Investigating the Effect of the Removal of Red Mangrove Trees on the Ecosystem of Kauai

Parsons, Isabella (School: Kauai High School)

Rhizophora mangle, also known as Red Mangrove, is an aggressive, opportunistic, invasive species that has drastically altered the landscape of Kaua`i (Mangrove Removal: Wai' Opae [n.d.] Malama O Puna, Protecting Hawaii's precious natural heritage, retrieved from https://malamaopuna.org/). The Hawaiian climate is conducive to the rapid spread of the species while choking out native species and producing an ecosystem with diminished biodiversity. In response, many local organizations are collaborating to eradicate the Rhizophora mangle from the culturally significant Alakoko Fishpond. Initially independent of this community effort, this first study of a multiple year investigation sought to determine "How does the removal of Rhizophora mangle affect the water quality of surrounding marine areas including the Alakoko Fishpond?" Over the course of five months, measures of dissolved oxygen (mg/l), temperature (°C), turbidity (NTU), flow rate (m/s), salinity (ppt), and pH were collected from four locations strategically selected around the removal site of the Alakoko Fishpond. Weather, tidal, and species removal data from outside sources were merged with the data sets. Data cleansing and analytical techniques were applied. The results indicate that dissolved oxygen, pH and salinity levels decreased, while temperature, turbidity levels and flow rates increased. This evidence seems to indicate that in the short term there is a negative correlation between the removal of Rhizophora mangle and water quality levels. These primary conclusion strongly suggest a need for continued research and monitoring of this ecosystem.

Awards Won: