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# Complex sedimentation of the Holocene mud deposits in a ria-type coastal area, eastern Korea Strait

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## Abstract

The innermost shelf of the eastern Korea Strait is a ria-type coastal sea comprising islands, intervening passageways and embayments. A detailed analysis of high-resolution (1–10 kHz) subbottom profiles and core sediments from this area reveals complicated depositional and distributional patterns of the Holocene mud deposits related to complex topography with varying supply of the adjacent Nakdong riverine sediments. Sediments from the Nakdong River were bifurcated around Gadeok Island, forming two proximal systems: Nakdong and western Gadeok systems. These proximal systems prograded offshore (southward) by active sediment supply from the Nakdong River in the early stage. Suspended sediments passing through the Nakdong system formed the distal (Gadeok Waterway and eastern Geoje) systems in the area between the northern Geoje and Gadeok islands. These distal systems show a northwestward (onshore) prograding tendency to Jinhae Bay, the biggest bay in the vicinity of the Nakdong estuary in which the Jinhae Bay system developed. In the late stage, a remarkable decrease of sediment supply from the Nakdong River has caused retrograding geometry of the two proximal systems. However, the most distal (Jinhae Bay) system has continuously prograded bayward due to the persistent supply of sediments resuspended by strong tidal currents from nearby distal (Gadeok Waterway and eastern Geoje) systems. These complex depositional features indicate that topography has an important influence on depositional developments of the Holocene mud deposits by controlling path and intensity of sediment dispersal and resuspension processes.

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*Keywords:* Holocene muds; depositional architecture; suspended sediment dispersal; ria-type coastal sea; Korea Strait

## 1. Introduction

The Holocene mud deposits are common in continental shelves (Milliman et al., 1985; Nittroauer et al., 1986; Díaz et al., 1990; Alexander et al., 1991; Díaz and Ercilla, 1993; Park et al., 1999; Chough et al., 2002). Depositional patterns of these mud deposits

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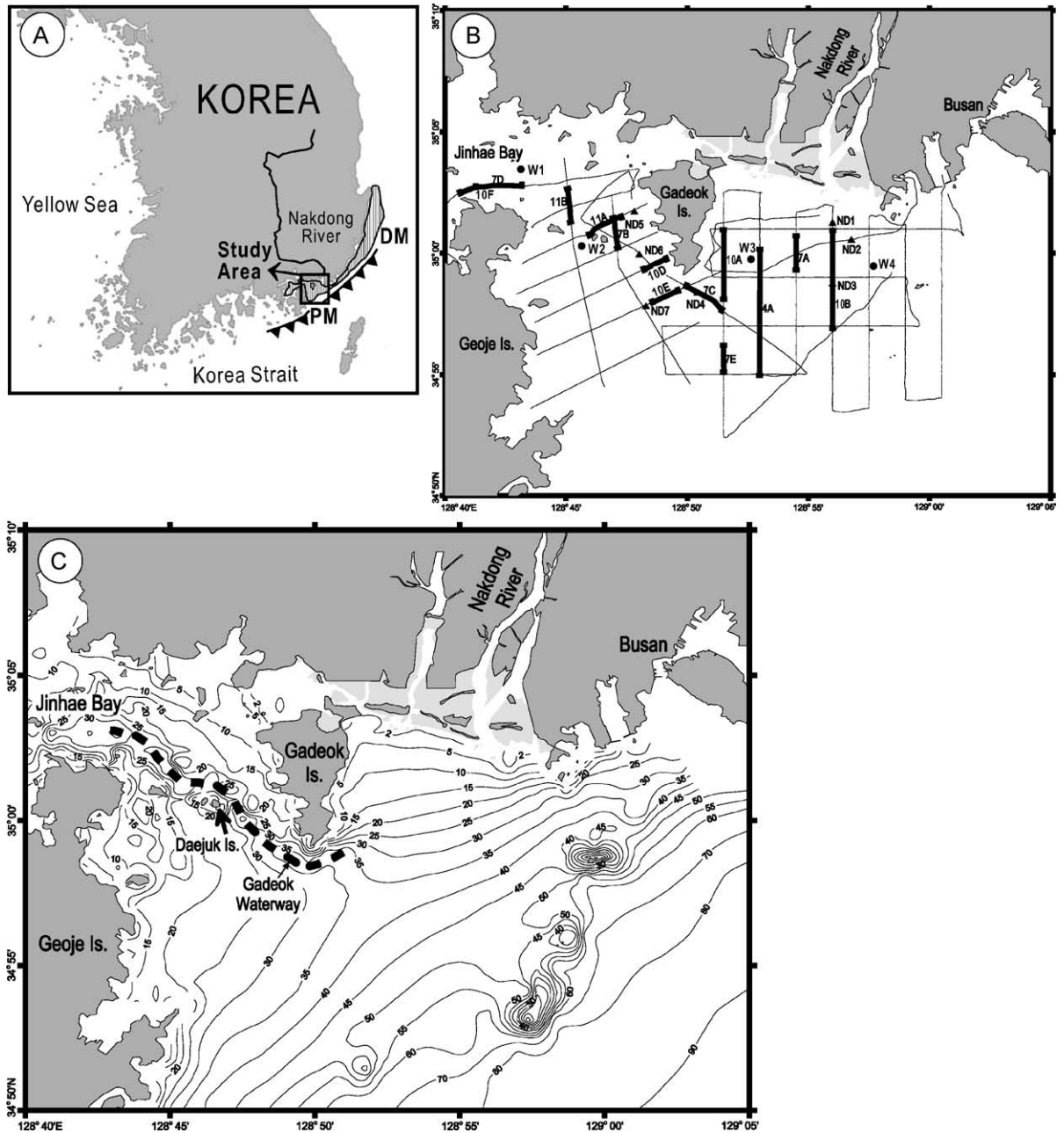


Fig. 1. (A) Map showing location of the study area. A hatched area indicates the Holocene muds along the southeastern coast of Korea. Hatched patterns denote the strong thermal front. PM—Proximal muds; DM—Distal muds. (B) Location of piston cores (▲), sites of wave data (●), and tracklines of high-resolution (1–10 kHz) subbottom profiles. Numbered thick bars denote location of Figs. 4, 7, 10 and 11. (C) Detailed bathymetry of the study area. Thick dotted line indicates location of the Gadeok Waterway (tidal channel). Contour interval is 5 m. Bathymetry in metres.

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