

An aerial photograph of a beach. On the left side, there is a rocky area with many grey and white stones. The rest of the image shows a sandy beach with waves crashing onto the shore from the right. The water is a light greenish-blue color, and the foam of the waves is white. The text 'Shoreline Status' is overlaid in the center in a large, white, sans-serif font.

Shoreline Status

Fripp Island - Shoreline Committee

Darryl Zoekler - November 10, 2021

An aerial photograph of a beach. On the left, there is a rocky shoreline with many light-colored, angular stones. The rest of the image shows the ocean with gentle waves washing onto a sandy beach. The water is a pale, milky green color, and the sand is a light beige. The overall scene is peaceful and natural.

1864

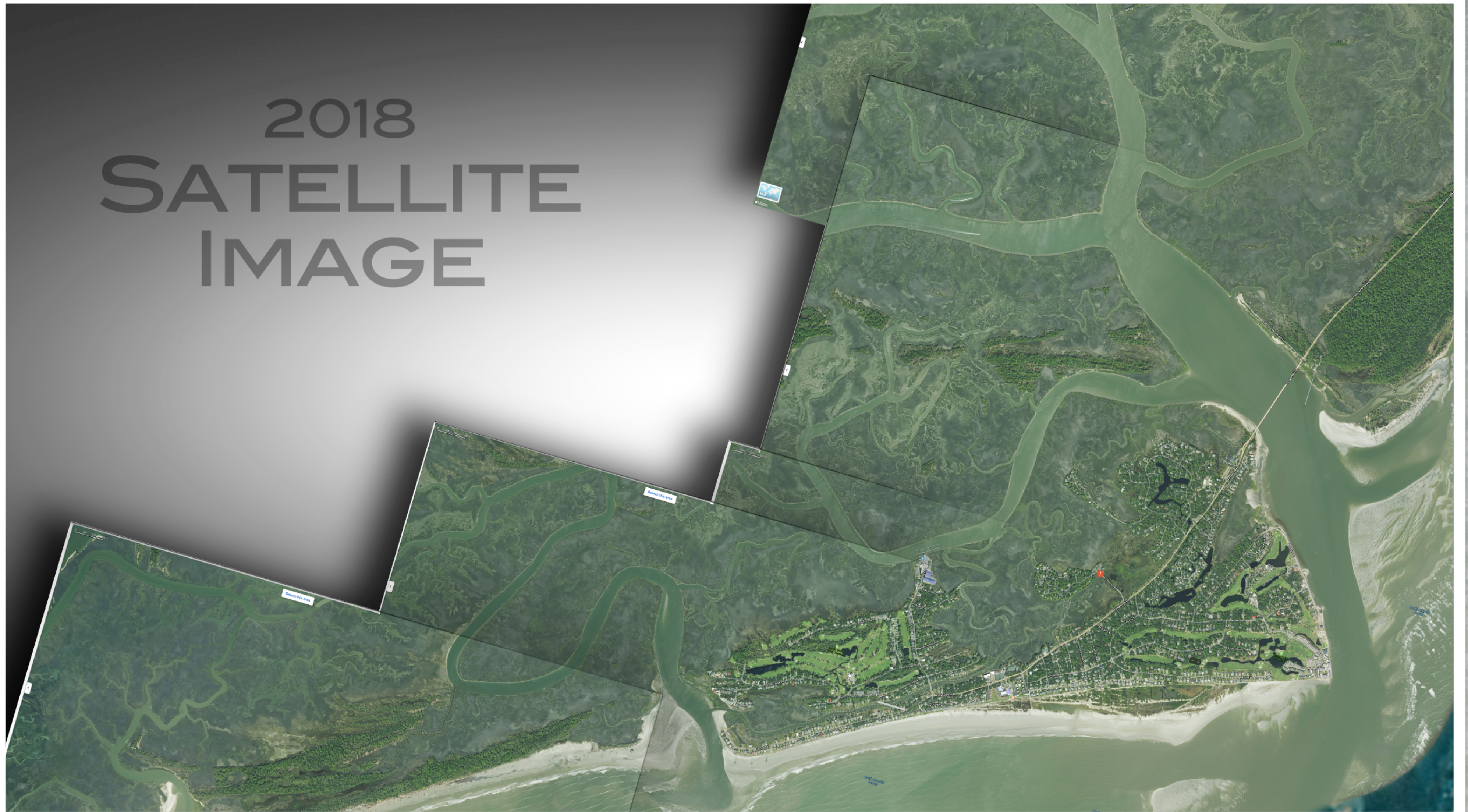
A unique opportunity to use the past to compare
the present to understand the future.



