Wednesday, January 8, 2020

New Location: Craft Republic Houston • 11470 Westheimer Rd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

New Cost: $35 Preregistered members; $40 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.
Pre-registration without payment will not be accepted.
Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

Steve Follmer

Flood Risk and Mitigation Analysis of the Brays Bayou Watershed

Flooding has been a problem of Houston since it was established in 1837. However, over the past 60 years Houston has gone from a city of about 900,000 people in 1960 to over four million today. This dramatic increase in population has greatly changed the landscape of Houston. The city has been and continues to expand outwards in all directions. The Brays Bayou Watershed is currently home to over 700,000 people in Houston. This study will examine the implications due to the recent updated annual exceedance probability (AEP) values on the Brays Bayou watershed. ESRI ArcGIS has been utilized to conduct a hydrological analysis of the watershed. A new model of HEC-HMS has been built using 2018 Lidar data to study the hydrology of the rainfall-runoff in the watershed. A new model of HEC-RAS has been built to analyze the changes that the new AEP values have on the depth and extent of flooding. The results from HEC-HMS show that the median AEP values will cause the discharge to rise by 29% for the 100-Year 24-Hour event and 33% for the 500 year 24-rainfall event at the outlet. The model showed that the peak discharges from Hurricane Harvey could have been reduced by at least 3.5% and volume reduction of 15% with the addition on the proposed detention ponds. The analysis for the 2040 projections shows that the peak discharge could increase in the range from 3.4% to 5.1% depending on the rainfall event. The HEC-RAS model shows three areas of increased water depth at the stream. The three areas coincided with areas of significant elevation change, and adjacent to highways crossing the streams. The lack of space left in the watershed will cause many challenges on the mitigation projects in the future. ■

Biographical Sketch

Steven Follmer has a master's degree from the University of Houston-Clear Lake in Environmental Science with a specialization in Environmental Geology. He also holds the license of Geoscientist in Training. His career began in the Marine Corps in 2005 where he held a number of positions while stationed in Afghanistan, Japan and the U.S. Given his years of military experience, Steven was asked to serve his final assignment as a recruiter for the northeastern region of Texas from 2012-2014. Upon completion of his military service, he pursued a Bachelor of Science degree in Geology with a minor in Environmental Science at Stephen F. Austin State University.