Appendix C
Data Repository – Organization and Content

In an effort to facilitate more efficient data searching, the taxonomy for the IPET Data Repository has been reorganized according to Pre-Katrina and Post-Katrina data. While the Pre-Katrina data is still organized primarily according to New Orleans Hurricane Protection Projects and the type of data stored (as shown in Report 1, Appendix G), the Post-Katrina data is currently organized as follows:

- (IPET) Interagency Performance Evaluation TaskForce
  - News Releases
  - Presentations
  - Reports
  - Soils
  - Structures
- Region Wide Data
  - Basemap
  - Presentations
  - Reports
- Photographs
  - 17th Street 2005 Sep Oct Nov
  - 17th Street Slide Block Cores 2005 Oct Nov
  - 9th Ward
  - Bayou Bienvenue 2005.09(Sep)30 10(Oct)05 06
  - Bayou Dupree
  - Chef Menteur Hwy US 90
  - Entergy Plant – Paris Rd and GIWW 2005.09(Sep)
  - Helicopter Tour 2005.11(Nov)15
  - IHNC – Inner Harbor Navigation Canal
  - London Canal
  - MRGO
  - MRGO Air Product 2005.10(Oct)05
  - MRGO and GIWW Levee West Boh Bros Contr 2005 Sep and Oct
  - MS River Levee East Bank Vic Pointe A La Hache LA 2005Oct12
  - New Orleans Docks

    - Orleans Canal 2005.09(Sep)29 and 11(Nov)14
    - Orleans Canal Pumphouse 2005.09(Sep)30
    - Orleans Lakefront
    - Plaquemines Parish 2005 Nov
- Project Information Reports
    - Lake Pontchartrain LA and Vicinity
    - New Orleans to Venice
- Structures
    - Floodwall Survey Profiles
    - Miscellaneous Surveys
    - Multi-Beam Channel Data
    - Single-Beam Channel Data
    - Topographic Surveys
- Videos - Aerial
    - New Orleans East
    - Plaquemines Parish Lower
    - Plaquemines Parish Upper
    - St. Bernard Parish

The architecture of the Data Repository, described in the Data Collection and Management section of IPET Report 1, is comprised of three main components: an unstructured data component, a GIS data component, and a large datasets component. An overall data manager integrates the data stored in the three components such that users may access all datasets from one central application without having to know which data is stored in which component. Following is a summary of data that is currently stored in each component of the Repository:

GIS Data Component

GIS is a computer technology that uses a geographic information system as an analytic framework for managing and integrating data, solving a problem, or understanding a past, present, or future situation. GIS provides an automated capability to link information to location data, such as people to addresses or buildings to parcels. The information can be graphically layered to provide a better understanding of how it all works together. A GIS is based on a structured database that describes features (buildings, streets, streams, monitoring wells, etc.) in geographic terms. The visualization component of GIS allows the geographic feature information to be displayed in a map view and supports queries, analysis, and editing of the data. The geoprocessing capabilities of GIS allow users to combine existing datasets, apply analytic rules, and create new derived datasets to support decision making. GIS is generally used as a decision support tool to map the location and description of features, to determine patterns of certain features, to determine what is near a specified feature, to map change in an area, or to perform ‘what-if’ analyses.

USACE enterprise standards have been defined to ensure that GIS is implemented and managed in a manner that facilitates data sharing and interoperability. An important feature of the enterprise GIS architecture is its scalability and repeatability across corporate, regional, district, and field office

levels. Scalable refers to its ability to accommodate a range in volumes of data and users, while repeatable means that this configuration can be replicated at corporate, regional, district, and field levels.

GIS is a fundamental component of this performance evaluation. GIS is being used to perform structural, hydrologic, economic, and risk analyses and visualizations. The Hurricane Protection System (levees, pumping stations, floodwalls), breach locations, roads, water bodies, parish boundaries, levee districts, digital elevations, and high water marks are just a few of the real-world objects represented as GIS features (Figure C-1).

