

Seagrass Monitoring Erakor Lagoon

The Vanuatu Environmental Science Society (VESS) has continued with the Seagrass Monitoring Program in important coastal areas for dugongs around Vanuatu. This program is in partnership with the Vanuatu Department of Fisheries and the Department of Environmental Protection and Conservation. VESS continues to build on its baseline data which investigates the condition of seagrass and measures, over time, any changes in the health of seagrass meadows. This baseline can be used for comparison in future years. The aim of this report is to inform communities of the findings of these surveys, which can be used to inform the management and protection of seagrass in these local areas.

Erakor lagoon was chosen as a monitoring site as it has a large seagrass meadow with many animals that rely on it for food and shelter, including dugongs, green turtles, juvenile fish, and many other small animals. VESS has chosen the two sites, EF1 and EF2 within the lagoon (Figure 1), and we have monitored the condition of the seagrass multiple times a year for the last four years, and we will continue to monitor annually. Over time, we can detect changes in the health of seagrass. Variations are expected within the year due to different growing seasons, but we are looking for changes over time, from year to year.



Figure 1: The Erakor sites named EF1 and EF2 shown on a Google image of Erakor Lagoon.

For each quadrat, we record the following:

- Percentage of seagrass cover;
- Average height of grass leaves;
- Different species of seagrass;
- Percentage of epiphyte cover (algae living on the seagrass leaves);
- Percentage of algae cover (algae not living on seagrass leaves);
- Sediment type e.g., sand, mud, shells;
- Anything else we find of interest such as how many snails are inside the area, or if there are feeding trails from dugongs; and
- Photos are taken at each quadrat as a back-up record and for quality assurance.

Method

At each site we go to the same location using a GPS to find it. Then we set up three 50m measuring tapes in parallel, 25m apart. These lines are called transects (Figure 2). Every 5m along the transects, we put a 50cm x 50cm square (quadrat) and look at the seagrass inside the square. There is a total of 33 quadrats for each monitoring event at each site.

We combine the information from all the quadrats together to get an average of the health of the seagrass across the whole site.



Figure 2: A quadrat next to the transect line. We collect data from inside the quadrat every 5m.

The data and photos are sent to Seagrass-Watch Head Quarters and is added to the international dataset after going through quality control and quality assurance process.

Results

VESS has identified four different species of seagrass in the Erakor lagoon sites (Figure 3). All four of these species have thin, strap-like leaves but they can be differentiated by their features. *Thalassia hemprichii* and *Cymodocea rotundata* are found the most throughout EF1 and EF2 at Erakor lagoon (Figure 4). *Halodule uninervis* was found in some of the quadrats and *Enhalus acoroides* was only found in a small number of our sample sites (which makes it hard to show in the graphs below). However, in the small bay where the boats come in, which is outside of our sample area, there is a large area of seagrass meadow dominated by *Enhalus acoroides*.

