Advancing Louisiana State University to become a disaster resistant university through the use of GIS
LSU Facts and Info

35,000 students and faculty

On-Campus EOC

2000 acres and 250 primary buildings

Internal utilities and generators

Louisiana State University
Baton Rouge, LA

ESRI Federal User's Conference  February 2008
Issues of concern…

- Proximity to the Mississippi River (hazardous barge materials)
- Proximity to major railroad (hazardous boxcar materials)
- Concentrated population during LSU home football game (100,000 - 150,000 people in one area)
- Chemical and biological materials on-campus in research labs
Purpose

- Develop a partnership with a local University to share data and other valuable resources during disaster events
- Assist in developing new data that didn’t exist but is critical to the long term recovery and response missions
- Provide guidance on disaster resistant university criteria
From Vision to Action…

- After a meeting at the LATRO in Baton Rouge, the FEMA GIU was approached by an LSU EOC representative (Joe Thompson).

- Joe wanted to map the LSU campus.

- Sounded simple enough…right?

- Not exactly

- How much data is too much?

- What layers should you collect by priority and what level of accuracy…100 feet…sub-meter…sub-centimeter??
A Phased Approach

- The team decided to take a phased approach to the issues
- Phase I
  a) Identify priority layers
  b) Locate existing data and gaps where data did not exist
  c) If data exists, then convert to a GIS format. If not, decide the means of collection and tools needed
    (Equipment: beg, borrow and squeal if need be…)
  d) Develop an attribute schema
  e) Start collecting and cleaning data
Utilizing existing data

- Contacted LSU Facility Management and CADGIS Lab
- Located all existing campus data layers
- Discovered numerous CAD layers (AutoCAD – multiple versions)
- FEMA team partnered with the USACE to incorporate CAD expertise along with GIS experts
- USACE representatives provided superior expertise and ideas to the project team
- Since their addition to the team, we have published approximately 8 articles, two of which were printed in professional journals and magazines
Methodology

- Converted AutoCAD .dwg files to ArcGIS formats
- Inconsistent scales and lacked geospatial referencing
- DWG files were in different versions of AutoCAD
Methodology (continued)

- Leveraged ArcMap database linkages by setting up a MicroStation tag set
- Captured the building name and ID along with the room number and floor
- Convert the tag sets to attributes to join to LSU’s Facility Management
- Critical data such as chemical and biohazard locations by room/floor
Methodology (continued)

- Used ArcCatalog to export to shapefile
- Performed data verification
Methodology (continued)

Shapefile was migrated to the project geodatabase once it was verified.

View of the resulting attribute table for one floor.
What about the non-existing data?

Phase I approach:

a) Identify priority layers.
b) Locate existing data and gaps where data did not exist.
c) If data exists, then convert to a GIS format.
   If not, decide the means of collection and tools needed.
d) Develop an attribute schema.
e) Start collecting and cleaning data.
Surveying and Mapping

- Surveying provides highly accurate acquisition of survey-grade measurements.

- Mapping is fast and flexible for collecting features and attributes.
Accuracy

Signifies the absolute nearness of measured quantities to their true values.
Point Development

- Project and Job Coordination
- Department’s Purchasing Procedures
- Equipment Standards
- Data Collection Standards
- Data Format
- Policy for Data Collection
- Exceptions for Data Collection
Data Collection

Department Requesting GPS Points and Data

Individual Collecting Data

Equipment Based on Data

Real-time Corrections

No

Post-Processing

Yes

GPS Data Exported into Required Format

Data is Emailed to Staff Requesting Points

Data is Uploaded to Department’s Database and Existing Data is Archived

Fail

Fail to GIS Coordinator For QC Review

Pass

Data is Emailed to Staff Requesting Points

Errors

Pass
Successful Field Work

- What points need to be collected
- Creating a customized attribute library
- Environment such as trees, water, and students
Gas Lines and Valves
Buildings
Critical Infrastructure & Security

- Buildings
- Chemicals
- Traffic
- Emergency Management
- Sporting Events
- Campus Growth
Medical Special Needs Shelter
LSU Tiger Football
Future of Collecting GPS Points

Real-time GPS Data
Summary

- Phase I is near completion
- Identified priority layers (Critical infrastructure and campus roads)
- Located existing data (AutoCAD files)
- Converted existing data (near completion)
- Collected new data (over 7000 data points and all campus roads)
- Developed an attribute schema to integrate with LSU Emergency operations and facility management needs
Contact Page

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