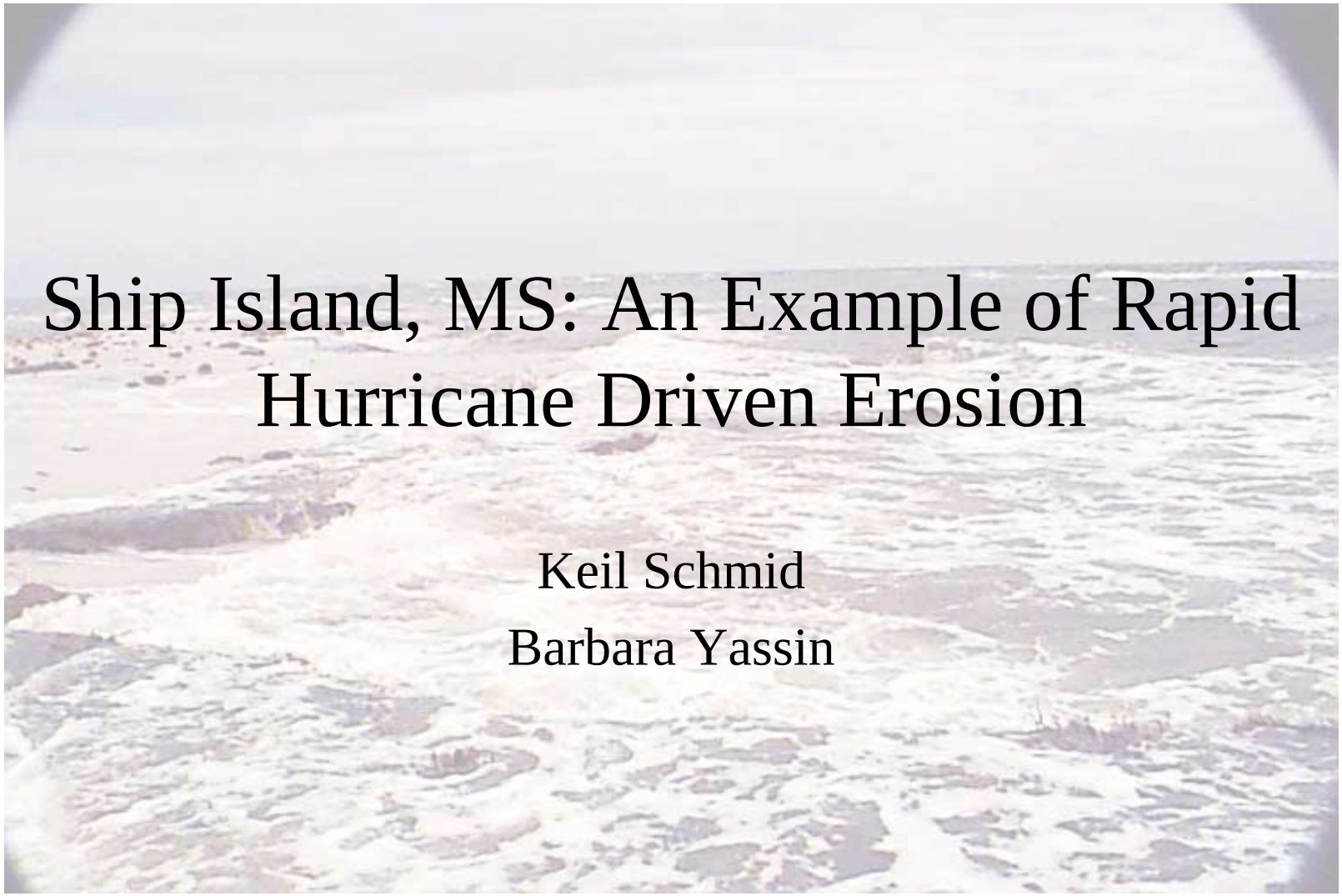
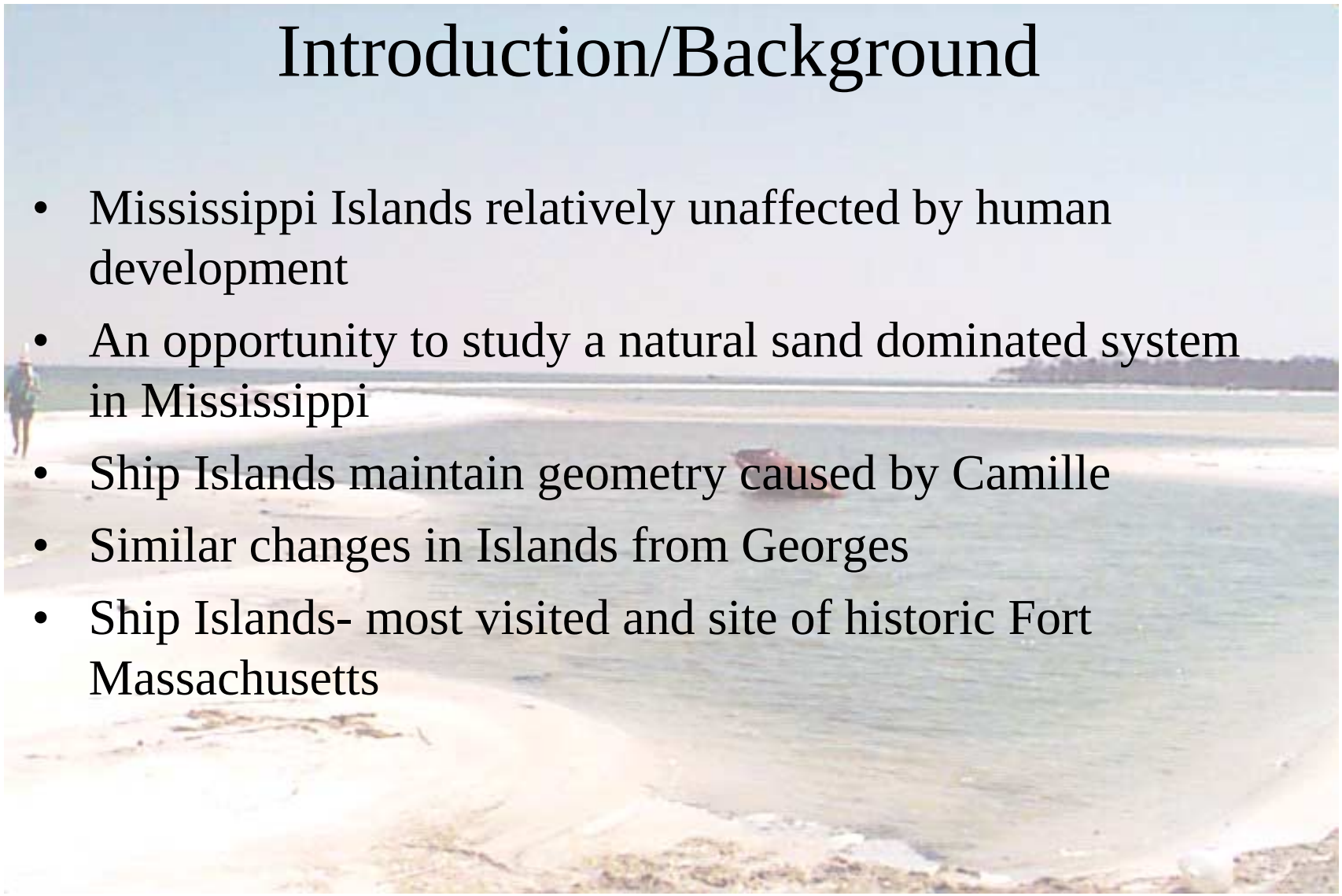