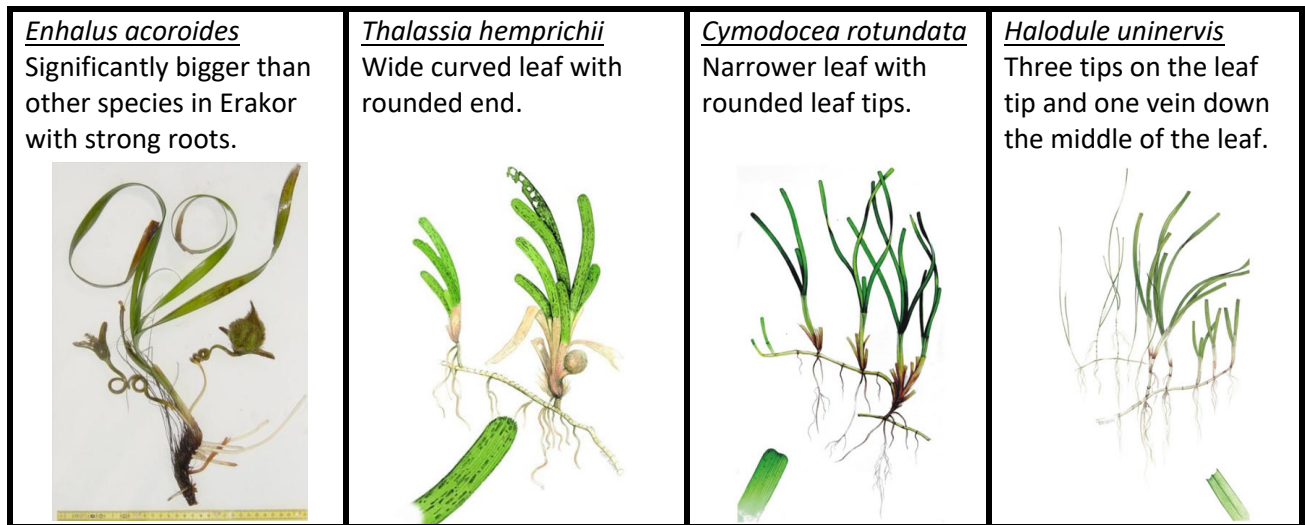


Figure 3: Four different seagrass species have been recorded in Erakor lagoon (source of images: http://www.seagrasswatch.org/id_seagrass.html)

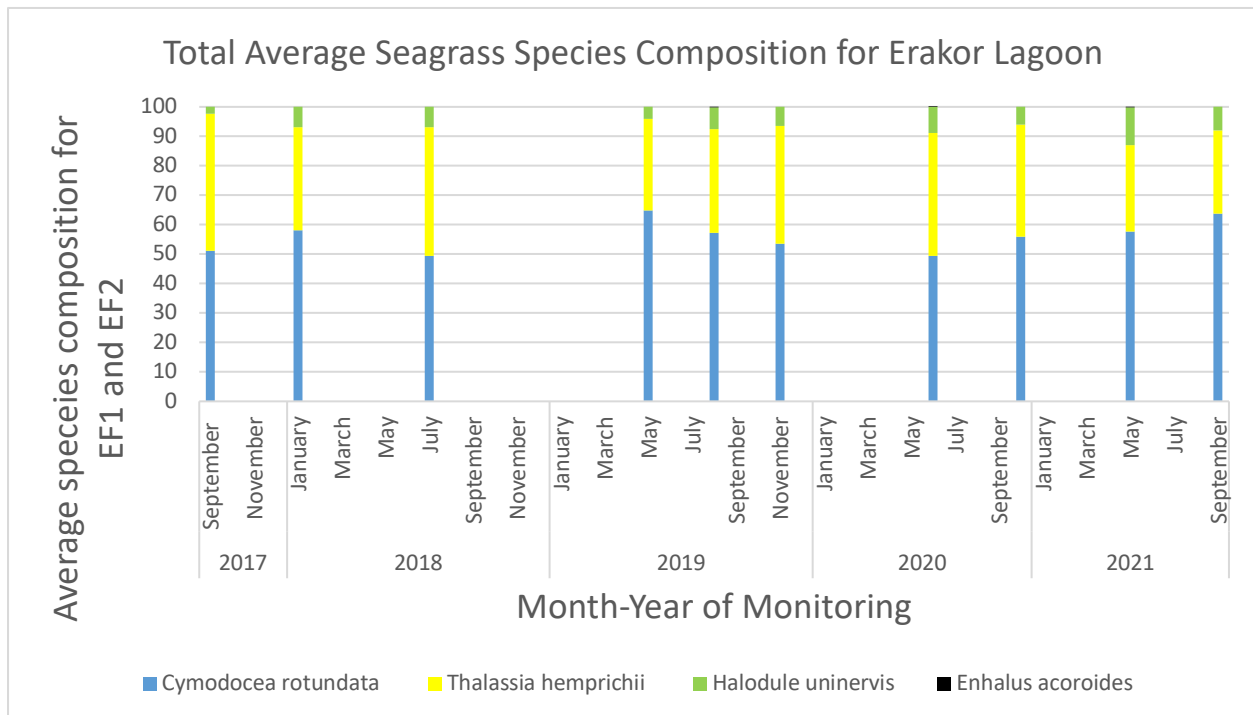


Figure 4: Total average of the seagrass species recorded at Erakor lagoon across years 2017-2021.

