Fine-scale saltmarsh complexity supports resident and transient nekton communities

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Background and Objectives

Post-restoration monitoring to evaluate the ecological success of restoration projects and improve creation practices frequently includes assessing metrics of ecological structure (e.g., species composition, abundance) in restored habitats in comparison to natural references. However, the temporal trajectory of changing landscapes and its effects on associated faunal communities in restored locations are rarely evaluated. The overall goal of this study is to determine how habitat characteristics (landscape and seascape features) interact with the biotic components of the system to influence the ecological structure and function of this ecosystem, specifically for nekton assemblages across a continuum of marsh morphologies and marsh habitats (edge, creek, pond).

Objectives

- (1) Characterize marsh morphologies (including created sites) representative of marshes in Barataria Bay, LA.
- (2) Compare on-marsh and off-marsh nekton assemblages across marsh morphologies and subhabitats.
- (3) Evaluate the connectivity of on- and off-marsh nekton assemblages across a range of habitat characteristics (e.g., land to water ratio).



The Marsh Mosaic



Interspersion Continuum. It has been shown that the degree of interspersion is important when considering the value of a marsh for movement/dispersal, foraging and nursery habitat.

We quantified the marsh seascapes using drone images of six sites based on four different water- and land-based features:

- Land (L). Marsh, not flooded
- Wetland (Wet). Marsh, flooded
- **Disconnected Water (DW).** Ponds
- **Connected Water (CW).** Creeks

The relationship between these and how they help discriminate our sites is depicted in the PCA plot (right). Marsh characteristics correlated (Pearson's r>0.3) to the position of the polygons (sites) are displayed as vectors and point to the direction of increasing value for that variable. Note that PS7, WPH1, and LHC fall along the interspersion continuum displayed above.



along marsh edges, shallower tidal creeks, and isolated or semi-isolated ponds.



Coastal restoration practices have been and will continue to be widely implemented across Louisiana; thus, the results of this study will contribute to the knowledge that is currently lacking regarding the relationships between restoration practices and faunal communities supported by the marsh.

Nekton Assemblages and Connectivity

(2) Assemblage similarity are highest within pond systems vs. edge habitats and even less so in creeks.

(3) Overlaps in species across sampling gear, namely blue crab and brown shrimp, may represent agents of connectivity between on- and off-marsh nekton assemblages.



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restorefoodweb.lumcon.edu

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