# LAGIC Technical Services Quarterly Report

## April - June, 2008

July, 2008

**Summary:**

During the fourth quarter of the 2007-2008 contract, tasks were generally split between LouisianaMap 2.0 geospatial portal development and LAGIC staffing issues.   LAGIC Technical Services manager and OES director coordinated on the development of a contract between ESRI and OES.  The scope of services would result in applications development and support for LouisianaMap 2.0 web mapping applications.  Additionally, the LAGIC Technical manager worked closely with developers at Methods Solutions, Inc. to generate a geocoding service prototype.

By the end of the fourth-quarter, Technical Services staff consisted of one full-time and one part-time employees.  In early November 2007, LAGIC and LSU coordinated job announcements for a GIS Systems Analyst/Developer and a Systems Administrator.  Interviews concluded in April 2008.  Two candidates were selected to become a Systems Analyst/ Developer and a Systems Administrator.  However, a State-mandated hiring freeze prevented LAGIC from filling the positions during the second half of the fiscal year.   Upon receiving an exemption from the hiring freeze in June, job offers were eventually issued to candidates.

In February, LAGIC technical services staff were asked to participate in the ESRI ArcGIS 9.3 Beta program.  LAGIC worked with LGISC member agencies that also invited to participate in the Beta program.  In-house testing primarily focused on performance issues, as well as enhancements made to the ArcGIS Server 9.3 platform.

During the first week of April 2008, Technical staff members provided services and support for the 2008 Louisiana Remote Sensing & GIS Workshop (LA RSGIS) held in New Orleans, LA.  Additionally, LAGIC Technical Services manager moderated a Web mapping presentation session.  Concurrently, LAGIC technical services staff coordinated the first meeting of an ArcGIS Server User Group, held in conjunction with the LA RSGIS workshop.  Approximately 40 people attended the pre-workshop meeting.

Finally, a significant number of technical enhancements to hardware, software and services were performed during the fourth quarter.  Details of these enhancements and other related technical issues are provided in the following text.

**Administrative & Staff:**

1) *Staff:*
LAGIC Technical Services currently employs one fulltime professional, and one part-time graduate assistant.  As permitted by LSU policy, graduate assistant Jinwoong Yoo will begin a full time schedule during the summer term.  Mr. Yoo will return to part-time status in the Fall.

During the early part of Q4, candidate interviews were convened for the two vacant technical positions (*i.e.* systems administrator and systems analyst/developer).  Interviews took place between March and April 2008.   The interviews consisted of informal and formal meetings that were conducted between candidates, LAGIC staff, and members of the LGISC oversight committee.  Following these interviews, qualified candidates were identified and recommended for hire.  However, a State-wide hiring freeze initiated by the Louisiana Division of Administration (LDOA) prohibited LAGIC and LSU from offering the positions until an exemption could be secured.  By May 2008, an exemption request was submitted to LDOA by LSU Human Resources.  By early June 2008, LAGIC was notified that the exemption had been approved.  Formal job offers were issued by Mid-June, with anticipated hire-dates between July and September.

2) *Training:*
LAGIC technical staff participated in a few hands-on training sessions during the fourth quarter.  Most sessions were informal review of existing software functionality.  Training provides necessary introductions/reviews of the various hardware, software, and data services utilized and/or maintained at LAGIC.

LAGIC technical staff have also begun developing in-house user guides and procedural manuals for various software systems and services (*e.g.* ArcSDE, ArcGIS Image Server, *etc.*).  These documents will be available to technical staff and GIS council members.

**Data Management & Services:**

1) *LAGIC Data Services:*
Upgrades to the LAGIC geospatial data collections and services are nearly complete. These updates include:

a. *Database System Upgrades:*
As a result of an inventory of system requirements and capabilities conducted during the third-quarter, recommendations were made to upgrade LAGIC's existing database server.  To that end, a new server was configured and purchased.   DBMS migration is expected during the first quarter of the 2008-09 LAGIC contract.  The existing hardware will be recycled within LAGIC for web-base application services.  No significant software or hardware upgrades were performed on the database during this quarter.  Software upgrades are anticipated in future quarters (*e.g.* ArcSDE 9.3, MS SQL Server 2008, Postgre SQL test/development environment).

b. *DBMS Organization:*
Currently, the LAGIC DBMS consists of six (6) geospatial data services:

     i.   LAGIC (in-house/production database)
     ii.   Louisiana Spatial Data Infrastructure (LSDI) [UTM & GEOG]
     iii.   US Census Bureau TIGER/Line - Second Edition 2006
     iv.   LOSCO Data Catalog
     v.   Louisiana Geographic Names Information System (GNIS)
     vi.   Louisiana Recovery Authority - Louisiana Speaks datasets

