An aerial photograph of a coastal area showing significant erosion and debris on the beach. The water is turbulent, and the beach is wide and sandy with scattered rocks and debris. The sky is overcast.

Geomorphic Expression of Erosion on the Mississippi Gulf Coast Islands
Caused by Hurricane Georges

By

Keil Schmid

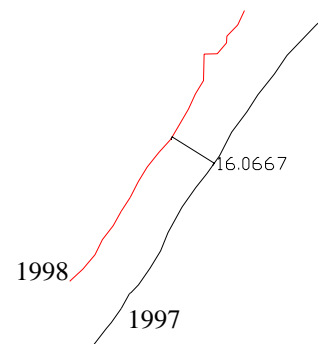
Mississippi Office of Geology

Introduction

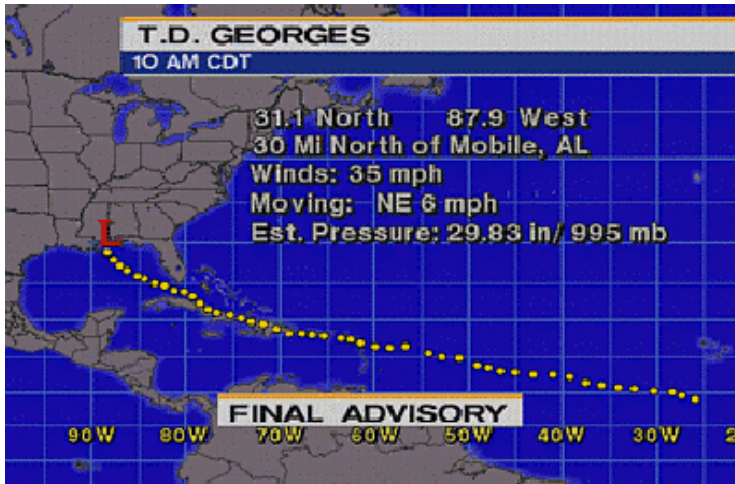
- Goals: 1) Examine erosional features on natural Gulf Coast Islands from a medium strength hurricane; 2) document the evolution/recovery of different geomorphic/physical island zones under ambient conditions.
- Purpose: 1) Develop a better understanding of the Gulf Coast Islands evolution and possible future; 2) Apply knowledge to more critical inhabited shorelines.
- Methods: Shoreline GPS mapping, Aerial Videography, and Field visits

Results

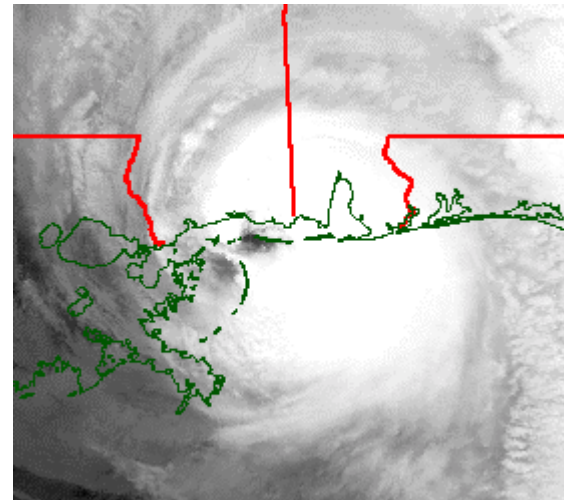
- Hurricane Georges-category 2 hurricane
- Wave terraces- large low angle wave attack
- Relict morphology- indicators of extreme erosion or a change in island evolution.
- Seaward sediment movement- crucial in the westward migration.
- Sand shoals- an ingredient of island migration & the recovery process
- Inhabited shoreline response