1864 COASTAL SURVEY SOUTH CAROLINA

“Grandpa, did you get that from Netscape?” - I started my comparison by examining an old coastal survey of Fripp Island, Hunting Island, and Harbor Island to see what the shoreline looked like in 1864. (download: <http://darrylzoekler.com/1864/1864CoastalSurvey.jpg.zip>)

2018 SATELLITE IMAGE



"A stitch in time.." - I pieced together 29 individual screen shots of satellite images, taken in 2018, into a single large photographic mosaic to create an accurate map that can be used to compare the data of the 1864 chart. (download: <http://darrylzoekler.com/1864/2018SatelliteImage.jpg.zip>)



Spot the differences - By placing the 1864 chart, next to a modern satellite image of the area, a pretty substantial difference appears on Hunting Island's north end where Johnson's Creek meets the sea. On Harbor Island, the faded area on the chart represents a salt marsh and the triangle tip is a sandbar that may not be above water at high tide. The chart lacks land detail but the tidal creeks look fairly proportional to the satellite image.



The search for clues - Many of the small feeder creeks were not drawn in completely on the 1864 chart, but the locations where they branch off from the main tidal creeks have been illustrated and are still visible on the satellite image after 157 years of changes to the area. These can be used to identify locational characteristics between the two maps.



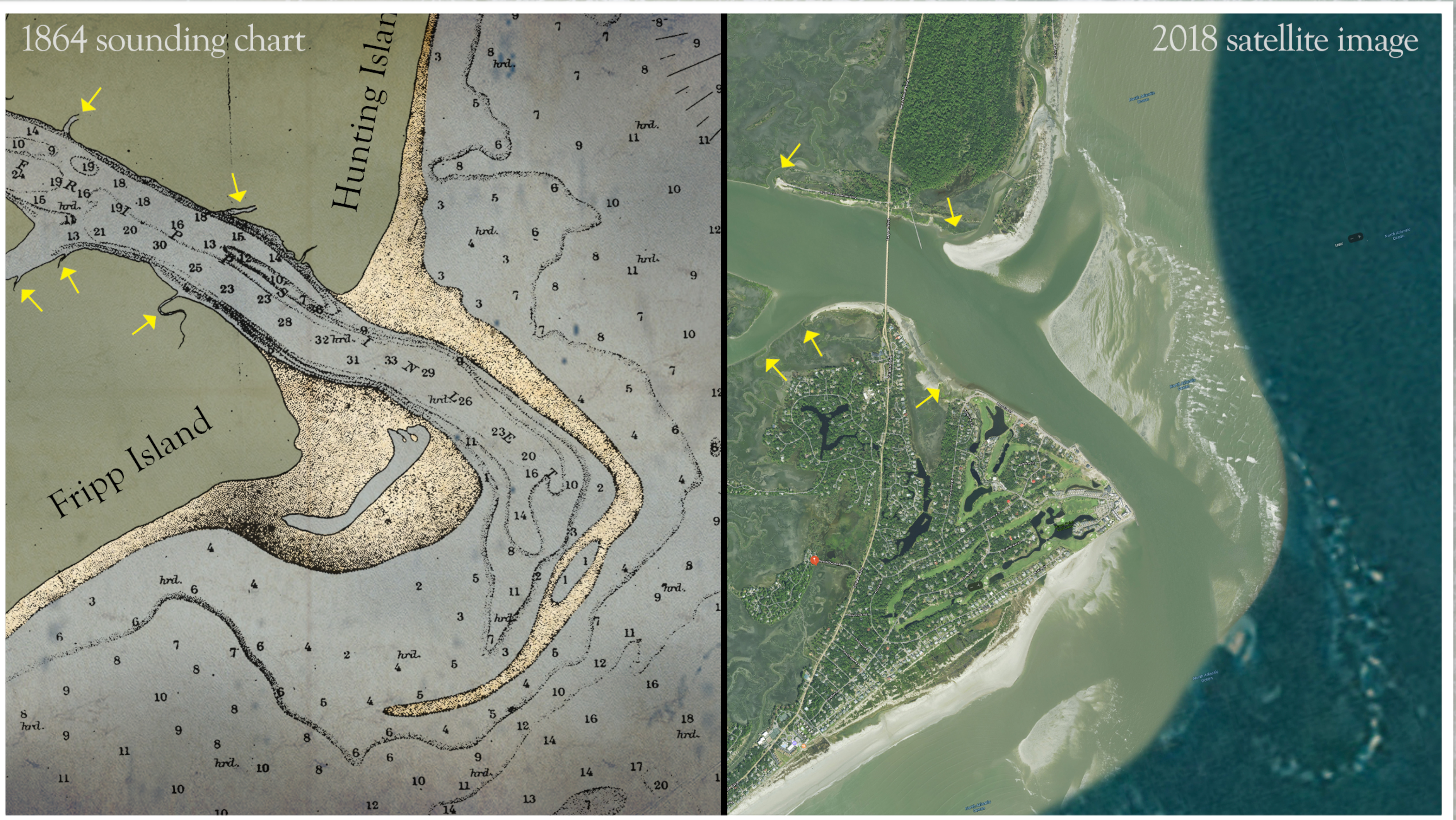
Connecting the dots - If we draw a line through the deepest parts of St. Helena sound we can identify the main channels. The channels flow “upward” past the islands in 1864, but “downward” today. The circled area is the deepest area of the chart measuring 35, 42, 43, and 34 feet of water and also, the mouth of Johnson’s Creek was quite deep in 1864, measuring 23, 19, 16, 23, and 25 feet as it enters the sound.



