Technical Report I

The Legacies of the MR-GO

Report to

Katrina Canal Breaches Consolidated Litigation

[Civil Action Number: 05-4182 "K" (2)]

United States District Court

Eastern District of Louisiana

Pertains to MR-GO, Robinson

[No. 06-2268]

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MRGO Deep Water Navigation Channel's Cumulative Negative Effects

The MRGO Deep Water Navigation Channel's cumulative negative effects (the loss of natural wetland buffer, the magnification of the waves in the deep channel, the accelerated and increased subsidence of the levee's crest elevation, and the rapid storm surge delivery) were primary causes of the breaching of the Flood Protection System levees in the vicinity of the MRGO (Figure 1). Without this major breaching, caused by the MRGO's negative effects, catastrophic flooding of St. Bernard Parish's populated areas would not have occurred.

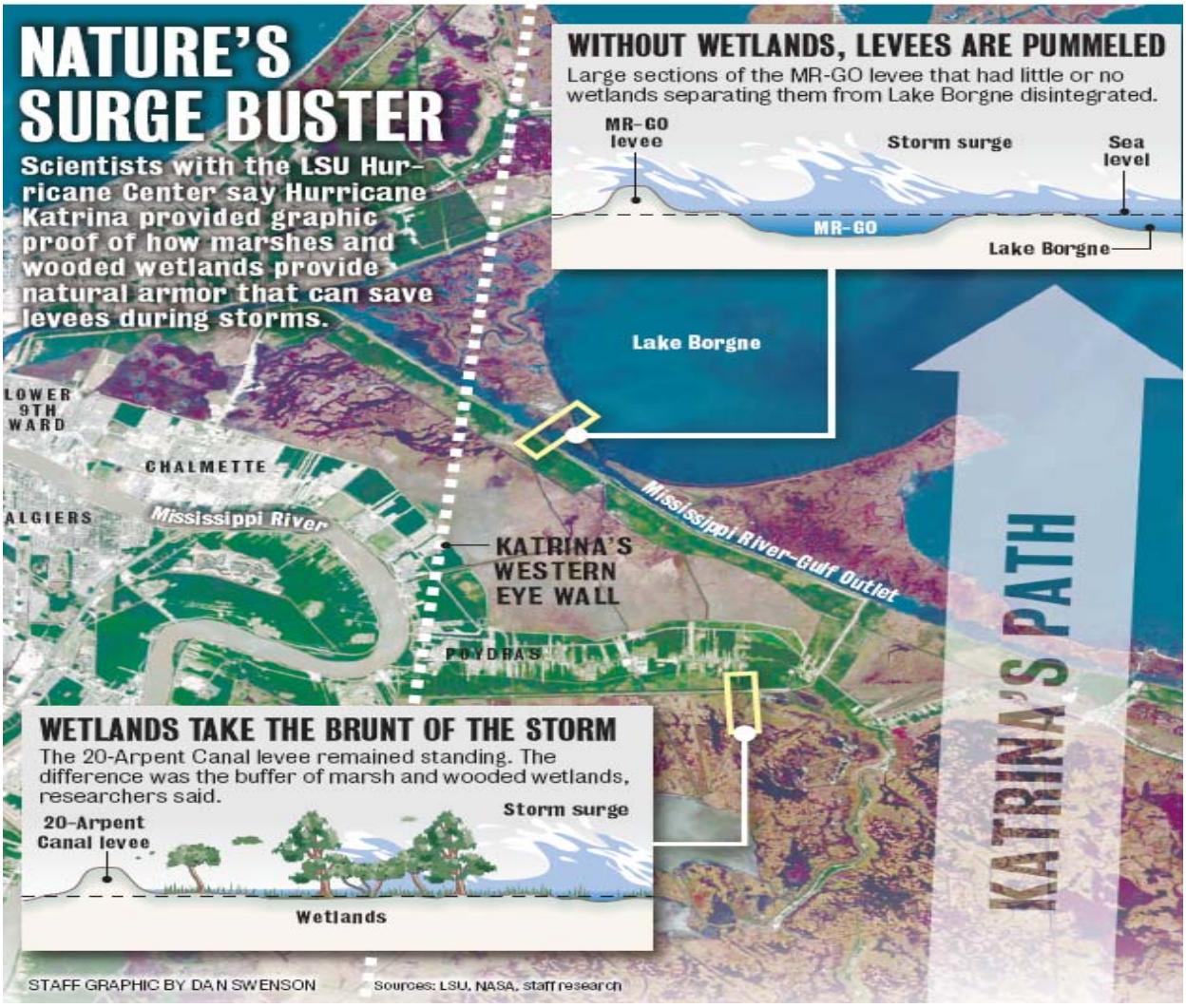


Figure 1 – Overview of the MRGO Deep Water Navigation Channel's cumulative negative effects.

