Proposed Diversions in the 2012 Master Plan

– Caveats and Questions –

Expert Panel on Diversion Planning and Implementation

8 January 2014
• Established in 1987
• Sec. 320 of the Clean Water Act
• Estuaries “of national importance”
The Barataria-Terrebonne
National Estuary
The B-T Management Conference

US Environmental Protection Agency, EPA
La Dept. of Environmental Quality
La Dept. of Economic Development Coalition to Restore Coastal La.
La. Assoc. of Levee Boards The Nature Conservancy National Park Service
US Geological Survey Plaquemines Parish NOAA Sea Grant
US Coast Guard Jefferson Parish
American Sugar Cane League La. Dept. of Natural Resources
Greater Lafourche Port Commission La. Independent Oil and Gas Assoc.
La. Assoc. of Conservation Districts NOAA, National Marine Fisheries Service
La. Universities Marine Consortium, LUMCON
La. Dept. of Culture, Recreation and Tourism
La. Dept. of Health and Hospitals
La. Mid Continent O & G Assoc.
US Army Corps of Engineers
US Fish & Wildlife Service
La. Wildlife Federation
Nicholls State Univ. Assumption Parish
Lafourche Parish St Charles Parish
Terrebonne Parish
La. Land Owners’ Assoc.
La. Department of Education
La. Oil Spill Coordinators Office
La. Dept. of Wildlife & Fisheries
La. Dept. of Agriculture & Forestry
Bayou Lafourche Freshwater District
Governor’s Office of Coastal Activities
South Central Planning & Development Com.
Comprehensive Conservation and Management Plan

Identified
7 Priority Problems

Proposed
51 Action Plans
ECOLOGICAL MANAGEMENT PLANS
FROM THE BTNEP CCMP

EM-1 Hydrologic Restoration

A comprehensive effort will be implemented to use both human-made and natural devices to recreate a more natural water and sediment flow pattern to and across basin wetlands. This plan will help to overcome the various hydrologic modifications (levees, navigational canals, etc.) which have disrupted the estuary’s natural hydrology.

EM-2 Freshwater and Sediment Diversions

Freshwater and sediment resources from the Mississippi and Atchafalaya Rivers can be used to preserve and create marshes by providing nourishment, controlling salinity levels, and offsetting the impacts of land subsidence. This action will help to create an integrated set of projects that will augment the existing limited system of freshwater and sediment flows into the marshes.
Small to moderately-sized diversions are excellent strategies for long-term sustainability, but:

• The concept of a big diversion has gotten much bigger

• At such large scales there are serious negative impacts

• Sociopolitical opposition, user conflicts, and other obstacles to implementation generally increase with scale
Proposed diversions were much smaller in previous plans.  

OCPR, 2006
CPRA 2012 Master Plan

Ten Diversion Projects

150,000 cfs  5,000 cfs
20,000 cfs    5,000 cfs
50,000 cfs    250,000 cfs
250,000 cfs   50,000 cfs
5,000 cfs     1,000 cfs
Diversions put nutrients and sediment back into the wetlands, but...

- It takes decades before land-building gives coastal communities any appreciable storm protection
Diversions put nutrients and sediment back into the wetlands, but...

- Abrupt changes to salinity regimes will impact fisheries, especially the oyster fishery
Diversions put nutrients and sediment back into the wetlands, but...

- Excess nutrients may weaken root systems of marsh plants
Diversions put nutrients and sediment back into the wetlands, but...

- They facilitate the spread of invasive species like Asian carp, Rio Grande cichlids, nutria, apple snails, water hyacinth, giant salvinia, and hydrilla
Invasive Species
Diversions put nutrients and sediment back into the wetlands, but...

- Induced shoaling threatened to close the West Bay diversion, and must be accounted for in planning and long-term cost estimates.
Diversions put nutrients and sediment back into the wetlands, but...

• May increase flood risk to coastal communities like Lafitte, Grand Bayou, and especially in lower Terrebonne and around Morgan City

* Costs to mitigate potential increased flood risk were not calculated in the 2012 MP, nor were costs for land, easements, rights-of-way, relocations, or disposals (LERRDs costs)
Diversions put nutrients and sediment back into the wetlands, but...

- Switch habitats to fresh marsh systems that are susceptible to salt damage when diversions can’t flow. This happens in late summer and fall when the river is low and it is hurricane season.
The Davis Pond diversion cannot flow when the river is below ~2.5 ft in New Orleans.
The river drops below 2.5 ft in New Orleans with some regularity. The six diversions below N.O. would be unable to flow even more often, as head differential decreases as you go downstream.
Average stage of river is lowest in late summer and early fall. (middle dotted blue line)
Low river stages occur at the peak of hurricane season when the coast is most likely to experience saltwater storm surges.
Salt marshes can take fresh water.

Fresh wetlands cannot take salt water.
Storm damage was most severe in areas of freshwater input (Wax Lake Delta, Caernarvon Diversion, Birdsfoot Delta). Caernarvon has not recovered as well as the others because freshwater cannot flow consistently.
Wax Lake Outlet and Atchafalaya are accreting deltas, but is this a fair analogy for diversions off the lower Mississippi?
Wax Lake Outlet and Atchafalaya Deltas
WLO channel was created in 1942 to reduce flood risk to Morgan City by diverting 30% of the flow from the Atchafalaya River. New land began to appear after the 1973 flood.
The Wax Lake Outlet Delta is a poor model for diversions off the Lower Mississippi River.

- Was constructed relatively quickly (prior to NEPA and other environmental regs)
- No control structure, so no battles over operations
- No communities to flood
- Few user conflicts or fisheries issues
- WLO receives bedload sediments (sand rolling along the bottom)
- WLO has been flowing continuously for 70 years with very high peak flows
Average annual flow is nearly 100,000 cfs, with peaks well over 200,000 cfs.
Diversions:

• Effectively combat saltwater intrusion
• Freshwater and nutrients alone can sustain marshes
• Sediment input can build new land —
  given enough time!
**Cons:**

- Amount of sediment available in the water column is 50% to 80% less than it was in 1850.
- Length of time needed to actually build land is debatable, but measured in decades.
- Any land building that does occur is geographically limited to the outfall site.
- Freshening of systems can have negative impacts on fisheries.
- Nutrients can have negative impacts on marsh plants’ root growth.
- Legal and sociopolitical difficulties in operating schemes and management.
- Diversions do not flow when the river is low, so any fresh areas created are susceptible to salt damage.
- Induced shoaling.
- Increased flood risk to communities.
Sediment Delivery Projects
Wetlands, islands, and ridges can be restored from sediments transported through pipelines with minimal amounts of water.
Diversions vs. Marsh Creation

• An acre today may be better than an acre tomorrow

• An acre here may be better than an acre there

• MC has fewer user conflicts and obstacles to implementation
Questions for 2017:

• How much can we divert without wiping out fishermen or flooding their communities?

• Need better resolution on basin-side water levels, especially in streams, i.e. the GIWW.

• How do we transition Marsh Creation from a series of projects to a strategic program of restoration dredging?

• Can the Penchant diversion really work?
• All habitat types must be restored, not just the freshwater-dependent ones.

• Maintaining healthy salinity regimes allows our fisheries culture to exist.

• Landscape restoration allows coastal communities to exist.
Who are we restoring for?