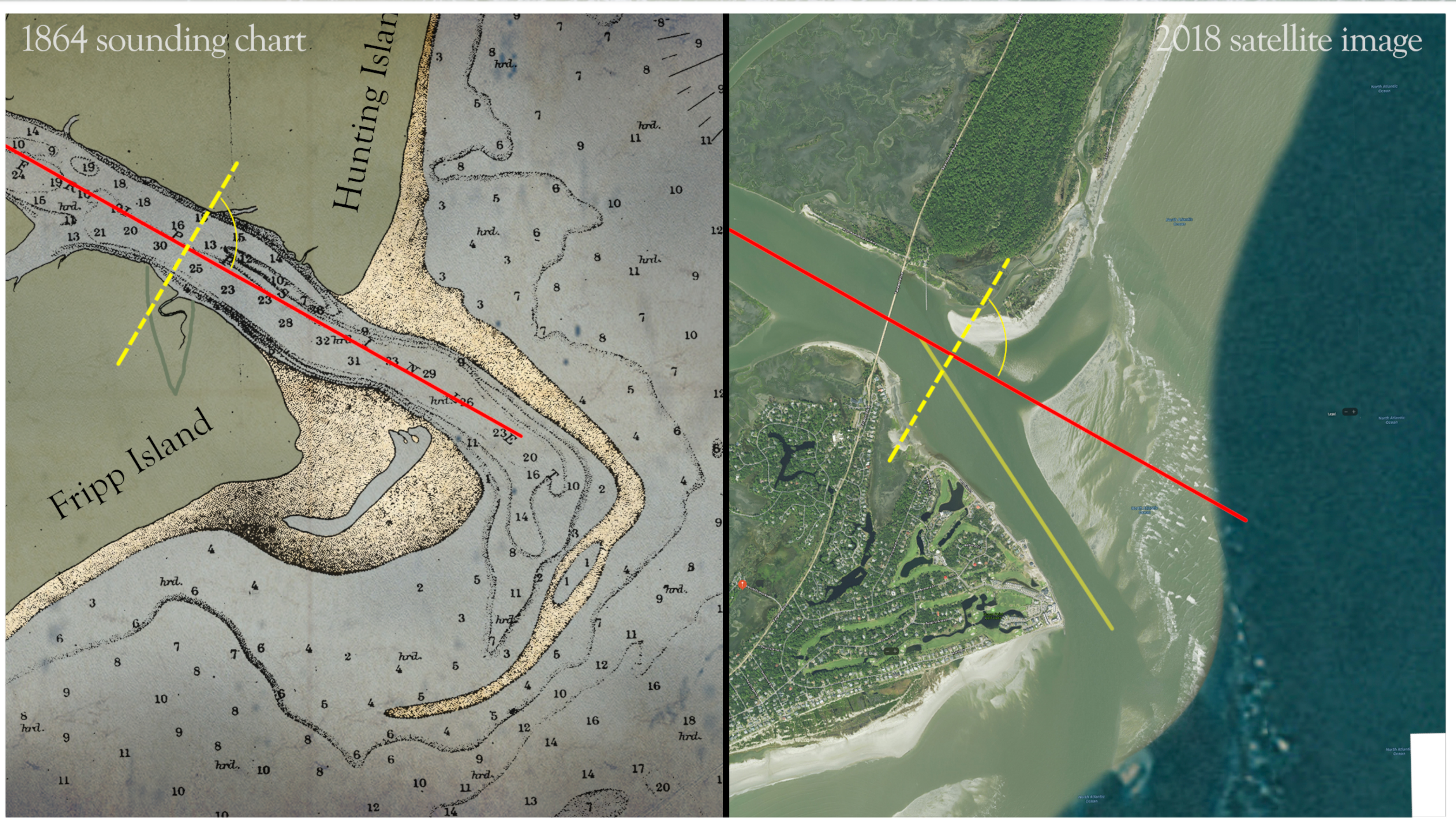
"Mama, say it isn't so!" - Even if the survey chart is not in perfect proportion because it's a drawing instead of a photograph, it's hard to imagine that the overall shoreline could be drawn so incorrectly and yet the complex detail of the feeder creeks be so accurate. I believe the chart is fairly accurate and can give a realistic idea of how much Hunting Island has changed since 1864.