Loss of Wetlands

Selection of land route for MGRO Channel caused catastrophic damage to trees, swamp, and wetland vegetation (Figures 2, 3 and 4). This damage significantly reduced the areas natural ability to dampen surge height and wave action. The fact that trees, healthy marsh and wetlands play a role in reducing the impact of storms is widely accepted. The MRGO channel played a large role in the destruction of this natural buffer and thus had a direct impact on the size of the waves and height of the surge that breached the MRGO levees.

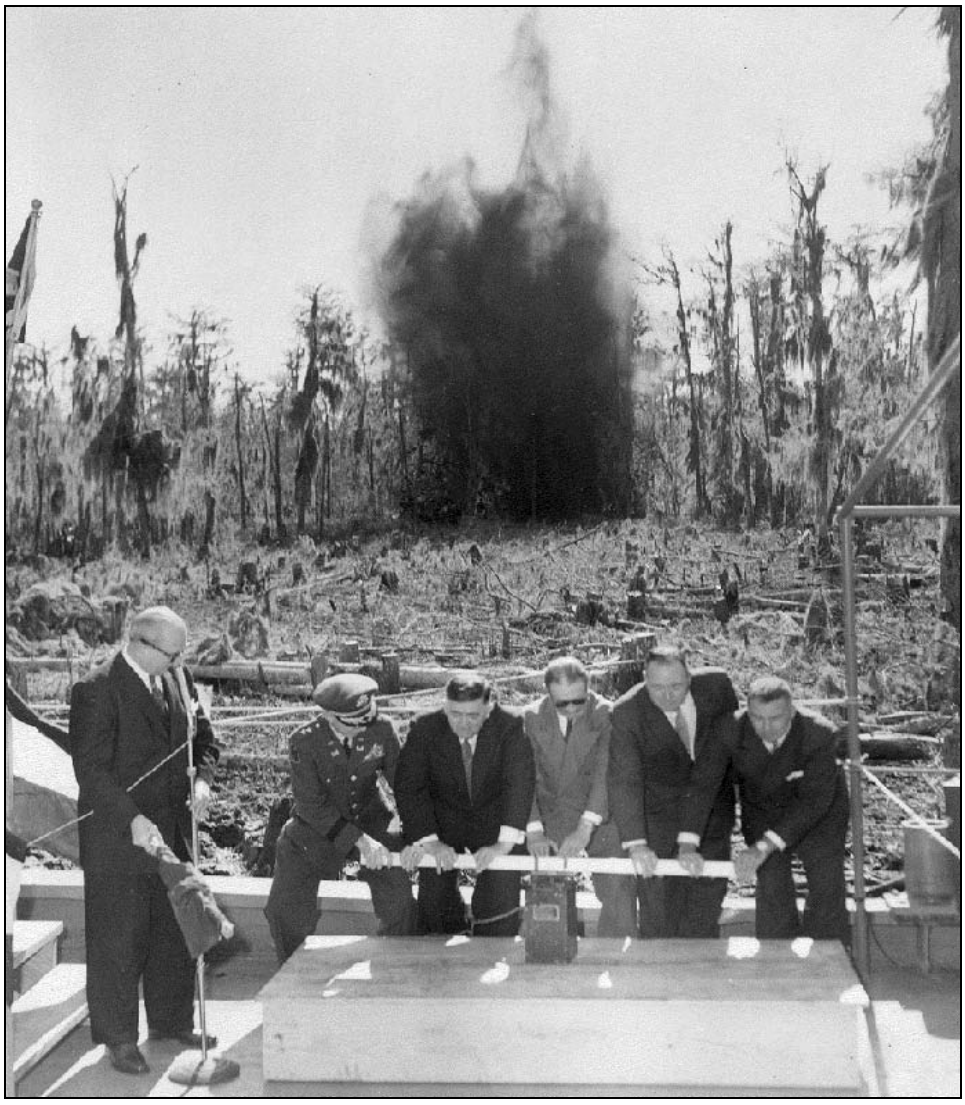


Figure 2 - Opening ceremony of MRGO construction showing destruction of cypress swamp.



Figure 3 - View of downtown New Orleans near Chalmette prior to Hurricane Katrina. Note the dead cypress trees in the foreground.



Figure 4 - Dredge barge digging MRGO channel through wetlands.

Deep Channel Wave Magnification

The fact that the channel was allowed to grow to several times the authorized size, caused it to serve as wave regeneration basin during Katrina (Figures 5, 6 and 7). The regenerated waves at the MRGO levee were significantly larger and more powerful than they would have been had the pre-channel wetlands and vegetation been present. The contribution to the destruction of the levee caused by waves, which were larger and more powerful than they would have been had the natural vegetation be present, was a direct cause of flooding due to the MRGO channel.