Ship Island, MS: An Example of Rapid Hurricane Driven Erosion

Keil Schmid

Barbara Yassin

Introduction/Background



- Mississippi Islands relatively unaffected by human development
- An opportunity to study a natural sand dominated system in Mississippi
- Ship Islands maintain geometry caused by Camille
- Similar changes in Islands from Georges
- Ship Islands- most visited and site of historic Fort Massachusetts

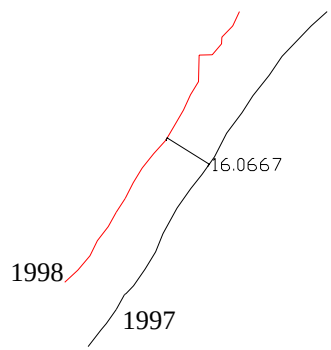
Goals/Importance

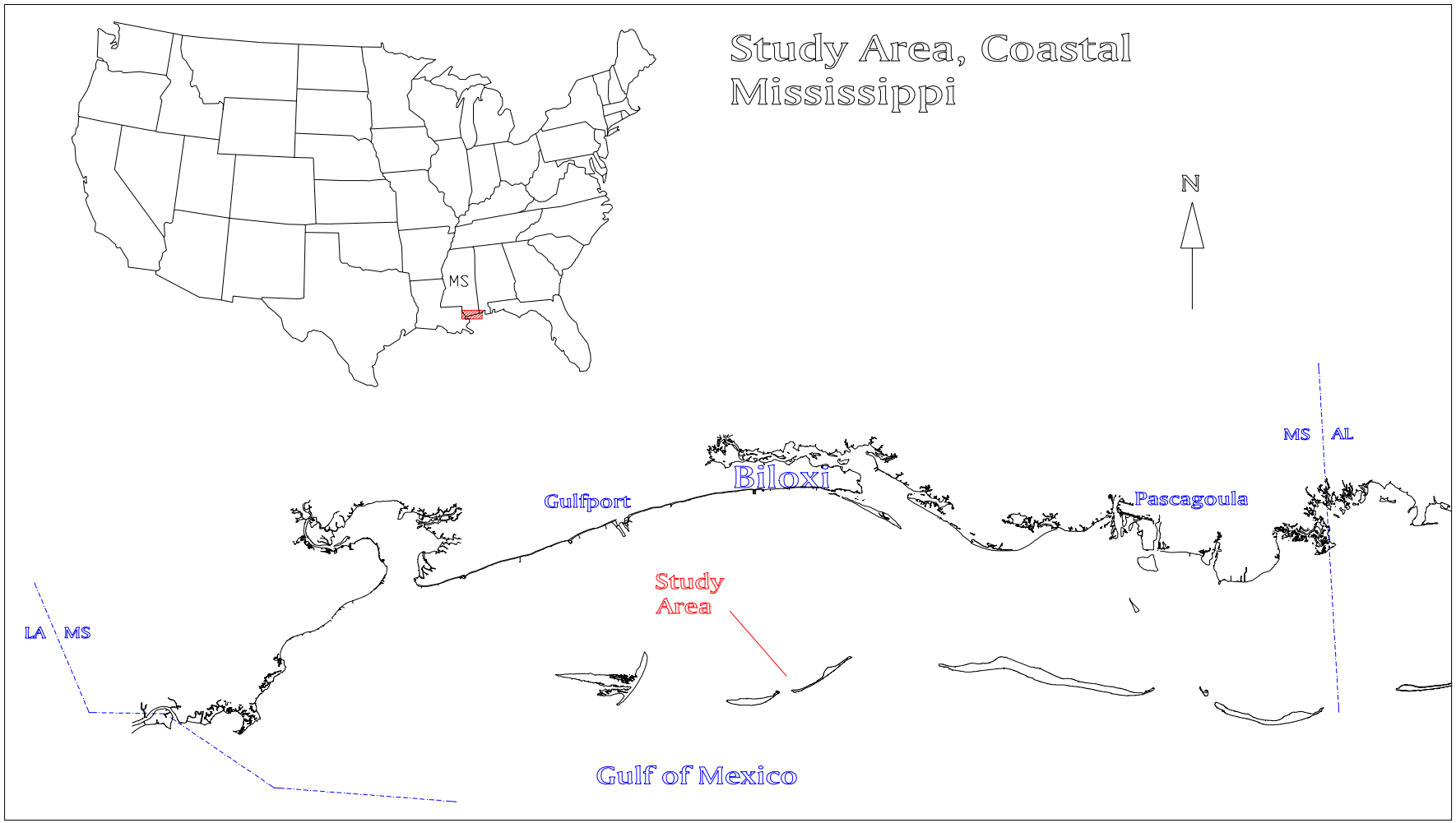
- Study of a “natural system” on a highly modified coast - natural shoreline evolution
- Transfer of knowledge to developed shorelines along Northeast Gulf Coast - event vs. continuous processes
- Consequences of human interaction - environmental changes in habitat

