

# Disentangling the importance of autochthony along a salinity gradient of a salt marsh food web

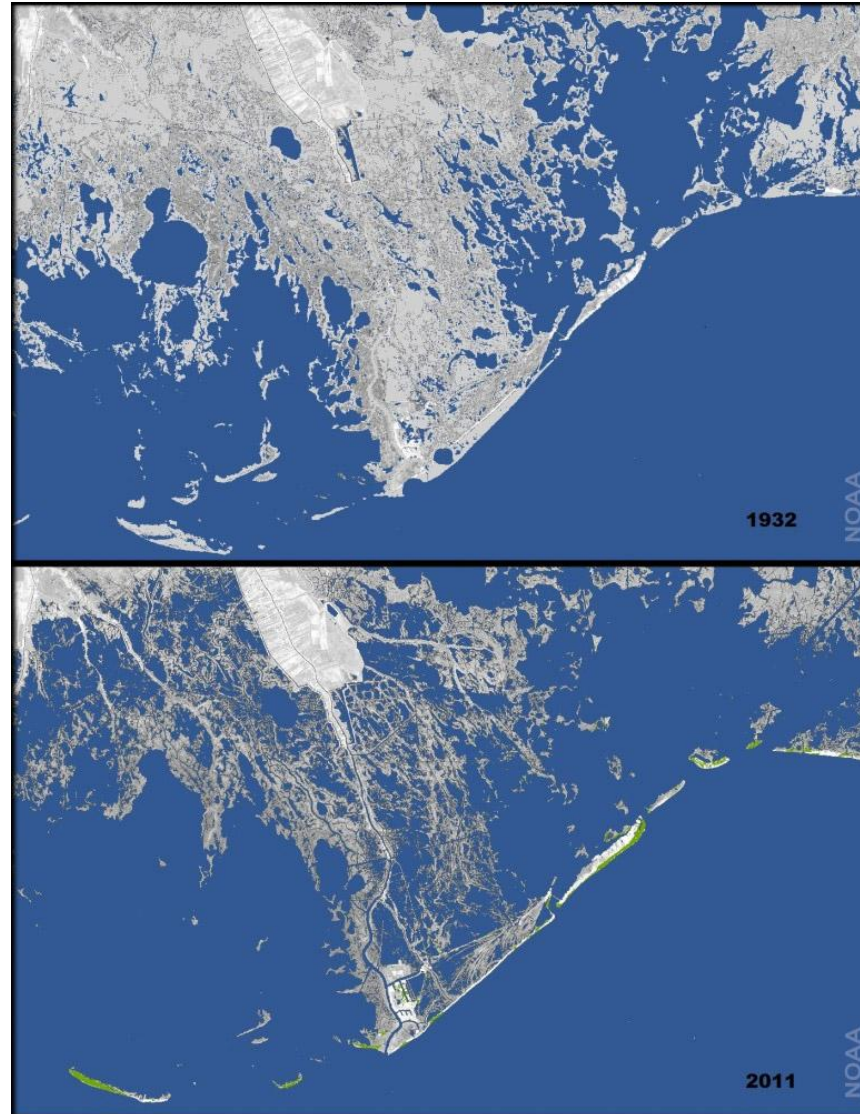
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# Acknowledgements:

- K. Kjos (laboratory assistance)
- Gulf of Mexico Research Initiative (GoMRI)
- NOAA
- Plaquemines Parish

