Evaluating On-Marsh Nekton Communities in Restored vs. Natural Salt Marshes

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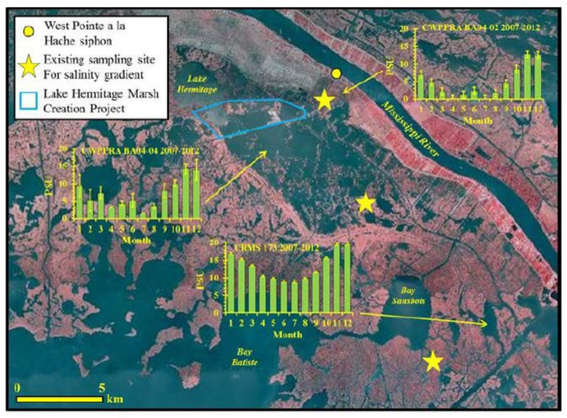
Marsh Loss and Restoration

Coastal land loss in Louisiana is estimated at 5,000 km^2 since the 1930s and, without preventative action, is predicted to claim an additional 4,500 km^2 in the next 50 years. The construction of tidal marshes such as the Lake Hermitage March Creation Project (LHMCP) and the use of river diversions such as the West Pointe a la Hache (WPH) siphon to build wetlands by reconnecting the Mississippi River to adjacent estuaries have been proposed as core components of management goals in the area.

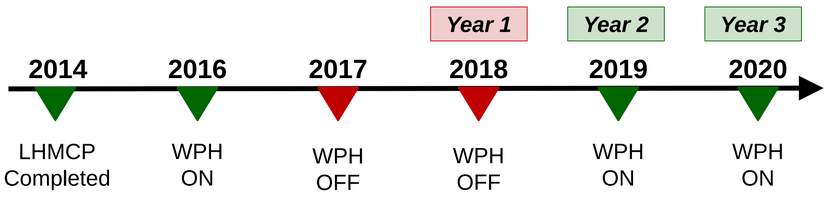


Provided by Erick Swenson

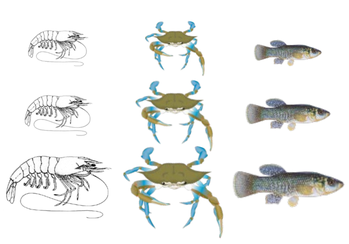
To understand how river diversions may influence the ecological trajectory, food web structure, and functionality of both natural and restored marshes, Year 1 Objective was *to evaluate the on-marsh nekton community across sites and marsh subhabitats.*

Timeline & Sampling Approach

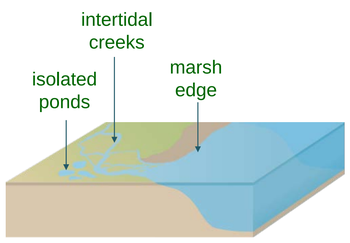
Our sites include two created marshes and one natural marsh at the LHMCP as well as three natural marshes at varying distances from the WPH siphon.



Wire mesh traps (n=3) were deployed 3 times for 1 hour at each subhabitat across 6 sites.

