

# **SIMULATION OF TSUNAMI EFFECTS ON SEA SURFACE SALINITY USING MODIS SATELLITE DATA DURING 2004 TSUNAMI**

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**Abstract:** On December 24, 2004, a massive 9.2 earthquake occurred off the island of Sumatra. It generated a deadly series of tsunamis that swept Indonesia, India, Madagascar, and Ethiopia. The death toll was estimated to be in the neighbourhood of 300,000 to 350,000. Remote sensing technology has been recognized as powerful tool for environmental disaster studies. Ocean surface salinity is considered as major element in marine environment. In this study, we simulate the tsunami 2004 impact on the physical ocean parameter using the least square algorithm to retrieve sea surface salinity (SSS) from MODIS satellite data. This study shows significant variations in the values of SSS before, during and after the tsunami event. The maximum salinity was observed after the tsunami with 38 psu as compared to pre and during tsunami event. The accuracy of this work has been examined using the root mean square and receiver operator characteristic (ROC) of sea surface salinity retrieved from MODIS satellite data. The study shows comprehensive relationship between in situ measurements and least square algorithm with high  $r^2$  of 0.98, 0.96 and RMS of bias value of  $\pm 12.34$  psu. In conclusions, least square algorithm can be used to retrieve SSS from MODIS satellite data during tsunami event.

**Keywords:** Tsunami, MODIS satellite data, Sea Surface salinity, Linear algorithm, least square algorithm