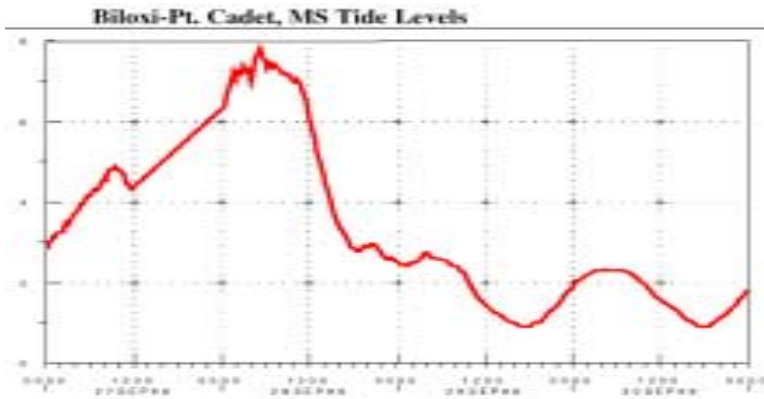
Hurricane Georges



Weather Channel



Space Oceanography Group, John Hopkins University



Mobile Army Corps Engineers

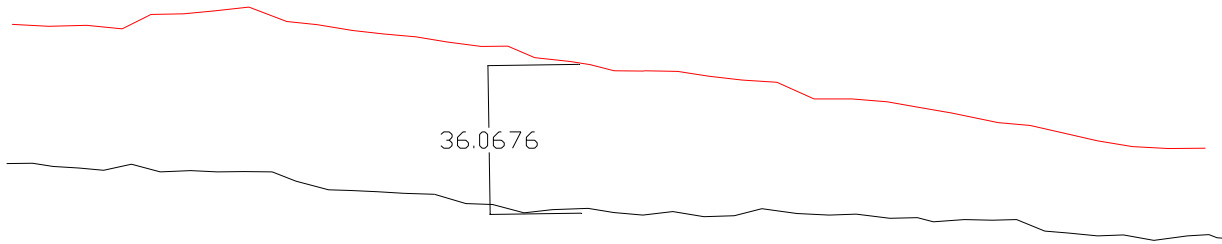
Storm Stats	Pascagoula-Biloxi	Offshore
Sustained wind speed (mph)	105	>80
Storm surge (ft)	8.0-9.6	
Wave heights (ft)		36, 16
Pressure	961	<963

Island Site Map

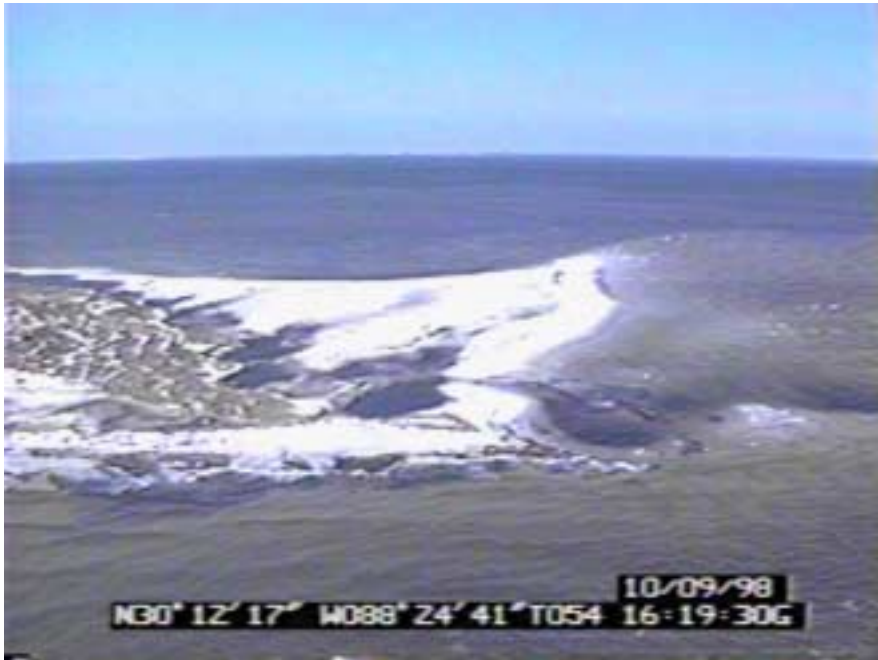
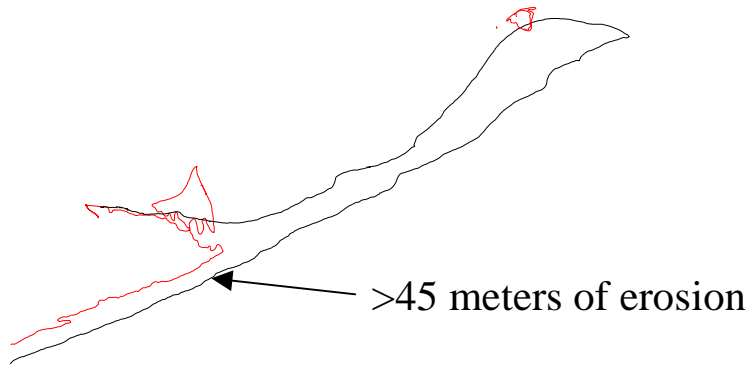


