Waterkeepers Bahamas

Coastal Management

August 13th, 2019

Waterkeepers® Bahamas and Save The Bays has brought to your attention the significance of our shoreline disintegration and raised sea levels as a result of global warming. Shoreline disintegration or coastal erosion is a characteristic procedure which may happen under steady conditions, occasional wind changes, or during storms. It can happen within a matter of weeks/days or at a slower pace (years). As a result of waves and currents and outrageous climate occasions such as storms or flooding, shoreline disintegration can occur, but it is a natural process.

Each beach in our Coastal management study has to be assessed every 3 months, therefore the data from each beach will help us to determine which beach is being negatively affected by erosion, slightly affected or not being affected at all. While assessing our results and comparing them to previous results we noticed that some beaches has had changes while others have not. Beach profiling is usually done in the warmer months, therefore the graphs below are the data from October 2018 compared to May 2019 and our recent profiles done in Aug 2019.

This report summaries the changes (if any) of three beaches, Taino Beach, East Palm Beach and Lovers beach. In our last report we noticed that Lover's Beach has changed and the slopes became steeper, this is because the beach is eroding. "Lover's Beach" should be considered a bay because of the effect that coastal erosion has had on it. There is a limited amount of sand and 95% rocks. This was formed by sands and clays dissolving/crumbling leaving groups for more grounded rocks, such as chalk, limestone, and granite.

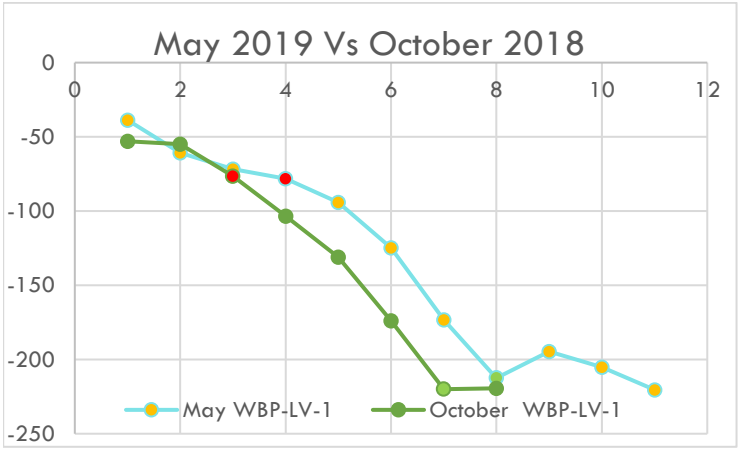
Figure 1 shows that Lover's Beach is being affected negatively by coastal erosion.

Figure 1

The **red oval** shows the sand has dissolved and left rocks. The **red square** indicates that there is a minimal amount of sand left on Lovers Beach.

The red dots highlight the hightide line and the green dots highlight the low tide line.

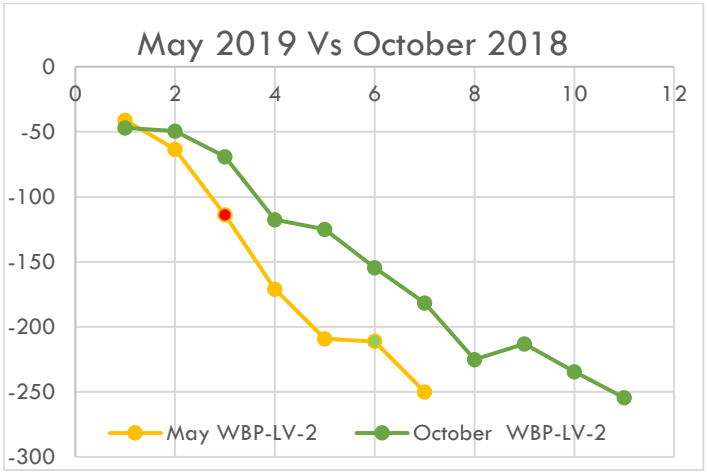
Graph A



Graph A shows the difference between transects 1 for October 2018 and May 2019. This graph shows the high tide line shifting outwards which makes the slope between high tide and low tide stepper, it also shows that the starting point from May 2019 has slightly shifted and this created a small slope between the starting point and the high tide line.

