

**Coles, S. L. and E. Brown. 2006. Twenty-year Changes in Coral Coverage on a Hurricane Impacted Reef in the Vicinity of a Thermal Outfall. Eos Trans. AGU, 87(36), Ocean Sci. Meet. Suppl. Abstract OS53L.**

**Abstract:**

A long term monitoring study which utilized methods with high precision and replicability was conducted at four stations near Kahe Point, leeward Oahu, Hawaii. Coral coverage on 10 quadrats at each station was measured yearly from 1981 through 2000 by re-photographing marked areas on the reef. The study began after a local storm reduced coral coverage in the area by about 50 percent in 1980, and the study period included the occurrences of two major hurricanes, which impacted the area in 1982 and 1992. Repeated measures ANOVA indicates significant differences among stations, time and station-time interaction with high statistical power. High spatial variability in coral coverage changes was determined within a scale of hundreds of meters. Patterns of change with time varied substantially among the stations, with the area nearest a thermal outfall showing the most stable coral coverage. Although immediate impacts from hurricanes were not substantial, long-term decreases in coral coverage are indicated which extended well after the times of the storms. Patterns of decline and recovery in coral cover appear to be cyclic on a decadal time scale.