

WIFM Numerical Model Study. A comprehensive model study was initiated in 1978 to resolve issues raised during litigation against construction of the Lake Pontchartrain Hurricane Protection Barrier Plan. The barrier plan proposed placing barriers across Rigolets and Chef Menteur Passes to exclude the largest portion of an incoming hurricane surge. The model study's intent was examination of the effects of the barrier plan on water quality, tidal circulation patterns, and hurricane surge. An extensive data gathering effort in support of the study included topographic and bathymetric surveys and measurements of stages, velocities and water quality. These data were used to calibrate both physical and numerical models. The WIFM program is a finite difference numerical modeling scheme developed by WES to predict hurricane surge flooding. The grid developed for the model covers most of the coastal area of southeastern Louisiana and part of the coastal area of southwestern Mississippi. For proper generation of the hurricane surge the grid extends well into the Gulf of Mexico. The WIFM results indicated that construction of the barrier plan could decrease stages on its protected side in Lake Pontchartrain and increase stages on the outside in Lakes Borgne and along the MRGO. As a result of these findings we asked WES to further examine the effects of levee height on hurricane stages. WES compared the effects of the high level plan levee heights against levee heights that existed before Hurricane Betsy for several hypothetical hurricanes as well as Hurricane Betsy and the 1915 Hurricane. Attached is a grid illustration of the results of a comparison for the hurricane having a forward speed of 12 mph and a maximum wind speed of 100 mph. Appropriate levee heights are also noted on the illustrations. These comparisons indicated that any increase in levee heights can affect the stages along the portion of the project that receives the brunt of the hurricane surge. The effect was determined to be an inverse impact of the barrier plan by WES. The barrier plan was thus abandoned and the model study ceased. Further investigation in the apparent levee effect was not explored further at that time since it was not the primary intent of the original model study.

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