

ABSTRAK

KARAKTERISTIK SEDIMEN LAUT DAN IDENTIFIKASI PALEOKLIMAT PADA KALA HOLOSEN BERDASARKAN DATA INTI BOR EW17-11 DI PERAIRAN PULAU SIMEULUE, ACEH

Oleh
Fredita Sukmawati
NIM: 111210085
(Program Studi Sarjana Teknik Geologi)

Perairan Pulau Simeulue di barat Sumatra memiliki peran strategis dalam merekam perubahan iklim masa lalu karena lokasinya yang berbatasan langsung dengan Samudra Hindia. Sedimen laut di kawasan ini berfungsi sebagai arsip alami paleoklimat selama Holosen. Holosen merupakan periode transisi penting dari Zaman Es ke iklim modern. Penelitian ini dilakukan untuk mengetahui karakteristik sedimen serta merekonstruksi kondisi paleoklimat kala Holosen di perairan timur Pulau Simeulue yang letaknya lebih dekat dengan daratan, sehingga memungkinkan identifikasi pengaruh daratan secara lebih jelas. Penelitian menggunakan sampel inti sedimen sepanjang 108 cm dari Ekspedisi Widya Nusantara 2017 di koordinat 95° 58' 183" BT dan 2° 59' 501" LU pada kedalaman 406 m di bawah permukaan laut. Penelitian menggunakan pendekatan multiproksi meliputi analisis ukuran butir, *X-Ray Fluorescence* (XRF), *Loss on Ignition* (LOI), dan foraminifera. Analisis besar butir untuk mengetahui karakteristik sedimen berupa *mean*, sortasi, *skewness*, dan kurtosis, serta proses transportasi dan mekanisme pengendapan, sedangkan analisis XRF untuk mengetahui kandungan unsur kimia terkait curah hujan. Analisis LOI untuk mengetahui kandungan karbon dan karbonat total sebagai indikator iklim, sedangkan analisis foraminifera untuk menafsirkan umur relatif, kelimpahan, serta lingkungan pengendapan. Integrasi keempat data proksi digunakan untuk merekonstruksi paleoklimat pada daerah penelitian. Sedimen di lokasi penelitian terdiri dari tiga fasies berukuran lanau hingga pasir sangat halus. Sedimen terendapkan di batial tepi dalam lingkungan tenang berenergi rendah melalui *pelagic suspension* pada kala Holosen. Terdapat tiga pola unsur kimia, tiga pola karbon dan karbonat, serta 17 spesies foraminifera planktonik dan 25 genus bentonik. Rekonstruksi menunjukkan tiga periode perubahan iklim dengan asosiasi iklim global yang terekam, yaitu: 8.2 *ka event*, *Holocene Thermal Maximum*, 4.2 *ka event*, dan *Medieval Climatic Optimum*.

Kata kunci: Holosen, Multiproksi, Paleoklimat, Sedimen laut, Simeulue

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CHARACTERISTICS OF MARINE SEDIMENTS AND PALEOCLIMATE IDENTIFICATION DURING THE HOLOCENE BASED ON CORE DATA EW17-11 IN THE WATERS OF SIMEULUE ISLAND, ACEH

By

Fredita Sukmawati

NIM: 111210085

(Geological Engineering Undergraduated Program)

The waters around Simeulue Island in western Sumatra play a strategic role in recording past climate change due to their location directly adjacent to the Indian Ocean. Marine sediments in this region serve as a natural paleoclimate archive for the Holocene. The Holocene is an important transitional period from the Ice Age to the modern climate. This study was conducted to determine the characteristics of the sediments and reconstruct paleoclimate conditions during the Holocene in the eastern waters of Simeulue Island, which are closer to the mainland, thereby enabling a clearer identification of the influence of the mainland. The study utilized a 108 cm sediment core sample from the 2017 Widya Nusantara Expedition at coordinates 95° 58' 183" E and 2° 59' 501" N at a depth of 406 m below sea level. The study employed a multi-proxy approach, including grain size analysis, X-Ray Fluorescence (XRF), Loss on Ignition (LOI), and foraminifera analysis. Grain size analysis was conducted to determine sediment characteristics such as mean, sorting, skewness, and kurtosis, as well as transport processes and deposition mechanisms, while XRF analysis was used to determine chemical element content related to rainfall. LOI analysis was used to determine total carbon and carbonate content as climate indicators, while foraminifera analysis was used to interpret relative age, abundance, and depositional environment. The integration of the four proxy data was used to reconstruct the paleoclimate in the study area. Sediments at the study site consisted of three facies ranging from silt to very fine sand. The sediments were deposited in a deep-water environment with low energy through pelagic suspension during the Holocene. There are three chemical element patterns, three carbon and carbonate patterns, and 17 planktonic foraminifera species and 25 benthic genera. The reconstruction shows three periods of climate change associated with recorded global climate events: the 8.2 ka event, the Holocene Thermal Maximum, the 4.2 ka event, and the Medieval Climatic Optimum.

Keywords: Holocene, Multiproxy, Paleoclimate, Marine sediments, Simeulue