Flooding in urban drainage basins is controlled by the interplay of a wide range of hydrologic, hydraulic and hydrometeorological processes. From the hydrometeorological perspective, the distribution of extreme rainfall rates at "short" time scales and "small" spatial scales is of fundamental importance for urban flood response. The hydrologic response of urban drainage basins is complicated by: 1) alterations to the drainage network, especially through the storm drain system of an urban drainage basin, and 2) alterations to the infiltration properties of a basin through detention basins and impervious cover. The hydraulic properties of urban stream channels are profoundly influenced by bridges, channelized reaches, detention basins and channel stabilization projects. Hydraulic properties of an urban stream channel are also altered by the river itself as it adapts to the changing hydrologic response of a drainage basin. We examine the hydrology, hydraulics and hydrometeorology of extreme floods in urban drainage basins based on observations from one of the most densely monitored urban regions, the Baltimore metropolitan area. The Baltimore Ecosystem Study (BES), which is a component of the
NSF LTER program, has provided the backdrop for development of an exceptional observational base for examining urban flooding. Analyses are motivated by two problems of prediction for ungaged basins, development of flash flood forecasting techniques for ungaged urban basins and estimation of the T-year floodplain in ungaged urban basins.
DE: 1821 Floods
DE: 1854 Precipitation (3354)
SC: Hydrology [H]
MN: 2003 Fall Meeting