**Pareto optimality for modelling Tsunami Effects on Sea Surface Salinity From MODIS Satellite Data.**

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**Abstract:**

Remote sensing technology has been recognized as a powerful tool for environmental disaster studies. Ocean surface salinity is considered as a major element in the marine environment. In this study, we simulated the tsunami 2004 impacts on the Sea Surface Salinity along Banda Aceh using the least square algorithm. **Methods:** this study is implemented the Pareto optimality with least square algorithm for retrieving sea surface salinity during and post tsunami day. Results: This study shows significant variations in the values of SSS pro, during and post the tsunami event. The maximum salinity was observed post tsunami event was 38 psu as compared to pre and during tsunami event. The results also show a good correlation between in situ SSS measurements and the SSS that is retrieved from MODIS satellite data with high r2 of 0.98 and RMSE of bias value of ±1.0 psu.In conclusion, the least square algorithm is an appropriate method to retrieve SSS from MODIS satellite data. **Conclusion:** Clearly, the tsunami 2004 has significant impacts on the SSS because of high sediment deposit concentrations which added more salts and minerals to coastal waters of Banda Aceh. It can be said that Pareto Optimality produced accurate mapping of sea surface salinity.