



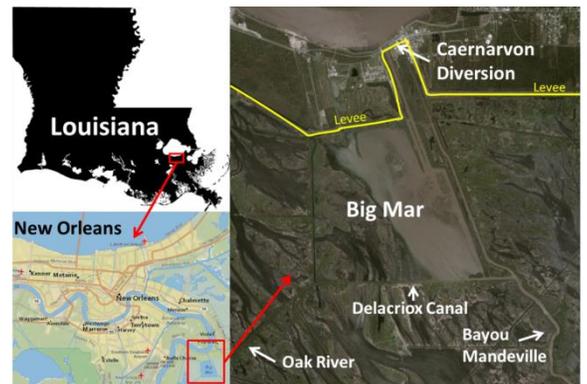
Coastal Sustainability Program

Caernarvon Delta

The Caernarvon Freshwater Diversion is located 15 miles downriver from New Orleans in Plaquemines Parish near the Plaquemines/St. Bernard Parish line and was constructed in 1991. The control structure was designed to divert up to 8,000 cfs or the volume of 2,352 large crawfish pots per second, from the Mississippi River into the local estuary. Big Mar Pond, a failed agricultural impoundment, is part of the receiving area for diverted waters. Since the construction of the diversion sediment has been deposited in the Caernarvon receiving area. Over time, there has been enough accumulation in some areas to permanently support emergent wetland plant life. In Big Mar Pond, prior to 2004, wetland growth was negligible. Since 2004, wetland growth (or land gain) has been significant and appears to be accreting annually. It is estimated that there was 19 acres of wetland growth from 1998 to 2004, and 581 acres since 2004 for a total of 600 acres of wetland growth in Big Mar Pond from 1998 to 2011. Since 2010, LPBF has planted 2,400 swamp species on the newly emerged delta complex.

Why Study the Caernarvon Delta?

- The Caernarvon Diversion has been in operation for 23 years
- Diversions are an integral part of the coastal restoration plan for southeast Louisiana
- Studying the basin side effects of this diversion can inform the construction and operation of future diversions
- Opportunity to observe land building processes
- A thriving delta with a restored swamp enhances hurricane storm surge protection to nearby levees and communities following the Multiple Lines of Defense Strategy



LPBF Research Program

- Weekly measurements of turbidity entering the receiving basin
- Calculate sediment load based on turbidity
- Investigate the rate and causes of delta growth in the receiving basin
- Conduct tree plantings
- Long-term monitoring of planted trees for survival and growth rates
- Compile lessons-learned from tree plantings to increase chance for successful reforestation
- Investigate the extent of the influence of the diversion into the basin



Caernarvon Delta growing and becoming forested from 2011 to 2013

For more information on our work at the Caernarvon Freshwater Diversion visit our technical reports page at: <http://saveourlake.org/coastal-resources.php>

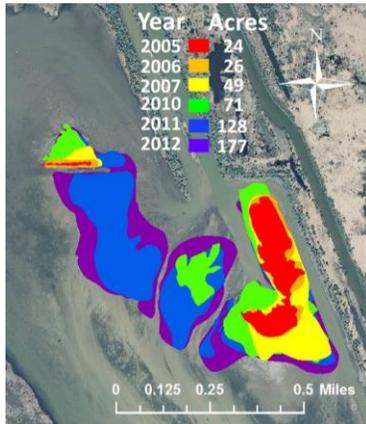
Major Conclusions

- There was little delta growth between 1991, when the diversion went online, and 2004. After 2004 there was substantial land gain in Big Mar



Aerial maps from 2004 and 2010 showing land gain

- From 2005 to 2012 there has been 153 acres of land gain just in the delta at end of the conveyance channel



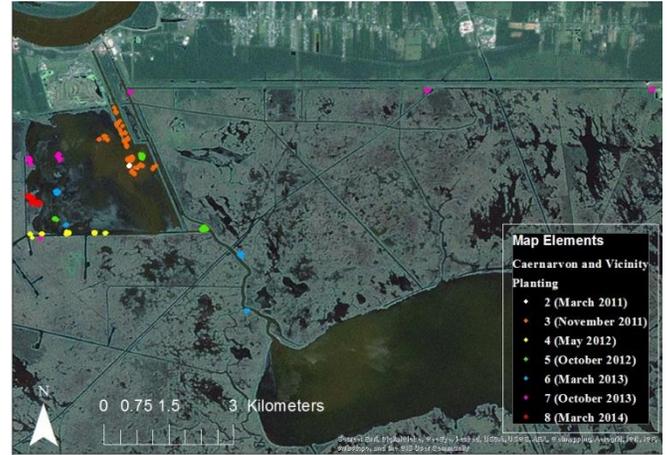
Land gain rate increased after 2010 when the diversion was opened to maximum capacity for the BP oil spill, there is also land gain in other parts of Big Mar

- A classic delta with bars, crevasse splays and distributary channels is developing



The vegetated Caernarvon delta shows typical delta morphology in 2011

- Seven swamp tree plantings have been conducted in and around Big Mar since 2011, mostly on newly formed land



Bald cypress, water tupelo and green ash have been planted across the growing delta

- Nutria protection is required on all planted trees



Nutria excluder devices were installed on all trees to protect from nutria damage that occurs without the device

- Forest and marsh plants thrive on the new formed delta



Black willow forest has expanded across the delta and marsh vegetation continues to colonize open mud flats