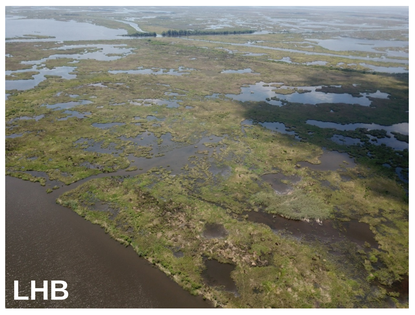


Various Taxonomic Groups and Size Classes



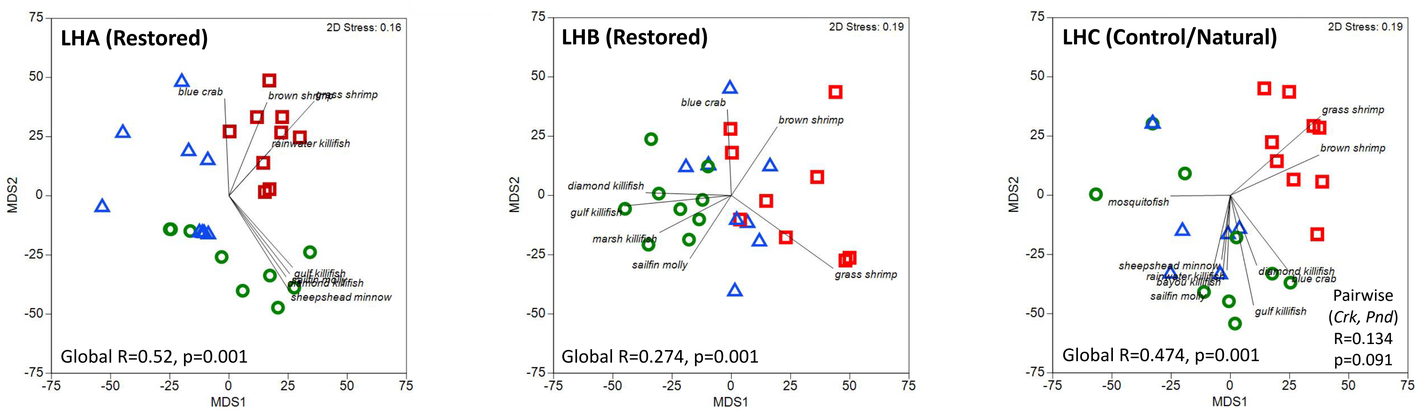
Marsh Subhabitats

On-Marsh Nekton Communities

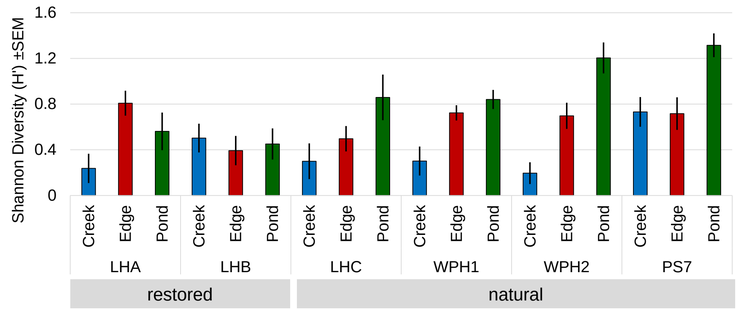


Representative salt marshes in Lake Hermitage (left), inside the area of influence of the WPH siphon, and outside (right).

Communities varied among subhabitats, but not to the same degree across sites. Species most highly correlated (Pearson's r>0.4) to the position of the points on the mMDS plot are displayed as vectors. ANOSIM results are included in each plot. Transformation: fourth root. Resemblance:S17 Bray-Curts similarity (+d).



At natural sites, mean Shannon diversity (H′) values were higher in **ponds** relative to **creeks** and marsh **edges**. At the restored sites, the pattern of higher diversity in ponds did not hold.



Discussion and Next Steps

On-marsh nekton communities that characterize different marsh subhabitats are not consistent across our sites. The patterns observed may be associated with the marsh landscape (e.g., marsh height, number of ponds, connectivity) at each site and its influence on species habitat use.

To determine which drivers influence community structure in different subhabitats across sites, we will incorporate site-specific data (e.g., pond sizes, marsh height) and characterize connectivity at each site.

We will compare nekton composition and abundance during periods of low freshwater (2018) and high freshwater (2019, 2020).

Sampled ponds ranged in size, distance from the edge, and degree of isolation

Resources

- Diagrams from IAN Library (ian.umces.edu/imagelibrary)
- Killifish drawings by J.R. Tomelleri in *Fishes of Alabama*
- Aerial pictures provided by Eddie Weeks (LSU)

Acknowledgements

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