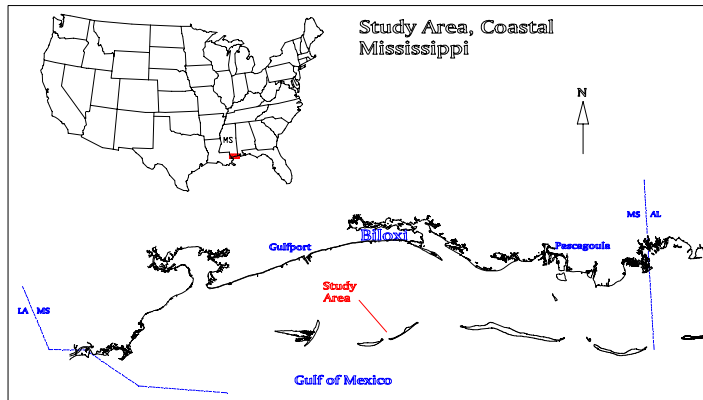


# Historical Evolution of Mississippi's Barrier Islands

By Keil Schmid

Geologic change can be a difficult idea to grasp because it occurs on a time scale seldom used. A recent and geologically rapid example is the latest ice age when 20,000 years ago the coast of Mississippi was more than 60 miles southeast of Biloxi. Although this example is during man's early presence in North America no written or passed down descriptions exist; buried sediments, fossils, and landforms on the continental shelf are the only clues. In contrast, the barrier islands along the Gulf Coast provide an opportunity to watch geologic change at an easily grasped time scale, substituting sediment cores for cameras and maps. Barrier islands are special environments sought after by scientists hoping to understand what the future may bring, but are also delicate and dangerous places to live. The five Mississippi Barrier Islands, of which four are in the Gulf Islands National Seashore, are striking examples because they are maintained mostly in their natural state. The one major structure on the Mississippi Islands, Fort Massachusetts, provides a useful example of the rapid evolution of these barrier islands. It was started in 1859 on the middle of Ship Island's extreme western end and now is both close to being in Mississippi Sound and more than 1/2 mile from the western tip. Natural examples of rapid island change also exist as relict morphology (landforms) and sediments. Relict is used in geology to describe characteristics associated with environments that differ from their present location, an environmental artifact of sorts. Good examples on the Mississippi Islands are trees and marsh banks in the surf zone, where they are obviously out of place.



Location of Mississippi Barrier Islands

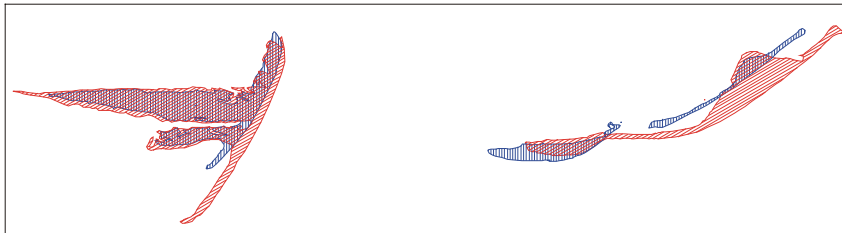


An example of relict morphology on E. Ship Is.

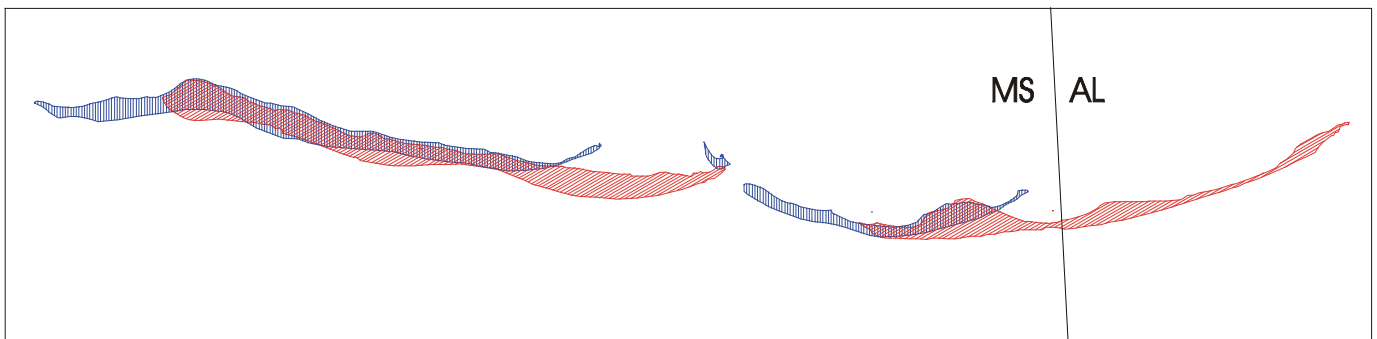
These physical examples of island evolution, coupled with accurate maps and surveys dating back to early European settlement help establish the history of island evolution along the Gulf Coast. Single events, such as hurricanes, to century long averages of island evolution suggests that the five islands in Mississippi, Petit Bois, Horn, East Ship, West Ship, and Cat can be separated into east and west compartments. The eastern compartment, containing Petit Bois and Horn Islands, is dominated by westward migration. The western compartment, containing the two Ship Islands and Cat Island, is typified by erosion over westward migration. The presence of a now abandoned Mississippi River delta (Saint Bernard) 2000 years ago near Ship and Cat Islands is the main cause for the difference.

A simple ratio of island erosion vs. island movement (% area lost per mile moved) from 1850 to 1997 illustrates the differences among islands. Horn and Petit Bois have ratios of 6 and 11% and have migrated 3 and 4 miles respectively, whereas Ship and Cat have ratios of 25 and 200%. Assuming this 150-year stretch is an accurate indicator of the future then 1000 years ago Petit Bois and Horn may have been in their infant stages off the Alabama/Florida boundary. Similarly, in another 1000 years they may be nearing the location of Ship and Cat Islands, though probably as much smaller entities. The western islands have a separate history with much higher erosion per mile moved. During the same 150-year period Ship Island (E. and W.) has eroded 50% yet moved little, suggesting that 1000 years ago it was in a similar location but 4 times larger. Cat Island's complex shape, and lack of movement, is a result of the Saint Bernard Delta that it may have been a part of 1000 or so years ago. The futures of these two low-lying islands are limited; it is likely that they will become integrated, in some form, into Horn Island.

These speculations are meant to underscore the dynamic nature of the Mississippi Barrier Islands. Clearly, many new natural and man made factors are involved, of which past data can only hint at; however, continuing research is helping provide likely scenarios for a host of possibilities.



Cat (left) and Ship Islands in 1850 (red) and 1997 (blue)



Horn (left) and Petit Bois (and Sand Is.) in 1850 (red) and 1997 (blue)

