

## Comments on the Coastal Texas Study

Bill Merrell, Texas A&M University

The \$20M USACE/TexasGLO Coastal Texas Planning Study covered the Texas coast and examined both Storm Surge Protection and Ecosystem Restoration. The report is out for public comment until January 13, 2021. The USACE and GLO have made a real effort to explain their outcomes to the public through visuals and inter-active programs. This is a welcome addition to a now 1000 page report that was missing in the first version. Overall, this second report is much improved and shows the results of a lot of hard work on a complex problem. However, the design can and must be made better.

The first thing that strikes us is the poor overall performance of the USACE design for its estimated expenditure of \$26.17B. The plan states expected damage reduction of only 60% over the 50 yr period of economic analysis. The principal issue causing these large damages is a failure to hold to the coastal spine "Ike Dike" principles of strong protection at the coast and keeping water out of Galveston Bay. USACE has used the coastal spine concept but made it weaker by not gating San Luis Pass and proposing very weak protection for the land barrier on west Galveston Island and Bolivar.

The original Ike Dike plan first proposed in 2008 had all protection at about 17ft height throughout the spine and gated San Luis pass. The USACE plan varies considerably in height and strength of protection. The Bolivar Roads gates are at 21.5 ft. heights and the present seawall raised to 21ft. But the principal coastal land barriers are two sand dunes at 12 and 14ft. These sand dunes have effective protection much less than those heights.

The USACE's dune response modeling shows that the dunes would be below 12ft for 75 to 80% of the time. This very weak dune component allows water into the Bay during storm events and won't hold up over the multiple years between nourishment. Because the regional storm surge protection modeling was done assuming the dunes afforded 12ft solid protection, the expected regional surge damages are actually greater than already poor stated results.

The other source of water into the Bay is an open San Luis Pass. Not closing the pass during storm or high water events allows fore-runner surge in the Bay as well as regular storm surge which directly effects structures on the west end of Galveston Island and on the mainland north side of West Bay. It also disallows sealing the Bay at low tide with an approaching hurricane to reduce Bay elevations as much as possible. Every contribution to water height in the Bay increases the surge in the Bay and thus increases the need for and strength of the Bay lines of defense.

Future articles will focus on 3 areas of concern; natural sand dunes as designed are simply not strong enough, the need for San Luis Pass gating to reduce surge effects throughout West and Galveston Bays, and the approach to Galveston Ring Barrier protection.