

Composition and Texture of Ooid-rich Carbonate Sediment along a Beach-to-Offshore Transect at Pigeon Cay, Cat Island, Bahamas

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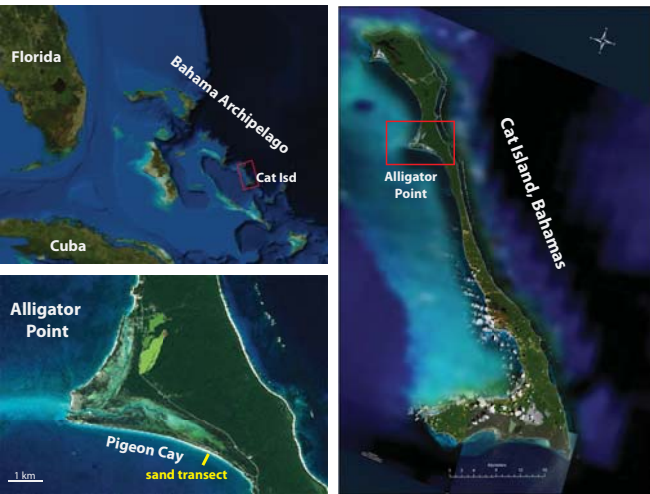
INTRODUCTION

Beach sand on Pigeon Cay, Cat Island, Bahamas is composed predominantly of small, round carbonate grains known as ooids. Ooids form by precipitation of calcium carbonate around a nucleus suspended in water. While common at several other locations in the Bahamas, ooids have only recently been reported as a major carbonate sediment contributor on Cat Island (Mylroie et al., 2006).

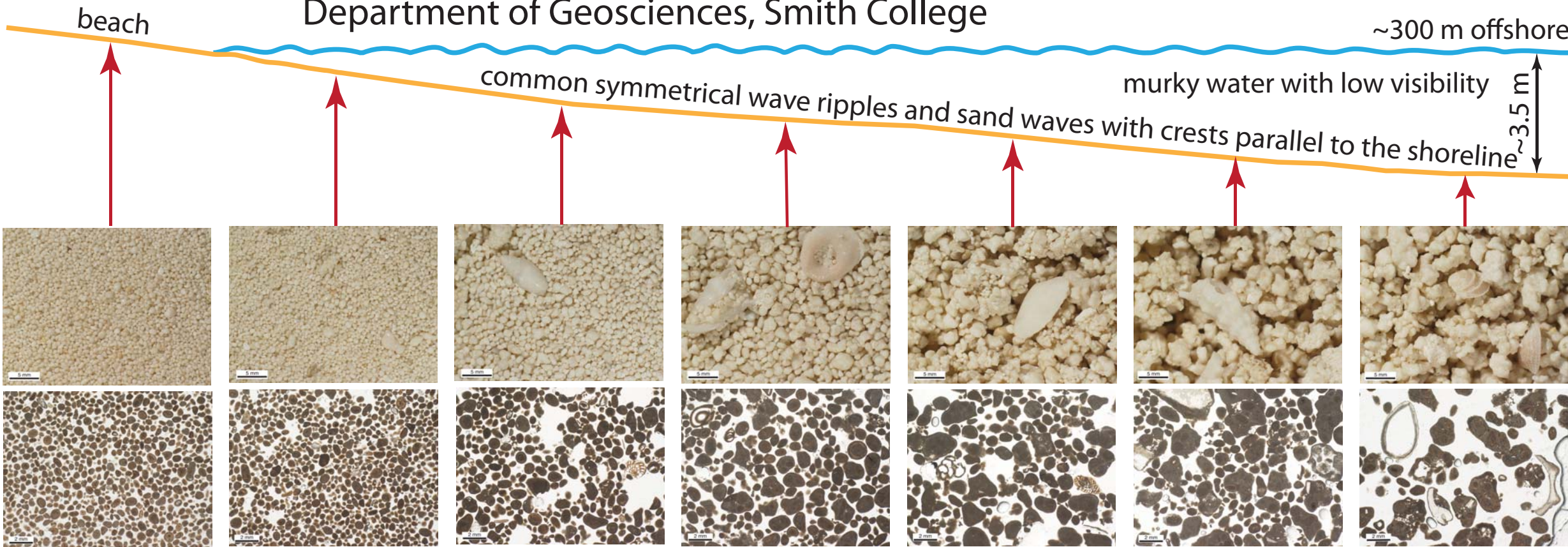
OBJECTIVE

To gain insights into the origin and distribution of ooids in modern carbonate depositional environments, the composition and texture of beach sand was compared to six sediment samples collected from the sea floor at every 50 meters along a transect from the beach to about 300 meters offshore with a maximum water depth of about 3.5 meters.

STUDY AREA



Data were collected off Pigeon Cay, Cat Island, Bahamas.



sand characteristics:

- fine grained
- well sorted
- shapes: round & spherical
- ooid dominated

TRENDS

- increasing grain size and decreasing sorting
- grains become more angular and irregular in shape
- ooids decrease in dominance and are replaced by grapestones (aggregates of ooids and skeletal fragments in micritic matrix) and skeletal grains

sand characteristics:

- coarse grained
- poorly sorted
- shapes: angular & irregular
- dominated by grapestones and shell fragments

INTERPRETATIONS & IMPLICATIONS

- Surprising variation of sand composition and texture within transect at Pigeon Cay.
- This study suggests that ooids likely form in a relatively narrow, high-energy, wave-swept shallow offshore environment corresponding to the middle part of the transect.
- Storms and waves transport ooids onshore where they are lithified as beach and eolian deposits. Ooids are also transported farther offshore where, under lower energy conditions, they lithify into grapestones with micritic matrix.
- High degree of micritization of ooids by microborers suggests a present-day slow rate of ooid formation and deposition.
- This study of ooids on Cat Island has a great potential to provide important information about the origin and distribution of ooids in carbonate depositional systems.

FUTURE WORK

- Extend this transect farther offshore; make better underwater observations under better visibility.
- Conduct similar studies elsewhere on Cat Island.

ACKNOWLEDGMENTS

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REFERENCES

Mylroie, J.E., Carew, J.L., Curran, H.A., Freile, D., Sealey, N.E., and Voegeli, V.J., 2006, Geology of Cat Island, Bahamas: A Field Trip Guide: San Salvador, Bahamas, Gerace Research Centre, 44 p.