Breach Update, March 2021

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A breach over flight on March 9th prefaced by an earlier aerial photo shoot by Rich Giannotti on February 26th indicate that there have been major developments in the breach in the past couple of months. And these photos are suggesting that we are heading toward closure. The reduction in water exchange between the ocean and bay is already showing up in the salinity record from Bellport, where salinities have been in the low range of 25 to 26 psu (practical salinity units) for the past couple of weeks and less than 28 psu for most of the past month. This compares to salinities between 29 to 30+ psu when the breach was in full exchange mode. Prior to the breach, salinities in Bellport Bay were typically in the range of 24 to 25 psu with occasional excursions higher when there was an influx of saline water from Moriches Bay.

The recent aerial photos, Figure 1, show features that we have not seen before, specifically, the extensive alongshore sandy shoals and ridges lying offshore and extending across the entire breach. We have often observed shallow shoals in the offshore area, but they were small and were almost always on the western side of the opening. Both photos were taken near local low tide, which exposed the offshore shoals. These areas are under water during high tide and clearly evolving as they are subject to ocean waves and alongshore currents.

Figure 1, Oblique aerial photos of the breach showing the developing offshore shoals.

February 26, 2021 (RG)

March 9, 2021 (CF)

Another aspect that is probably playing a role in the development of the offshore shoals is the reduced flow, especially during ebb, limiting the ability of the breach to clear itself of the sand buildup. The area immediately inside the breach is now extremely convoluted as shown in Figure 2. In the past there has been a reasonably clear channel through the flood delta between the ocean and Bay but as Figure 2 shows, the connection is now blocked by many shallow areas. In January, Roger Flood and I had considerable difficulty in navigating into the breach area to conduct another bathymetric survey. And at that time the deepest waters that we saw in the breach were only in the range of 2 meters, roughly a third of what they had been when last surveyed nearly four years ago. A side note is that Pelican Island is still hanging on, although it is now about the about the size of a dining room table.

March 18, 2021

Figure 2, Oblique photo of the breach from the March 9, 2021 overflight.

Figure 3 shows the temperature and salinity record from the SeaCat at the Bellport dock since the beginning of 2021. Salinity is the variable most closely linked to the condition of the breach, and the recent record shows a great deal of variability with salinities fluctuating between 26 and 30 psu. This suggests that there have been intermittent periods when the breach was either more open and/or nor'easters forced more saline ocean waters into the Bay. More recently, salinity has been very low, which is especially notable as we have not had any significant rainfall events in the past month.

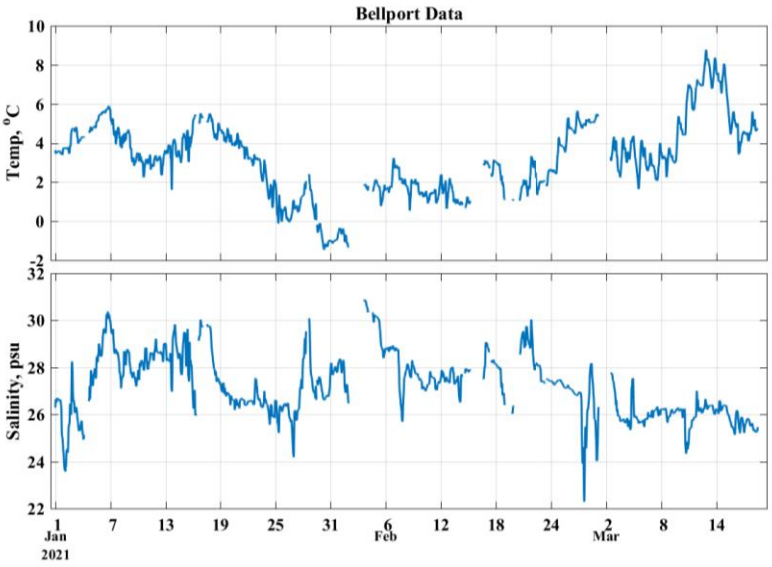

Figure 3, Temperature and salinity record from the SeaCat deployed at the Bellport dock.

At this time the breach has been open for almost 8.5 years, short compared to the longevity of the Old Inlet breach that lasted some 60 years but perhaps longer than initially expected.

March 18, 2021

All undefended openings in barrier islands eventually close through natural processes. So we should not be surprised that it may be happening here. The benefits of the breach have been significant in terms of reduced eutrophication in Bellport Bay and portions of Patchogue Bay and in the response of the fish, clams, oysters and sea grass. If the breach does close, it will be of more than academic interest to see to what extent and how quickly these ecological benefits wane.