Fripp Inlet - On the 1864 chart, the massive sand shoal with the large tide pool on Fripp Island is probably most of the golf course today and the small creek detail is probably the tidal creek that feeds the salt marsh behind River Club. The long, flowing sand bar that starts at Hunting Island and goes around the northern tip of Fripp Island is still there today, but in a very different configuration.



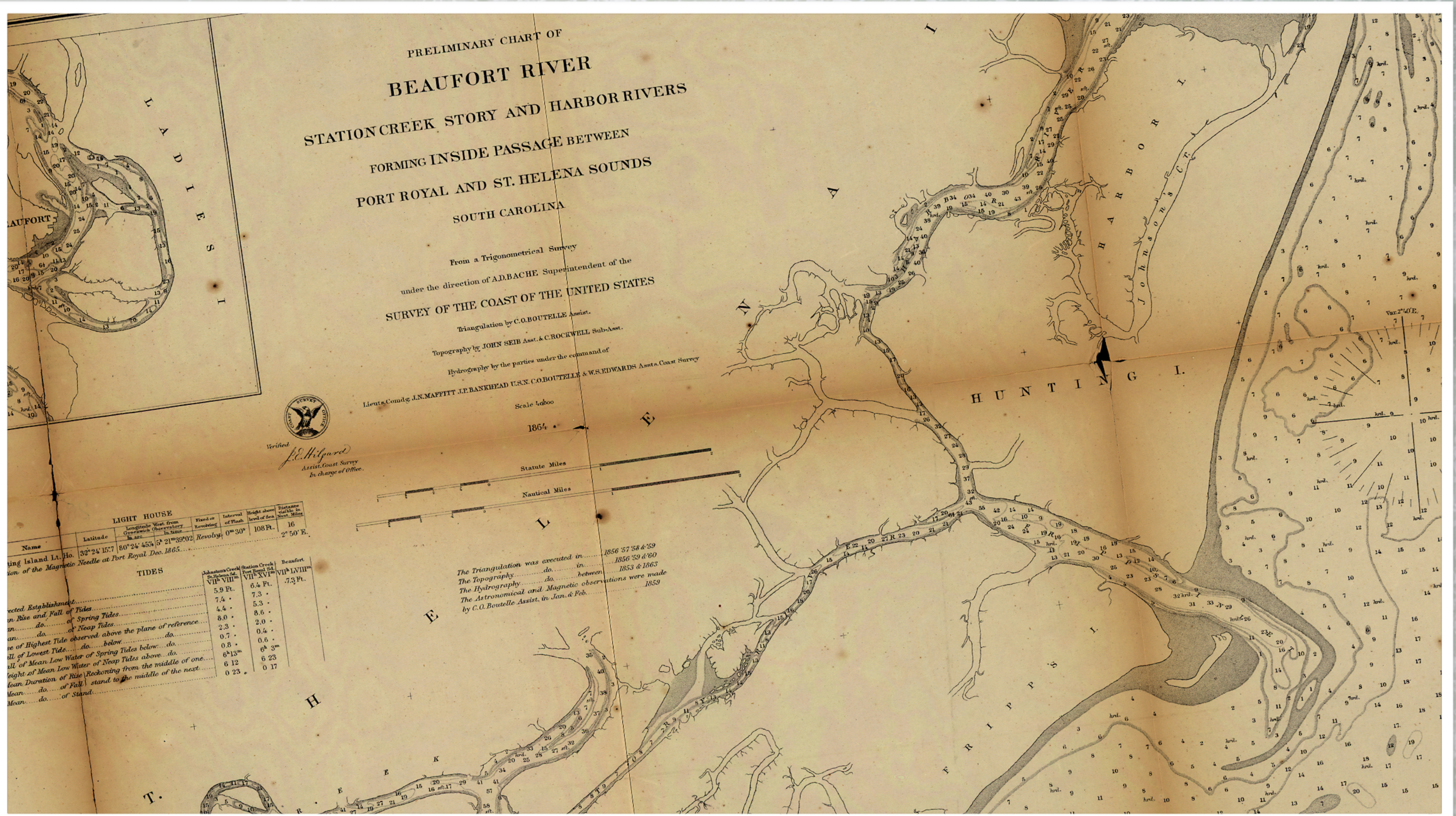
Same day, different story - Being able to identify the same feeder creeks on the satellite image that are illustrated on the old chart shows a remarkable stability to the inland creeks area. But notice the radical difference to the ocean side of the shoreline as depicted on the chart versus the satellite image. A big reason for this difference is that the shoreline is exposed to wave action, the inland creeks are not.