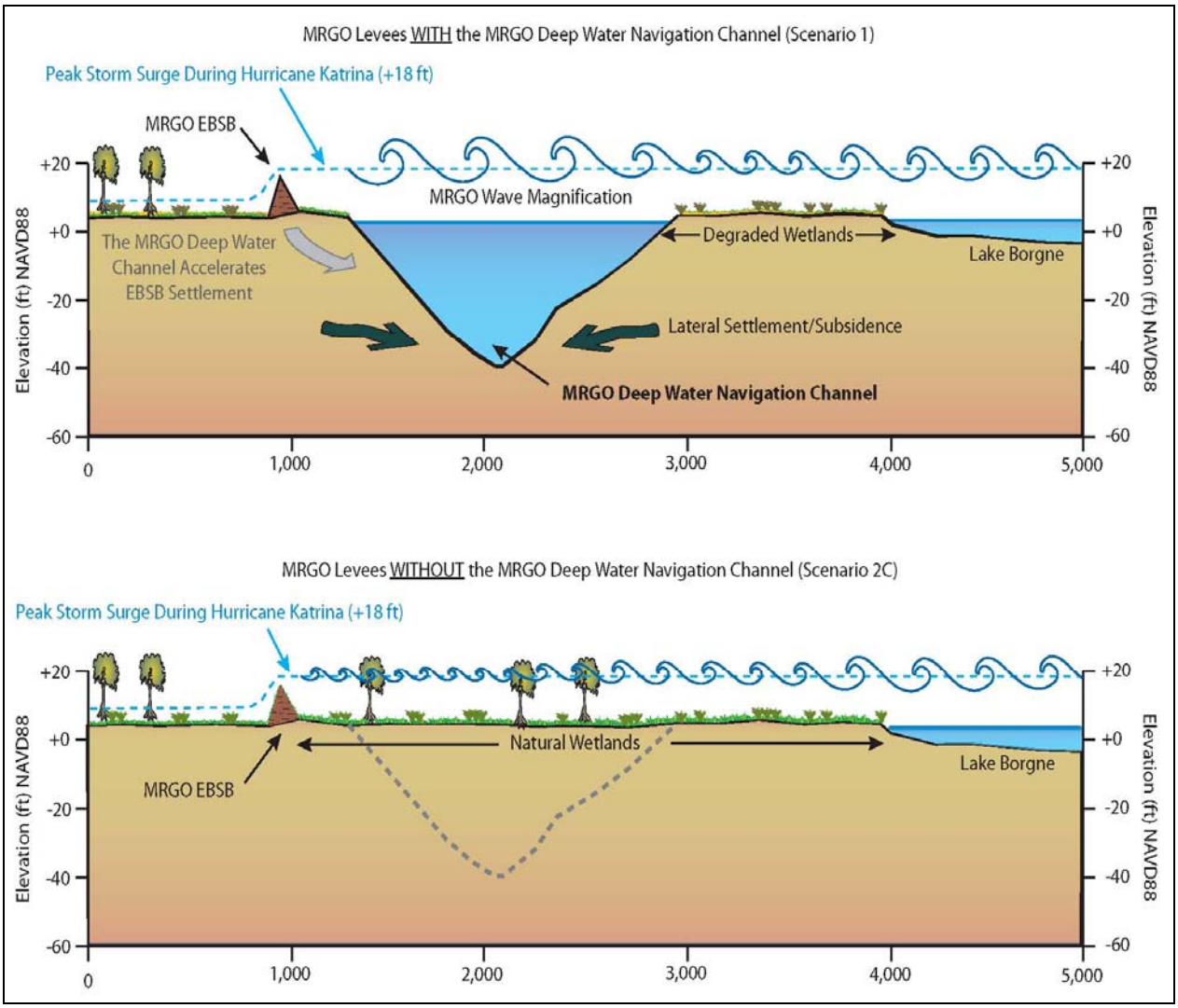


Figure 5 – This figure depicts the negative affects that the MRGO channel and degraded wetlands had on the size of waves that attacked the MRGO levees.



Figure 6 - MRGO channel was allowed to widen to several times its authorized width.

