Assessing Coral Reef Changes through Supervised Classification and its Correlation with SST and Chlorophyll-A: A Remote Sensing Approach

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SUMMARY

Coral reefs are essential for marine ecosystems, coastal protection, and the livelihoods of millions of people. However, they are increasingly threatened by climate change and human activities, including pollution. To address these challenges, we propose a study utilizing remote sensing techniques to assess the status of coral reefs and investigate their correlation with various environmental indicators. Our goal is to provide insights that inform climate-responsive land governance.

We plan to employ supervised classification algorithms for coral reef classification, conduct time series analysis, and use indices for chlorophyll-A content mapping along with sea surface temperature (SST) data from NOAA. Pearson's correlation coefficient will be used to analyze the relationships among these parameters. By integrating supervised classification, time series analysis, and ARIMA modeling, this research aims to enhance our understanding of coral reef ecosystems and their responses to environmental stressors. ARIMA modeling will strengthen our predictive capabilities, allowing us to forecast future SST trends and their impacts on coral reef health.

Expected outcomes include the creation of precise coral reef classification maps, identification of SST and coral trends, and insights into the relationship between chlorophyll-A concentrations and coral reef health. We anticipate that temporal change detection will reveal a negative correlation between coral health and SST, and a weak positive correlation with chlorophyll-A content. These findings will contribute to climate-responsive land governance by providing critical data for managing and mitigating the impacts of climate change on coral reef ecosystems.

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