1864 sounding chart

2018 satellite image

There was a crooked man... - If a line is drawn down the center of the Fripp Inlet on the chart (red line) and a 90 degree line (yellow dotted) intersecting the red line is added, you can get the salt marsh creek on Fripp to line up with the pedestrian bridge creek on Hunting Island. If you move those two lines over to the satellite image, you can get them to line up almost exactly in the same spot with one big difference, the whole inlet turns to the right at Hunting Island (yellow fade line)



🎵 "Reflections of the way life used to be..." - The goal is to determine just how accurate the 1864 Coastal Survey is and then compare it to the satellite image. This will show just how much actual change has taken place to the area's shoreline. To be continued....

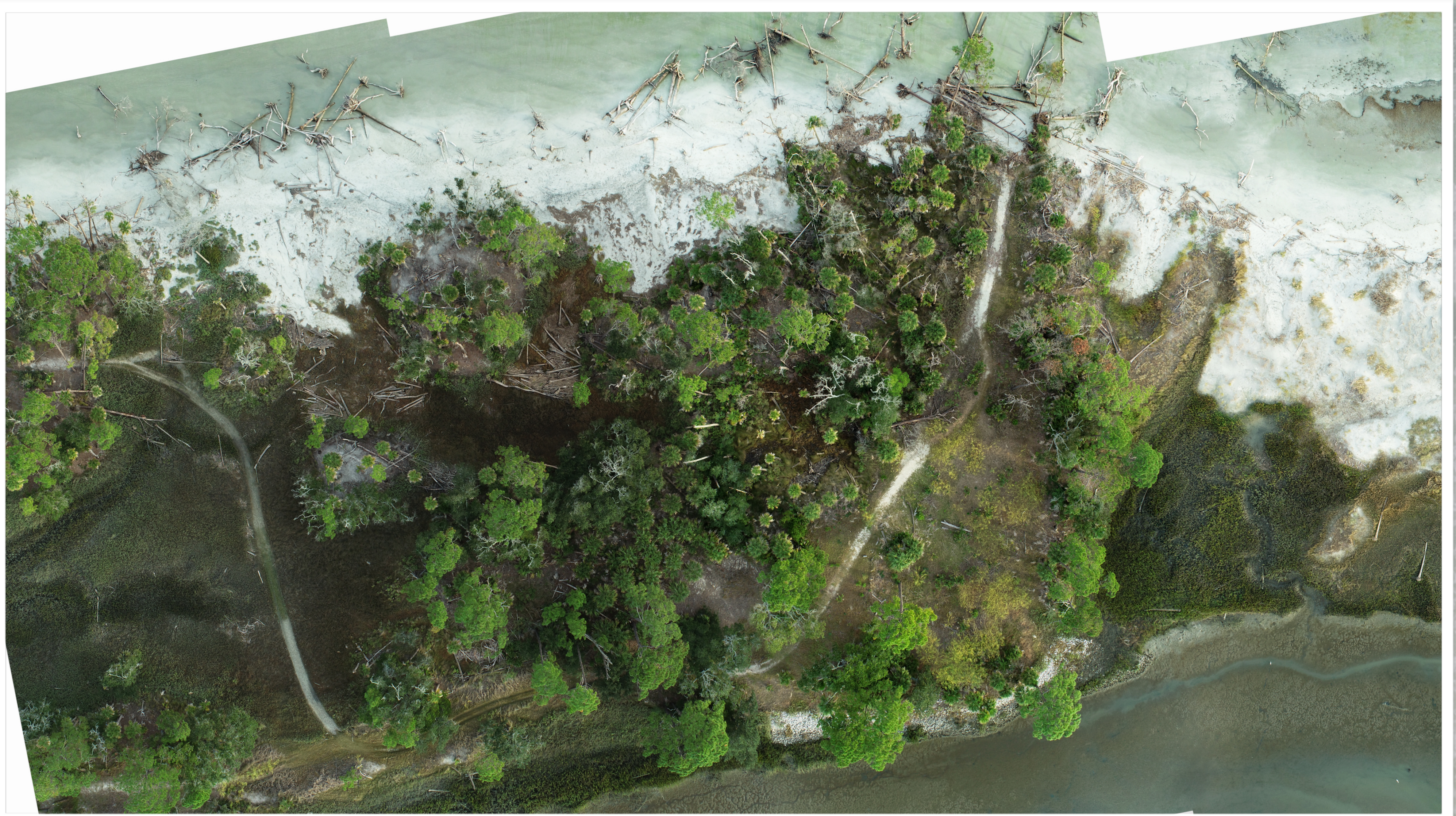
An aerial photograph of a beach. On the left, there is a rocky shoreline with many light-colored, angular rocks. To the right of the rocks is a wide, sandy beach. Further right, the ocean waves are breaking, creating white foam. The water is a light, pale greenish-blue color. The overall scene is a natural coastal landscape.

