

EKA WARDANI. NIM 22.03.4.1.1.00112. Dinamika Nutrien dan Klorofil-a di Samudra Hindia Akibat Dampak Tropical Cyclone (TC) Neville 2024. Dibawah bimbingan **Ary Giri Dwi Kartika S.Kel., M.Si.**

ABSTRAK

Penelitian ini bertujuan untuk mengidentifikasi afinitas temporal-spasial antara pusat TC Neville dan data *in situ* (BGC-Argo float) guna menentukan area terdampak, menganalisis pengaruhnya terhadap struktur kolom perairan SEIO (parameter kimia dan biologi) selama dan setelah kejadian, serta memahami peran interaksi atmosfer-laut dalam memodulasi pencampuran massa air, dinamika klorofil-a, dan ketersediaan nutrien.

Hasil penelitian menunjukkan bahwa TC Neville memberikan pengaruh terhadap struktur kolom air. diketahui Afinitas temporal-spasial antara pusat TC dan posisi Argo float terjadi pada 22 Maret 00:00 dengan jarak terdekat 27,76 km (titik Argo ke-3 tanggal 30 maret). TC Neville menyebabkan perubahan signifikan pada struktur kolom air di SEIO, ditandai variasi nilai N, perubahan MLD, BLT, dan ILD pada fase pra-TC stratifikasi melemah akibat eddy antisiklonik yang memicu mixing, sedangkan pasca-TC stratifikasi menguat akibat upwelling dari arus divergen. Selain itu, TC Neville memengaruhi dinamika nutrien dan klorofil-a melalui interaksi atmosfer–laut, di mana angin kuat saat siklon memodifikasi EPV, SSHA, dan stabilitas kolom air pra-TC terjadi konvergensi dan downwelling yang memperdalam nutricline dan SCM, sementara pasca-TC terjadi upwelling lemah yang meningkatkan suplai nutrien, memperkuat stratifikasi, serta mendangkalkan kembali nutricline dan SCM.

Kesimpulan penelitian ini adalah TC Neville memberikan pengaruh yang lebih dominan pada lapisan subsurface, yang ditunjukkan oleh masih terdeteksinya perubahan struktur kolom air meskipun data Argo diperoleh 7 hari setelah kejadian (30 Maret).

Kata Kunci : *Argo float*, *TC Neville*, Nutrien, Klorofil-a

EKA WARDANI. NIM 22.03.4.1.1.00112. Nutrient and Chlorophyll-a Dynamics in the Indian Ocean as an Impact of Tropical Cyclone (TC) Neville 2024. Under the guidance of **Ary Giri Dwi Kartika, S.Kel., M.Si.**

ABSTRACT

This study aims to identify the temporal–spatial affinity between the center of Tropical Cyclone (TC) Neville and in situ data (BGC-Argo float) to determine the affected area, analyze its influence on the water column structure in the Southeast Indian Ocean (SEIO) (chemical and biological parameters) during and after the event, and understand the role of atmosphere–ocean interactions in modulating water mass mixing, chlorophyll-a dynamics, and nutrient availability.

The results show that TC Neville significantly influences the water column structure. The temporal–spatial affinity between the TC center and the Argo float position occurred on March 22 at 00:00, with the closest distance of 27.76 km (Argo point 3, recorded on March 30). TC Neville caused significant changes in the water column structure in the SEIO, indicated by variations in N values, as well as changes in mixed layer depth (MLD), barrier layer thickness (BLT), and isothermal layer depth (ILD). During the pre-TC phase, stratification weakened due to an anticyclonic eddy that triggered mixing, whereas in the post-TC phase, stratification strengthened due to upwelling associated with divergent currents. In addition, TC Neville affected nutrient and chlorophyll-a dynamics through atmosphere–ocean interactions, where strong winds during the cyclone modified EPV, SSHa, and water column stability. During the pre-TC phase, convergence and downwelling deepened the nutricline and subsurface chlorophyll maximum (SCM), while in the post-TC phase, weak upwelling enhanced nutrient supply, strengthened stratification, and shoaled the nutricline and SCM.

In conclusion, TC Neville exerts a more dominant influence on the subsurface layer, as indicated by the persistence of changes in the water column structure even though the Argo data were recorded 7 days after the event (March 30).

Keywords: Argo float, TC Neville, Nutrients, Chlorophyll-a