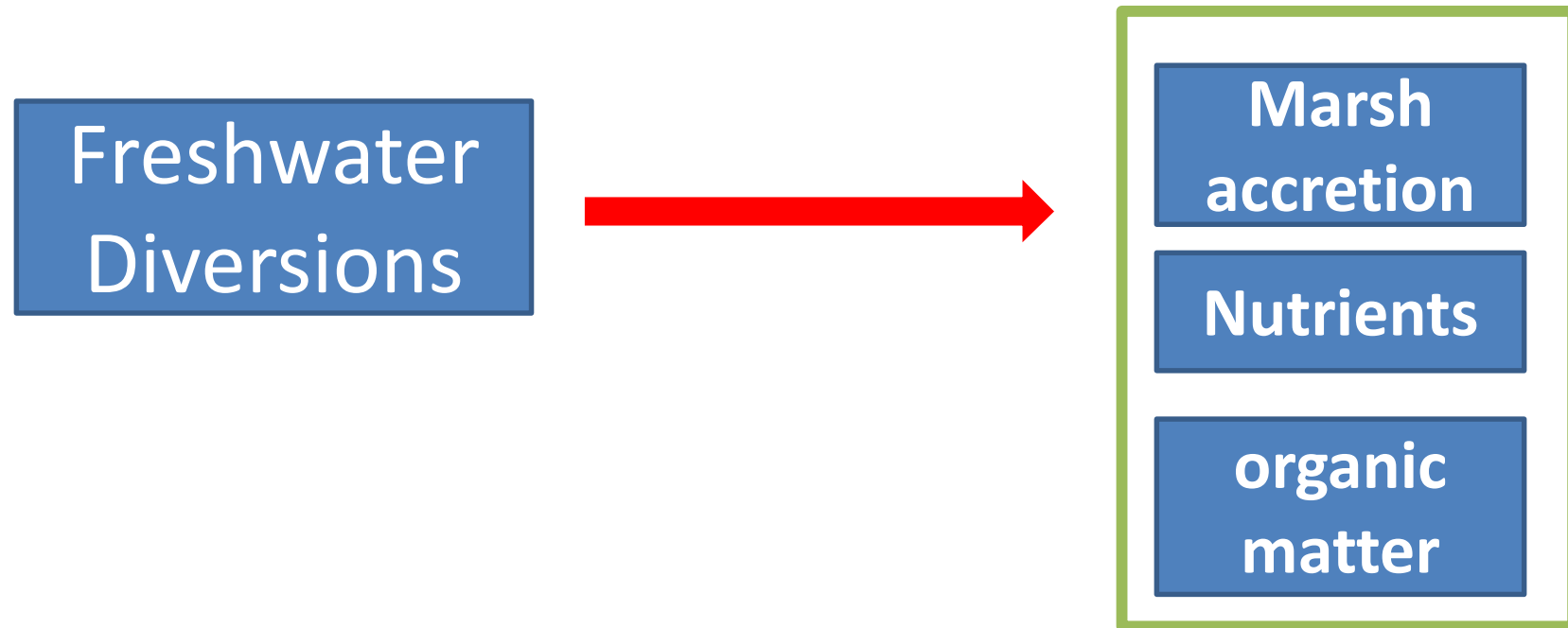
# Land loss in coastal Louisiana



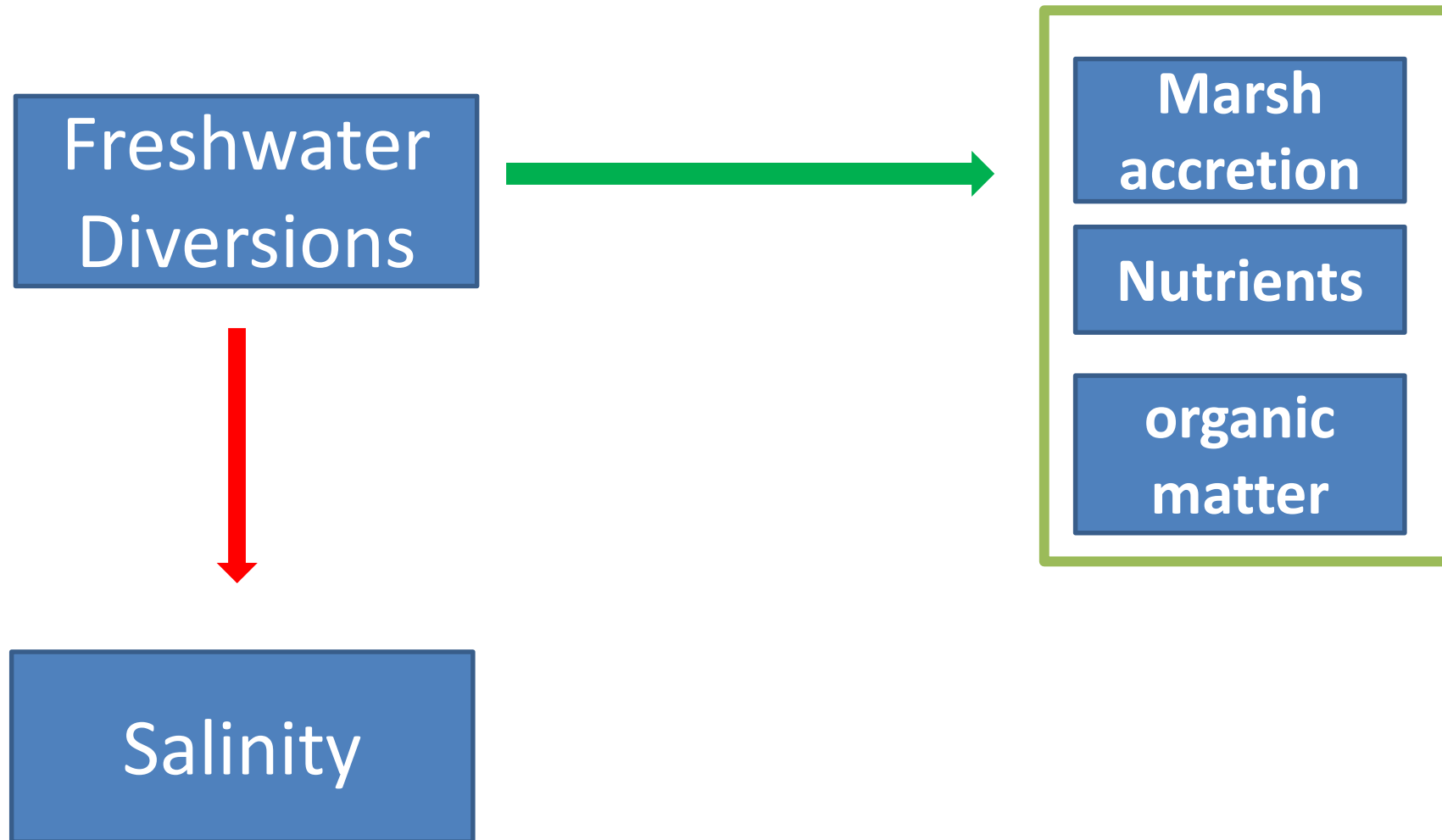
# Freshwater diversions as a solution for land loss

