NPS Remote Sensing Research (PH)

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NDVI AND PANCHROMATIC IMAGE CORRELATION USING TEXTURE ANALYSIS

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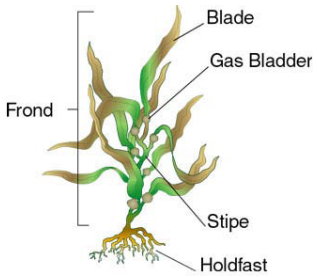
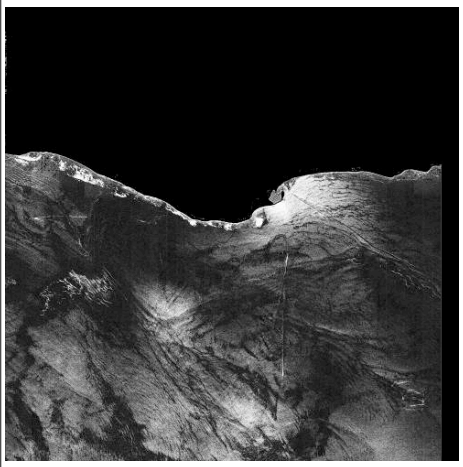
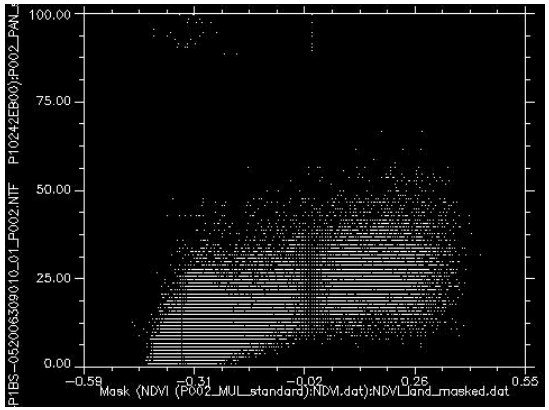
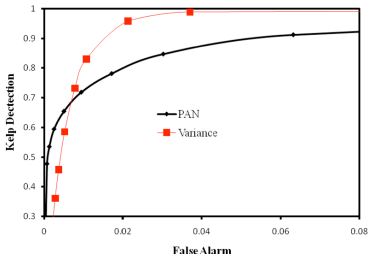


The purpose of this research is to apply panchromatic satellite imagery to the task of locating kelp in the California coastal waters. The task is currently done using multi-spectral imagery (MSI), but there are time intervals wherein only panchromatic data are available. Panchromatic images were analyzed using various threshold approaches, analysis techniques, and texture analysis. Results were then compared to MSI data analyzed using the standard Normalized Difference Vegetation Index (NDVI). Four classification methods were used: Maximum Likelihood, Mahalanobis Distance, Minimum Distance, and Binary Encoding.

The main problem with this approach was sunglint off of the water. It proved difficult to eliminate all of it in the classification of kelp. The Receiver Operating Characteristic (ROC) curves proved that the panchromatic and variance texture feature images were well above the line of no-discrimination, so they are a very good detector and discriminator of kelp and water. Using panchromatic and variance in the Mahalanobis Distance, and Minimum Distance classification methods, the result is an overall accuracy of 98.5% of the Santa Barbara Coastal Long-Term Ecological Research (SBC-LTER) Program research areas of Arroyo Burro and Mohawk.







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