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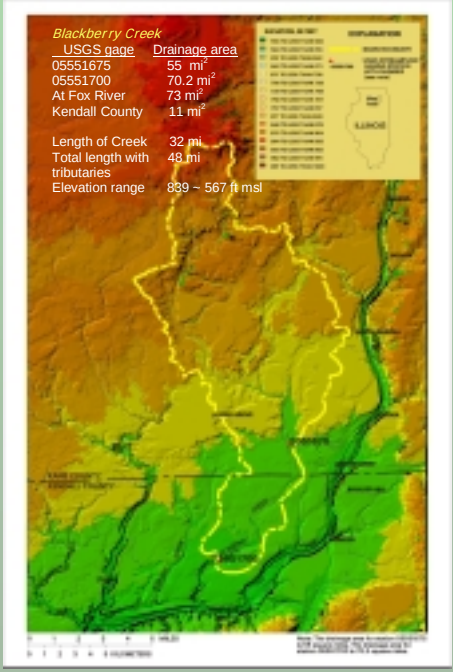
Hydrological Study Activity in the Blackberry Creek Watershed, Illinois

Background

The Blackberry Creek Watershed is a largely agricultural 73-square mile watershed located at west end of Chicago metropolitan area; and across Kane and Kendall Counties. The watershed is developing rapidly with both population and proportion of urbanized land area in the watershed expected to double in the next 20 years. Recurring flooding in recent years has caused concerns about the pace of development and the future conditions of the watershed. The U.S. Geological Survey (USGS) and the Kane County's Department of Environmental Management are developing hydrologic and hydraulic models, based on detailed digital elevation data, to improve and update floodplain delineation. The models also will be used to analyze future conditions according to the land-use plan developed by the county, including detention requirements, flood mitigation, wetland protection alternatives, and water-quality conditions.



Study Objectives

- Create a Digital Elevation Model (DEM) from 2-foot contour elevation data (FEMA 37 compliant).
- Develop HSPF hydrologic and HEC-RAS hydraulic models for future analyses.
- Develop 2-D FESWMS model to study the flood diversion at Jericho Lake.
- Integrate the models with simple querying, analysis, and display systems.
- Produce the inundation surface on Digital Orthophoto Quadrangles (DOQ) acceptable for use in the NFIP.
- Project future floodplain based on projected 2020 land use.

Future Development Plan

Kane County has developed *2020 Land Resource Management Plan* as a guideline how the county and municipalities can work together to assure the sustainable development and resources preservation within the county. A Blackberry Creek Watershed Resource Planning Committee also has been formed.

Approaches and Methodologies

The USGS will analyze watershed processes due to land uses changes according to existing features within the watershed and describe the processes using the HSPF model. After the model is calibrated and validated, it will be used to generate continuous stream flow record at selected locations. The record will be examined and analyzed with statistical methods and for deriving flood magnitude of selected frequencies. The design floods will then be applied to a HEC-RAS model for flood profile analysis, which then be used for floodplain delineation. The HSPF model development will also consider the needs by the county for water quality modeling.
The FESWMS model, also developed on the basis of DEM, will analyze the occurrence and conditions when diversion of flow to the City of Montgomery. The Jericho Lake is located on the watershed boundary.

Other Activities in the Blackberry Creek Watershed

- Kane County is a candidate for the Cooperating Technical Community (CTC) project with FEMA.
- IDNR and USEPA are examining watershed development scenarios and the effects in the watershed and Fox River Basin scales.
- USGS—NAWQA is conducting a land-use gradient study to investigate the water-quality response along urban land-use gradients, the effects on sediment quality and biologic responses because of land use changes. Also are the development of non-linear regression calibration HSPF for hydrologic and water-quality parameters for selected sub-watersheds in selected Fox and Des Plaines River Basins.

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