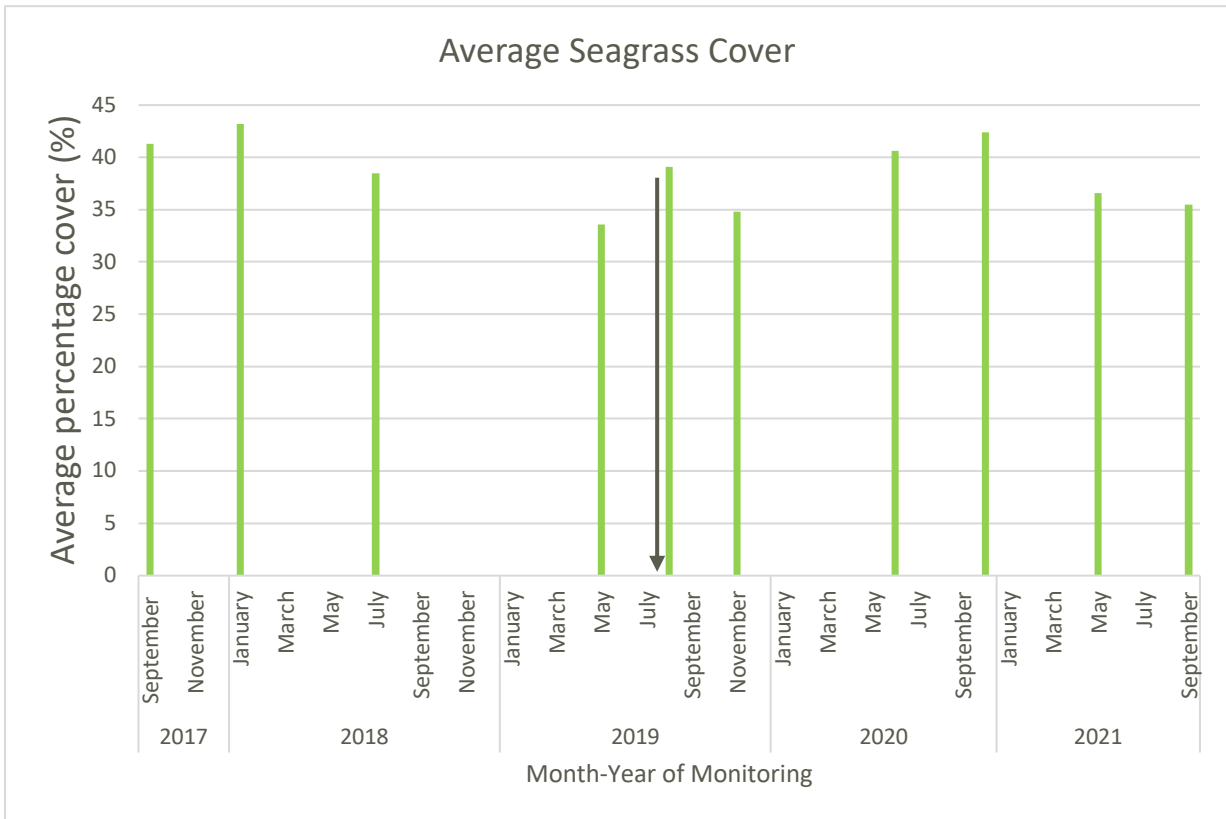


Figure 5: Average seagrass cover at Erakor lagoon over the years 2017-2021 shows seasonal variations but no major changes. Taboo started (→ August 2019).

