



LAGIC Technical Services Quarterly Report

LAGIC-LSU Contract: 2008-2009

April - June, 2009

August, 2009

Summary:

During the fourth quarter of the 2008-09 contract, LAGIC continued to maintain and enhance the LouisianaMap 2.0 framework. Emphasis was on data services, which are provided in the geospatial data services catalog at: http://map.la.gov/resource_center.aspx. An *end of service* strategy for the old LouisianaMap site was postponed.

LAGIC has acquired and published access to the 2008 one-meter resolution aerial photography for the central gulf coast of the United States (predominantly Louisiana & Mississippi). This data was collected by the U.S. Geological Survey (USGS) and is available online as three and four-band image services (natural color, and infrared enhanced). Additionally, LAGIC completed development of a comprehensive weather data service, which is available online for GIS desktop and Web clients. In coming months, both of these services will be made available via LouisianaMap.

LAGIC Technical Services continues to coordinate with the Louisiana GIS Council and various geospatial data stakeholders to develop strategies for utilizing and promoting access to the LouisianaMap map services. Numerous meetings have been held. In addition to the Council membership, participants included Lincoln Parish GIS, LA Dept. of Transportation and Development, the LSU Police Department - GIS Unit, and the LSU AgCenter and Cooperative Extension.

LAGIC Technical Services and Program Support Managers have begun working on a Louisiana broadband mapping initiative. LAGIC, LGISC, LSU, and the Louisiana Optical Network Initiative (LONI) are coordinating mapping support for a Broadband Technology Opportunities Program (BTOP) grant initiative. The BTOP grants will be issued through the National Telecommunications and Information Administration (NTIA), and the Rural Utilities Service (RUS). Coordinating meetings have held to identify how best LAGIC can provide mapping support for the State various broadband grant initiatives.

Due to an electrical problems within the LAGIC facility, access to various data services experienced intermittent interruptions for approximately four weeks. Damage assessments were limited to three servers and one workstation. New hardware was required, including batteries for two uninterrupted power supplies (UPS), hard drives, and power supply. Data and related services were

temporarily migrated to test servers while replacement hardware was acquired. A new, low-end server will be acquired to provide roll-over and recovery functions.

Administrative & Staff:

1) Staff:

LAGIC Technical Services continues to employ two full-time professionals, and one part-time graduate assistant.

LAGIC received significant budget cuts for the current and coming fiscal years. As a consequence, LAGIC technical services has begun scaling-back/suspending services in anticipation of significant budget adjustments which will affect staffing. LAGIC Technical services has been working with GIS Council membership on contract opportunities.

2) Technical Training:

LAGIC continues to participate in various online training seminars focused on Web mapping services and open-source GIS data services. Recent subjects included map templates and optimization techniques for improving performance of Web mapping services.

Technical Services staff has registered for free SQL Server training, to be held in August 2009.

Technical staff continue to develop in-house user guides, white papers, and procedural manuals for various software systems and services (*e.g.* ArcSDE, ArcGIS Image Server, *etc.*). More than 60 training guides, e-books, and more are available to technical staff, and distributed to GIS council members on request.

Data Management & Services:

1) LAGIC Data Services:

LAGIC maintains the following in-house data services:

a. Database System Management:

LAGIC is currently hosting the majority of static geospatial data assets within a SQL Server 2005 Database Management System. Geospatial assets are directly accessible via ArcSDE spatial database engine. Clients primarily comprise of in-house users. However, numerous Web-based mapping applications hosted by LAGIC access these data layers.

b. DBMS Organization:

Currently, the LAGIC hosts approximately 1,000 feature classes, raster datasets, and spatially enabled data tables:

- i. LAGIC in-house/production database, (~25 feature classes)
- ii. Louisiana Spatial Data Infrastructure (LSDI) [UTM & GEOG], (254 feature classes, 3 raster datasets, and 39 data tables)
- iii. US Census Bureau TIGER/Line - Second Edition 2006, (42 feature classes, 9 data tables)

- iv. LOSCO Data Catalog, (302 Features, 12 tables)
- v. Louisiana Geographic Names Information System (GNIS), (2 feature classes)
- vi. Louisiana Recovery Authority (LRA) - Louisiana Speaks datasets (42 feature classes)

Ad Hoc databases include:

- i. Homeland Security Infrastructure Program (HSIP), (132 feature classes)
- ii. Miscellaneous Data, (100 feature classes)
- iii. Elections Database, (3 feature classes)
- iv. NOAA Weather Database, (20 feature classes and raster datasets)
- v. TIGER2006 Second Edition - WGS-1984, (42 feature classes)
- vi. TIGER2008 First Edition - WGS-1984, (40 feature classes)

LAGIC's primary spatial data inventory system is maintained in accordance to the Louisiana Spatial Data Infrastructure (LSDI) schema. The LSDI data structure is hierarchically organized according to *framework data layer category* (i.e., data theme), *feature name*, *data provider*, and *year of publication*. In order to accommodate various performance enhancement strategies for online publication, it was necessary to organize the data according to both Geographic and UTM coordinate systems.