Freshwater  
Diversions

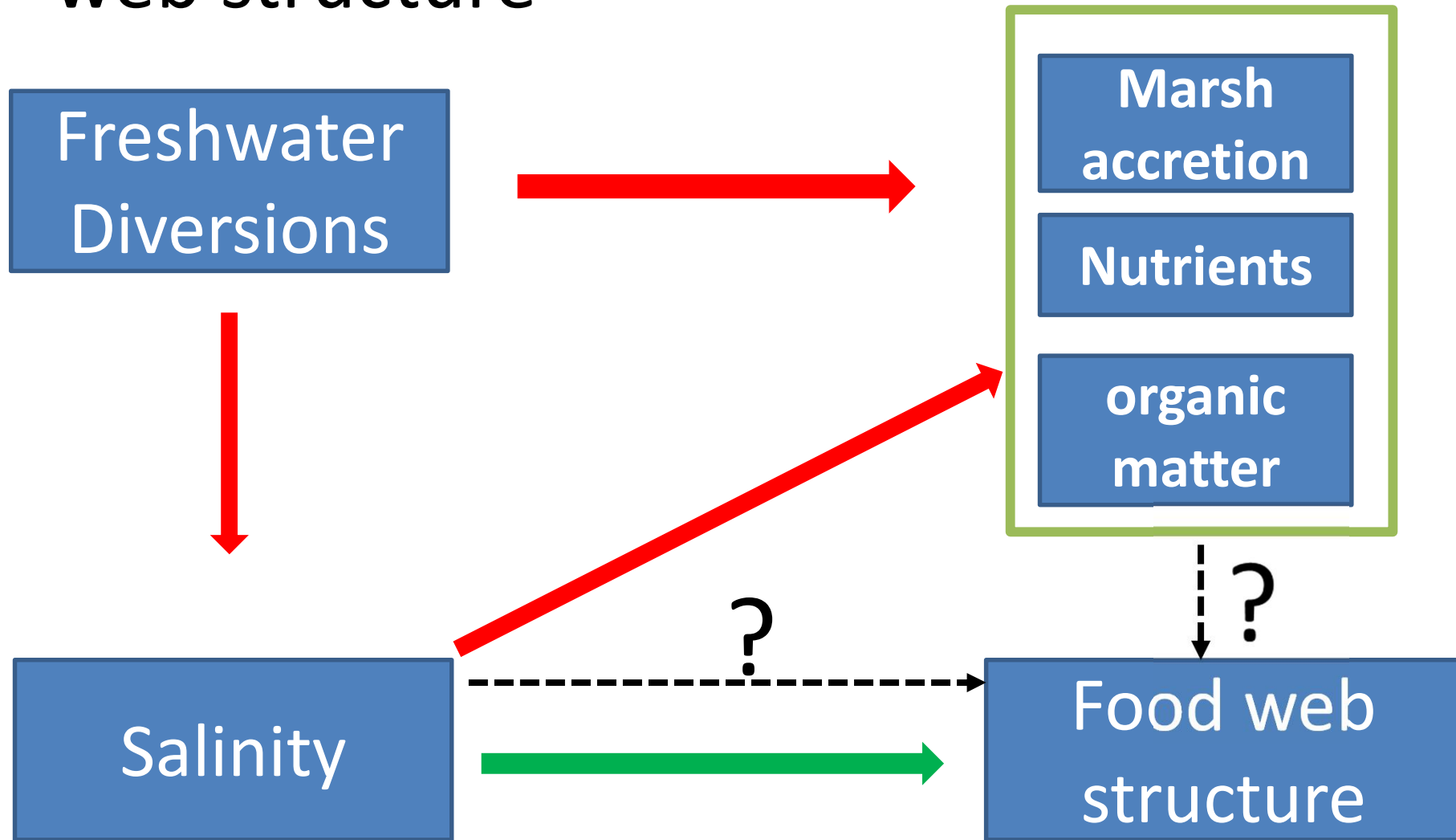
# Freshwater diversions as a solution for land loss