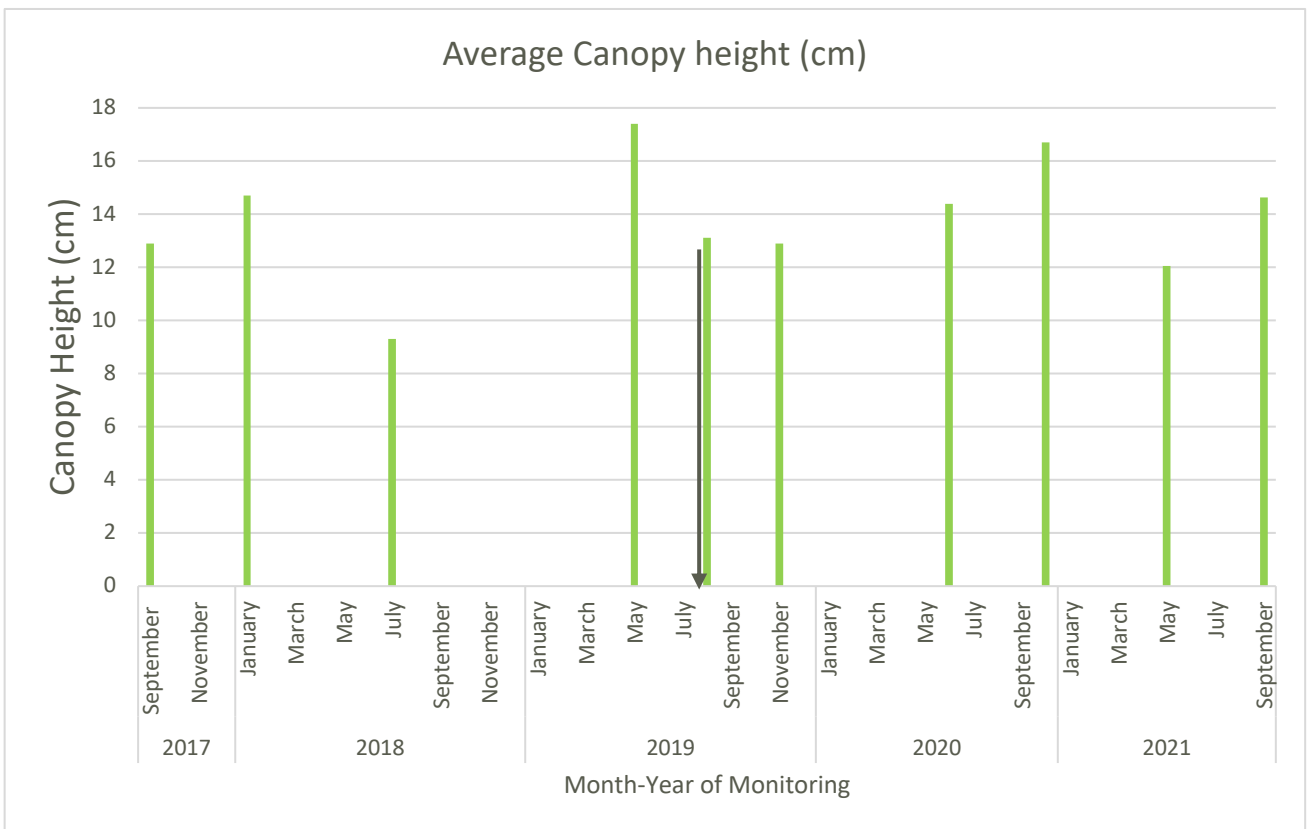


Figure 6: Average canopy height at Erakor lagoon over the years 2017-2021 shows seasonal variations but no significant changes to the canopy height. Taboo started (→ August 2019).

