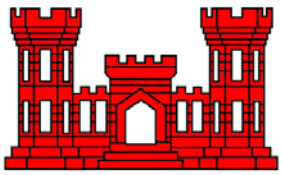
Appendix M
Part 3

GIS Applications for Elevations



U.S. Army Corps of Engineers
Memphis District

Existing data was used to develop contour elevations for the project. U.S. Geological Survey 10-meter Digital Elevation Models (DEM) were obtained from the U.S. Department of Agriculture Geospatial Data Clearinghouse (http://datagateway.nrcs.usda.gov/).A DEMs was obtained for each specific quadrangle[1] map that comprised a portion of the St. Johns Bayou Basin. The DEMs were mosaiced together and then clipped to the overall St. Johns Bayou Basin limits.

USACE previously developed a DEM along the Mississippi River that included the batture area and the New Madrid Floodway by utilizing LIDAR. Applicable project area data was extracted from this overall data set that represented the boundary of the New Madrid Floodway.

Once the data was assembled, the following procedure was conducted to establish contours within the project area:

1. One-foot contours were developed with ArcGIS 9.3, ArcToolbox, Spatial Analyst Tools, Reclassify tool. This resulted in reclassification of the previous data sets into one-foot contours.
2. The reclassified DEM was converted into a polyline utilizing the Contour Tool within Spatial Analyst.
3. Geometry was repaired utilizing ArcGIS 9.3, ArcToolbox, Data Management Tools, Features, Repair Geometery. The input shapefile was each particular contour of interest. This step repaired the polyline coverage and allowed polygons to be created. The following geometry issues were repaired:
    a. Null geometry – The feature will be deleted from the feature class.
    b. Short segment – The geometry's short segment will be deleted.
    c. Incorrect ring ordering – The geometry will be updated to have correct ring ordering.
    d. Incorrect segment orientation – The geometry will be updated to have correct segment orientation.
    e. Self intersections – The geometry's segments that intersect will be split at their intersection.
    f. Unclosed rings – The unclosed rings will be closed.
    g. Empty parts – The parts that are null or empty will be deleted.
4. Once the feature repair geometry step was complete, ArcGIS 9.3, ArcToolbox, Data Management Tools, Features, Feature was accessed to create a polygon coverage from the polyline coverage. The input feature was the particular contour of interest with the output feature class being the polygon coverage created from the input polyline coverage. After the polygon coverage was created, merged individual polygons were created for each particular contour interval.

[1] Specific USGS quad maps are as follows: Anniston, Bayouville, Betrand, Cache, Cairo, Chaffee, Charleston, Charter Oak, East Prairie, Henderson, Hubbard Lake, Kewanee, Morehouse, Morley, New Madrid, Oran, Scott City, Sikeston North, Sikeston South, Thebes, Thebes SW, Vanduser, Wickliffe SW, and Wyatt.