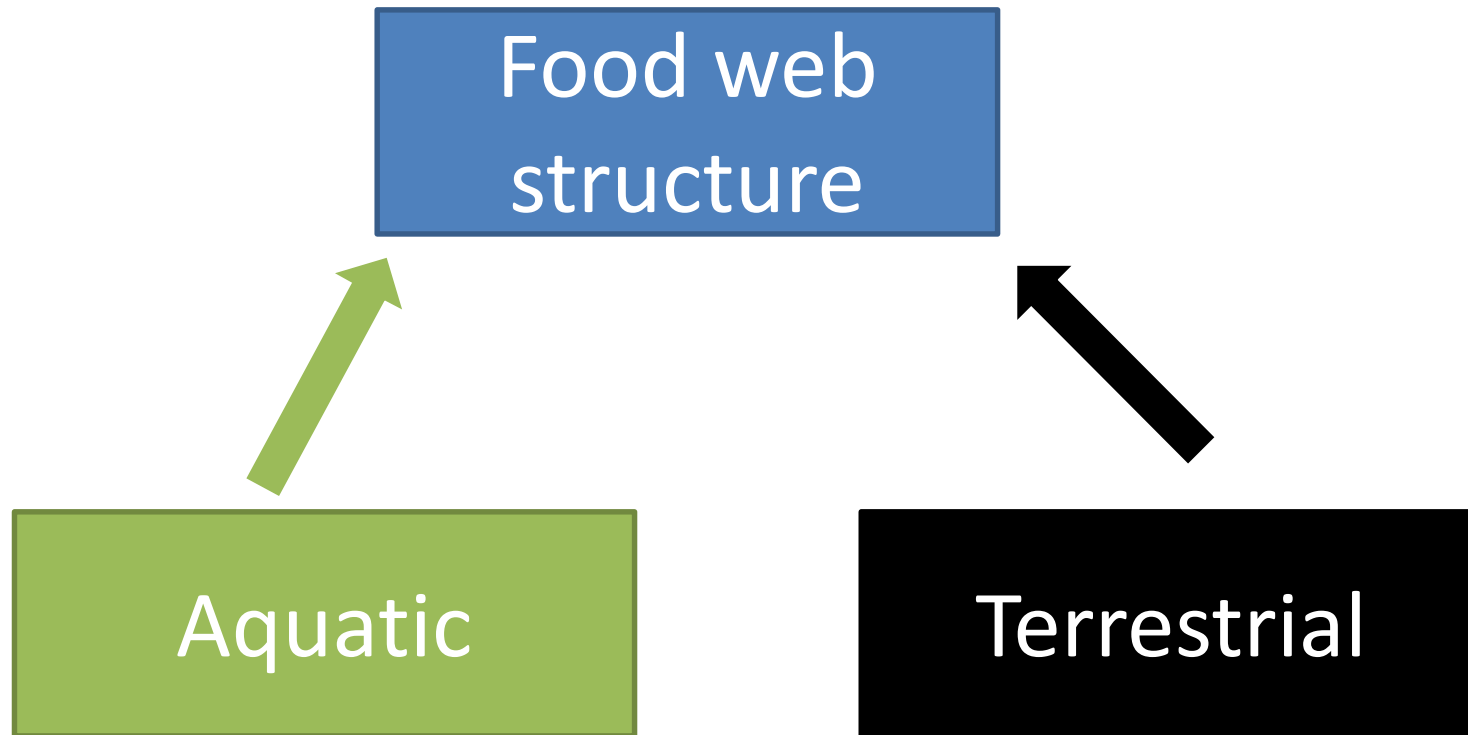
# Freshwater diversions as a solution for land loss