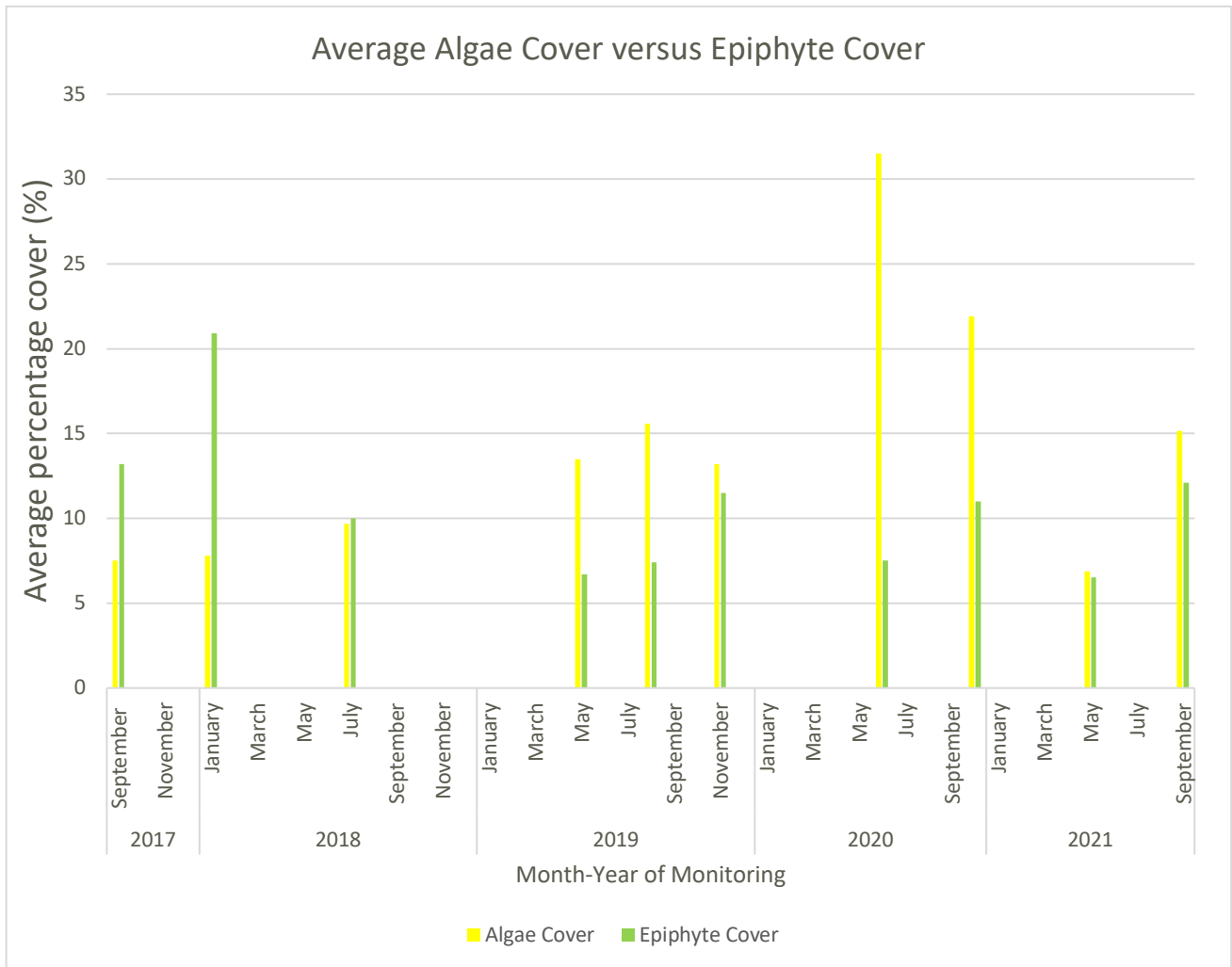


Figure 7: Average algae cover (algae not living on seagrass leaves) and epiphyte cover (algae living on seagrass leaves) at Erakor lagoon over the years 2017-2021. Generally, results are fairly stable apart from one monitoring event in June 2020, when the algae cover was higher. One result does not indicate a general trend so VESS will continue to monitor to see if a trend develops. Taboo started (→ August 2019).

There are natural changes in the seagrass meadows during the year, as the weather changes. Seagrass height and cover tends to be higher in the warmer months with longer sunshine hours. Algae, (both attached to the leaves and living separate to the seagrass), tends to be greater when there is more nutrient in the water as well as when the water is warmer. But the algae levels can be affected by the number of snails or other animals that feed on the algae too.

VESS started monitoring seagrass in the Erakor lagoon in 2017, and since then we have survey data for ten monitoring events (September 2017 to September 2021). The results are shown in the graphs (Figure 5,

Figure 6 and Figure 7). We can see that there are some variations with the different times of the year, as expected. However, the seagrass meadows appear to be stable when we look at the data across the years. It is important to continue monitoring so we can see if there are any changes over a longer period of time.

VESS will continue to update the community on the results of our monitoring to help with management of coastal areas and conservation actions that may be needed. We thank the Erakor community for allowing VESS to continue with the monitoring program and hope to continue working together to monitor this important ecosystem and protect the marine life that depends on it.