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## Predicting yellowfin tuna stock in offshore fisheries in Sri Lanka using sea surface temperature, sea surface salinity, and chlorophyll distribution

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Fisheries sector plays important role in addressing the national, regional, and global need for food security of human, and the sector supports nearly one million fishers, workers, and their family members in Sri Lanka. Yellowfin tuna is an important contributor to export revenue of Sri Lanka. The highly migratory and widely dispersed yellowfin tuna landings are influenced by seasonal and geographic fluctuations. Abrupt changes in climatic conditions disrupt the estimation of stocks. Thus, predicting spatial distribution of the species is important in reducing the fishing cost. The Sea Surface Temperature (SST), Sea Surface Salinity (SSS), and Sea Surface Chlorophyll (CHL), obtained from remote sensing satellites were used in predicting yellowfin tuna caught by longline vessels in the Indian Ocean near Sri Lanka. In this context, SST, SSS, CHL, and CPUE (Catch per unit effort), computed as the number of fish caught per hook per trip collected from the logbooks of the Department of Fisheries, Sri Lanka, were evaluated. The relationship between sea surface temperature, sea surface salinity, sea surface chlorophyll, and CPUE has been determined using the Generalized Additive Model (GAM). The present findings on the CPUE data throughout 2019 indicate that SST (28<sup>0</sup>C - 28.5<sup>0</sup>C), SSS (33.5ppt - 34 ppt), and CHL (0.15mg/dm<sup>-3</sup> - 0.17mg/dm<sup>-3</sup>) have the optimum CPUE values. Results showed a good match between predicted and actual catch. The present study affirms that developed model could estimate yellowfin tuna stock at given SST, SSS, and CHL data.

**Keywords:** CPUE, GAM, Salinity, Temperature, Yellowfin tuna

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