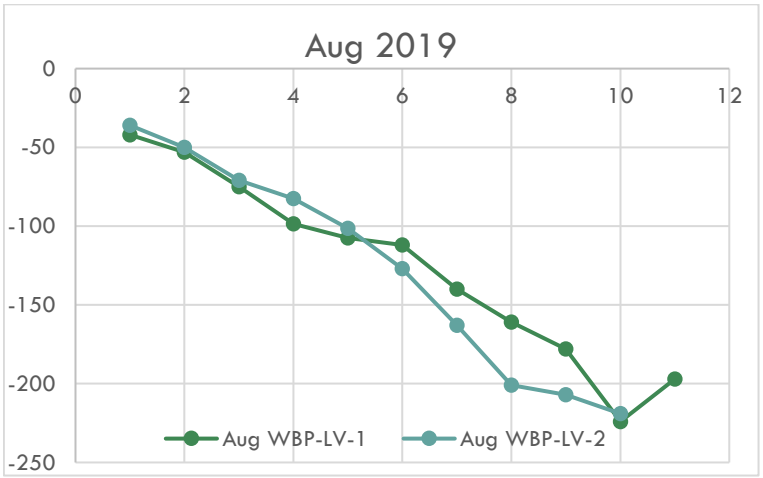
Lover's Beach is known to have steeper slopes than any other beach. As a result of the beach changing shape during the warmer months, the slopes have changed, this is shown in both transects.

Graph B



Graph B shows that at transect 2 the starting points hasn't changed much but the slope from the hightide line to the low tide line in May 2019 is stepper than in Oct 2018.

Graph C

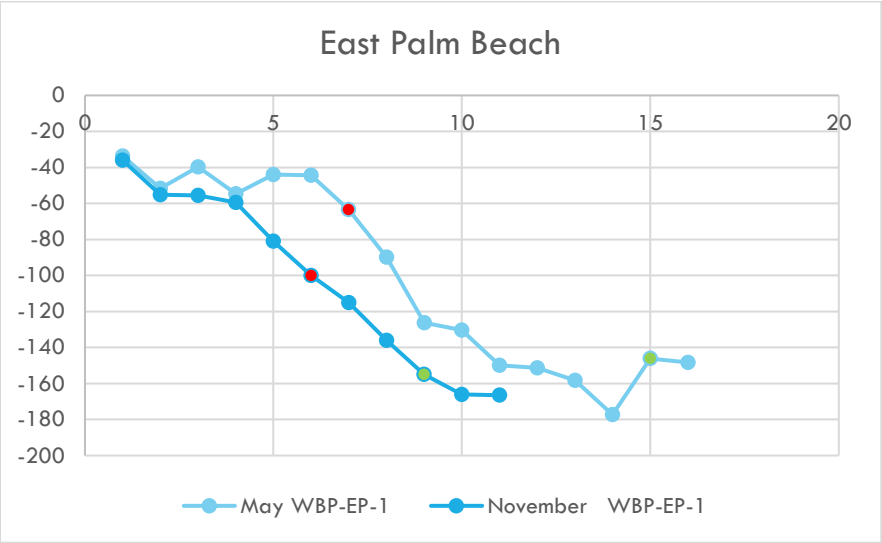


Our most recent transects reveals that Lovers Beach slope has changed to some degree and that is because of the summer months.

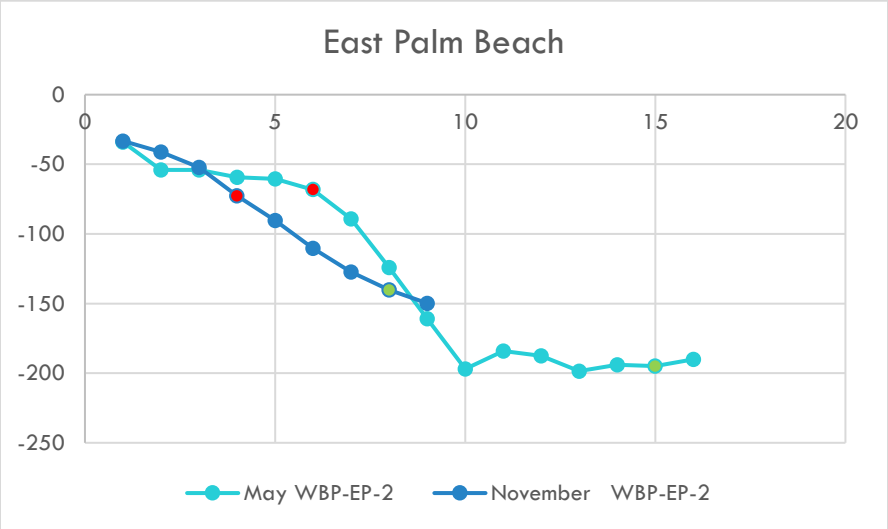
We will continue to monitor Lovers Beach to ensure that any changed that is taking place will be assessed.

