currently 3.8 *petabytes*. Imagery comprises 99% of this amount and increases constantly. While the vector data is very small in comparison, it is very important for geographic and program analysis. Creating, storing, maintaining, and archiving this amount of data has serious implications for infrastructure, application development, and telecommunications capabilities. The Forest Service data center at Salt Lake has the capacity to hold 300 terabytes of data, and new data is being loaded daily. The Forest Service anticipates that its data alone at Salt Lake will reach 500 terabytes of geospatial data by the end of calendar year 2009. This includes data that is being migrated from the Regions and Stations as the Forest Service continues to stand up the data center. Forest Service Region and Station storage needs are also increasing, as they acquire more high resolution resource photography.

The heart of this alternatives analysis and architecture is to facilitate data sharing in order to lower costs and improve services. USDA participates in the Federal Geographic Data Committee, the Geospatial Line of Business, and numerous data and technology standards committees to coordinate such efforts.

The purpose of creating and managing "master" geospatial data sets is to create a Common Operating Picture and eliminate duplicative storage of data. However, USDA agencies have contrasting needs for geospatial data. For example, APHIS and FAS are interested in using or sharing all the different imagery most often used whereas ERS and RD are not. Conversely, due to its global mission, FAS is less interested in US vector and census data than are ERS and RD.

## **Data as a Service**

One “output” of this enterprise approach to geospatial services is interoperable and commonly used data. Use of common data that is easily consumable by many ‘client’ applications such as those from ESRI, Google, Microsoft, and other specific GIS software and applications. In keeping with the trajectory of the Geospatial Line of Business Common Solution and Technical Architecture, USDA would have a Common Operating Picture to support program administration, emergency preparedness, and other functions. This common view could be the basis for most of USDA’s geospatial activity. A single hosting location would be used for hosting all master data sets, and federated webservices can be implemented for sharing and consumption of data by agencies. Agency-specific databases housing program data would continue to reside with their agencies and contribute to the master data sets when appropriate. Program specific geospatial and tabular data would be hosted at USDA Enterprise Data Centers (EDC). The master geospatial dataset can provide backdrop and reference geospatial data to agency business applications for use in operational transactions.

Certainly the standards and technology already exist to support this effort. USDA needs to transportation toward a more robust environment with which to provide data services. This will eliminate duplicative storage of data and greatly reduce the risk involved in maintaining conflicting or inaccurate geospatial data. However, USDA agencies have contrasting needs for geospatial data. For example, APHIS and FAS are interested in using or sharing all the different imagery most often used. For example, this is true for soils data from NRCS, National Agriculture Imagery Program data from FSA, and wildfire data from the Forest Service, and Multifamily Housing data from RD, and international imagery data for FAS. Leveraging the geospatial webservices and data of other agencies is vital to cost reduction and data quality improvements.

## **Software as a Service (SaaS)**

The principles of service as a reuse promotes consolidation and standardization of technology which maximizes data sharing and minimizing costs associated duplicate management efforts. USDA is working to establish the environment in which reuse of services can be most effective and can thrive. For deployment of the Environmental Systems Research Institute (ESRI) geospatial software, USDA has relied on traditional desktop installations. USDA is now reconsidering this approach for standard use and applications. As ESRI makes more desktop software functions available in a server-based or web-based environment, the more USDA can move software provisioning to a service-based process.

In keeping with this goal, FSA is already conducting a pilot project using this technology to centralization the storage and editing of the CLU data and to deploy geospatial data development software using Citrix. Citrix will be utilized to provide thin client access to existing Desktop GIS toolset through this pilot of 17 counties. In order to pare down geospatial software costs, FSA and other agencies have considered delivery of more instances of the standard ESRI Software via Citrix instead of desktop implementations.

The Forest Service is taking image processing functions off the desktop and is implementing the ERDAS Apollo web-based tool set to share data using various domain specific applications. Primarily, the solution provides image processing capability in a browser setting, rather than being confined to separate desktops across which it is difficult to share data. Apollo facilitates centralizing geospatial information metadata, with search, retrieve and disseminate capabilities. ERDAS Image Manager implements comprehensive Web Mapping Service (WMS), Web Coverage Service (WCS), Catalogue Service (CS-W), Web Feature Service

(WFS), Web Map Context (WMC) and ISO 19115/19139 standards. These interoperable standards allow data and software functions to be consumed by other web-based applications or desktop software.

