Global Cumulative Cyclone Tracks
Frequency Coastal Disturbance; and those with little cyclone activity
Managing River and Coastal Processes linked with Engineering Design to Develop a Self-Maintaining Delta Landscape (footprint)
ECOGEOMORPHOLOGY of Deltaic Coast

Wax Lake Delta – An analogue to study the processes of prograding delta;

In contrast to coastal basins in the delta that represent degrading stages (ecosystem state change) of delta
“In particular, hurricanes appear to be the overwhelming pathway of new inorganic sediments for coastal wetlands in western Louisiana, because the few riverine sources bring relatively trivial amounts inorganic sediments into the marsh.” (1)

“Restoration programs that restrict the underlying cause-and-effect relationships and remedies to focus on inorganic sediment source and delivery may be fatally flawed.” (2)

Wax Lake Sediment Deposition (Current Delta Area = 112 km$^2$)

This study = $5.22 \times 10^6$ MT
(82% flood event; 18% hurricane event)
Resources

Shark River, SRS-6

Taylor River, TsPh-6

Basal area of Mangrove Forests relative to Total Phosphorous

FCE LTER

Center for Ecology and Environmental Technology
Forest Structure

**Tree density**

- Avicennia germinans
- Laguncularia racemosa
- Rhizophora mangle

**Basal area**

- Basal area (m$^2$ ha$^{-1}$)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avicennia germinans</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>Laguncularia racemosa</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Rhizophora mangle</td>
<td>500</td>
<td>600</td>
</tr>
</tbody>
</table>
### Forest Structure Summary

<table>
<thead>
<tr>
<th>Site</th>
<th>Tree density (No. ha(^{-1}))</th>
<th>Basal area (m(^2) ha(^{-1}))</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverine</td>
<td>Riverine</td>
<td>Basin</td>
<td>Reference</td>
</tr>
<tr>
<td>Terminos Lagoon, Mexico</td>
<td>3360</td>
<td>-</td>
<td>Day et al. 1987</td>
</tr>
<tr>
<td>Florida Coastal Everglades, USA</td>
<td>3675</td>
<td>4875</td>
<td>Day et al. 1999</td>
</tr>
<tr>
<td>Fringe</td>
<td>Fringe</td>
<td>Basin</td>
<td>Reference</td>
</tr>
<tr>
<td>Terminos Lagoon, Mexico</td>
<td>7510</td>
<td>-</td>
<td>Day et al. 1987</td>
</tr>
<tr>
<td>Terminos Lagoon, Mexico</td>
<td>3610</td>
<td>1670</td>
<td>Day et al. 1996</td>
</tr>
<tr>
<td>Samaná Bay, Dominican Republic</td>
<td>1016</td>
<td>26.8</td>
<td>Sherman et al. 2003</td>
</tr>
<tr>
<td>Gulf of Fonseca, Honduras</td>
<td>1231</td>
<td>3052</td>
<td>Castañeda-Moya et al. 2006</td>
</tr>
<tr>
<td>La Mancha, Mexico</td>
<td>510</td>
<td>616</td>
<td>Present study</td>
</tr>
</tbody>
</table>

Tree density is notably lower than in other Caribbean systems  
Basal area falls within the range observed in these same systems.
Environmental Settings – Shore Barriers

- Sand flat
- Low tide flats
- Salt marshes
- Overwash apron
- Maritime forest
- Barrier flats
- Dunes
- Backshore
- Nearshore
- Lagoon sediments
- Overwash layers
- Dune bedding
- Soil
- Peat
- Overwash fan
- Berm crest
- Trough bar
- Shoreface sediments
- Low tide
QUESTIONS?