LAGIC's primary spatial data inventory system is maintained within the LSDI.  The LSDI data structure is organized hierarchically according to *framework data layer category*, *feature name*, *data provider*, and *year of publication* (see Figure 1 in Appendix). 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.

c.  *File-based Organization:*
Data provided on the ArcSDE geospatial database is also available online for broad distribution.  Data layers have been exported as ESRI Shapefile format, and include properly attributed 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/](http://lagic.lsu.edu/geodata/)

In March 2008, the LGISC, LAGIC, Louisiana Recovery Authority (LRA), Center for Planning Excellence (CPEX), Calthorpe  Associates (LRA contractor), and Dr. John Pine (LSU) participated in a conference-call regarding data quality concerns observed within the Louisiana Speaks GIS data layers.   It was concluded that a revised version of the LRA data and metadata would be developed and re-submitted for distribution.  By April, a second edition of the Louisiana Speaks GIS data package was issued.  This update replaces the existing package available on the LAGIC web site.

In accordance to contracted deliverables, a catalog detailing the LAGIC geospatial data assets has been published : *The 2008 Louisiana Spatial Data Index (LSDX)*.  Details about this product will be forthcoming.

d.  *Miscellaneous Data Services:*
LAGIC Technical staff continues to work closely with the technical administrators of the Geospatial One-Stop (GOS) regarding metadata harvesting.   Due to an as-yet-undefined technical problem, the GOS is incapable of harvesting the geospatial metadata assets served from the LAGIC Z39.50 index server.  As an alternative to the ISITE service, a file-based harvesting technique has been utilized.  While effective, this file-based harvesting is inefficient, and requires more hands-on support than the ISITE solution.  Accordingly, only a limited number of metadata records are available via the GOS.  LAGIC will continue to work with GOS administrators in resolving the ISITE (Z39.50) index problem.

LAGIC Technical staff continue to examine ways in which to optimize the 2007 NAIP aerial photography (1-meter, true-color photography) acquired from the US Dept. of Agriculture. Due to display problems attributed to the data's image compression routine (MrSID wavelet compression), the data must be manipulated in order to provide as a distributed internet service. Options are being pursued that will allow LAGIC to acquire the un-compressed GeoTIFF images for the 2007 NAIP imagery.

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 Electronic Services (OES). Additional details are provided in the Technical Support and Applications Development section.

   a. *DBMS Organization:*
   Organization of the LouisianaMap data servers mimic those created at LAGIC (see above).

   b. *Data Maintenance:*
   Updated LRA Data will be uploaded to the LouisianaMap servers is planned.

   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, testing for these capabilities will be incorporated within the LouisianaMap services program (see below).

## Technical Support and Applications Development:

1) ***LouisianaMap 2.0:***
*Data Services*: Various data layers have been successfully uploaded to the LouisianaMAP Spatial Data server. To date, this data includes US Census Bureau's TIGER/Line 2006, LSDI, and other data products. Additional data layers will be added as needed.

   a) *Applications Development*:
   Development of LouisianaMap 2.0 application services has been the primary focus for the last two quarters. A number of key map applications and services have been developed, including:
   i. <u>LouisianaMap 2.0 Base Map</u>: 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 factors, resulting in highly-responsive, interactive mapping. Services include basic map manipulation functionality, including zoom in/out, and pan. Additional functionality is planned (e.g. printing, geocoding/address matching).
   ii. <u>Explore Louisiana 2.0 (BETA)</u>: 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. Much of the custom functionality of this application required the assistance form ESRI technical services.

     iii.   <u>LOSCO Boat Launch & Lift Locator</u>: 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).

The map applications and services presented above are accessible via the LouisianaMap beta site: http://map.la.gov/maps/.  In addition to the web-based interface, users can access these data services via ArcGIS compliant applications, including ArcGIS ArcMap, ArcCatalog, ArcGIS Explorer, and Google Earth (limited availability).

*Note: these services are beta, and are under constant revision.*

In addition to the services listed, a number of enhancements are planned.  Development of these capabilities will be coordinated through a technical-services contract with ESRI.  OES, LAGIC, and ESRI have negotiated a services and support contract that will detail LouisianaMap 2.0 developmental services performed by ESRI.  A draft scope-of-services was submitted in March 2008, and delivered to the OES Director for review.  In June, OES Director assigned responsibility for the contract to LAGIC and LSU.  Details regarding the status of this contract will be available in the next fiscal year.