### **Infrastructure as a Service (IaaS)**

IaaS provides IT resources - processing power, storage, data center space, services, compliance - on-demand - that are reliable, secure, and well administered. USDA can save money and provide better services by taking advantage of an IaaS environment through virtualization, Cloud computing, out-sourcing functionality and operations, and many more strategies. Furthermore, USDA can become a provider of IaaS to support geospatial projects from other agencies on request.

With growing emphasis on the transparency of Federal expenditure and projects, there is growing need for turn-key approached to data management and provisioning. Achieving this cannot wait for the acquisition and implementation of servers, networks, and applications. It is possible to have these at hand through virtualization and SaaS. USDA can become a leader this effort while accomplishing its own goals.

IaaS can include many different data center services from dedicated hosting, to managed security, managed storage, infrastructure optimization, and professional services. The system components include virtualized servers, virtualized storage, and network management using associated tools that oversee multiple physical and virtual platforms. The benefits of this configuration are reduced maintenance over many systems, reduced energy costs, more efficient uses of facility space and utilities, and, ultimate, more robust and effective customer service.

This consolidated infrastructure design will enable USDA to expand its services while reaping these benefits. Such systems would undergird the operation of the Geospatial Enterprise Data Center. This particular infrastructure combination would reuse other USDA services and capabilities.



## **Service Level Agreements**

In order to effectively implement the selected alternative, USDA must establish SLAs with internal and external service providers.

USDA's information Technology Services (ITS, now International Technology Services) maintains existing Service Level Agreements with FSA, NRCS, RD, OCIO, OCFO, DA, and NFC. ITS agrees to various levels of service depending on the technology or service. The areas include:

- Application Availability
- Application Response Time
- Server Software Upgrade/Refresh
- End User Services
- Account Management.
- Provisioning Hardware for Users
- Service Desk Incident Response.
- Service Desk Incident Resolution

All of these and the rest of ITS services are applicable to geospatial activities. For geospatial applications application response time, database integrity, cyber security, server reliability, change management, user hardware and software, and network reliability are the among the most critical service performance areas. For example, the service level ensured for "application availability" is only 99%. This would probably need to be increased for some geospatial applications, particularly for the Forest Service.

With regard to responsibility for data security requirements, data classification requirements and compliance with the Privacy Act to include all NIST and USDA PII requirements regarding data security, this is the responsibility of the data business owner; including Certification and Accreditation and specific data encryption requirements. ITS currently supports the USDA enterprise encryption solution using SafeBoot encryption software. Explicit rules for handling sensitive data fall under the purview of the customer Agencies, which are responsible for assigning user access, appropriate security levels, based upon Agency business needs.

## **Reuse and Collaboration:**

### **Reuse:**

#### **Internal to USDA**

The Farm Service Agency's (FSA) geospatial investment provides a technological solution for geo-spatial data management and a data and imagery acquisition solution that enables more efficient collection and manipulation of information. The program eliminates data redundancy by collaborating with partner agencies in the data management processes of collection, verification, distribution and use by federal, state and local entities. Program capabilities include the assembly, storage, transfer, manipulation, and display of geo-spatial data. The Geographic Information System (GIS) program promotes efficiency and cost-savings in government operations and also in agricultural benefits administration.

FSA produces a large number of computerized maps such as soil survey, National Agriculture Imagery Program (NAIP) imagery, common land unit (CLU), and others that are used both internal to USDA and are available to the wide range of customers via data centers and data warehouses. FSA produces data that is widely used as the most complete national orthophotographic data set available from the federal

government. In FY2008, as of February 9, 2009, government entities (.gov domain addresses) downloaded 2,494,142.43 megabytes of just the 2007 NAIP imagery. The private commercial sector (.com domain addresses) downloaded 19,309,991.42 megabytes of 2006 NAIP data.

NRCS's Natural Resource Information, Inventory and Assessment (NRIIA) investment provides the science-based geospatial natural resource information for NRCS business applications, conservation planning and implementation to make informed decisions about soil, water, plant, and other natural resource issues. NRCS has strived to improve the availability of information to citizens. NRIIA applications will continue leveraging data developed and maintained by other government agencies and the private sector. Funding will continue for data collection, NRIIA staff resources, appropriate hardware and software updates, and cooperative agreements with universities.

