

## **Fluctuation of Sea Surface Temperature (SST) Over Shallow Coral Reef Ecosystems in Eastern Coast of Sri Lanka During the Past 15 Years Period**

**S.W.R. Sewwandi\***, E.P.D.N. Thilakarathne and Prasadi De Silva

*Department of Animal Science, Faculty of Animal Science and Export Agriculture Uva Wellassa University, Passara Road, Badulla, Sri Lanka*

*\*Corresponding Author E-mail: sewwandirusiri@gmail.com, TP: +94778071649*

Coral reefs are dynamic and complex marine habitat which are highly sensitive to elevated Sea Surface Temperature (SST) than their optimal maximum temperature (27°C). Elevated SST directly affects coral bleaching and services they provided. Satellite remote sensing data can be effectively and efficiently used for spatial and temporal analysis of SST. The 1km Multiscale Ultrahigh Resolution (MUR) Level 4, SST data from NASA from 2005 to 2020 (15 years) were used for this study. Highly biodiverse and popular shallow reefs (<10m) along the Eastern coast i.e., Pigeon Island, Parrot Rock, Adukkuparu, Kayankerni and Passikudha were selected for this study. The area of reefs extended less than 10m water depth were demarcated by field surveys followed by polygon layers created by Google Earth Pro (7.3.3). The annual average SST for the period of 2005-2020 were as 28.95°C, 28.96°C, 28.71°C, 28.71°C, 28.71°C respectively. They will be expected as 29.29°C, 29.29°C, 29.31°C 29.39°C, 29.75°C by 2030 and may cause the extinction of most of the remaining live corals. Predominantly extreme SST recorded between 30°C to 31°C in April to May in 2010, 2016 and April to June in 2019 due to El Niño conditions and they were more severe in Kayankerni reef (30.23°C, 30.18°C in 2010 and 30.60°C, 30.30°C in 2016 and 30.86°C, 30.75°C, 30.75°C in 2019) and Passikudha reef (30.23°C, 30.23°C in 2010 and 30.60°C, 30.30°C in 2016 and 30.87°C, 30.87°C, 30.79°C in 2019). In addition, the mean SST levels recorded in the East coast during the Northeast monsoon period and the Southwest monsoon period were Significantly different ( $p < 0.05$ ). During the past fifteen years period, the mean SST value during the Southwest monsoon (May to September) was calculated as 29.22°C and the mean SST value during the Northeast monsoon (December to February) was 27.48°C. The mean SST for Southwest monsoon differs 1.74°C from mean SST in Northeast monsoon. Therefore, these findings are highly important when implementing coral conservation and replanting projects in particular areas and declared areas as seed banks to replenish more susceptible site.

**Keywords:** Coral bleaching; Satellite remote sensing data SST; Thermal stress; El Niño, Coral reefs in Sri Lanka