Coral recruitment and calcium carbonate (CaCO₃) accretion are fundamental processes that help maintain coral reefs. Many reefs worldwide have experienced degradation, including a decrease in coral cover and biodiversity. Successful coral recruitment helps degraded reefs to recover, while CaCO₃ accretion by early successional benthic organisms maintains the topographic complexity of a coral reef system. It is therefore important to understand the processes that affect coral recruitment and CaCO₃ accretion rates in order to understand how coral reefs recover from disturbances. The aim of this thesis was to determine how biophysical forcing factors affect coral recruitment, calcification and bioerosion on a pristine coral reef.