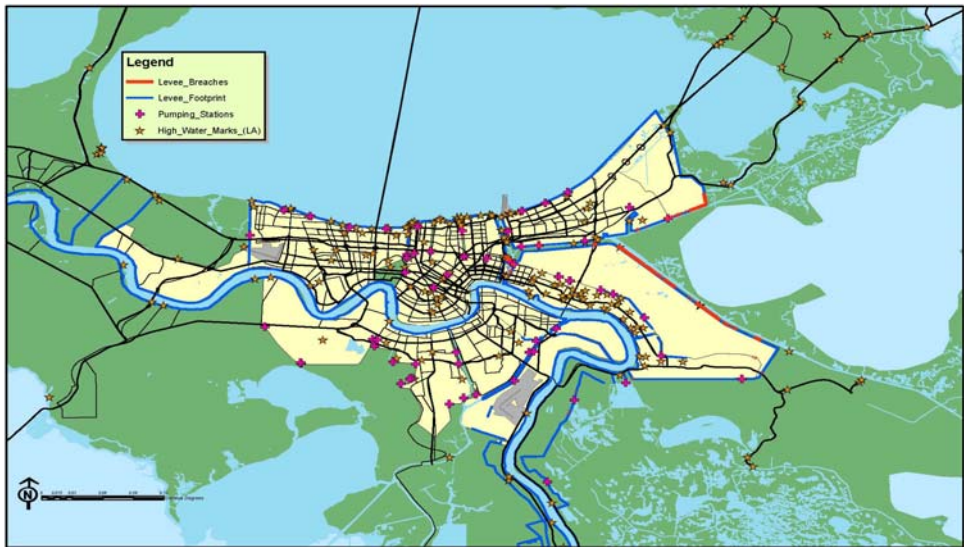

Figure C-1. Example of GIS features displayed in ArcGIS.

To assure that we are maximizing the effectiveness and efficiency of our geospatial resources within IPET, TFG, TFH, TFX, MVD Forward and MVN, a Geographic Information System (GIS) working group was established. The working group consists of representatives from TFG, TFH, MVD Forward, MVN, and each IPET Task. This group conducts weekly conference calls to coordinate GIS efforts and to facilitate a smooth transition of IPET GIS data to MVN when the performance evaluation is concluded. The IPET GIS component was designed and implemented according to the Corps GIS Enterprise Architecture. Data are stored in an Oracle database on a USACE Central Processing Center server. Metadata is being collected and stored according to the FGDC metadata standard. Web Mapping Services are being developed to deliver some of the data layers and documents produced by the IPET. All USACE GIS users can request and receive access information to connect to this data. GIS data that is being developed by MVN, MVD Forward, TFG, and TFH will be sent to the IPET Data Manager for inclusion in this enterprise GIS database.

Once the IPET has completed their work, all raster products, vector data products and data sets will be replicated on MVN servers in Oracle databases. This will allow quick retrieval of large raster and vector products at MVN and

provide a mirrored back up system at MVD to protect against data loss from catastrophic events.

Large Datasets Component

Large Datasets, such as LIDAR, imagery, and Digital Elevation Model (DEM) data, are stored on a terabyte server, with metadata and geospatial extents of each dataset stored in an Oracle SDO database. Currently, the following datasets are available:

- LIDAR data for both pre-Katrina and post-Katrina timeframes at varying resolutions and spatial extents
- DEM datasets derived from LIDAR data
- Existing pre-Katrina DEM datasets provided by other organizations

Table C-1 lists the DEMs that have been adjusted to the new vertical datum (NAVD88 2004.65) as well as the source from which they were derived and other metadata about the source.