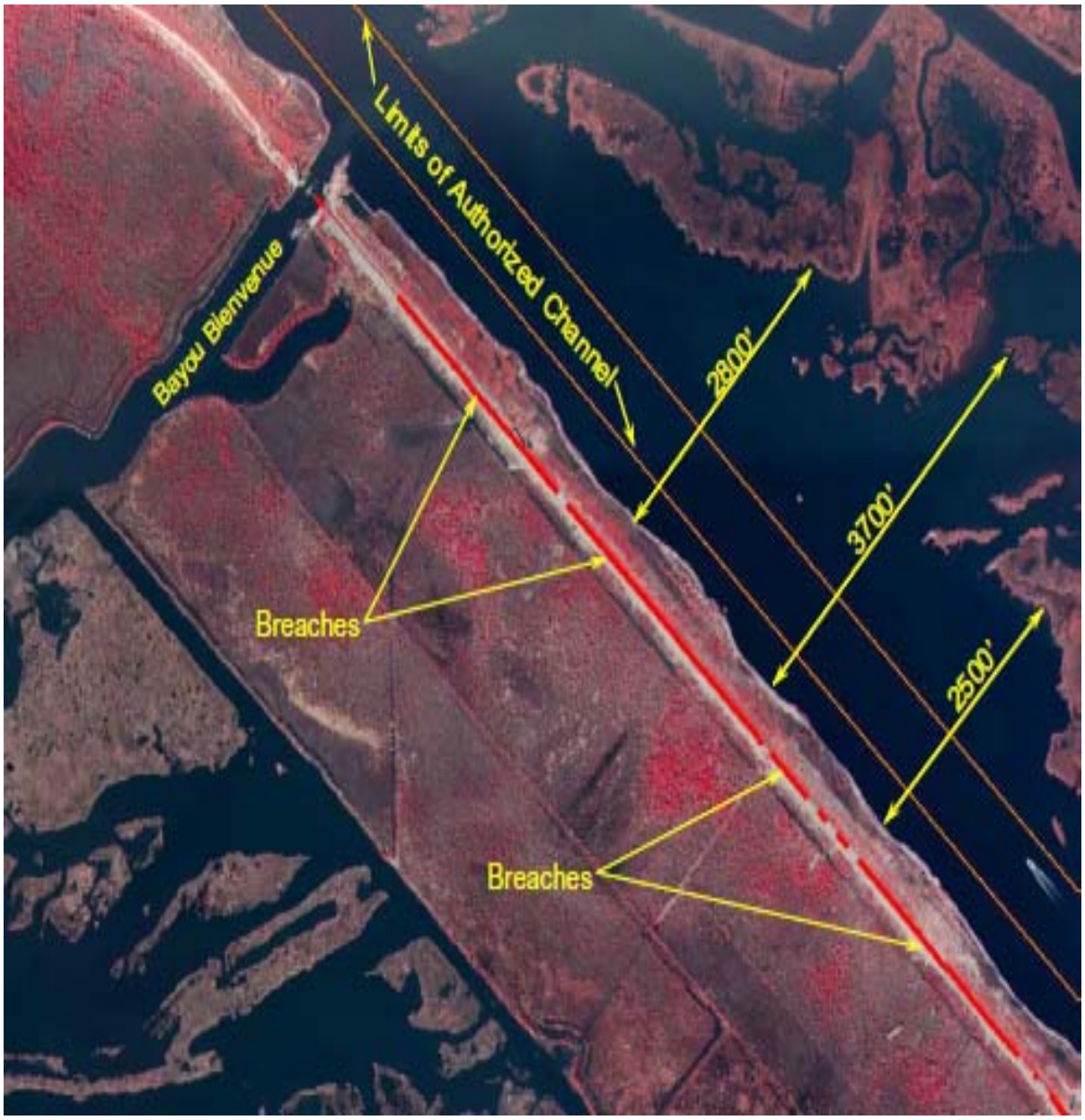


Figure 7 – MRGO channel dimensions at Bayou Bienvenue

Accelerated and Increased Subsidence

The close proximity of the deep water MRGO navigation channel to the MRGO levee facilitated increased settlemtent and loss of levee crest elevation (Figures 7 and 8). The low areas of the levee crest had an increased exposure to both erosive wave action and overtopping. Many of the portions of the levee that were the lowest at the time of Katrina experienced the most breaching. This is a direct link between the MRGO channel and the flooding of populated areas.