- Ship Islands offer protection to highly developed shoreline between Gulfport and Biloxi
- Change in Mississippi Sound-Gulf of Mexico circulation and mixing
- Loss of habitat and recreational space
- Navigation hazards

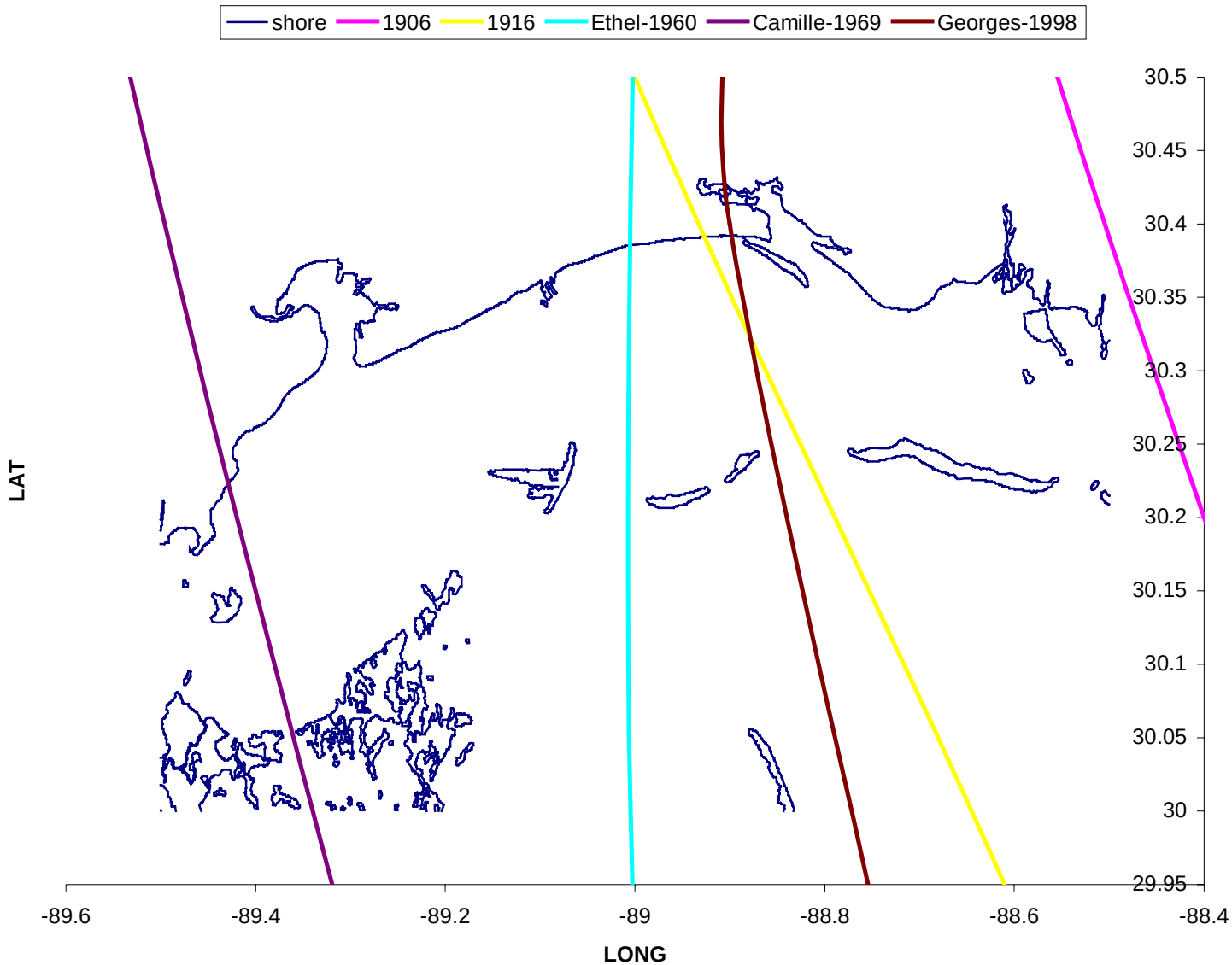
Methods

- GPS shorelines before and after Hurricane George
- Digitized shorelines prior to 1993
- GIS analysis of shoreline positions through time
- Field photos and notes from visits directly after George and in following months
- Buoy reports