HUNTING ISLAND TODAY

The current condition of the south end of Hunting Island and the vast trail of sand that flows out around Fripp Island.



The south end of Hunting Island - The land mass continues to erode as each row of trees succumb to the invading sand, salt, and sea. As this happens, the overall shape of the south end of the island has begun to change.



“Can't see the forest for the trees.” - In this montage image, made up of a series of individual photos stitched together, the trees can be counted and the erosion into the remaining woods on the south end of Hunting Island becomes obvious.



The New Boundary - As the sand pushes towards the pedestrian bridge, it slowly covers over the existing vegetation and forms a new beach boundary along the main land mass of Hunting island.



The Littoral Current - When waves strike the land mass at an angle, as seen here, it creates a flow called a littoral current that runs parallel to the shoreline. This is a natural distribution of sediment along a beach. Here, the sand is being pushed into the inlet and the current carries it out around the front of Fripp Island.



April 22, 2020



The flat tire - The littoral current has carved a channel in front of the sand bar at the southern tip of Hunting Island that has eroded a flat spot into the side of the sand bar where it was once very round.



The trail of sand - This aerial photo is an overall view looking back over the area and shows the angled waves, the channel parallel to the shore, and the flattened area of the sand bar.



The trail of sand - Looking seaward from the south end of Hunting Island, the vast sand shoal is visible along the side of the Fripp Inlet and wraps around the northern tip of Fripp Island.



The trail of sand - About midway down the trail of sand, there is a large break in the shoal where a channel has carved an almost perfect curve through the sand and a portion of the sea flows in and out of this channel during the tide cycle.



The Channel - Looking down the channel carved in the sand, is an almost perfect curve. This photo was taken at low tide and shows the channel has some depth to it.



The Channel - But at low tide, the opening of the channel on Hunting Island's side is still quite shallow and would probably be a risk to navigate for most vessels.



The trail of sand - Moving past the channel, an almost straight line runs parallel to the rock revetment. The straightness of this sand line mirrors the straightness of the revetment as though the sand can only compress the channel so much due to the force of the current in the inlet.



The trail of sand - A view of the dog-leg or bend in the shoal where it turns and wraps around Ocean Point running along the front of Fripp Island.



The trail of sand - Just past the dog-leg is another channel. This is the channel most vessels navigate to get to the ocean from the inlet. On the southern side of the channel is a build up of sand that acts like a reserve for the sand that continues southward.



The trail of sand - Past the reserve sand pile, the trail of sand continues. This is where the shoal formed in 2017 before attaching to the beach in 2020 and becoming an established extension of the beach today.



The end of the trail - The visible outer shoal ends where the circle is drawn. This is the same spot where the previous shoal formed and grew in 2017. The arrow points to where the shoal attached to the beach. As of yet, there is no sand visible above the surface at low tide, but it will be the area to watch in future to see if a shoal forms there or moves further down the beach.

Shoreline Status

The aerial photographs used in this presentation were taken on October 19, and 24, of 2021

Fripp Island - Shoreline Committee

November 10, 2021

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