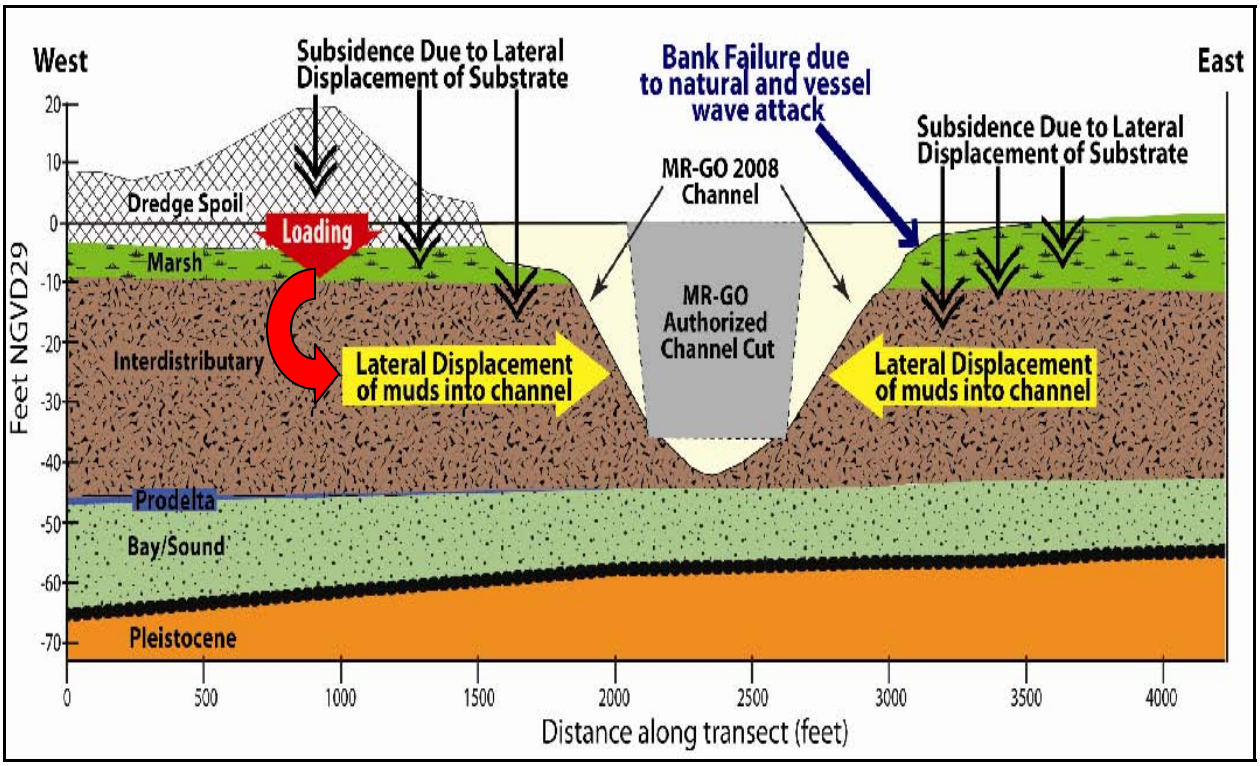


Figure 7 - The proximity of the MRGO deep water channel to the MRGO levee caused subsidence of MRGO levee.