The Foreign Agriculture Service (FAS) serves as the repository and manager of the USDA Satellite Imagery Archive. Access is available to USDA subscribers only for a fee. The Archive was established in 2001 as a cost-sharing agreement among the various subscribers. The archive contains many different types of high-resolution and natural and hyperspectral imagery from commercial as well as other Federal sources. For example FAS, in cooperation with the National Aeronautics and Space Administration, and the University of Maryland's (UMD), Earth System Science Interdisciplinary Center (ESSIC) are routinely monitoring lake and reservoir height variations for approximately 100 lakes located around the world.

Within USDA geospatial software is reused and shared through an Enterprise Service Level agreement that creates a uniform platform for mapping and applications. This uniform platform creates interoperable services for external consumption

Furthermore, USDA has a Blanket Purchase Agreement for national cartographic data and geocoding services through Tele Atlas corporation. This facilitates USDA agencies sharing a common data set with common geospatial reference points.

Agencies within USDA have created formal and informal data sharing agreements. For example, FSA's Common Land Unit is used – as the law allows – by several agencies within USDA. FSA and the Animal and Plant Health Inspection Service have a unique data sharing agreement for geospatial and tabular data

In a unique example of collaboration and reuse, USDA has incorporated the Geospatial Line of Business (GLOB) lexicon into USDA's Subject Area and Entity directory in the USDA Data Reference Model based on the Federal Enterprise Architecture Data Reference Model. This is an initial step toward harmonizing USDA's definitions with those agreed to by multiple agencies. In addition, USDA agency representatives participated in the GLOB's recommended Data Lifecycle Management process, but also USDA's Data Architecture Subcommittee is reviewing the GLOB Data Steward roles and responsibilities for use as a USDA guide for data stewardship in general.

## **External to USDA**

USDA provides imagery, soils, climate, recreational, and forestry data to the public, private sector, and other units of government. There are many examples from the Forest Service, FSA, and NRCS

The NRCS Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil survey information.

Soil surveys can be used for general farm, local, and wider area planning. Onsite investigation is needed in some cases, such as soil quality assessments and certain conservation and engineering applications. Users can now download the spatial and tabular soil data, and a custom Microsoft Access template database that includes soil reports similar to those available in Web Soil Survey, for use in local GIS applications to generate maps and reports.

USDA contributes funds and expertise to other federal government initiatives. An especially successful collaboration, which will provide reusable more precise data is the Watershed Boundary Data and the National Hydrography Data. This is a very successful venture led by NRCS and EPA, and USGS, and many other federal agencies participate. Watershed boundaries define the aerial extent of surface water drainage to a point. The intent of defining hydrologic units (HU) for the Watershed Boundary Dataset is to establish a base-line drainage boundary framework, accounting for all land and surface areas. This will be integrated with the National Hydrography Data set which digitally delineates lakes, rivers, streams, and other water features. The Watershed Boundary Dataset is being developed under the leadership of the Subcommittee on Spatial Water Data, which is part of the Advisory Committee on Water Information (ACWI) and the Federal Geographic Data Committee (FGDC). The USDA Natural Resources Conservation Service (NRCS), along with many other federal agencies and national associations, have representatives on the Subcommittee on Spatial Water Data. As watershed boundary geographic information systems (GIS) data is completed, statewide and national data layers will be made available via the NRCS "Geospatial Data Gateway" to everyone, including federal, state, local government agencies, researchers, private companies, utilities, environmental groups, and concerned citizens. The database will assist in planning and describing water use and related land use activities.

The Forest Service Data Gateway provides downloadable data and softcopy maps for its many essential customers. For example, the "Cartographic Feature Files" include roads and trails, streams, water bodies, political and administrative boundaries, land ownership, and constructed features. CFFs contain the vector representation of the point and line features shown on published Forest Service 1:24000 maps. The Forest Service distributes forest health and ecological data and maps.

One of the Forest Services' most widely shared data is the MODIS remote sensing data of active and current wildfires. MODIS data is used in many contexts but especially in fighting land and wild fires. The Forest Service is a partner in the Geospatial Multi-Agency Coordination Group or GeoMAC, which is an internet-based mapping application originally designed for fire managers to access online maps of current fire locations and perimeters in the conterminous 48 States and Alaska. Using a standard web browser, fire personnel can view this information to pinpoint the affected areas. With the growing concern of western wildland fires in the summer of 2000, this application has also become available to the public. This is a critical information source for the National Interagency Fire Center (NIFC), located in Boise, Idaho, which is the nation's support center for wildland firefighting.