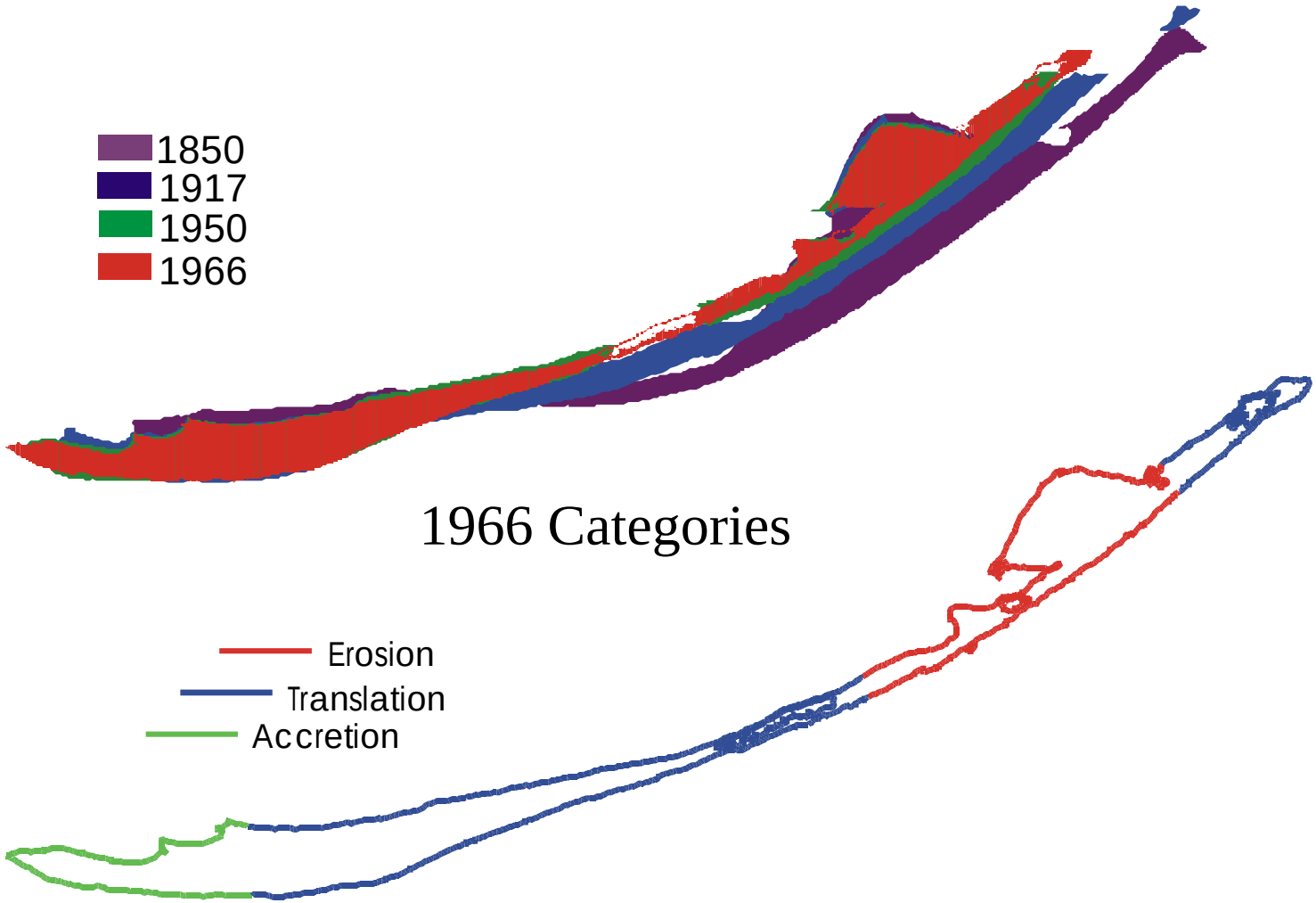



Study Area, Coastal Mississippi
MS
N
MS AL
Biloxi
Gulfport
Pascagoula
Study Area
LA MS
Gulf of Mexico

