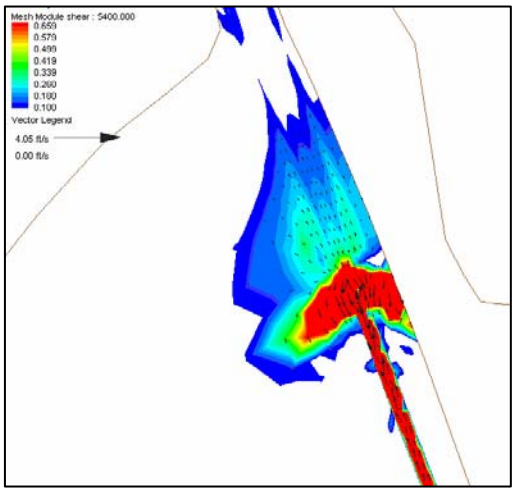
US Army Corps of Engineers®
Engineer Research and Development Center

# Houston-Galveston Ship Channels Sedimentation Study, Phase 2 Extension: Vessel Impacts




**Description**

The U.S. Army Engineer District, Galveston, recently enlarged the Houston Ship Channel in depth and width and were met with larger than anticipated rates of shoaling. A validated sediment model was developed that included sediment loads from the Trinity and San Jacinto Rivers as well as winds and currents to drive the sediment transport within the domain. However, the Houston Ship Channel sees an average of 50 – 60 deep draft vessels a day, which are likely to have a significant impact on the shoaling in and along the channel. This is a significant amount of traffic and with the enlarged channel, these vessels can move faster than they could before, having a larger impact on the sediment transport. The dynamics of vessel movement is a forward flow in front of the vessel and then a return current out around the vessel that returns to the channel behind the vessel. The impact of this movement is that any sediment in suspension within range of the vessel's return current will get pulled toward the channel. Another impact is that the moving vessel can generate bed shears along the channel and into the shallower regions that are high enough to cause erosion of the bed, thereby providing more suspended sediment available for transport into the channel by the vessel's return current. The high vessel speeds will also generate bores in shallow regions, causing more resuspension that may then deposit in the channel.

**Issue**

In order to account for all of the sources of sediment transport in the domain, the effects of vessel traffic on the bed shear stresses should be included in the validated sediment model. A typical day of vessel traffic will be simulated and the resultant shear stresses will be incorporated into the sediment model so that the cumulative effect of the currents, river inflows, and vessel traffic on the sedimentation can be determined.

**Products**

Final products are a published CHL technical report and a validated sediment model, including vessel effects, of the Galveston Bay and Houston Ship Channel area.

**Supporting Technology**

TABS-MDS hydrodynamic, salinity, and sediment model. Adaptive Hydraulics (ADH) vessel movement and hydrodynamic model.

**Benefits**

The results of this project will provide a sediment model of the Houston Ship Channel that includes the impact due to the vessels to be used as an engineering tool to help make explain the shoaling processes and make decisions for future improvements to the waterway.

**Sponsors**

US Army Corps of Engineers, Galveston District.

**Point of Contact**

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**Partners**

US Army ERDC; US Army Corps of Engineers; Port of Houston Authority.