Wave Terraces

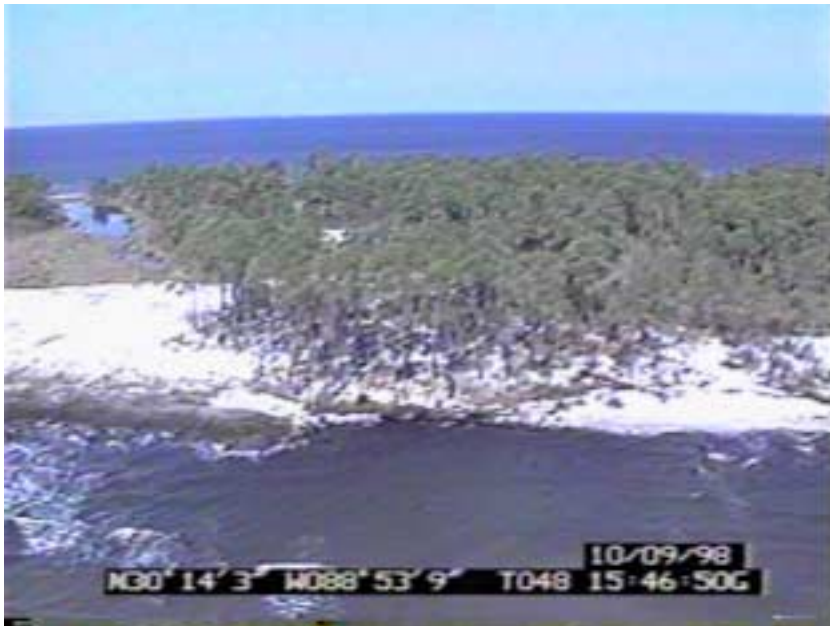
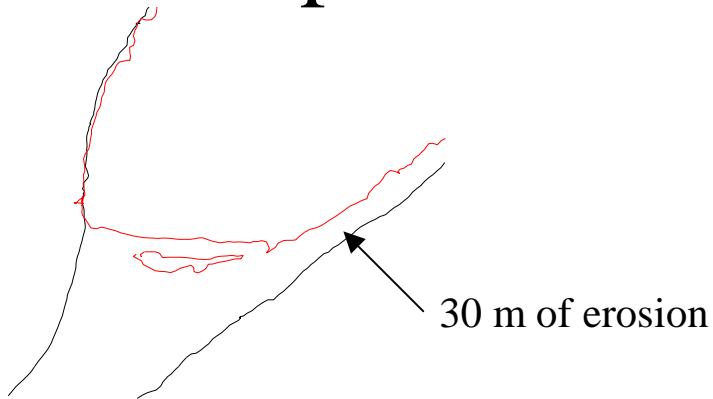
Horn Island



Exposed Relict Morphology



Exposed Relict Morphology:2



Seaward Sediment Transport



Cat Island

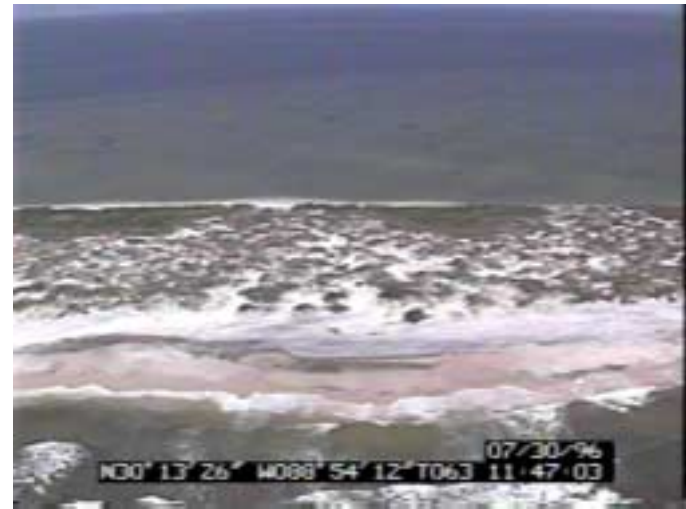


- Cat Island the most western of the studied islands
- Exhibit the highest degree of morphology associated with offshore sediment movement