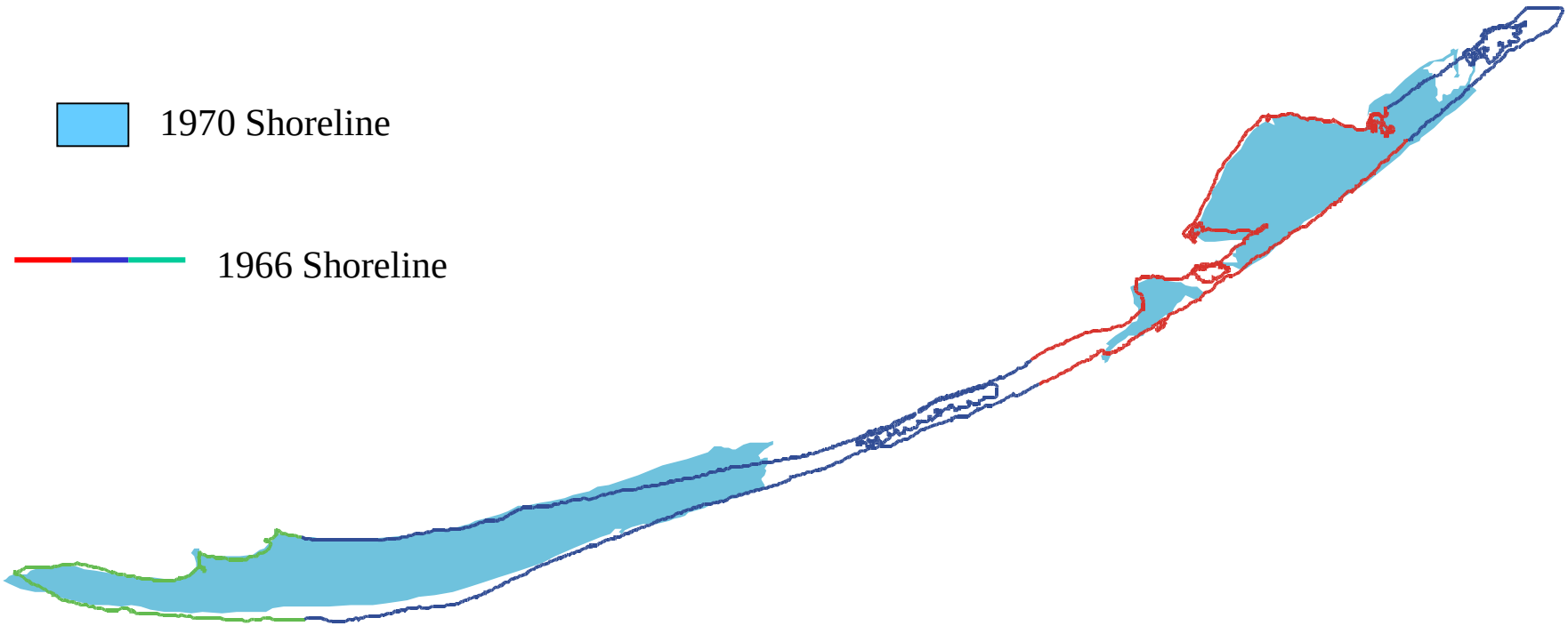
Hurricanes


shore
1906
1916
Ethel-1960
Camille-1969
Georges-1998
LAT
30.5
30.45
30.4
30.35
30.3
30.25
30.2
30.15
30.1
30.05
30
29.95
-89.6
-89.4
-89.2
-89
-88.8
-88.6
-88.4
LONG

