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The identification of proximal hyperpycnal flow and tempestite deposits by means of standard geological marine surveying and cores analysis: the case study of the Bonea stream offshore (Salerno Bay, Southern Tyrrhenian Sea).

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Practical diagnostic elements to identify and distinguish riverine hyperpycnal flow and sea-storm deposit in the shelf stratigraphic record off rocky coastal areas, based on sediment core analysis and seismic surveying, are here proposed. Both deposits are originated by down-welling currents (Myrow and Southard, 1996; Mulder and Syvitsky, 1995) and some of their lithologic and stratigraphic features might be very similar. A large amount of sand is delivered to the infralittoral and circalittoral environment following sea-storms and/or mountainous stream floods and settle as sharp based coarse beds, interlayered in the muddy shelf deposit. Nevertheless some peculiarityies regarding the sediment textures and grain size, the organic and bioclastic content, the stratigraphic position of the erosional surfaces at the base and the areal distribution of the sandy layers could be diagnostic for recognizing the two kinds of depositional processes. This study makes use of VHR seismic records and gravity cores collected at noteworthy sites in the Salerno Bay (Southern Tyrrhenian Sea), off the Bonea stream mouth. This area is a well fitting zone for pointing out the differences between the two kinds of deposits, due to the geographical and morphological features. In fact, the northern sector of the Salerno Bay is exposed to storms coming from N 190˚ and N 280˚ with the maximum fetch corresponding to the sub-sector 230˚-260˚ (660 nm)

where the greatest number of generating waves events come from. Storm waves approaching the coast from N 190˚ -N 220˚ (about the 25% of the events) and from N270˚- N280˚ induce strong alongshore currents respectively towards NW and SE. (Cocco et al., 1992). Besides, during the last three centuries several floods episodes hit the coastal area; the high gradient of the Bonea stream path and the shortness of the transfer zone accounted for the overcharged sediment fluxes moving rapidly downstream, following intense rainfalls (Esposito et al., 2004a, 2004b) and entering the shallow sea (Budillon et al., in press; Violante and Budillon, 2004). This geographical configuration makes the Bonea stream catchments and the Salerno Bay particularly sensitive to the Autumn and Winter south-westerly cyclonic storms which normally carry the higher peak of seasonal rainfall (Ramos, 2000a; 2000b); some of these major events are recorded as event beds in the recent stratigraphic record of the shelf. The reconstruction of remarkable events in the shallow marine sediment record highlights the flood- and sea wave-related hazard and the associated risk to which is exposed the Salerno coastal area, when major storms hit the coast and re-organize the morphology of the shore and the seabed.

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