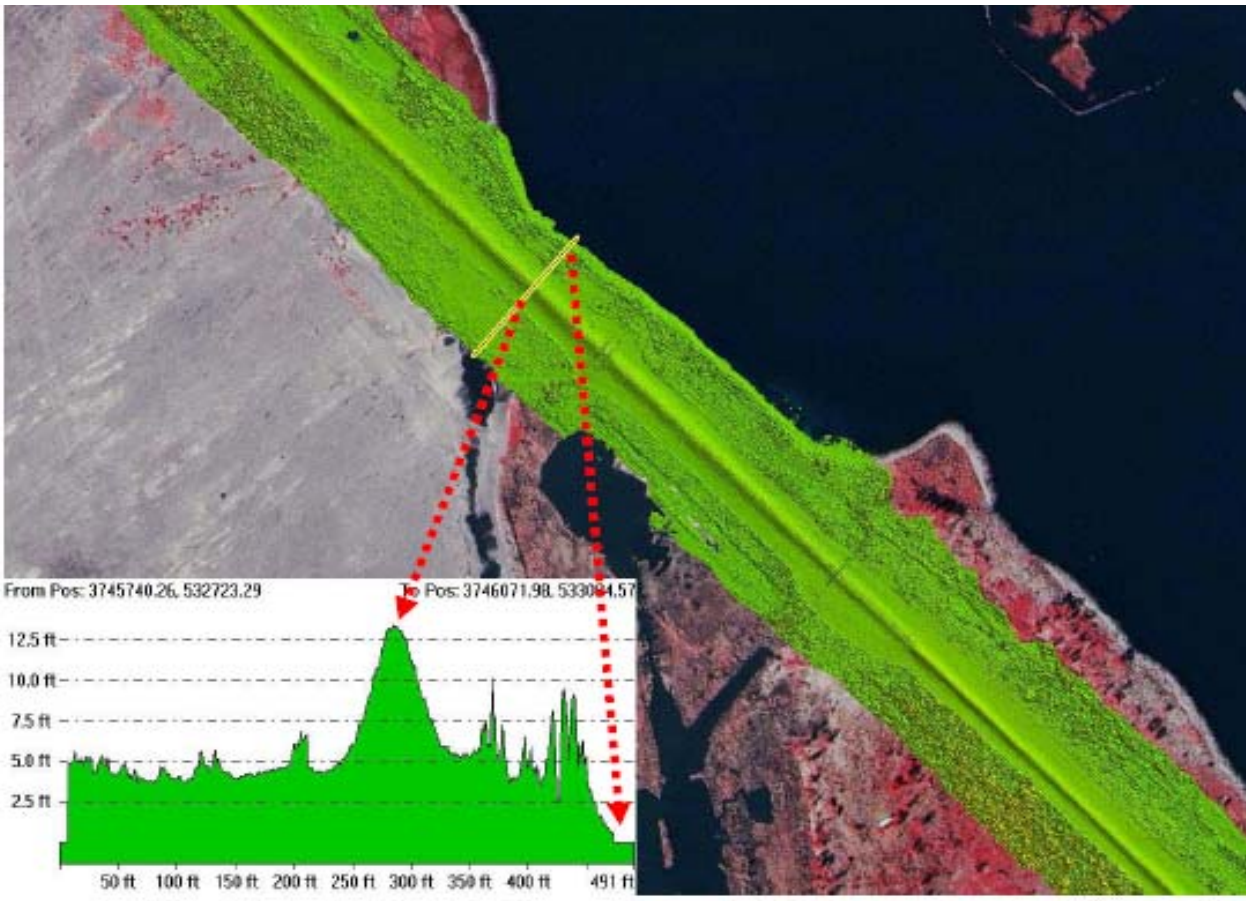


Figure 8 - The proximity of the MRGO deep water channel to the MRGO levee caused subsidence of MRGO levee.

Rapid Storm Surge Delivery

The route selection of the MRGO deep water navigation channel created an artificial funnel shape, and served as a direct deep water conduit to the open ocean (Figures 9 and 10). The direct connection and funnel geometry caused increased storm surge. The deep water channel served as a conduit which carried the storm surge water into the St. Bernard Parish, New Orleans East, and the IHNC area more rapidly than the natural vegetation would have allowed.

