



Flood Risk Analysis in Brays Bayou

Steven Follmer

University of Houston–Clear Lake

ABSTRACT

Houston is a city that is known for flooding. The city has been subject to major flood events especially in recent years, e.g. Tropical Storm Allison in 2001, Memorial Day floods in 2015 and Hurricane Harvey in 2017. However, over the past 60 years Houston has gone from a city of about a 900,000 people in 1960, to over 2.3 million today. This significant increase in population has greatly changed the urban landscape of Houston as the city has been and continues to sprawl outwards to meet development demands. This research focuses on the Brays Bayou watershed that is currently home to over 700,000 people and expected to be under pressure for housing more people in future years. The main objective of this study is to conduct a flood risk analysis of the Brays Bayou watershed under current and future conditions (i.e., the 2040 projections of the region). The study will use the following software: HEC-HMS, HEC-RAS, and ArcGIS. HEC-HMS will be used to analyze the hydrology of the watershed under the latest changes in the Atlas 14, Volume 11 for the State of Texas. HEC-RAS will be used to conduct flood analyses to identify critical areas within Brays Bayou. This study will evaluate possible management scenarios of what could possibly help to attenuate the flooding in high risk areas. The results of this study will include flood hydrographs from HEC-HMS, flood plain maps from HEC-RAS, and hydrologic maps from ArcMap. The overall goal will be to analyze where the bayou is at today and what could be done to mitigate future flood risk.