All data are securely maintained, and are accessible via policy-based usernames and passwords.

Data and metadata records receive continuous QA/QC for continuity. Additional changes and edits to the data are made as needed.

Ad hoc databases are created as needed, and are often the result of a special request or technical project. Due to the nature of their function, some of these systems (e.g., HSIP) may become permanent database services.

c. *File-based Organization:*

Data provided on the LAGIC DBMS geospatial database is also available online for download. Data layers have been exported as ESRI Shapefile format, and include comprehensive metadata. These assets have been compressed to ZIP format, and are accessible for download from the LAGIC web site data catalog(s): <http://lagic.lsu.edu/geodata/>.

d. *Miscellaneous Data Services:*

Geospatial One Stop (GOS), on going
LAGIC maintained metadata continue to be accessible via the GOS Federal data catalog. Metadata records are harvested according to an automated schedule, ensuring that the latest updates are propagated to the GOS search indexes.

2007 NAIP, available

LAGIC Technical staff have successfully published the US Dept. of Agriculture, 2007 NAIP aerial photography (1-meter, true-color) via ArcGIS Image Server. Accordingly, it is accessible for consumption via: <http://lagic02.lsu.edu/lagic/rest/> <http://lagic-caddo.lsu.edu/arcgis/rest/> (temporarily moved due to electrical fire and subsequent hardware failure). Image Server publishes image services, providing distributed data

services that allow compatible client applications to consume the image data quickly and in real-time.

2008 Central Gulf Coast DOQQs, available

LAGIC Technical staff have successfully published the US Geological Survey, 2008 Central Gulf Coast DOQQ aerial photography (1-meter, four-band) via ArcGIS Image Server. True color (RGB) and all band (IRGB) services are available. Services are accessible for Web and desktop client consumption via: ~~<http://lagic02.lsu.edu/lagic/rest/>~~ <http://lagic-caddo.lsu.edu/arcgis/rest/> (temporarily moved due to electrical fire and subsequent hardware failure).

Louisiana LIDAR Digital Elevation Model (DEM), available

LAGIC is working with the LSU and LOSCO to distribute the LIDAR DEM data set as an image service. The DEM data layer is 64GB raster dataset will be hosted via ArcGIS Image Server platform. Accordingly, it is accessible for consumption via: ~~<http://lagic02.lsu.edu/lagic/rest/>~~ <http://lagic-caddo.lsu.edu/arcgis/rest/> (temporarily moved due to electrical fire and subsequent hardware failure).

2) LouisianaMap Data Services:

LAGIC data assets have been replicated and transferred to the LouisianaMap data server(s) maintained by the Division of Administration, Office of Information Services (OIS). Additional details are provided in the Technical Support and Applications Development section.

a. Database System Management:

To accommodate additional datasets and map service cache, storage space on the DOA storage area network was increased to 800GB and assigned to the 1SPGISSDE server. Additional data resources are obtained from the SDE data layers maintained by LAGIC, on the LSU Campus.

b. DBMS Organization:

To ensure efficiency and replication needs, the organization of the LouisianaMap data servers mimic the structures maintained on LAGIC servers(see above).

c. Data Replication Services:

Interest has been expressed to extend the LouisianaMap data services capabilities to members of the LGISC and Louisiana geospatial community. This has prompted LAGIC Technical staff to explore data replication strategies that can be utilized across heterogeneous networks and the Internet. As time permits, capabilities testing will be incorporated within the LouisianaMap services program (see below).

d. Web Usage Monitoring:

LAGIC is currently examining resources for monitoring and tracking system usage. Recommendations made in Q4 include Google analytics and AWStats. Both are currently have been implemented and undergoing assessment.