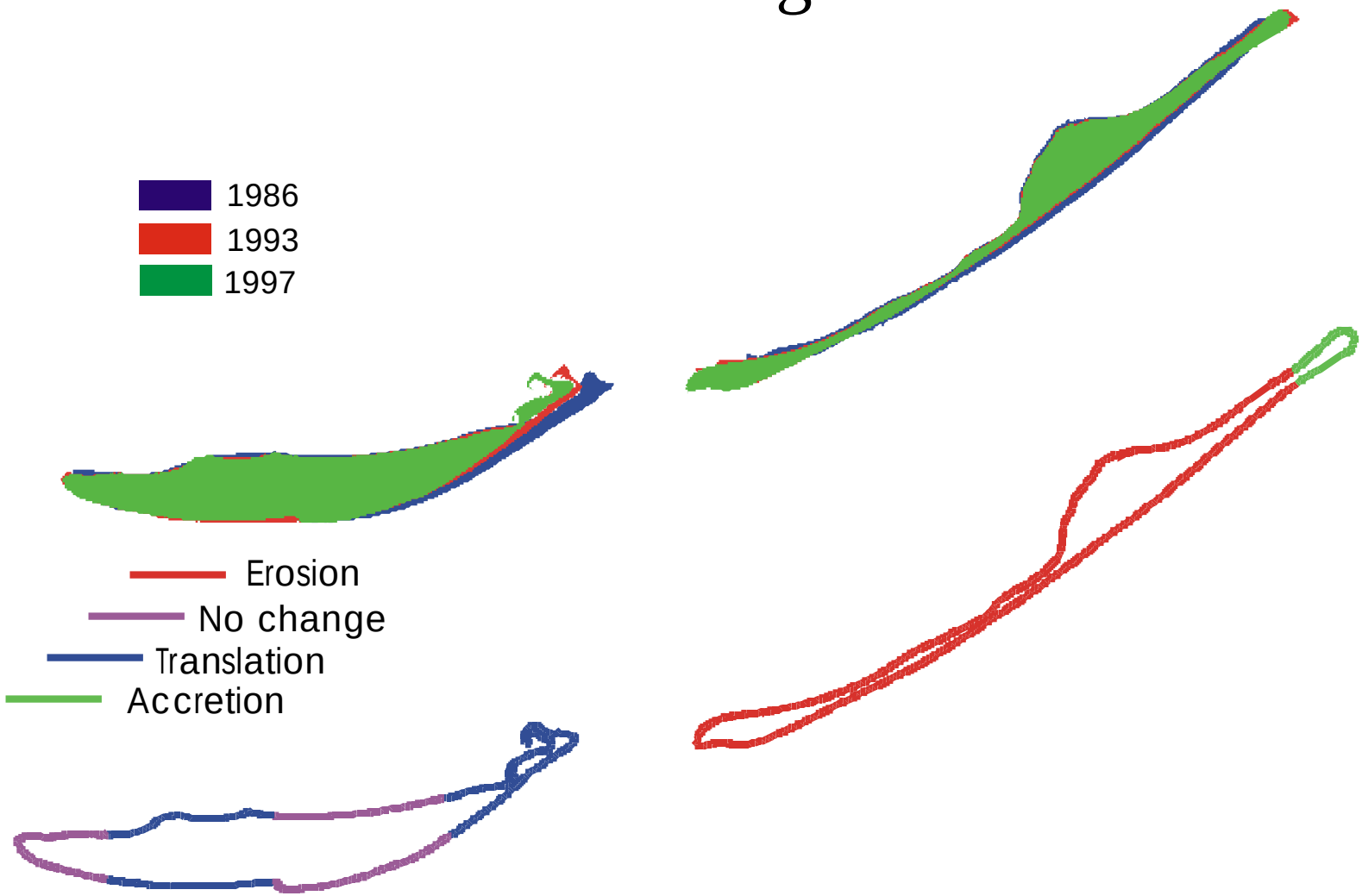
Pre-Camille


1850
1917
1950
1966
1966 Categories
Erosion
Translation
Accretion

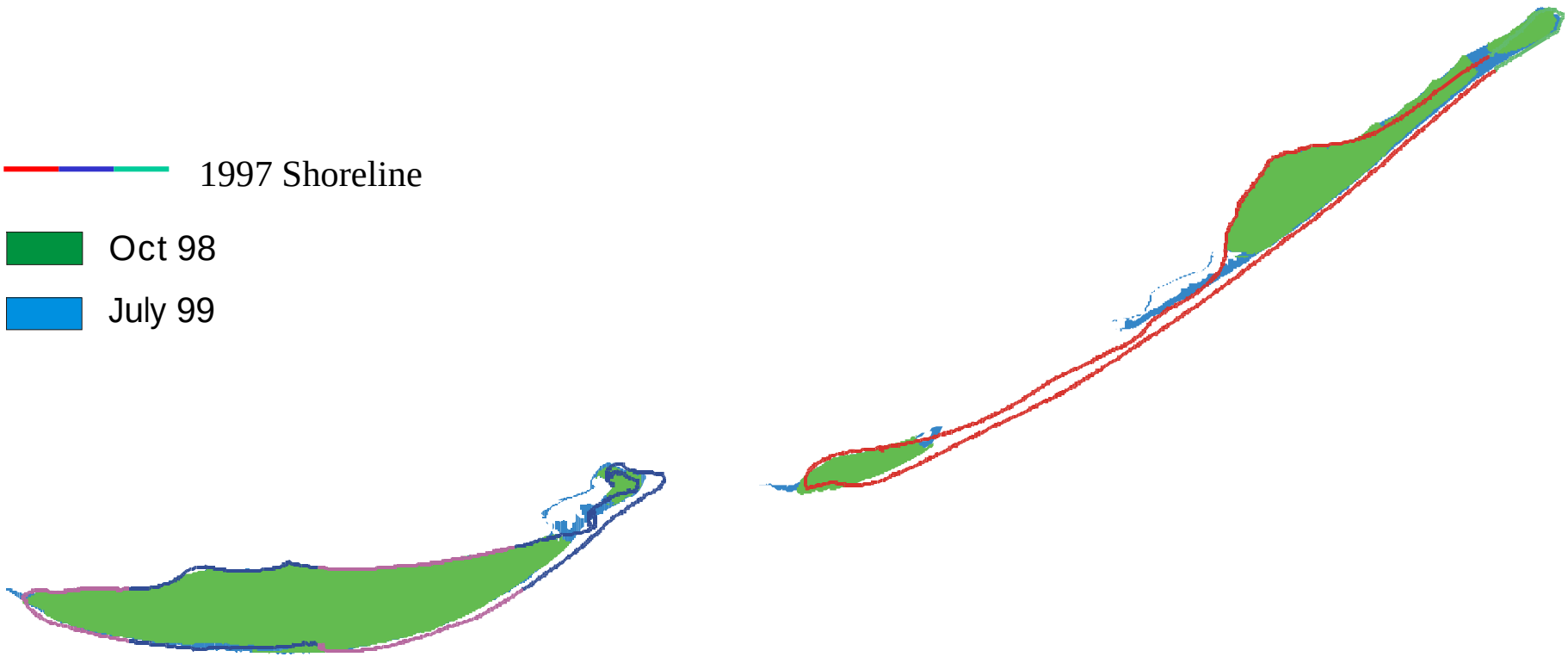
Post Camille



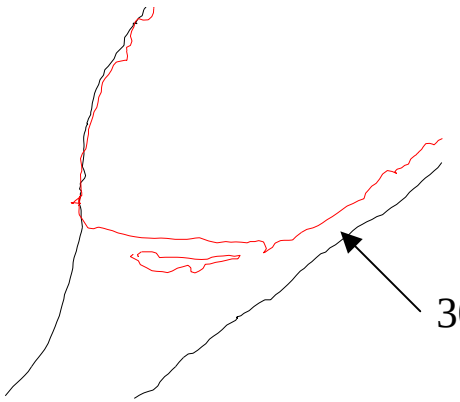
Pre Georges



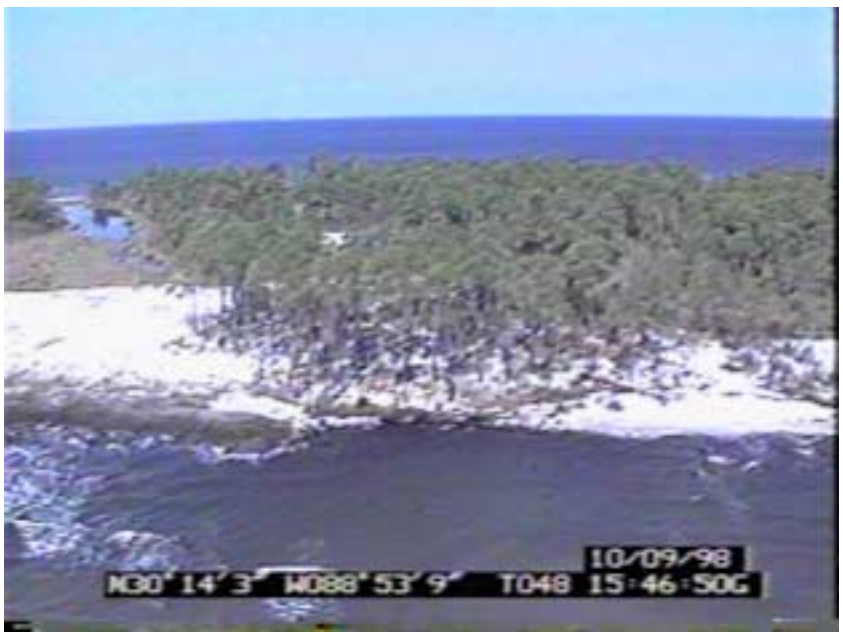
Post Georges



Post George Morphology

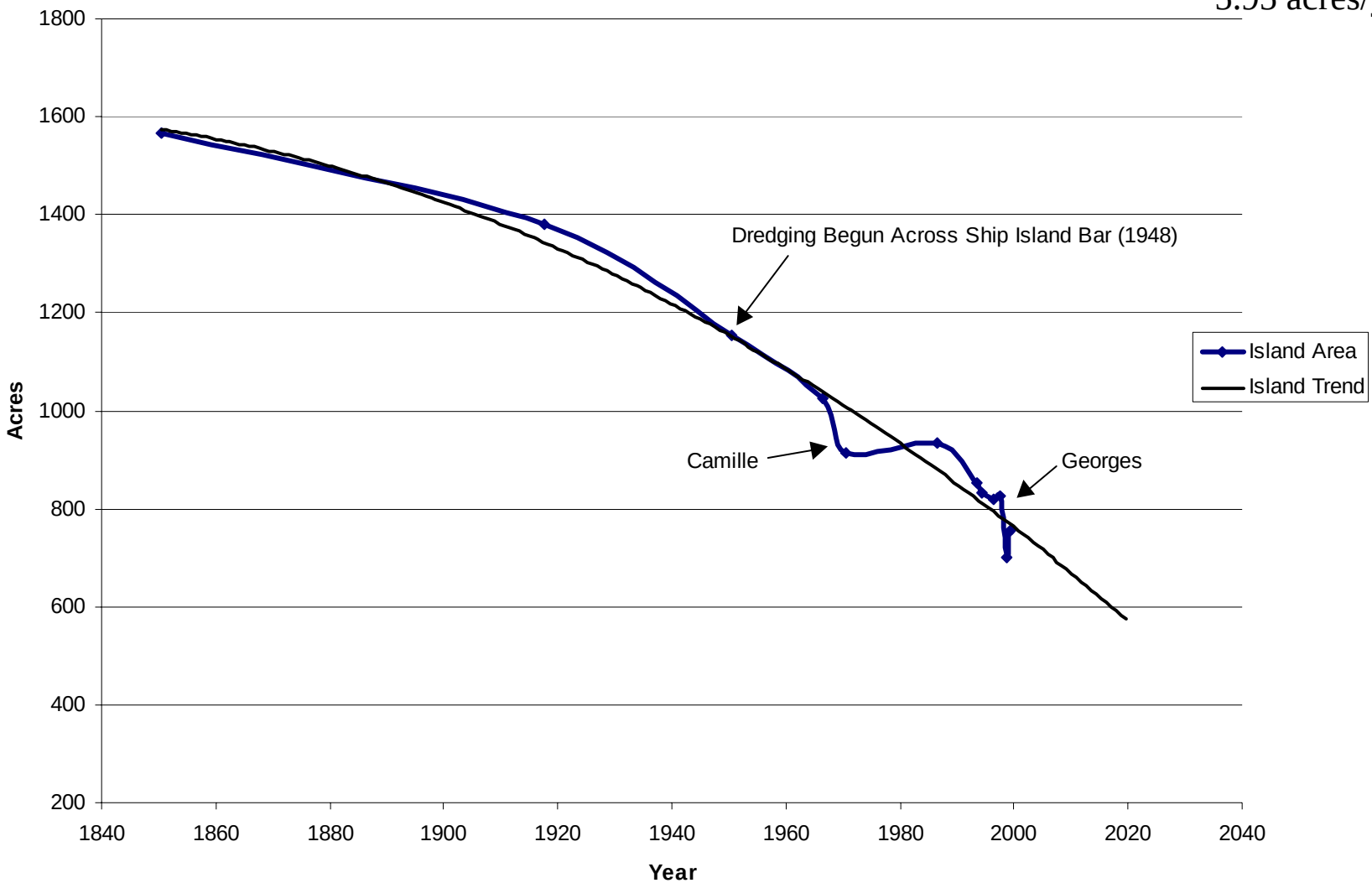


30 m of erosion