Furthermore, OES, LAGIC, and Methods Solutions have begun development on a geocoding service that will allow users to dynamically geo-reference and map non-spatially enabled datasets.   A number of translation strategies were explored, including a Geographic Markup Language (GML) based service that geo-tags XML based data. Following a requirements analysis, a working prototype was developed and tested during Q4.  In general, the service parses each data record in order to identify any geographic references stored within the data fields (e.g. city, town, address, etc.).  These references are assigned a geographic coordinate to the record according to the GML open-source standards.  For this initial environment, reference data was limited to the USGS GNIS database for Louisiana.  Future reference database are planned.   This preliminary service has demonstrated the validity of this geocoding approach.  Modifications to the service are anticipated over the coming months that will address limitations to the existing service model.

b)  *Data Replication & Distributed Data Services:*
As indicated earlier, various LGISC agencies 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**
a)  *Image Services:*
As mentioned earlier, LAGIC Technical staff have been experimenting with ESRI Image Server as a means for quickly distributing raster data to data users.   Initial tests at LAGIC suggest that there is a measurable performance increase when using the software.   The 2007 NAIP photography will soon be deployed by the LAGIC image server, with a demo

available in January 2008.

b) *Globe Services:*
In addition to the services listed above, LAGIC has begun to prepare globe services that present historic maps obtained from the US Library of Congress. These map services will utilize ArcGIS Explorer, Google Earth, and NASA World Wind globe/visualization software. Globe services will be 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 will entertain these requests as time and resources permit.

3) **LAGIC Technical Services**:
a) *2008 Remote Sensing & GIS Workshop:*
Technical Services staff provided support for the 2008 Louisiana Remote Sensing & GIS Workshop, which occurred in April 8-10 in New Orleans. This support extends to the development and maintenance of the Workshop's web site, email notifications, post-card announcements, mail-outs, news, and agenda updates.

The LAGIC Technical Services manager agreed to moderate the Web Mapping Applications session to be held during the 2008 RSGIS workshop. Additionally, the Technical Services Manager will demonstrate many of the newly created LouisianaMap 2.0 mapping services during the session.

b) *ArcGIS Server User Group:*
LAGIC Technical Services has coordinated a first meeting of an ArcGIS Server developer's support group. LAGIC is coordinating this effort with various members of the GIS Council (currently LDOTD, LDEQ, and Lincoln Parish) and other interested parties. The first meeting coincided with the 2008 Louisiana Remote Sensing & GIS Workshop, held April 8-10, 2008. Approximately 30 people attended the meeting, which included guest speakers from ESRI San Antonio regional office.

## LAGIC Technical Support Services:

1) LAGIC technical staff continues to maintain geospatial data systems and services.

   As per recommendations following the annual technology inventory, additional hardware upgrades are planned in the coming quarter.

2) 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, and systems management.

3) Ad Hoc Administrative Technical Support
   a. Participation in LAGIC Oversight meetings.

b. Technical staff continues to respond to miscellaneous technical request and support from both the GIS Council and LSU GIS Community.

## Short-term Outlook:

Anticipating new Technical support staff by the end of the first quarter of the 2008-09 contract.

Additional efforts developing the data and application services at LouisianaMap 2.0 are planned for the first quarter of 2008-09.

The 2008 ESRI International User Conference will be held in San Diego, CA during the first week of August, 2008.

LSU Information Technology has announced changes to the existing network topology. These changes have yet to be clearly defined, and their impact on LAGIC's existing workflow is unclear. Additional information is expected in the coming weeks.

**End of Year Summary of Deliverables:**

| Task One Deliverables: Geospatial Data Management & Services | |
|---|---|
| TASK DESCRIPTION | STATUS |
| a)  Internet accessible catalog of Agency/Organization geospatial assets | Continuous |
| b)  Continued operation of the geospatial metadata catalog | Continuous |
| c)  Annual Report on the status of the Framework Data Development  (e.g. LSDX) | Completed |
| d)  Maintain an inventory of Louisiana Framework data layers | Continuous |

| Task Two Deliverables: Technical Support & Services | |
|---|---|
| TASK DESCRIPTION | STATUS |
| a)  Provide technical services for the support and enhancement of the LouisianaMap geospatial portal<br>　　i.　　Deployment of geospatial information and mapping services<br>　　ii.　　Support open standard data services<br>　　iii.　　Deploy Standardized Framework data services when available | Continuous |
| b)  Develop processes and guidelines for Framework data migration as directed by OES or LGISC | Completed (as needed) |
| c)  Publish general guidelines regarding GIS functional and technical requirements | Completed |
| d)  Deploy Framework data assets via open distribution protocols | Continuous |
| e)  Conduct technology evaluations and produce evaluation reports as directed by OES or LGISC | Completed |

| Task Three Deliverables: LAGIC Technical Support | |
|---|---|
| TASK DESCRIPTION | STATUS |
| a)  Progress reports on IT support activities | Completed |
| b)  Maintenance and enhancement of various LAGIC and LGISC websites | Continuous |
| c)  Provide technical support for briefings, workshops, presentations, and/or other LGISC activities | Completed |
| d)  Deliver generalized IT support for LGISC and LAGIC | Continuous |

