

Coral Reefs and Ocean Acidification

At the northern Pacific coast of Costa Rica, strong winds push surface waters away from the shore causing upwelling of cold and nutrient-rich deep waters during dry season. The occurrence of this event called 'Papagayo upwelling' affects the chemistry and physical conditions of the seawater, causing **rapid changes in temperature, pH, nutrients, oxygen and turbidity**. Therefore the Gulf of Papagayo can serve as natural laboratory for changes in water parameters and the response of coral reefs. The reefs in this area are exposed to a highly dynamic environment during the upwelling and I want to investigate how the **corals and the ecosystem react and adapt to the natural variability**. This is a crucial question as the impact of climate change worldwide will be determined by the capacity of species to adjust to environmental changes.

Together with a Costa Rican PhD student I monitor water-parameters as well as the status of local reefs at three locations along the Pacific coast of Costa Rica which are differently exposed to seasonal upwelling over a whole year. By cross transplanting coral fragments between the different locations we will be able to see possible physiological adaptation of corals to upwelling conditions, especially to a lowered pH. The gained information may help to estimate the functioning and structure of coral reefs in an acidified ocean as projected for the future worldwide.

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