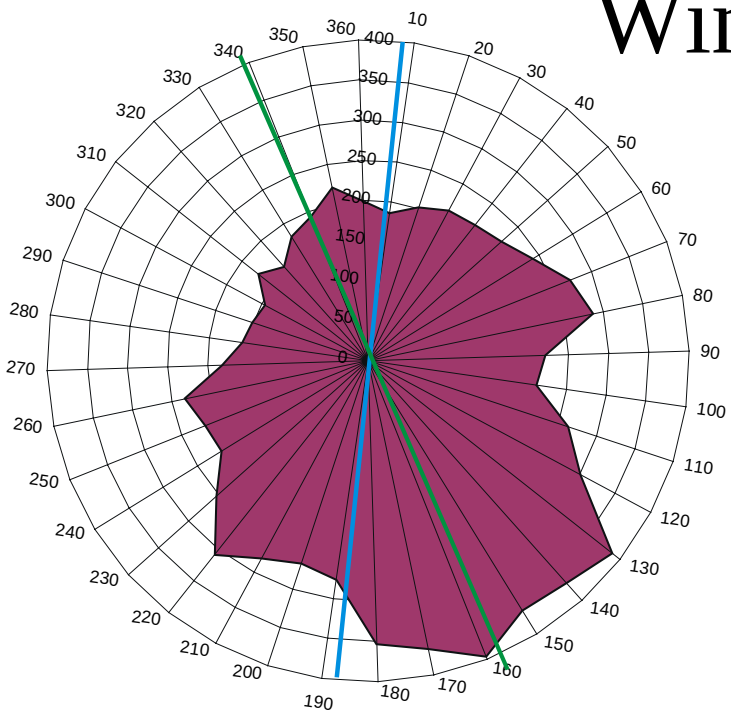


Area Change 1850-1999

- 1850-1966 loss of 4.64 acres/year
- 1970-1999 loss of 5.95 acres/year

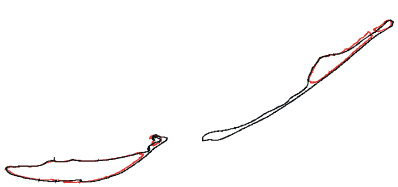


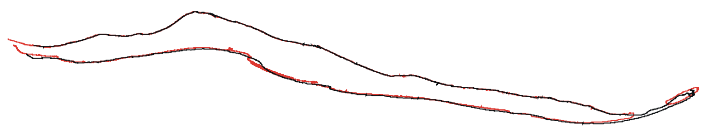
Wind Data



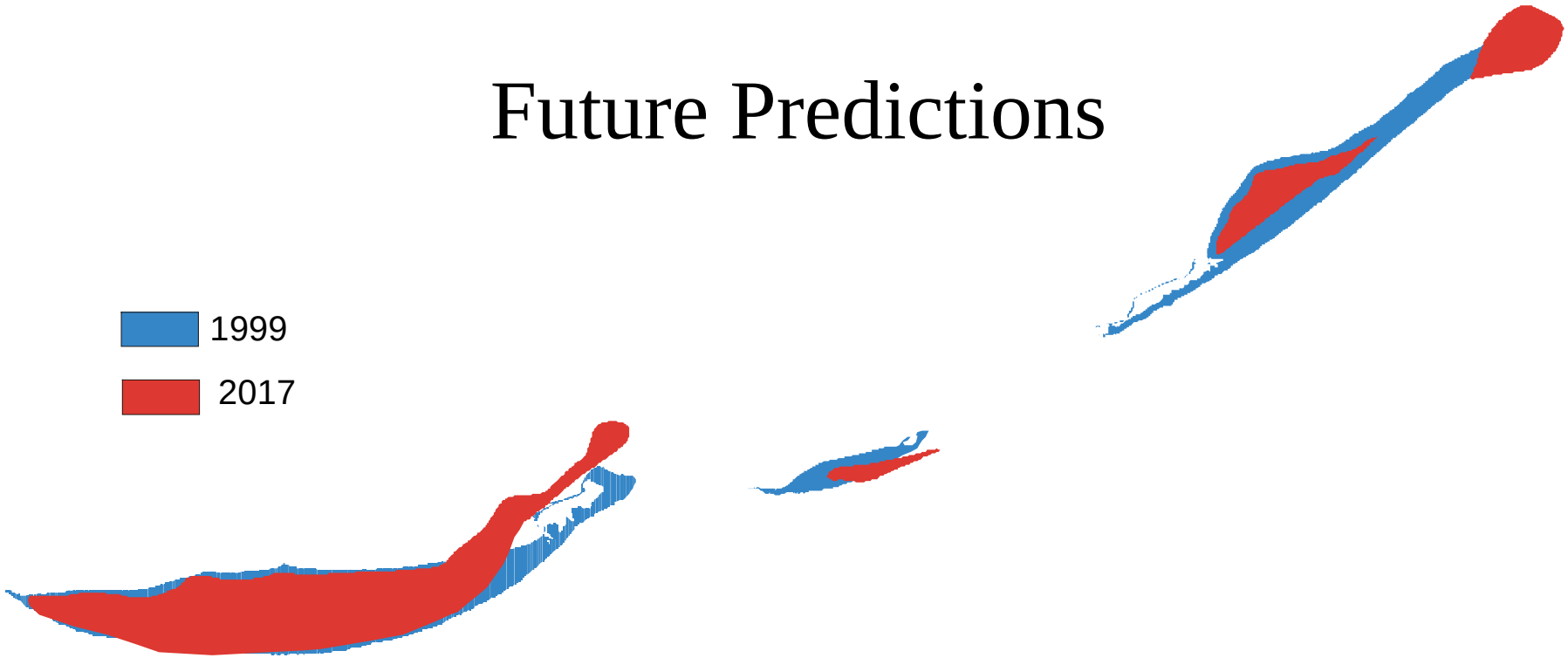
Horn Island

Ship Island





Future Predictions



- Calculated 2017 area from cross island transects (1986-1997) = 611 acres
- Calculated 2017 area from long term area change (graph of 1850-1999) = 600 acres

Conclusion

- Ship Islands are predominantly erosional; westward migration minimal
- Cyclical island breaching and thinning on E. Ship, nearly steady state on W. Ship
- Island Loss increased from 4.6 to 6.0 acres/yr. after Hurricane Camille
- Dredging across Ship Island Bar in 1948 effected long-term erosion rate