

Analisis Paleoklimatologi di Perairan Utara Jayapura Berdasarkan Core Laut "UP" = Paleoclimate Analysis in Northern Jayapura Waters with "UP" Marine Sedimentary Core

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Abstrak

Studi paleoklimatologi penting untuk memahami perubahan iklim masa lalu yang tidak tercatat secara instrumental dan menjadi dasar untuk memprediksi pola iklim masa depan. Penelitian ini bertujuan merekonstruksi kondisi paleoklimat di Perairan Utara Jayapura berdasarkan salah satu core dengan kode "UP". Daerah Perairan Utara Jayapura merupakan salah satu pintu masuk Arlindo (Arus Lintas Indonesia) yang merupakan bagian dari sirkulasi perairan global, sehingga diperkirakan mampu merekam jejak perubahan iklim global. Analisis dilakukan secara multiproksi, meliputi distribusi ukuran butir, LOI (Loss on Ignition), unsur jejak (XRF), dan kelimpahan foraminifera. Hasil menunjukkan dominasi sedimen lempung dan lanau berbutir kasar, dengan struktur masif dan menyerpih. Stratigrafi vertikal menunjukkan perubahan energi pengendapan dari stabil ke dinamis. Peningkatan unsur Fe dan Ti di bagian dangkal menunjukkan peningkatan input daratan akibat curah hujan. Penanggalan relatif terhadap data radiokarbon menunjukkan umur sampel 13.625 BP (Pleistosen Akhir), dengan batas Holosen pada kedalaman 92 cm (~11.500 BP). Setelah batas tersebut, terjadi lonjakan kelimpahan foraminifera dominan seperti *Globigerina bulloides*, *Globigerinoides ruber*, *Bolivina robusta*, dan *Trilobatus immaturus*. Berdasarkan komposisi foraminifera dan indikator lingkungan, paleoklimat direkonstruksi dalam tiga periode: Pre-Holocene Climate Optimum (13.625–11.875 BP), Holocene Climate Optimum (11.625–9.125 BP), dan Post-Holocene Climate Optimum (8.875–0 BP), yang masing-masing mencerminkan variasi suhu, curah hujan, oksigen, kedalaman termoklin, dan dinamika sedimen sejak Pleistosen Akhir hingga Holosen.

.....Paleoclimatology studies are important for understanding past climate changes that are not recorded instrumentally and as a basis for predicting future climate patterns. This study aims to reconstruct paleoclimate conditions in the North Jayapura Waters based on one of the marine sedimentary core coded "UP". The Northern Jayapura Waters area is one of the entrances of ITF (Indonesian Through Flow) which is part of the global water circulation, so it is estimated to be able to record traces of global climate change. The analysis was carried out using a multiproxy method, including grain size distribution, LOI (Loss on Ignition), trace elements (XRF), and foraminifera abundance. The results show the dominance of coarse-grained silt sediments, with massive and flaky structures. Vertical stratigraphy shows changes in depositional energy from stable to dynamic. Increased Fe and Ti elements in the shallow part indicate increased land input due to rainfall. Relative dating to radiocarbon data shows the age of the sample is 13,625 BP (Late Pleistocene), with the Holocene boundary at a depth of 92 cm (~11,500 BP). After this boundary, there is a surge in the abundance of dominant foraminifera such as *Globigerina bulloides*, *Globigerinoides ruber*, *Bolivina robusta*, and *Trilobatus immaturus*. Based on the composition of foraminifera and environmental indicators, the paleoclimate is reconstructed into three periods: Pre-Holocene Climate Optimum (13,625–11,875 BP), Holocene Climate Optimum (11,625–9,125 BP), and Post-Holocene Climate Optimum (8,875–0 BP), which reflect the variations in temperature, precipitation, oxygen, thermocline depth, and sediment dynamics from the Late Pleistocene to the Holocene, respectively.