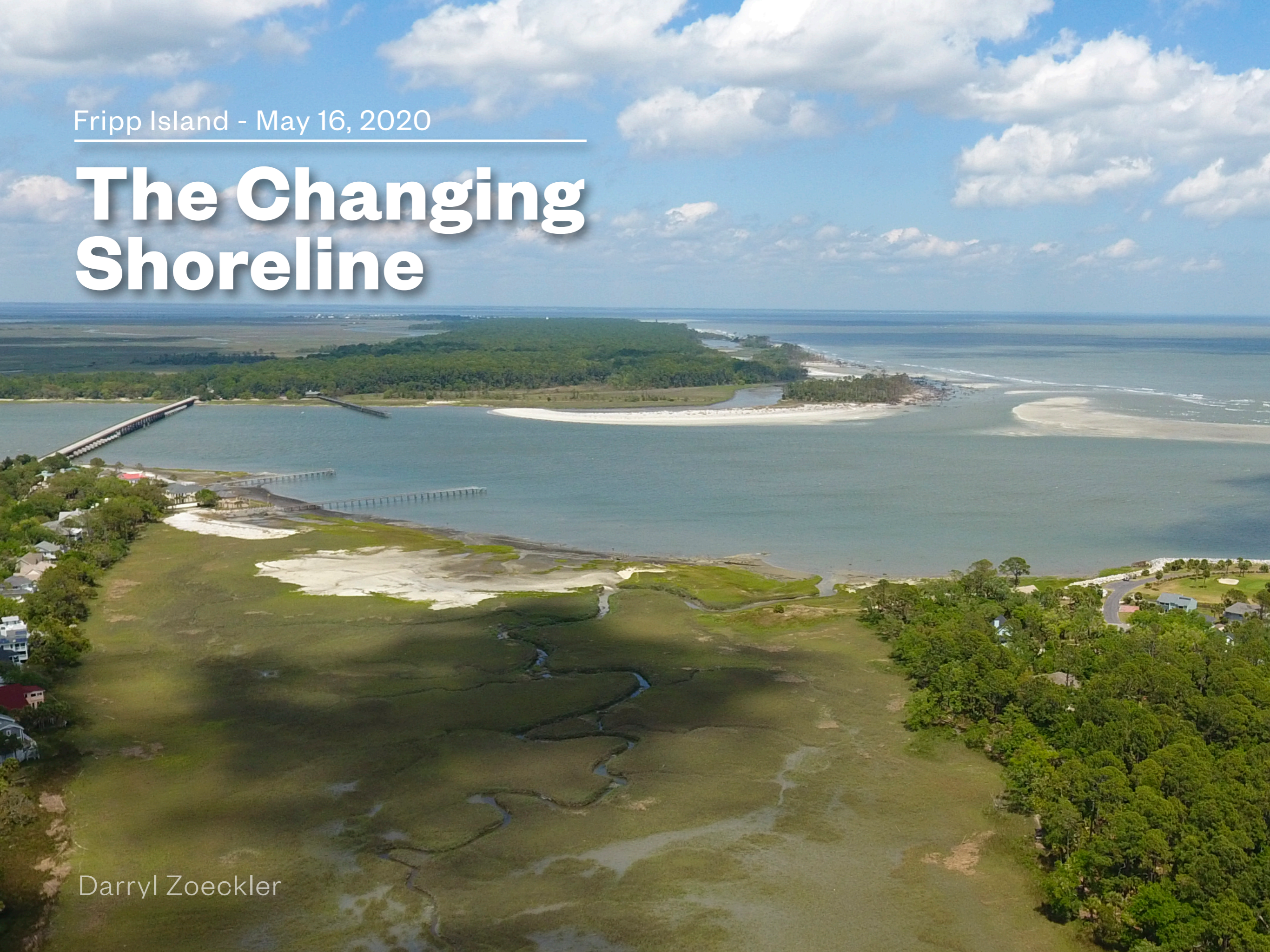


Fripp Island - May 16, 2020

The Changing Shoreline



Darryl Zoeckler



The beach renourishment

The 2020 beach renourishment project on Hunting Island State Park is complete after more than one million cubic yards of sand were added.

The beach at Hunting Island has been renourished with new sand dredged from offshore, a process repeated several times over the years as the sand continues to erode from the beach and threatens the lighthouse. The island is South Carolina's most popular state park attracting more than a million visitors each year. This fact alone could play a big part of the cost justification for the continued beach renourishment program.



The south end

The southern end of Hunting Island continues to deteriorate as the sand and sea swallow up more of the maritime forest and beach area.