# Freshwater diversions can affect food web structure



# Assessing food web structure by studying flow of energy





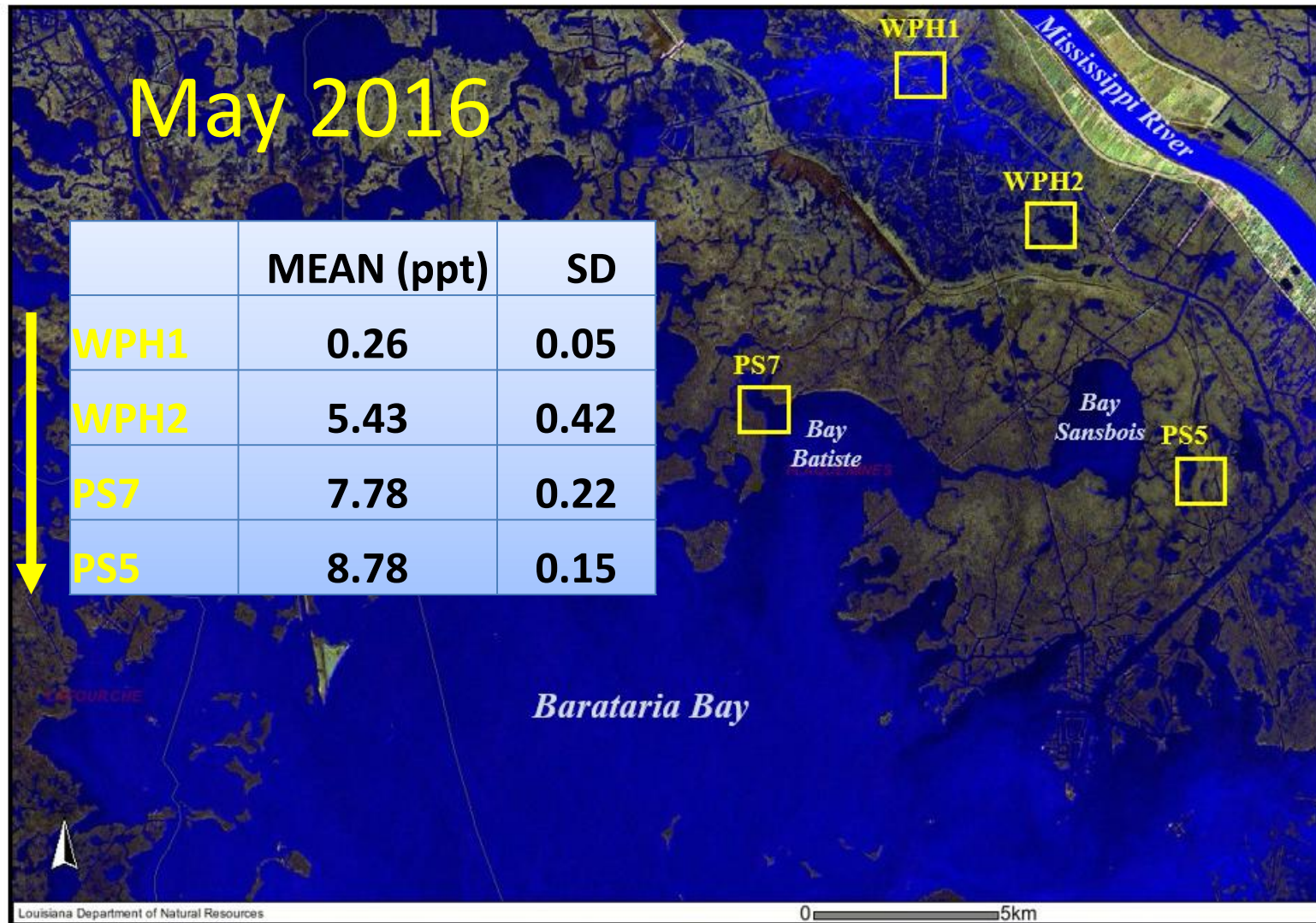
# Assess food web structure along a salinity gradient

To assess food web structure along a salinity gradient:

Specifically, **Assess the relative importance of aquatic and terrestrial carbon to consumers along a salinity gradient**