Technical Support and Applications Development:

1) LouisianaMap:

The portal is accessible via <http://map.la.gov>. The following geospatial assets are available to the public:

a. Data Services:

LouisianaMap currently hosts a number of active geospatial data services and mapping applications:

- i. Basemap services include: the US Census Bureau's TIGER/Line 2006 [map], Satellite and High-resolution aerial photography [imagery], and a service consisting of both satellite and basemap features [hybrid]. This application is available online: http://map.la.gov/explore_map.html
- ii. Supporting the basemap services are the LSDI geospatial data services: thematic map services that feature data layers represented in the LSDI framework. Available services include Biological, Cadastral, Demographics, Imagery, Land Use, Transportation, and more. Weather data services added in June 2009. All services are accessible via ArcGIS desktop and server clients. Users can browse and access services here: http://map.la.gov/resource_center.aspx
- iii. All services are available via the LouisianaMap services directory: <http://map.la.gov/lamap/rest/services>

Basemap and Data services are available for *ad hoc* mapping. These include address matching and geocoding services (hosted by ESRI), 2008 presidential election results, and the LOSCO public marinas and boat launches.

All data services are accessible via Web-based clients, and compatible GIS software platforms, including Google Earth, NASA World Wind, Gaia 3.2, and all contemporary ESRI GIS platforms (e.g. ArcGIS Desktop and Server).

b. Applications Development:

Development of the LouisianaMap 2.0 mapping application platform has been the primary focus for the last three quarters. A number of key map applications and services have been developed, including:

- i. LouisianaMap 2.0 Base Map: Base-map of Louisiana constructed using U.S. Census Bureau's TIGER/Line 2006 Second Edition data layers. Map services are cached to 9 scale levels, resulting in highly-responsive, interactive mapping. Services include basic map manipulation functionality, including zoom in/out, and pan. Advanced functionality requiring advanced programming is currently being developed by ESRI developers (e.g. printing, geocoding/address matching). The LouisianaMap 2.0 base map is also available broadly via the ESRI [Data Resource Center](#).
- ii. Explore Louisiana 2.0: Map application utilizing the LouisianaMap 2.0 base map. In addition to the functionality identified above, the mapping application includes an identify tool that can be used to reveal attribute details regarding user-selected parishes. http://map.la.gov/explore_map.html
- iii. LOSCO Boat Launch & Lift Locator: Map application that reveals the location and details of publically-accessible boat launches throughout south Louisiana. Boat launch data

was provided and maintained by the Louisiana Oil Spill Coordinator's Office (LOSCO).
http://map.la.gov/losco_marinas.html

- iv. **2008 Election Map:** Map application utilizing the LouisianaMap 2.0 base map and election results provided by the Louisiana Secretary of State office.
http://map.la.gov/elections_20081104.html
- v. **Weather Services** (proposed): With the availability of weather data services, a project is being developed to push a Weather Mapping application online. This concept is under development.
- vi. **Broadband Mapper** (proposed): LAGIC is participating with numerous stakeholders in an effort to map broadband access across the state. In an effort to coordinate this initiative with the State's interests, LAGIC will examine ways in which LouisianaMap can be utilized as a clearinghouse for the map initiative. This concept is under development.

c. System Updates

ESRI has released a point-upgrade to the existing map services software. LAGIC will coordinate with OIS on system backups and general upgrade of the server software. This upgrade will be scheduled in the first quarter of the 2009-10 contract.

d. Data Replication & Distributed Data Services:

As indicated earlier, various LGISC members have expressed interest in extending data services to the GIS Council and Louisiana geospatial data community as a whole. The scope of these services have not been defined, and technical challenges relating to the replication and exchange of data across heterogeneous networks will need to be examined. Additional information will be compiled as time permits.

2) Custom Services

LAGIC supports a number of custom services on the LouisianaMap platform.

a. Image Services:

As mentioned earlier, LAGIC Technical staff have implemented the ESRI ArcGIS Image Server (hosted at LAGIC) as a means for quickly distributing raster data to users. NAIP 2007 and LIDAR DEM services are accessible via the [LouisianaMap Resource Center](#). The 2008 Central Gulf Coast DOQQs will be made available in future quarters.

b. Globe Services:

In addition to the services listed above, LAGIC has explored various strategies for publishing globe services. Samples included historic maps obtained from the US Library of Congress, demographic data, election results, hurricane maps, and more. These map services will utilize ArcGIS Explorer, Google Earth, and NASA World Wind globe/visualization software (when possible). Select [globes](#) are available on the LouisianaMap 2.0 Web site.

c. Ad Hoc Services:

The success of the map and data services provided during the 2007 hurricane season has prompted a number of inquiries about similar resources during the 2008 hurricane season. LAGIC has begun developing this service, and will make it available as time and resources permit. This service will extend the weather data services, which were published in June 2009.

d. Custom Map Applications and Services

Support for additional mapping applications is currently being considered, including Flex mapping applications, Google Maps applications, Microsoft Live Maps applications, geoprocessing (e.g., buffer and analyze, add, and edit) services, OGC Web Feature Services, and more.