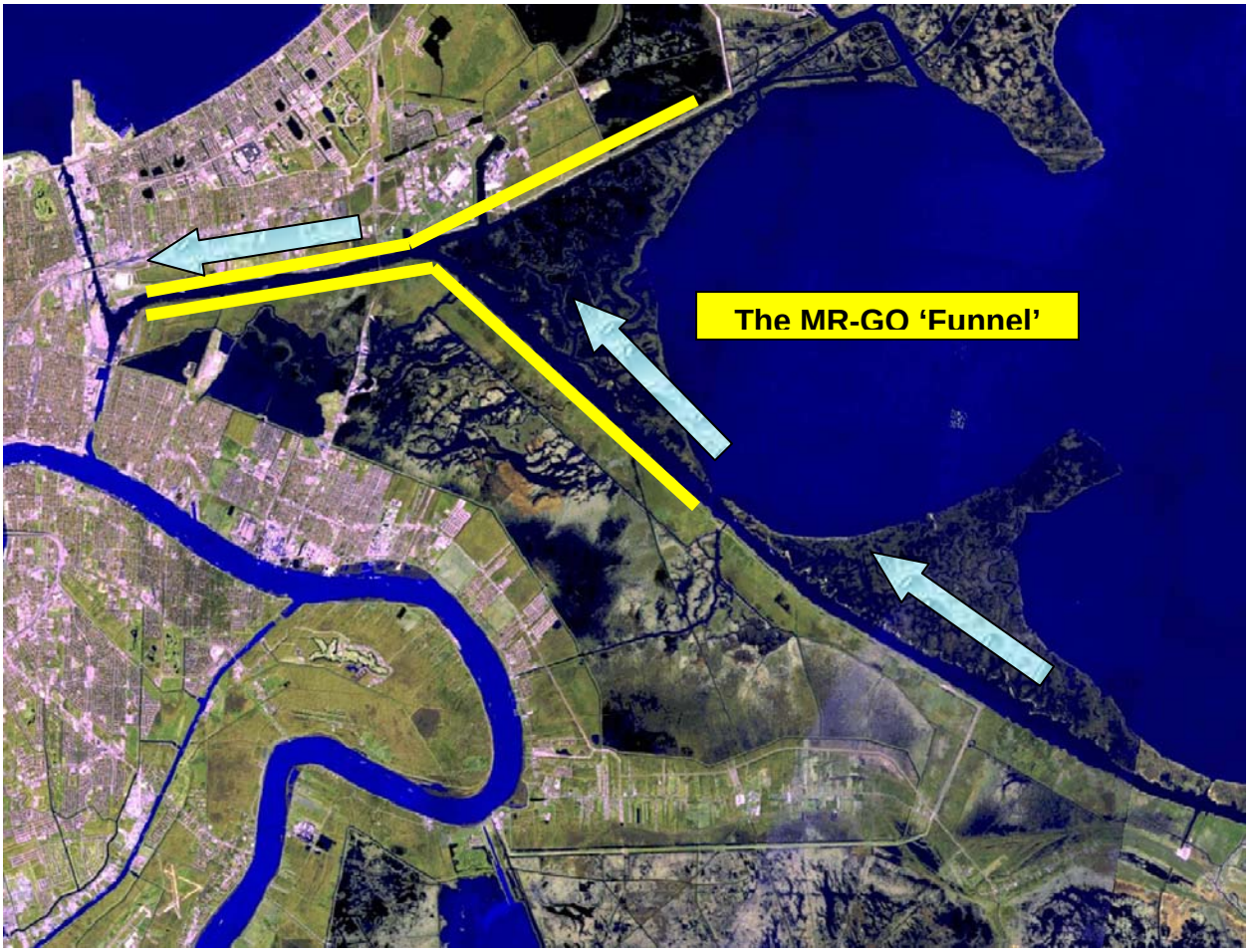


Figure 9 – The MR-GO 'Funnel'.

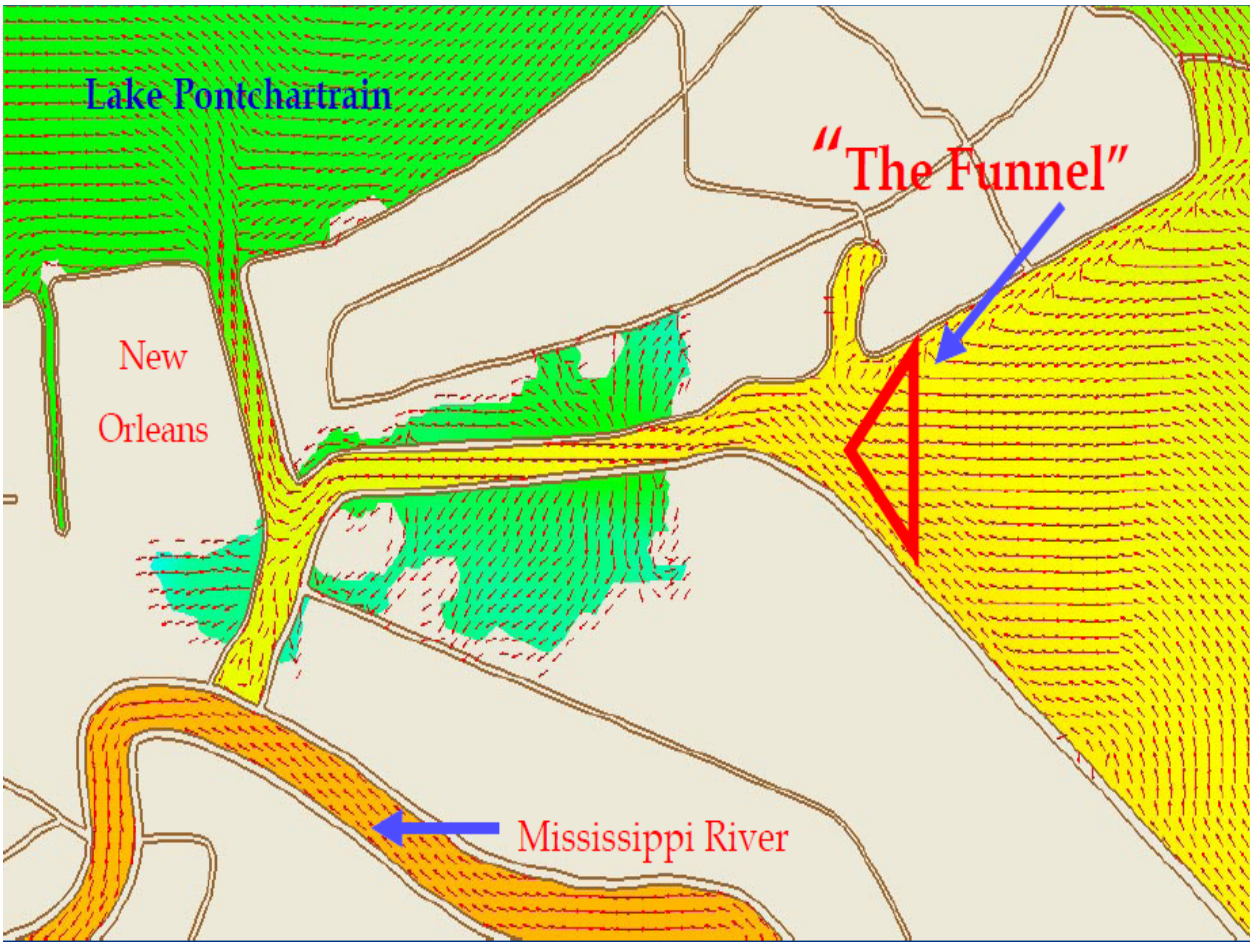


Figure 10 – The MR-GO 'Funnel'.