The Forest Service and NRCS participate with USGS's EROS data center and many other partners to create and update the Multi-Resolution Land Characteristics (MRLC) Consortium, which is a group of federal agencies who first joined together in 1993 to purchase Landsat 5 imagery for the conterminous U.S. and to develop a land cover dataset called the National Land Cover Dataset.

## **Collaboration**

USDA is the third largest producer of geospatial data in the Federal Government after the Department of Interior and the Department of Commerce. The endeavors of 26 agencies are coordinated through OMB's Geospatial Line of Business, which facilitates both collaboration and reuse across the Federal government and in conjunction with other units of government. USDA participates in many ways, but primarily in the Lifecycle Working Group. USDA representatives have contributed to a standard lexicon or taxonomy of geospatial terms and development of data stewardship recommended processes. Both documents were submitted to OMB in the "Supplemental Guidance to OMB Circular A16." In addition, USDA representatives participate in the Technical Evaluation Board of the new SmartBuy for geospatial software and data.

The Federal Geographic Data Committee (FGDC) is an interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis. FGDC and, specifically, the FGDC Steering Committee is the policy-level interagency group responsible for overseeing Office of Management and Budget (OMB) Circular A-16 related activities and implementation of the National Spatial Data Infrastructure (NSDI). USDA has been a long-standing member of this and its predecessor organizations. USDA's Associate Chief Information Officer for Technology Planning, Architecture, and E-Government serves as USDA's Senior Agency Official for Geospatial Information (SAOGI) and is USDA's representative to FGDC's Executive Committee and to the FGDC Steering Committee.

FGDC's Coordination Group is the operational-level interagency group responsible for facilitating Office of Management and Budget (OMB) Circular A-16 related activities and the development of the National Spatial Data Infrastructure (NSDI). The central focus of the Coordination Group is to carry out working level responsibilities under OMB Circular A-16 that are guided by the FGDC Steering Committee directions and decisions. The (SAOGI) designates USDA's main representative and other staff chair or participate in the various other committees on data, standards, enterprise architecture, and coordination.

The FGDC Executive Committee has established several high priority data production initiatives such as "Imagery for the Nation," which is a multiagency effort to create a standard and seamless orthophotographic data set for the nation. The Imagery for the Nation (IFTN) initiative aims to provide a sustainable and flexible nation-wide imagery program to meet the needs of government at all levels. IFTN will take advantage of existing programs that acquire imagery for Federal purposes. While FSA and USGS are the major existing data production agencies involved, FSA co-chairs the Technical Plan Working Group that has guided the requirements analysis and business model for IFTN. USDA representatives participate in the Contracting Strategy group and the Hosting and Archiving Strategy groups. Many other USDA staff participate as National Digital Orthophoto Program group representatives to the IFTN initiative.

USDA's Associate Chief Information Officer for Technology Planning, Architecture, and E-Government along with Forest Service, NRCS, and FSA staff contribute to emerging initiatives that are outside the

purview of the FGDC proper. The Forest Service has developed an interactive mapping application to track the location of the money from the American Recovery and Reinvestment Act (ARRA) being distributed and managed. At this stage, the application displays data from USDA and, in the near future, HUD. FGDC created interagency group for the Federal Communications Commission (FCC) to support transparency of the ARRA funding for broadband internet service. The OCIO and Rural Development help the FCC consider data and technical options for this project. Another FGDC sponsored initiative is the production of geospatial elevation data for Alaska. While data for Alaska is very old and inaccurate, USDA is an important stakeholder in this effort and can help produce and ultimately use that data for Forest Service and NRCS programs.

## Transition Strategy

The transition required for this effort can be briefly described this way. The focus of the transition is creation of the Geospatial Enterprise Data Center (GeoEDC). The transition plan and sequence reflect a more detailed project plan to architect, design, and implement the GeoEDC and the segment in general. There are many infrastructure, security, data storage, and distribution services that need to be considered.



Primarily, two challenges are presented by this approach.

- A logical sequence of steps is focused on identifying, prioritizing, and sequencing the transition activities that will be necessary to achieve GeoEDC Target EA.
- The Transition Plan becomes the GeoEDC primary roadmap for IT solutions modernization, migration and management; driving both investment and implementation.

Below are specific transition goals and milestones for the segment as well as critical investments. These do not constitute a full project plan and work breakdown structure.