In an effort to reduce redundancy and prevent confusion resulting from multiple resources, LAGIC is also coordinating efforts with various GIS stakeholders via regular coordinating meetings of the LouisianaMap committee of the Louisiana GIS Council. Additional coordination efforts will be extended to the Council's Digital Data committee.

3) Support Services

a. ArcGIS Server and LouisianaMap User Groups

LAGIC Technical Services is coordinating the ArcGIS Server developer's support group. Group members include public and private sector geospatial professionals. Currently, the User Group has an online presence hosted by Google Groups. LAGIC also maintains the LouisianaMap User Group on the same Google Groups platform. Currently this group is closed to new membership. New members will be accepted on a limited bases starting in Fall 2009. LAGIC serves as the group administrator for both Google Groups.

b. Ad Hoc Support:

LAGIC Technical services staff continues to participated in, and responded to, various support requests, meetings, and more. Support requests are primarily issued by LGISC members and partners. Such requests generally involve questions surrounding GIS issues (e.g. trouble shooting, configuration inquiries, and implementation strategies).

LAGIC Technical Support Services:

1) System Support - LAGIC

a) Systems Administration:

LAGIC technical staff continues to maintain/support geospatial data systems and services (see above) on the following hardware assets:

i. Application Servers:

- Dell PowerEdge 2600 Server hosting SQL Server 2005 DBMS and ArcSDE Server. Suffered failures resulting from an electrical fire. System down.
- Dell PowerEdge 1900 Server hosting ArcGIS Server, ArcGIS Image Server.
- Dell PowerEdge 830 Server hosting LAGIC/Council centric Web, Email, and File services. System pending.
- Dell PowerEdge 840 Server - auxillary data services added as replacement for Dell PowerEdge 2600.
- Dell Power Edge SC430 Test Server hosting ArcGIS Server applications.
- Miscellaneous Test Server -- custom built server used to support data service following electrical fire. Temporary.

ii. Workstations & Desktops:

- Three Dell Precision T7400 production workstations
- Two managed desktops

- iii. Mobile Training/Laptops
 - Twenty-Five laptops

Where ever possible, all outdated computer/hardware are upgraded, re-assigned, or scavenged for parts. Scrap is collected by LSU property management.

b) *Networking:*

LAGIC technical staff continue to work closely with LSU ITS-NI with various small networking and/or enterprise IT issues (*e.g.* connectivity, security, *etc.*).

2) Technical Support - LAGIC

a) *Ad Hoc Service & Support:*

LAGIC technical staff members continue to support all LAGIC related IT issues and requests, and troubleshooting. These include, but are not limited to, technical training, systems preparation, network management, training and outreach support, and systems management.

b) Broadband Technology Opportunities Program (BTOP):

LAGIC and the LGISC were approached by LSU and the Louisiana Optical Network Initiative (LONI) to provide mapping support for a Broadband Technology Opportunities Program (BTOP) grant imitative. The BTOP grants are issued through the National Telecommunications and Information Administration (NTIA), and the Rural Utilities Service (RUS). Coordinating meetings were held in order to identify how best LAGIC can provide mapping support for the State various broadband grant initiatives. LAGIC is looking to secure a technical mapping service roll in the State's efforts to deliver broadband to underserved communities. More details as they become available.

3) Technical Support - LGISC

a) *Ad Hoc Administrative Support:*

- i. Participation in LAGIC Oversight meetings.
- ii. Technical staff continues to respond to miscellaneous technical request and support from both the GIS Council and LSU GIS Community.
- iii. LGISC LouisianaMap committee meetings.
- iv. 2009 Louisiana Remote Sensing & GIS Workshop
- v. Miscellaneous desktop and IT support for LAGIC training and outreach.

Short-term Outlook:

In light of the recent budget cuts, the extent of our ability to provide technical services and support will be limited. LAGIC technical services has begun scaling-back and suspending services in order to accommodate the significantly reduced budget. However, all efforts are being made to minimize disruptions to LouisianaMap and LGISC support. The deployment goals and objectives established in the LAGIC contract must be revised. Additional impact is expected in our ability to take-on *ad hoc* tasks that do not result in direct, quantifiable benefit to LAGIC or LouisianaMap . Staff morale is down as a consequence from uncertainty associated with long term viability of the LAGIC program.