

CITYWIDE FLOODPLAIN MAPPING

Johns Creek, Georgia

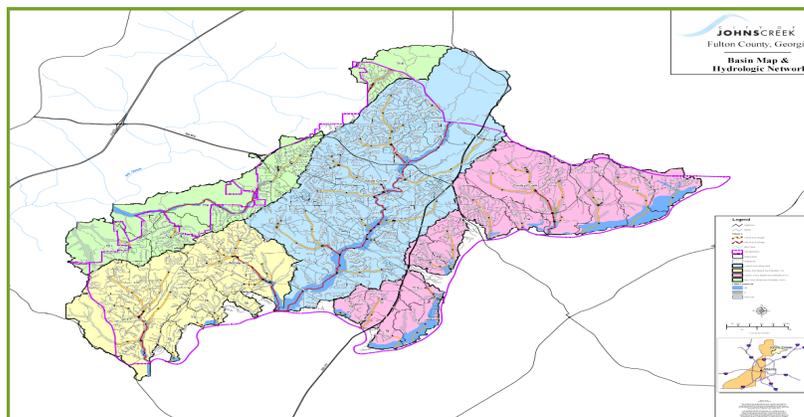


CLIENT

City of Johns Creek, Georgia

SCOPE OF SERVICES

GIS Database Development
Field Survey and Reconnaissance
Citywide Basin and Hydrologic Network
Hydrologic/Hydraulic Analysis and Modeling
GIS-based Floodplain Delineation/
Mapping
Translation of Stormwater Inventory shapefiles to Personal Geodatabase



The City of Johns Creek authorized Manhard Consulting to begin a citywide floodplain mapping effort, which included the modeling and mapping of 22 stream miles within the Johns Creek watershed. Existing and future condition 100-year floodplains were determined and delineated for the 13 square mile basin.

Manhard developed a HEC-HMS flood hydrograph/hydrologic model utilizing ESRI's ArcHydro data model with the HEC-GeoHMS ArcGIS extension. Peak flood discharges were determined along the City's streams for the 100-year storm event. ESRI's ArcMap GIS was used to develop input parameters and digitally setup the HEC-HMS model. Using the ArcHydro Tools and the USACE's HEC-GeoHMS extensions, much of the hydrologic modeling set up is automated. Along streams with existing models, the hydraulic analysis incorporated the new peak flood discharges into updated HEC-RAS models and any necessary modification to the conveyance structures, based on field visits, were integrated. For previously unstudied streams, the HEC-RAS model was automatically constructed using the HEC-GeoRAS extension.

The model was then refined by adding survey data (bridges/culverts/roadways), filtering the cross section lines to remove unnecessary vertices, adjusting channel geometries, and adding ineffective flow areas at structures. The HEC-HMS peak flows were linked to the HEC-RAS model through HEC-DSS (a hydrologic database), the model was executed and resultant floodplain elevations/extents were determined.

Floodplains were delineated utilizing automated floodplain mapping functions within ArcGIS. Results from the final HEC-RAS models were mapped using HEC-GeoRAS, a GIS extension developed by USACE. This procedure provides an accurate delineation of the floodplain on a digital surface, created using the City's 2-foot topographic mapping. Floodplain delineations at roadways and any area with a rapidly changing flood profile required close review and QA/QC.

Manhard's trained engineers and GIS staff are experienced at identifying these areas and quickly correcting the mapping using advanced GIS tools. The digital floodplains were also verified and corrected as necessary by our senior technical staff, who are experienced in reviewing floodplain mapping and delineations. All digital deliverables were provided in a personal geodatabase GIS format and appropriate metadata was incorporated.