Objective

# Sites sampled along a salinity gradient



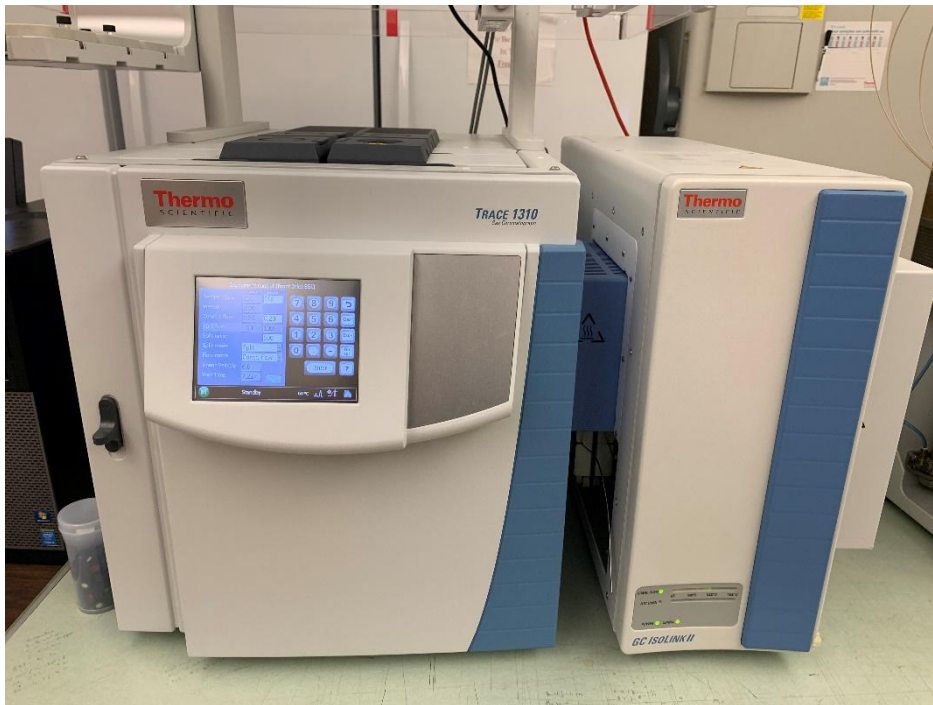
Study Area

# Sample collections along a salinity gradient [2016]

<b>Fish</b>	Blue Catfish Hardhead Catfish	Spotted Gar Alligator Gar	Gulf Killifish Bayou Killifish
	Red Drum Spot	Striped Mullet	Sheepshead Minnow
<b>Aquatic invertebrates</b>	Fiddler crab Blue crab Ribbed Mussels	Grass Shrimp Brown Shrimp Marsh Periwinkle	Oysters Amphipods
<b>Terrestrial invertebrates</b>	Ants Blissids	Grasshoppers Spiders	Striped flies
<b>Aquatic carbon sources</b>	Particulate organic matter	Filamentous Algae	Epiphytic macroalgae
<b>Terrestrial carbon sources</b>			
<b>C3</b>	<i>Phragmites australis</i>	<i>Zizania palustris</i>	<i>Juncus roemerianus</i>
<b>C4</b>	<i>Sporobolus alterniflora</i>	<i>Ipomoea sagittata</i>	<i>Spartina patens</i>