The south end of Hunting Island was not included in the 2020 beach renourishment project and continues to rapidly erode. As the encroaching saltwater kills off the remaining maritime forest, the vegetation and topsoil are replaced by sand and sea. The footpath visible in the photo was once connected to “Cabin Road” where several cabins lined both sides of it. None of the cabins remain, having either been moved or torn down due to the erosion. The pedestrian bridge once crossed a lagoon that was separated from the beach by this road.



A new line in the sand

A new shoreline will be created as the sand continues to erode.

It's conceivable that as more and more of the beach and maritime forest are eroded by the ocean, the southern shoreline of Hunting Island will recede as well. Several hundred feet of beach area and maritime forest have already been erased due to the rapidly retreating shoreline and there is a good chance this process will continue into the foreseeable future.



Exposing Fripp Island

As the erosion continues, the southern end of Hunting Island will no longer act as a deflection barrier.

As the south end of Hunting Island continues to erode away, more of the inlet side of Fripp Island will be exposed to the wave action and tidal forces of the open ocean. This new reality will place a greater emphasis on the strength and integrity of the rock revetment wall that lines the inlet side of Fripp Island. Areas such as the salt marsh behind the River Club and Quail Cove neighborhoods, which are not protected, already show signs of damage due to scouring and vegetation loss.



The rock revetment

The rock revetment wall will serve more and more as a front line defense protecting property and utilities from storms and waves.

The entire rock revetment will play a vital role in not only protecting the utilities that run along the edge of Porpoise Drive, but also the entire side of the island itself. The structure should be looked at as a whole unit and not as individual parts in order to avoid a weak-link-in-the-chain scenario. Baselines should be established that define integrity, strength, and composition. Areas of weakness should be identified and reinforced. An island-wide maintenance schedule should be created as the wall becomes more important in maintaining the island's existence.

The curve

The northern tip of Harbor Island has no hard structures to protect its sandy shoreline from the erosive sawing action of the tide entering and leaving Harbor Inlet. As a result an almost perfectly round arc is formed by the repeated action to the loose granular material.



Because the northern tip of Fripp Island is protected entirely by a rock revetment the rounding doesn't occur. If the same erosive sawing action did happen to an unprotected side of Fripp Island, the damage would be catastrophic to a large number of homes.





Areas of concern

Exposed areas on the inlet side of Fripp Island are changing fast due to the increased wave action.

The protection once offered by the southern end of Hunting Island is becoming less as the island erodes leaving the salt marsh located on the inlet side of Fripp Island more exposed to the wave and tidal forces of the open ocean. The salt marsh is currently experiencing a scouring effect from the waves that plow the existing sand and sediment further into the marsh, smothering the vegetation.



The tidal flow

Observing the impact of tidal flows as they interact with vulnerable areas.

In this photo, the incoming tide is starting to flow into Fripp Inlet. By observing the direction of the sediment laden seawater, it becomes apparent that a big part of the flow heads towards the unprotected entrance of the salt marsh. Normal tides such as this may not cause as great an impact, but if a storm surge, wind-driven, or seasonal flood tide were to accompany the tidal inflow, a lot of damage could occur in a short time frame.



The salt marsh

Scouring occurs when the waves from the Fripp Inlet plow the existing sand and sediment further back into the marsh, smothering the vegetation.

The vegetation in the salt marsh reduces the wave action that flows into the marsh area. When the vegetation is smothered by sand and sediment there is nothing slowing down the waves that enter the marsh. As a result, the waves travel further in unimpeded and push more sand and sediment with them exacerbating the destructive cycle until eventually the area is permanently damaged or destroyed. This salt marsh acts as a protective buffer to the surrounding homes and the inland lakes at the far end.



Flooding

A weakened or destroyed marsh area will allow the ocean to penetrate the interior of the island.

During “king” tides, floods, or other storm situations, the salt marsh becomes less effective at protecting the inland lakes such as Deer Lake and Blue Heron Lake from being exposed to the wave action of the open ocean. This also introduces an “in” for the ocean to enter and increase the destruction to the interior of the island. A worse case scenario would be the lakes to become tidal and changing the lakes from brackish to saltwater will unquestionably change the nature of the wildlife that utilize them.



The bridge abutment

As increased tidal forces act against the approach ramp of the bridge, erosion activity is increasing.

Another vital area directly effected by the increased exposure to the ocean and the erosion of the south end of Hunting Island is the bridge abutment at the entrance of Fripp Island. Wave action has begun eating into the sides of the earthen structure and will most likely continue. It will force either the bridge to be extended or the abutment to be rebuilt, or both. Evaluating the structure and/or the surrounding area should be a priority due to it being a key link to accessing the entire island. Flooding is also an issue to this area.