Below is a graph both transects of East Palm's beach from the November 2018 and May 2019.

Graph A



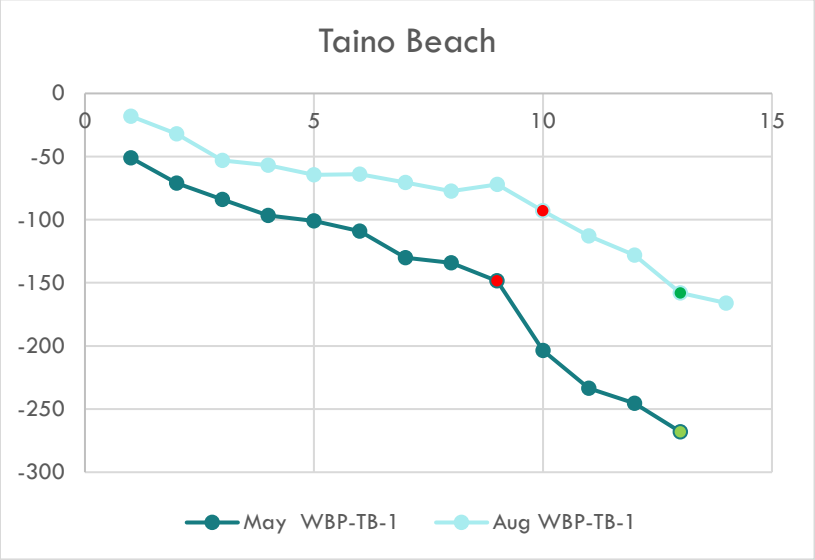
Graph B



In the figures to the left, Graph A shows transects 1 and Graph B shows transects 2. The first thing that is noticeable is the length of the beach in November compared to May 2019. This can be caused by several things, the time we visited the beach, the force of the moon etc. If we look closely at Graph A we can see that the high tide berm is persistent in both transects but the low tide berm for November 2018 created a steeper slope for the beach by moving towards the high tide line. In addition, we can see where the low tide line for May 2019 moves towards the sea which has created a sharp slope between the high tide and low tide line.

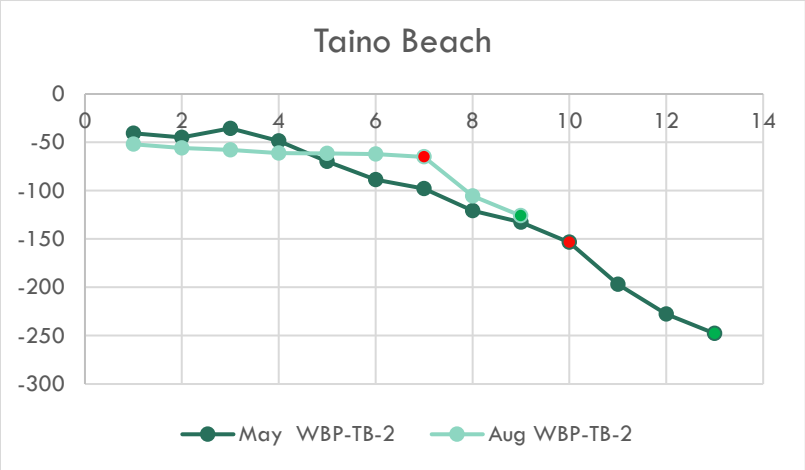
The graphs below represent any changes that has occurred on Taino Beach.

Graph A



Graph B

Taino Beach is one of our consistent beaches because the sand is displaced/smoothed monthly by a private company. Looking at the graph above us we can see that there was not much change and that is a good sign. The high tide lines are accordant and the low tide lines has a slight modification.



Immediately the length of the beach is noticed, this can be caused by different reasons. In particular, the geologically starting point not being equivalent or tide raising while beach profiling is being done resulting in the length of the beach being short. Aug 2019's transects 2 slope is more consistent than May 2019's transect 2, consequently the slope is smoother. The hightide line in May 2019's slope is in proximity of the starting point and a steeper slope was created between the high tide and low tide line.

The results from all beaches that were mentioned above are similar to research that was done before. A significant element to reflect on is that this process is unpredictable, and shorelines will change depending on rainfall or forceful weather. If climate change increases, we might see a raise in coastal erosion. We will continue to observe and manage our shorelines every 3 months; the data from each beach will help us to determine which beach is being negatively affected by erosion, slightly affected or not being affected at all.

Authored By: Liyah Davis 2019