# Naming Concept - Geodata Framework
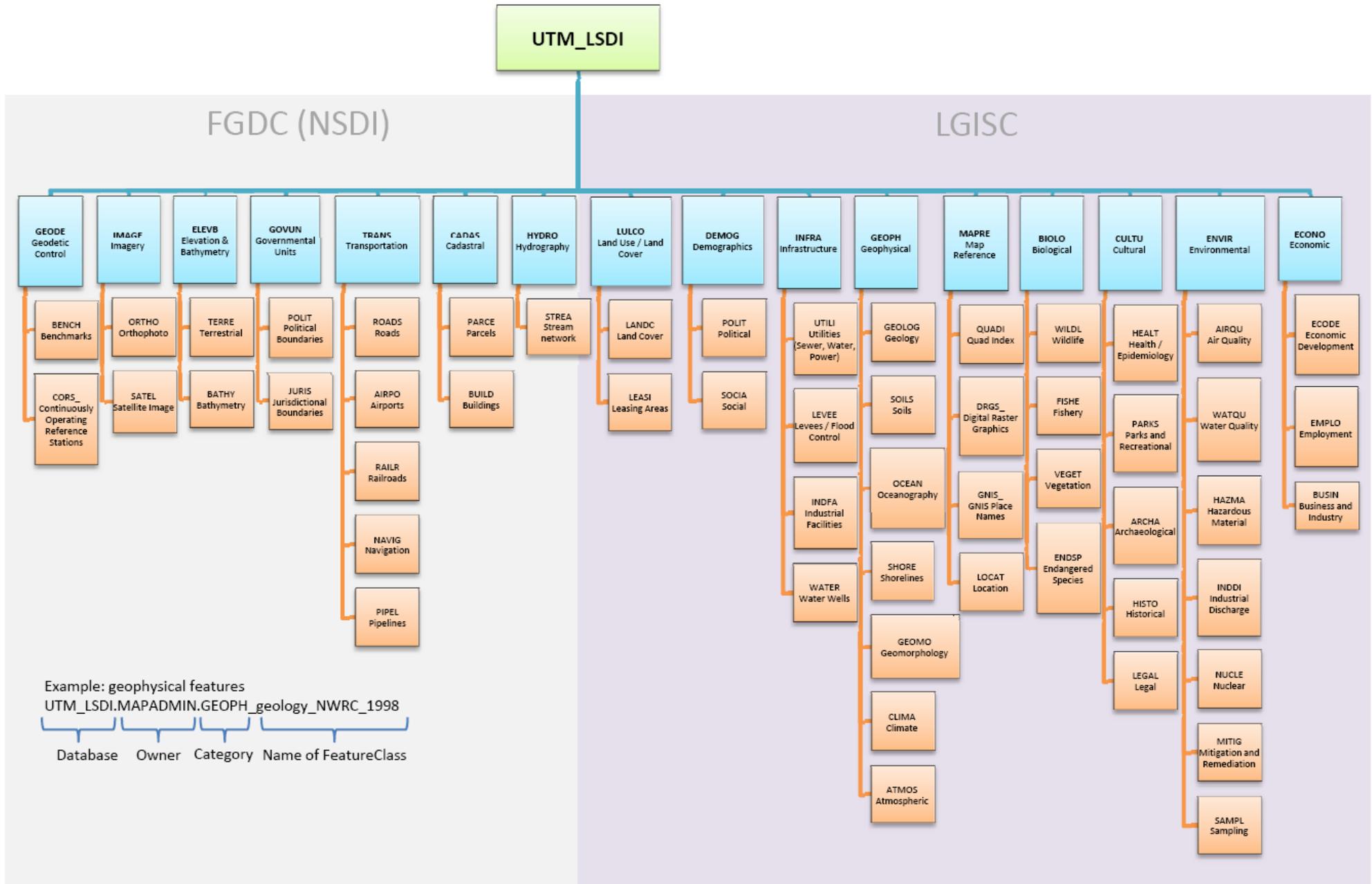## Version 1.1 09/30/2007



**Figure 1: Naming Concept for the Geodata Framework** – Günther Sagl (9/30/07)