Sand Shoals

P. Bois Is.

E. Ship Is.



96



98

Island Recovery

E. Ship Is.

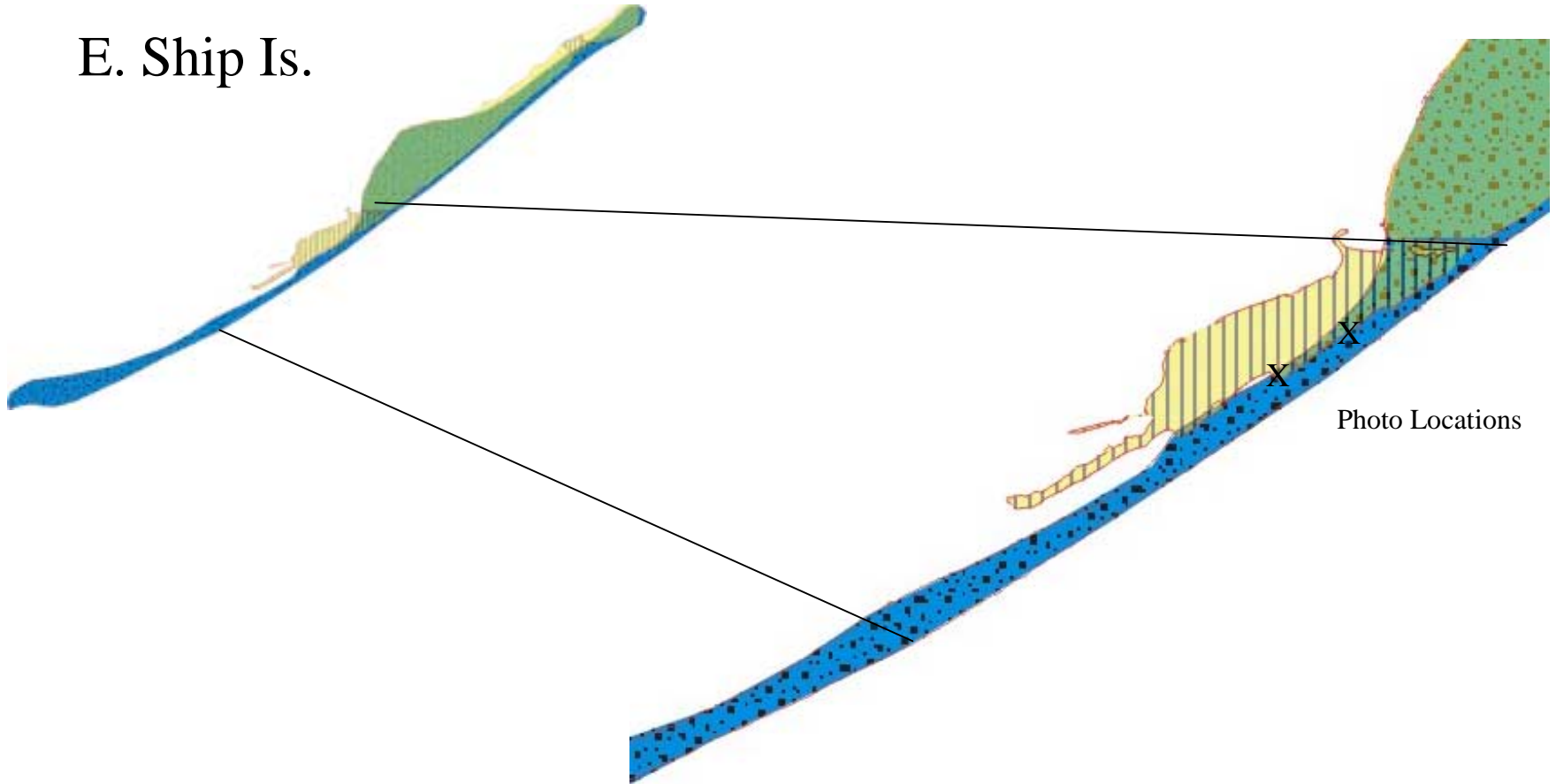


Photo Locations

Island Recovery



10/98



01/99



Inhabited Shoreline Responses



Dauphin Island Vs. Horn Island

- Similar over-wash patterns
- Distinctly different outcomes
- Mitigation Vs. Migration



Conclusions

- Wave Terraces- experienced high erosion but did not show a distinct change in morphology; equilibrium state
- Relict Morphology- low sediment budget; out of equilibrium with conditions
- Seaward Sediment Transport- low at all but the western most island
- Sand Shoals- storm breaching widespread on all eastern islands with shoreward sediment movement
- Island recovery- transgressive sand shoals
- Populated Shorelines- Erosion Vs. Evolution