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Effect of Stream Nutrients on Benthic Algal Overgrowth in Vatia Bay

According to a recent NOAA study on “Nutrient Dynamics and Changes to Benthic Communities in Vatia, American Samoa”, Vatia Bay is experiencing an unusual overgrowth of benthic algae, possibly due to high nutrient levels in the bay. This algal bloom is threatening to outcompete the bay's corals, which are economically valuable, diverse ecosystems. NPSA's water quality data on the streams feeding Vatia Bay also indicates high nutrient levels in the streams. If there is a positive relationship between the algal overgrowth in Vatia Bay and excess nutrients entering the Bay from its feeding streams, we hypothesize that the percentage of benthic algae will decrease as the distance from the mouth of the streams increases.

To test this hypothesis, we mapped three transects at each of the two streams, extending from the stream mouth to the edge of the reef at 45, 90, and 135 degree angles. Equidistant points 20m apart were plotted along each of these six transects, and at each of these points, a 1m by 1m quadrat will be laid on the ocean floor. Within the quadrat, the percentage of algae, coral, sand, and other matter will be estimated and recorded.

A graph, plotting the data, will show the percentage of algae cover versus the distance from the stream mouth at each given point along the six transects. A negative slope would support our hypothesis, suggesting that a decline in nutrients within the streams will reduce excess algal growth and protect the Bay's coral reefs.

Key words: stream nutrients, benthic algae, Vatia Bay, coral reef