**Methods**

# Analysis of samples collected along a salinity gradient

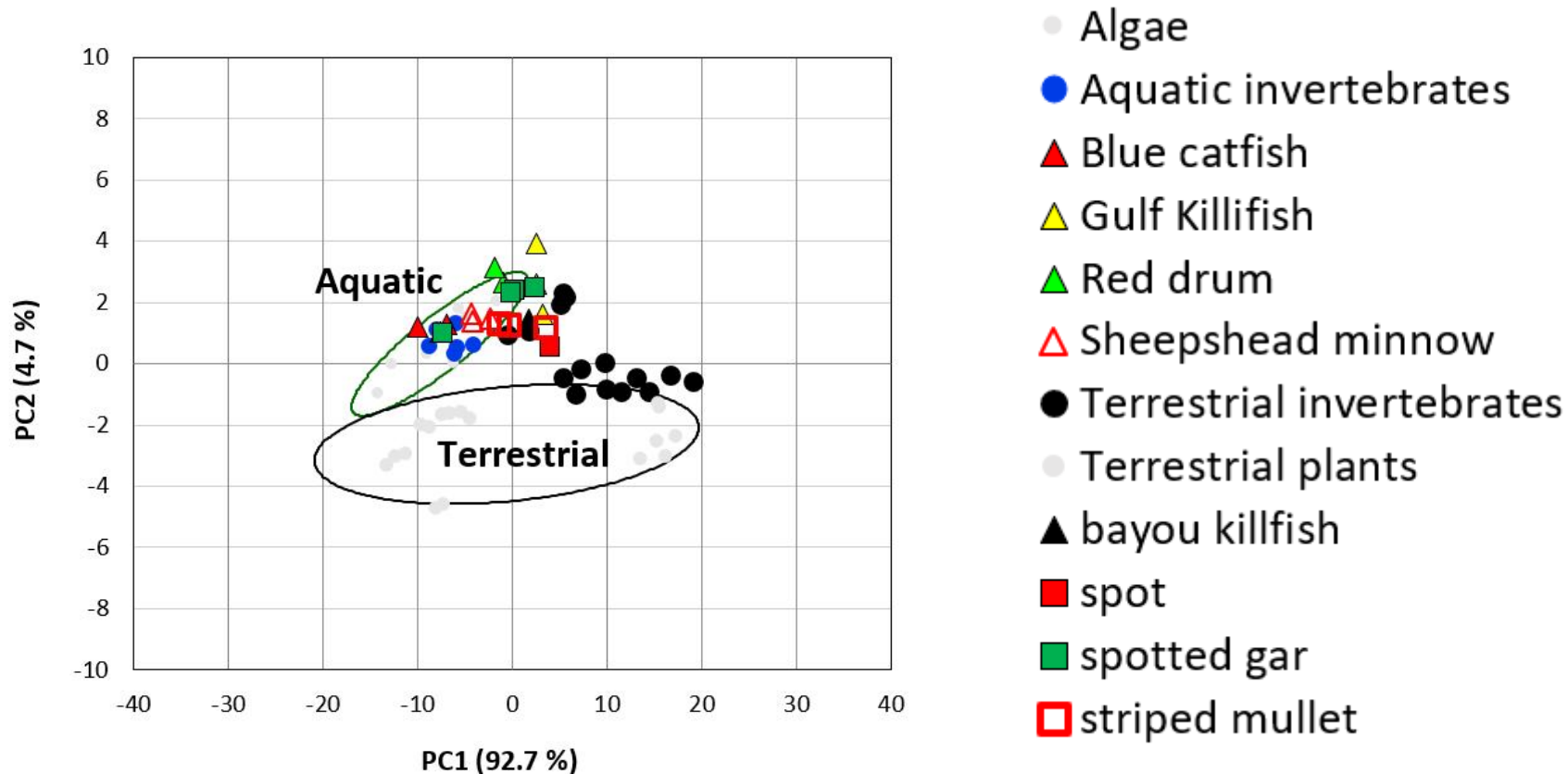


- Freeze dried
- Ground
- Hydrolysed
- Compound specific stable isotope analysis of amino acids (CSIA)
- Identified essential amino acids

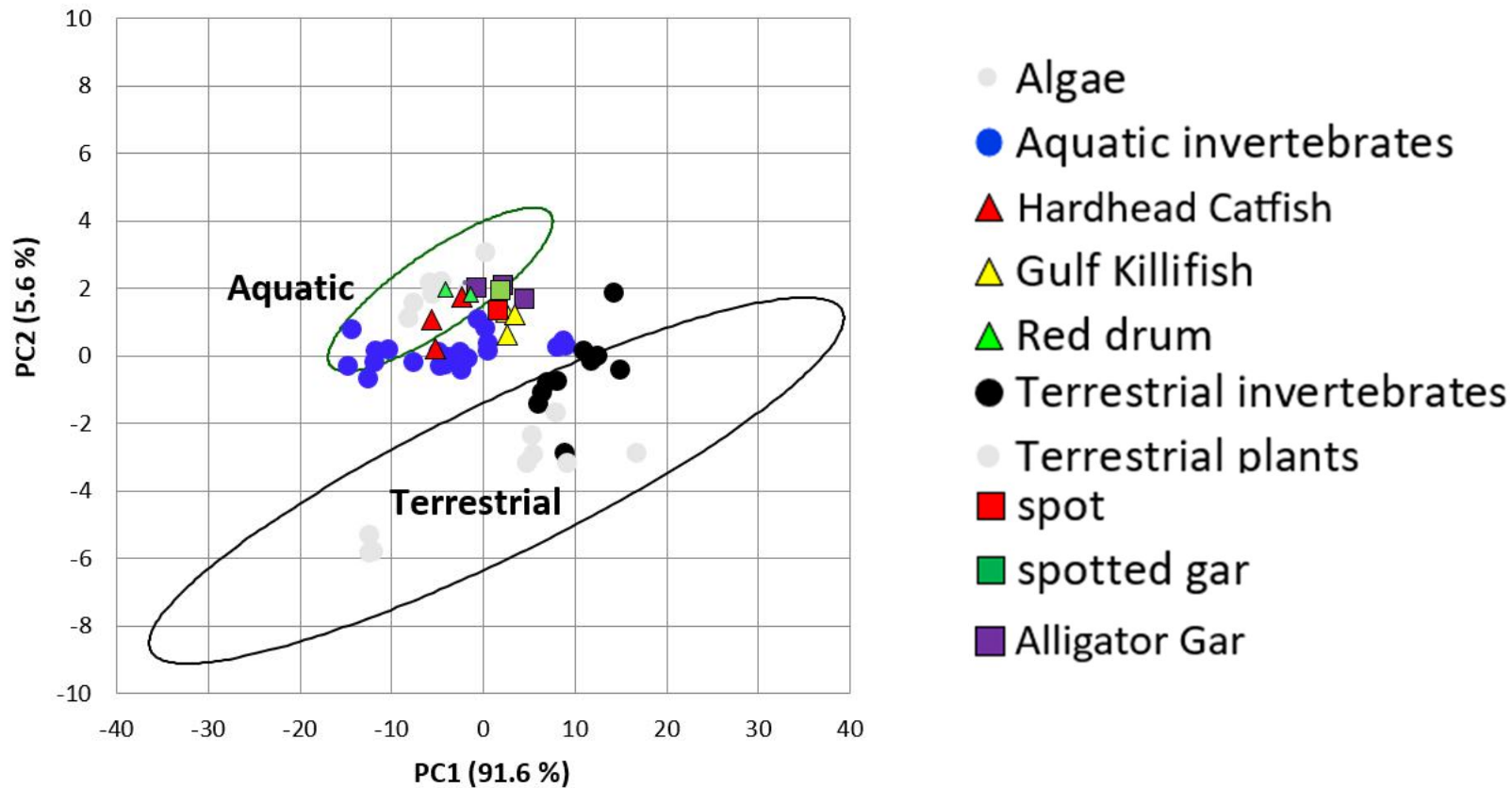
# Data analysis of samples

- Essential amino acids (Valine, Isoleucine, Leucine, Phenylalanine)
- Normalised data
- Principal Component Analysis (PCA)

