

Project Update: May 2020

From late November 2019 to February 2020, four fieldwork trips were carried out to the islands of Makogai (1) and Yadua (3). Following the visit to Makogai Island, the project objectives had to be shifted given the unexpected occurrence of a natural phenomenon. Unfortunately, the presence of a very significant amount of pumice, a volcanic floating rock (*Photo 1 and 2*), on all the bays around the island changed the original plans. According to the locals, the pumice had been growing gradually, and I could confirm its origin from an underwater volcano eruption in Tonga.



Photo 1 and 2. Pumice on Makogai Island.

This massive amount of pumice completely covering the seagrass beds during high tide (hampering significantly the light penetration and influencing on the physical-chemical characteristics of the water column and sediments) won't allow me to disentangle the effects of mangrove loss due to Cyclone Winston when compared to my other sampling site (Yadua Island), which so far has no pumice in its bays. In order to maintain the purpose of evaluating the influence of mangroves on adjacent seagrass beds and relate it to the diet of green turtles feeding on such foraging grounds, the study was redirected only towards Yadua Island. In this sense, the effect of ranges of mangrove extension on adjacent seagrass beds will be assessed (following the original methodology) as well as potential site fidelities of green turtles given discrepancies among seagrass beds conditions.

Fieldwork activities:

Upon arrival at each island, I introduced the project to the community's chief during a traditional Fijian protocol (*sevusevu*) counting on the translation support provided by my field assistants (*Photo 3*). The chiefs gave me and my team their official consent and support for the time spent in their villages.

Mangrove and seagrass beds sampling:

A total of 14 sites were sampled on Yadua Island. At each site, three plots were placed along a transect from the terrestrial forest in the hinterland of the mangrove (1), through the mangrove patch (1), and into the seagrass bed (1). The following activities were carried out (Photos 4-13):



Photo 3. Fieldwork assistants and I before attending to the “sevusevu” Fijian protocol (wearing a “sulu” (a kilt-like garment) is a matter of respect when visiting a Fijian village).

Plot	Terrestrial	Mangrove	Seagrass
Estimation of mangrove and seagrass bed extension through GPS tracking and further remote sensing analysis			
Soil (terrestrial forest) and sediment (mangroves and seagrass beds) sampling from the upper 2 cm for the estimation of nutrient content (nitrate, phosphate and ammonia), physical-chemical parameters (organic matter content, salinity and pH) and the chemical characterization of organic matter (py-GC/MS) at low tide			
Characterization of the forest structure (main forest communities, DBH, height and tree density)			
Leaves/blades collection of most abundant plant species as reference for py GC/MS analysis			
-Percentage of seagrass species, epiphytes and algae coverage measurement on five 50x50-cm quadrants at low tide -Blade area estimation through height and width measurement at low tide			

-Water depth measurement at high tide
-Water sampling at high tide for the estimation of nutrient content (nitrate, phosphate and ammonia), salinity, pH and chlorophyll-a in the water column
-Secchi depth measurement at high tide as indicator of turbidity







Photos 4-13. Fieldwork activities in mangroves and seagrass beds.

Green turtle sampling:

During each fieldtrip, turtle rodeos were carried out on Yadua Island. Green turtle individuals were hand-captured by local villagers highly experienced in such activity (Photo 4, 5 and 6). Turtles were brought on shore where biological data as well as faecal samples were taken from each individual using cloacal swabs in order to analyse the organic matter present in their faeces. Turtles were released between 1-2 hours after capture (Photo 7, 8, 9 and 10).

Overall progress

Data collection in the field was successfully done. About half of the data has been obtained and is being processed. Nevertheless, some parameters have not been estimated, since part of the laboratory phase will take place in Germany, and it has been postponed due to the current global sanitary emergency.



Photo 14, 15 and 16. Local villagers' hand-capturing green turtles on Yadua Island.



Photo 17, 18, 19 and 20. Green turtle individuals sampling and release.