## 203-000 - Geospatial Services

Creates a comprehensive line of sight for segment performance as well as financial and non-financial success stories attributed in whole or in part to the Segment Architecture

### Segment Performance

<b>Fiscal Year</b>	<b>Metric</b>	<b>Target</b>	<b>Actual</b>	<b>Comments</b>
FY2009	Define Vision and identify relationships, roles, and responsibilities of COEs and GeoEDC	100% by August 2009		Design and establish the PMO
FY2009	PMO organization begins	100% written charter by August 2009		
FY2009	Update EA report and Transition Plan to OMB	100% August 2009		As OMB requires
FY2009	Form technology liaisons with other federal agencies, publicize COE conduit of information for solutions architecture, standard features, and custom services	75% liaisons formed with and services offered to DoI, EPA, HUD, DoT, and FCC December 2009		Begins in FY10 and is on going;
FY2010	Ensure continuity of data sharing, collaboration, Business Process Management review and change cycle	100% create business and change management policy and implementation documents		Begins in FY10 and is on going;
FY2010	Begins in FY10 and is on going;	Achieve average of 15-day length of time for reporting and correction.		Begins in FY10 and is on going;
FY2011	Review of Master Data sets every 6 months for data quality and consistency	Initial 100% review, addition, enhancement, or correction of Master Data sets distributed by the EDC		Begins in FY11 and is on going;

## Investment Performance

Fiscal Year	Metric ID	Metric Type	Measurement Indicator	IT Investment Name	System/App/Program	Strategic Goal	Measurement Category	Measurement Grouping	Target	Actual
FY2009	203-PM-NRIIA-01	Output Metric	Average number of unique visits per day to Web Soil Survey	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase by 5% to 3,972 visits per day	
FY2009	203-PM-NRIIA-02	Output Metric	Average number of unique visits per day to PLANTS web site	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase by 5% to 22,314 visits per day	
FY2009	203-PM-NRIIA-02	Output Metric	Average number of unique visits per day to PLANTS web site	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase by 5% to 22,314 visits per day	

<b>Fiscal Year</b>	<b>Metric ID</b>	<b>Metric Type</b>	<b>Measurement Indicator</b>	<b>IT Investment Name</b>	<b>System/App/Program</b>	<b>Strategic Goal</b>	<b>Measurement Category</b>	<b>Measurement Grouping</b>	<b>Target</b>	<b>Actual</b>
FY2009	203-PM-NRIIA-02	Output Metric	Average number of unique visits per day to PLANTS web site	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase by 5% to 22,314 visits per day	
FY2009	203-PM-NRIIA-03	Output Metric	Acres of Digital Soil Surveys made available	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 14,000,000 acres	
FY2009	203-PM-NRIIA-04	Output Metric	Hours spent on data collection per sample segment	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Reduct to .99 hours	



<b>Fiscal Year</b>	<b>Metric ID</b>	<b>Metric Type</b>	<b>Measurement Indicator</b>	<b>IT Investment Name</b>	<b>System/App/Program</b>	<b>Strategic Goal</b>	<b>Measurement Category</b>	<b>Measurement Grouping</b>	<b>Target</b>	<b>Actual</b>
FY2009	203-PM-NRIIA-05	Output Metric	Acres mapped or updated per million dollars	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 492,280 acres	
FY2010	203-PM-NRIIA-01	Output Metric	Average number of unique visits per day to Web Soil Survey	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 4,170 visits per day	
FY2010	203-PM-NRIIA-02	Output Metric	Average number of visits per day to PLANTS web site	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 23,429 visits per day	

<b>Fiscal Year</b>	<b>Metric ID</b>	<b>Metric Type</b>	<b>Measurement Indicator</b>	<b>IT Investment Name</b>	<b>System/App/Program</b>	<b>Strategic Goal</b>	<b>Measurement Category</b>	<b>Measurement Grouping</b>	<b>Target</b>	<b>Actual</b>
FY2010	203-PM-NRIIA-6	Output Metric	Increase technical soil services to Customers	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Customer Benefit	Customer Satisfaction	Increase # of customers reached by 10%	
FY2010	203-PM-NRIIA-03	Output Metric	Acres of Digital Soil Surveys made available, number	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 14,750,000 acres	
FY2010	203-PM-NRIIA-04	Output Metric	Hours spent on data collection per sample segment	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Reduct to .98 hours	

