

## GIS BASED APPROACH TO URBAN RIVER CORRIDOR DELINEATION AND FLOOD RISK ESTIMATION

As urbanization continues to occur at exponential rates in many regions of the world, so too does the modifications to urban streams. “Quick-fix” developmental practices of the past and some uncontrolled developmental practices of the present have resulted in undesirable alterations to the hydrology, morphology and ecology of urban watersheds and streams. As the watershed becomes more developed, it also becomes more hydrologically active, changing the stream’s flow components as well as the origin of flow. In turn, flood flows that once occurred during pre-development periods have now become more frequent and more severe due to the transformation of the watershed from rural to urban land uses. Consequently, the extent of the flood plain is also altered and the risk of flooding imposed on surrounding riparian inhabitants is increased. Despite the advent of more controlled and “environmentally friendly” approaches to watershed planning and development, there remains a need to make the flood plain GIS representation dynamic to respond to the change in river flows due to urbanization and express it in the GIS environment. In addition, there is also a need to develop a GIS methodology for representing flood risks spatially within the corresponding flood plain. These applications of GIS for flood plain delineation and risk estimation would greatly improve, as well as expedite, hydrological modeling capabilities and risk assessment, offering hydrologists and planners the powerful capability to analyze and visually express flood control. The proposed methodologies have been applied to the Oak Creek watershed located within Southeastern Wisconsin, a predominantly rural, yet rapidly developing watershed. The paper will 1) discuss the methodologies utilized for delineating the flood plain and estimating the corresponding flood risk based on stream flow within a GIS environment, and 2) demonstrate the capabilities of spatially representing these two entities.