A054 ENGR

Effect of Wind Intensity, Forward Speed, Minimum Pressure, and Track Change on Hurricane Harvey Storm Surge Hindcast

Abstract

It is known that wind intensity, forward speed, minimum pressure, and track change alter the characteristic of a hurricane and resulting storm surge. The present study is based on examining effects of these factors on Hurricane Harvey storm surge hindcast. Hurricane Harvey is the second most costly hurricane ever in United States history by causing over $125 billion damage and killing 68 people in 2017. It caused flooding dropping more than 60 inches of rainfall in Texas. This study is essential to save lives by providing accurate and reliable information to evacuate people before a hurricane strike. SWAN (Simulating WAves Nearshore) and ADCIRC (ADvanced CIRculation) coupled model is used to generate waves and storms. The storm surge model is formulated based on shallow water equations. The wind intensity, forward speed, minimum pressure and track change are varied and analyzed separately to predict the factors that affect storm surges the most. In addition, different combinations of these factors are studied to understand which combination have the most effect on the Harvey storm surges. It is found that shifting the track 5 degree east affects the behavior of the hurricane storm surge the most. Among the combined factors, wind intensity and forward speed have the most impacts.