SUBMARINE MASS MOVEMENTS AND THEIR CONSEQUENCES
Advances in Natural and Technological Hazards Research, 2003, Volume 19, Section 4, 401-408, DOI: 10.1007/978-94-010-0093-2_44

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Keywords late-Holocene – swath bathymetry – seismicity – weak layer – fluid escape

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1. Introduction

On the Adriatic continental shelf the late Holocene mud wedge accumulated as part of the highstand systems tract (HST) after the attainment of the present sea-level highstand, about 5.5 cal kyr BP (Correggiari et al., 2001). High sediment accumulation rates (up to > 1.5 cm yr^{-1}) reflect the combined supply of the Po and the Apennine rivers resulting in a total thickness of the HST up to 35 m in a shore-parallel trend (Fig. 1). Geochronological data indicate that a basal HST unit above the maximum flooding surface (mfs) marks an interval of condensed deposition between 5.5 and ca. 3.7 kyr BP (Oldfield et al., 2003; Cattaneo et al., in press). The late Holocene mud wedge has a subaqueous offlap break in water depths of about 25 m and a laterally continuous prodelta slope of about 0.5°. Gas is common at very shallow levels (a few metres below the seafloor) in the topset region; gas venting and gas-charged sediments have been reported from other shallow stratigraphic units beneath the late-Holocene HST (Conti et al., 2002). The study area lies within the Adriatic foreland basin, an area characterized by intense shallow seismicity (Fig. 1) and historical tsunamis (Tinti et al., 1995).

In water depths greater than 70 m, the toe of the late-Holocene mud wedge contains small-scale mud reliefs characterized by an acoustically transparent core in seismic lines above a basal discontinuous unit of high-amplitude reflectors. The reliefs are rooted on the basal HST unit and protrude 4-8 m above the mfs (or 2-4 m above the adjacent seafloor), and are several tens of m in cross section. The reliefs occur in two different geologic settings: 1) where the late-Holocene HST reaches its maximum thickness on a

J. Locat and J. Mienert (eds.), Submarine Mass Movements and their Consequences, 401–408.