

Remote Sensing Mapping of Turbidity in the Upper San Francisco Estuary

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Executive Project Summary

An empirical relationship between total suspended solids (TSS) and reflectance data obtained from Landsat imagery was developed for the San Joaquin River where $\text{Log TSS} = 0.0788x - 0.4546$ ($R^2 = 0.756$). X is the ratio between the difference of Band 2 and Band 1 and sum of Band 2 and Band 1. The ratio algorithm was implemented from Gitelson et al. 1993. Results are promising, however sample size was too small (N=4). Additional sites must be included to make relationship more robust and representative of the rest of the estuary, analyzing two other available images will make this analysis more complete. This results will be used to develop methodology to map and monitor turbidity in the San Francisco estuary. Agencies routinely sample different regions of the estuary. However, field sampling is costly, does not extend to all regions of the estuary and is measured at discrete locations. Remote sensing would allow continuous coverage, regional comparisons, and monitoring of changes over time if image resolution is deemed appropriate.

Reference:

Gitelson, A., G. Garbuzov, F. Szilagyi, K-H. Mittenzwey, A.Karnieli, and A. Kaiser. 1993. Quantitative remote sensing methods for real time monitoring of inland waters quality. *International Journal of Remote Sensing* 14(7): 1269-1295