



Coarse fan deltas off Amalfi coastal area (Italy): an interplay between catastrophic floods and volcanic fall-out events.

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High resolution seismic surveys, side-scan sonar imagery, multibeam bathymetry, and diving inspections performed offshore Amalfi coast, a rocky coastal area on the southern side of the Sorrento peninsula (Italy), revealed the occurrence of prograding fan delta systems at mouth of major streams. The submerged deltas have a front gradient averaging 25-27‰ to water depths up to 50 m, and develop up to 500 m from the present shore. The intertidal and supratidal deltas are narrow areas where human settlements developed because of water resources and low topographies. A volcanoclastic level found offshore in core samples and recognized elsewhere as the underwater expression of A.D. 79 fall out event, develops at the base of the prograding units thus providing a lower chronological constrain. The coastal streams drain high-relief basins and have high-gradient steep-sided profiles cutting into carbonate bedrock discontinuously covered by reworked fallout deposits of the A.D. 79 Somma-Vesuvius eruption. These latter occur as well lithified flood/landslide accumulations (locally called Durece) up to 40 m thick along the Stream valleys. Large floods and sliding phenomena have frequently occurred in this area, suggesting rapid slope morphodynamics. Slides are triggered by intense rainfalls over a range of magnitudes, inducing displacement of the sedimentary covers rapidly flowing down slopes (earth/debris flow). These events induced severe flood-flow in the main Streams: the first delivery area for the displaced materials then ultimately transported to the delta area and adjacent inlets. The discovery of a fan-delta system offshore Amalfi coastal area testifies the recurrence of extreme floods as a consequence of the famous A.D. 79 Somma-Vesuvius

eruption. These events were mainly fed by unstable accumulation of volcaniclastic fall-out deposits on a steep rocky coast, and induced a maximum seaward shift of the shoreline of about 500 m. The emplacement of the fan-deltas at Amalfi coast implied very critical conditions for human activities, lasting many decades after the destructive A.D. 79 eruption and after, as testified by flooding events occurred over the last century in this area.