# Aquatic carbon is important at low salinity (0.2 ppt)

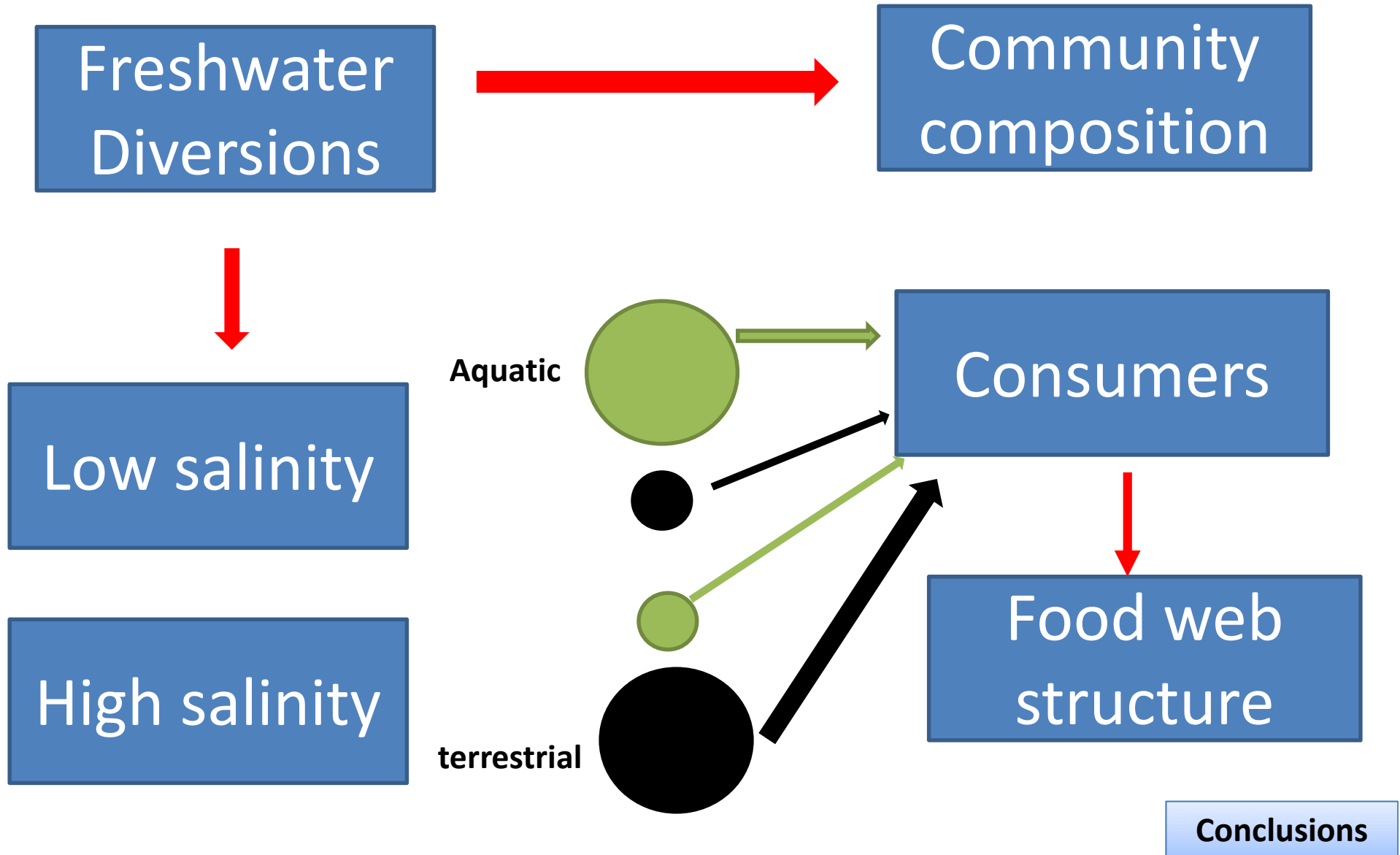


# Aquatic and terrestrial carbon important at high salinity (7.8 ppt)





# Freshwater diversions change food web structure





# Estimate relative contributions of aquatic versus terrestrial carbon to consumers

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Bayesian mixing models

Use of existing dietary data from parallel studies

Next steps

# Thank you

**LSU**

