



# The importance of winds in controlling deposition and reconstructing climate within the estuaries of the Gulf Coast, USA



terrestrial realm.

environmental changes including: - sea level, tectonics (e.g. earthquakes), and climate

- 1.) Relatively shallow (0-5 m)
- 2.) Microtidal setting (< 0.6m)
- semiarid
- them





- Relationship also holds true for percent silt in Texas estuaries

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- 2.) Ideally compare to conservative mode - none exists, so use windsourced.mode
- 3.)Use ratio of the two for dimensionless proxy for wind strength.
- 4.) Remove grain-size measurements associated with modes representing extreme events (e.g. storms, floods,
- 5.) Extract record from longest section of middle-bay deposits





Large backstepping event at 8.2 ka



(D) 4.8-2.5 ka

Large scale development of oyster reefs

1-11-1	Upper-Bay Deposits
	Middle-Bay Deposits

Delta-Plain Deposits

Oyster Reefs and Shell-Hash Oyster Reefs and Middle-Bay Deposits



from longer duration winds





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# "Wind-work" proxy



- .) Overall increase throughout core most
- A.) Overall widening of bay during
- B.) Overall decrease in rate of sea-
- 2.) Storm and flood events (mode 4)
- However, cannot distinguish stronger wind

Comparison with other paleo-climate proxies



## Summary and Conclusions

- .) Copano Bay experienced a general transgression over the last 9.6 ky due to sea-level rise
- 2.) The overall transgression was marked by 4 punctuated events
- 3.) The largest event recorded in the sediments of Copano Bay is the 8.2 ky event in which the estuarine environments backstepped 7.5 km
- 4.) Middle-bay sediments within the estuaries of NW Gulf of Mexico contain 4 major grain-size modes
- 5.) We used the ratio of two of these modes as a proxy for "windwork" over the last 8.2 ky
- 6.)The windiest conditions recorded in our proxy occurred during the mid-Holocene
- 7.) Estuaries contain valuable records of paleoclimate

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