Table C-1

DEM	Source	Collected by	Year Collected	Postings	Coverage
Pre-Katrina 1ft. Levee	LIDAR	John E. Chance Inc.	2000	Horizontal ~1ft.	Levees alignments surrounding East Orleans, Pontchartrain South Shore, St. Bernard Parish (MRGO, ICWW)
Post-Katrina 2ft. Levee	LIDAR	John E. Chance Inc.	2005	Horizontal ~2ft.	Levee alignments surrounding East Orleans, St. Bernard and Plaquemines
Post-Katrina 3ft. Levee	LIDAR	Joint Airborne Lidar Bathymetry Technical Center of Expertise	Jan-06	Horizontal ~3ft.	Levee alignment and back of levees for Pontchartrain South Shore, London Ave. Canal, 17th St. Canal, IHNC
Pre-Katrina 15ft. Interior	LIDAR (existing DEM from http://atlas.lsu.edu)	3001, Inc.	2003	Horizontal ~15ft.	All surface areas in Southern Louisiana

The following procedure was followed to adjust the data posted in NAVD88 elevation to the new NAVD88 (2004.65) elevation datum:

1. The location and elevation of the available NGS (National Geodetic Survey) control points for the New Orleans area were obtained from IPET Vertical Datum team. These points have both the old (date varies) and new elevation values obtained from NGS.

2. The deviations from the old elevation to the new elevations were computed for each point using the following equation: deviation = old_elevation – new_elevation. Since all new elevation data is lower than the old data, all deviation values were positive. The data was converted to feet using the

following conversion factor: 1 m = 3.28083333 ft. The values and associated computations were stored in a spreadsheet table.

3. The location and deviation values were converted into ESRI generate format. Only those control points where both old and new elevations were known were converted.

4. The deviation values at these control points were used to create a raster deviation surface with 1000' horizontal spacing using the following ArcInfo command:

```
idw0_100 = idw(adjust.gen, #, #, 2, SAMPLE, 12, #, 100,
3227549.1114483, 181878.84143203, 3936932.6150204,
733296.72876957)
```

5. The deviation surface was then rounded to three decimal places to reduce interpolation artifacts using the following ArcInfo command:

```
idw1_100 = (float(int( ( idw0_1000 * 1000) + .5)) / 1000)
```

6. The deviation surface was split into tiles to match the tiling of the DEMs and the spatial resolution changed to match the 1' horizontal spacing of the elevation data.

7. Each raster tile from the data set was then converted to the new datum by subtracting the deviation surface from the elevation data.

Following the datum adjustments, control data collected by the Vertical Datum team are used to validate the new DEMs. Currently, all four datasets listed in Table C-1 are undergoing validation.

These datasets are available for download as .zip files from the Basemap/Elevation folders in the Repository. USACE users may directly connect to an Internet portal that provides download capability, https://erdcpw.erdc.usace.army.mil/ldr.

Unstructured Data Component

Unstructured data, such as .pdf files, .doc files, .jpg files, .txt files, .ppt files, etc., as well as engineering design files (.dgn) are stored in a Microsoft SQLServer database managed by Bentley ProjectWise Software. Currently, the following data are stored in this component:

- IPET News Releases
- IPET Presentations
- IPET Reports
- IPET Soil borings and cone penetrometer test data
- IPET Pump Station preliminary performance data for St. Bernard Parish
- USACE Operations Center briefing slides

- Post-Katrina reports
- Photographs of various New Orleans and Southeast La. Sites post-Katrina
- Project Information Reports for the rehabilitation efforts currently underway in New Orleans
- Post-Katrina surveys of the levees and floodwalls
- Aerial videos of the New Orleans and Southeast La. Area
- Annual inspection reports for the maintenance of completed flood control works in the New Orleans District
- NEXRAD hourly gridded multisensor precipitation data for 28,29,30 August 2005
- Pre-Katrina geodetic, geotechnical, hurricane, and miscellaneous reports
- Design Memoranda for the Hurricane Protection Projects within the IPET study area
- Periodic Inspection Reports for the Hurricane Protection Projects within the IPET study area
- Miscellaneous reports related to the Hurricane Protection Projects within the IPET study area
- Plans and Specifications for the some of the Hurricane Protection Projects within the IPET study area
- Contract documents for some of the Hurricane Protection Projects within the IPET study area
- Microstation design files (.dgn) of the Hurricane Protection Projects within the Lake Pontchartrain LA and Vicinity area.

As of 23 February 2006, there were 4,194 documents/datasets stored in the IPET Data Repository.