Fiscal Year	Metric ID	Metric Type	Measurement Indicator	IT Investment Name	System/App/Program	Strategic Goal	Measurement Category	Measurement Grouping	Target	Actual
FY2010	203-PM-NRIIA-05	Output Metric	Acres mapped or updated per million dollars	Natural Resource Information, Inventory and Assessment		Protect and Enhance the Nation's Natural Resource Base and Environment	Natural Resources	Conservation, Marine and Land Management	Increase to 510,740 acres	
FY2009	203-PM-FSA84-01	Output Metric	% of end-users of the application or system who report they are satisfied with the application or system.	Geographic Information Services #84		Support Increased Economic Opportunities and Improved Quality of Life in Rural America	Effectiveness	User Satisfaction	Increase by 3%	
FY2009	203-PM-FSA84-02	Output Metric	% of projects conforming to Agency System Development Life-cycle Processes	Geographic Information Services #84		Support Increased Economic Opportunities and Improved Quality of Life	Management and Innovation	Compliance	5% increase	

Fiscal Year	Metric ID	Metric Type	Measurement Indicator	IT Investment Name	System/App/Program	Strategic Goal	Measurement Category	Measurement Grouping	Target	Actual
						in Rural America				
FY2009	203-PM-FSA84-03	Output Metric	% of offices where GIS acreage reports are collected and GIS compliance is conducted	Geographic Information Services #84		Enhance the Competitiveness and Sustainability of rural and Farm Economies	Customer Benefit	New Customers and Market Penetration	5% increase	
FY2010	203-PM-FSA84-01	Output Metric	% of end-users of the application or system who report they are satisfied with the	Geographic Information Services #84		Support Increased Economic Opportunities and Improved Quality	Effectiveness	User Satisfaction	3% increase	
FY2010	203-PM-FSA84-02	Output Metric	% of projects conforming to Agency System Development Life-	Geographic Information Services #84		Enhance the Competitiveness and Sustainability	Management and Innovation	Compliance	5% increase	

<b>Fiscal Year</b>	<b>Metric ID</b>	<b>Metric Type</b>	<b>Measurement Indicator</b>	<b>IT Investment Name</b>	<b>System/App/Program</b>	<b>Strategic Goal</b>	<b>Measurement Category</b>	<b>Measurement Grouping</b>	<b>Target</b>	<b>Actual</b>
			cycle Processes			ity of rural and Farm Economies				
FY2010	203-PM-FSA84-03	Output Metric	% of offices where GIS acreage reports are collected and GIS compliance is conducted	Geographic Information Services #84		Enhance the Competitiveness and Sustainability of rural and Farm Economies	Customer Benefit	New Customers and Market Penetration	5% increase	

## 203-000 - Geospatial Services

Provides segment progress milestones to track the development of a segment within an Agency. These milestones are different from those found in the Exhibit 300s.

### Segment Transition Plan

<b>Milestone ID</b>	<b>Segment Transition Milestone</b>	<b>Target Completion Date</b>	<b>Dependant on Milestone X</b>	<b>Dependencies/ Constraints</b>	<b>Milestone Theme</b>
203-sa-01	Define Vision and identify relationships, roles, and responsibilities of COEs and GeoEDC	August 31,2009			Strengthening investment quality
203-sa-02	Draft PMO Charter	August 31, 2009	203-sa-01	program definition	Strengthening investment quality
203-sa-03	Update EA report and Transition Plan to OMB	August 31, 2009	203-sa-02	business case and OMB requirements	Strengthening investment quality
203-sa-04	Form technology liaisons with other federal agencies, publicize COE conduit of information	December 31, 2009	203-sa-02	business case and PMO organization	Transparency
203-sa-05	create business and change management policy and implementation documents	June 30, 2010			Saving money
203-sa-06	Ensure continuity of data sharing, collaboration, Business Process Management review and change cycle	August 31, 2010	203-sa-05	working business plan and infrastructure consolidation	Improving data quality
203-sa-07	Achieve average of 15-day length of time for reporting and correction by USDA data stewards	December 30, 2010	203-sa-06	Implementing change management process	Improving data quality
203-sa-08	Implement review and	December	203-sa-07	Implementation of	Saving

Milestone ID	Segment Transition Milestone	Target Completion Date	Dependant on Milestone X	Dependencies/ Constraints	Milestone Theme
	correction of Master Data sets distributed by the EDC	30, 2011		Master Data Management process and "Utility" based system of services	money