

ABSTRAK

(Nafisa Azzahra Zeta. 26050119130088. Variabilitas Tahunan Klorofil-a dan Prediksi Periode Penangkapan Ikan di Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPPNRI) 715, Muhammad Helmi dan Kunarso).

Ketidakpastian pola musim menjadi kendala utama nelayan di Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPPNRI) 715 dalam menentukan daerah penangkapan ikan. Penelitian ini bertujuan menganalisis variabilitas spasial-temporal klorofil-a di WPPNRI 715 periode 2010–2024 berdasarkan pengaruh parameter suhu permukaan laut (SPL) dan angin muson, serta implikasinya terhadap kalender perikanan. Data satelit klorofil-a, SPL, dan angin diunduh dari Copernicus Marine Service (CMEMS), diolah menggunakan IDL 8.5 dan ArcGIS, serta dianalisis menggunakan uji korelasi Pearson. Hasil penelitian menunjukkan bahwa angin muson mengendalikan variabilitas klorofil-a melalui kontrol termal perairan, di mana penguatan angin monsun tenggara pada bulan Agustus membangkitkan Transpor Ekman menjauhi pantai (*offshore Ekman transport*) yang memicu fenomena *coastal upwelling* kuat di Laut Seram (wilayah timur). Kondisi ini menghasilkan puncak kesuburan utama dengan nilai klorofil-a tertinggi mencapai $0,83 \text{ mg}/\text{m}^3$ dan SPL minimum $25,8^\circ\text{C} - 26,9^\circ\text{C}$. Sebaliknya, pada bulan Januari terjadi musim puncak sekunder akibat pengadukan mekanis angin barat. Fase paceklik utama terjadi pada bulan April akibat melemahnya angin yang memicu stratifikasi termal kuat, diikuti paceklik sekunder pada bulan November. Pada skala lokal, Laut Maluku (wilayah barat) menunjukkan tingkat kesuburan yang stabil-moderat sepanjang tahun akibat proses pengadukan vertikal (*vertical mixing*) yang digerakkan oleh dinamika batimetri kasar dan arus Arlindo. Anomali lokal lainnya ditemukan di Teluk Berau (subur sepanjang tahun akibat *river runoff*) dan Teluk Tomini (rendah sepanjang tahun karena kondisi perairan tenang dan oligotrofik).

Kata kunci : Klorofil-a, Suhu Permukaan Laut, Angin Monsun, WPPNRI 715, Kalender Perikanan.

ABSTRACT

(Nafisa Azzahra Zeta. 26050119130088. *Interannual Variability of Chlorophyll-a and Prediction of Fishing Seasons in the Fisheries Management Area of the Republic of Indonesia (FMA-RI) 715*, Muhammad Helmi and Kunarso).

Uncertainty in seasonal patterns remains a primary constraint for fishermen in the Fisheries Management Area of the Republic of Indonesia (FMA-RI / WPPNRI) 715 when determining fishing grounds. This study aims to analyze the spatial-temporal variability of chlorophyll-a in WPPNRI 715 during the 2010–2024 period as influenced by sea surface temperature (SST) and monsoon wind parameters, as well as its implications for the fisheries calendar. Satellite data of chlorophyll-a, SST, and winds were downloaded from the Copernicus Marine Service (CMEMS), processed using IDL 8.5 and ArcGIS, and analyzed using Pearson correlation tests. The results demonstrated that monsoon winds heavily control chlorophyll-a variability through the thermal control of the waters. The intensification of the southeasterly monsoon winds in August generates offshore Ekman transport, triggering a strong coastal upwelling phenomenon in the Seram Sea (eastern region). This mechanism produces the main peak of marine productivity, with the highest chlorophyll-a concentration reaching $0,83 \text{ mg/m}^3$ and a minimum SST of $25,8^\circ\text{C} - 26,9^\circ\text{C}$. Conversely, a secondary peak season occurs in January driven by northwest monsoon wind-induced mixing. The primary lean season (*paceklik*) occurs in April due to weakening winds that induce strong thermal stratification, followed by a secondary lean season in November. On a local scale, the Maluku Sea (western region) exhibits a stable-moderate chlorophyll-a concentration throughout the year due to vertical mixing processes driven by rough bottom bathymetry and the Indonesian Throughflow (ITF) currents. Other localized anomalies were observed in the Berau Bay (fertile year-round due to river runoff) and the Tomini Bay (low year-round due to calm, oligotrophic waters).

Keywords : Chlorophyll-a, Sea Surface Temperature, Monsoon Winds, WPPNRI 715, Fisheries Calendar.