The Legacies of the MR-GO

It is important to note that had the Reach 2 of the MRGO Levee been overtopped, without major breaching, Chalmette would not have been flooded by storm surge waters (Figure 11). The volume of water from overtopping would not have overtopped the Forty Arpent levee. Peak storm surge heights, above the height of the MRGO Levee, only existed for a few hours. If the Reach 2 MRGO levees had withstood this brief peak water level, as did many other levees in the area which were not subjected to all of the negative impacts of the MRGO channel, much of the flooding of the populated areas would not have occurred.

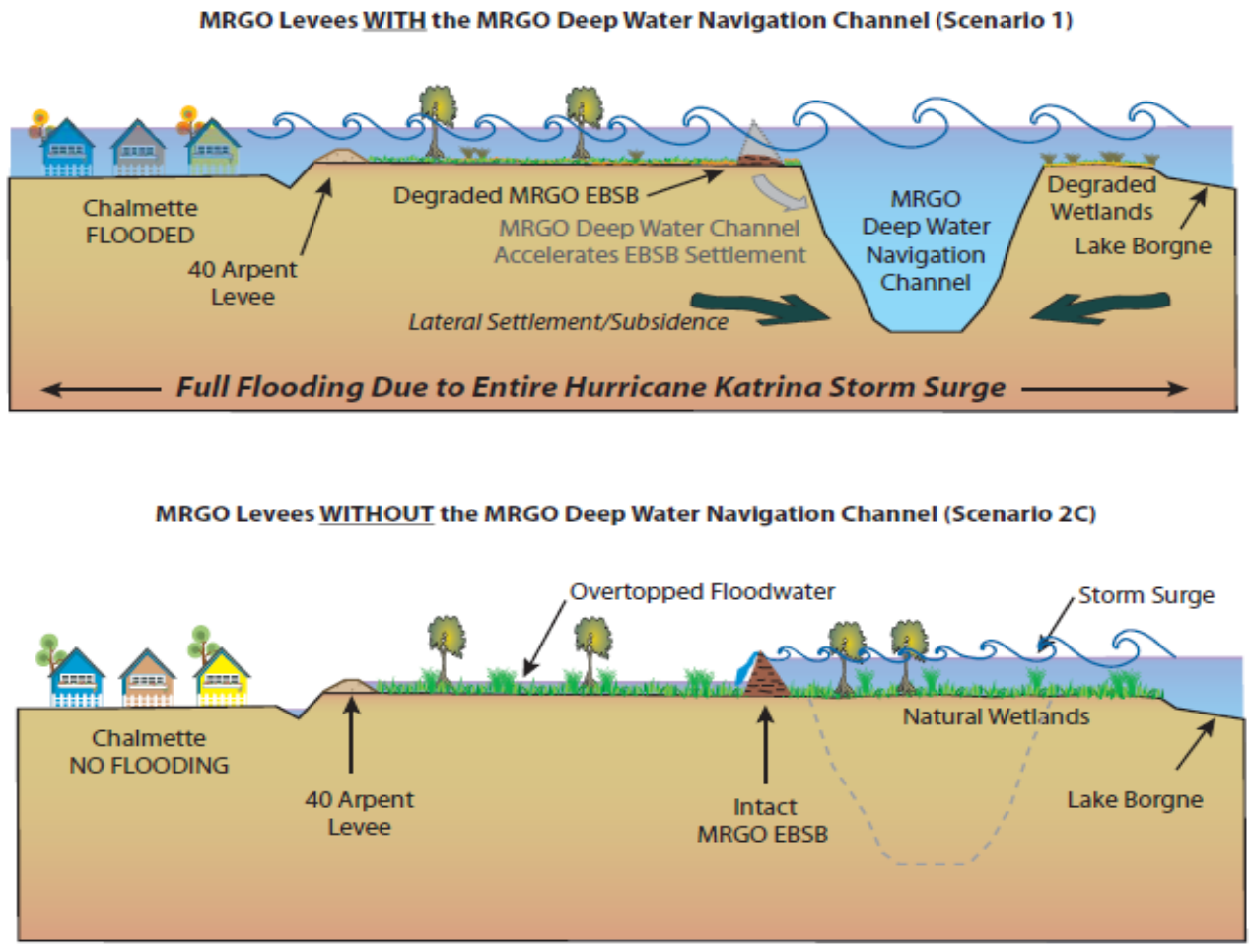


Figure 11 – Flooding of St Bernard Parish due to Hurricane Katrina and due to a Neutral MRGO ("do no harm") Hurricane Katrina.



Figure 11 –Hopefully, not the end.