

THE CRATI SUBMARINE FAN (Ionian Sea)

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Abstract: the Crati Fan (Gulf of Taranto), presently growing in a tectonically active area, can provide useful insights into the geological context of turbidite sedimentation in ancient "flysch" basins. The system is small, relatively shallow, fault controlled, with depositional lobes and under the influence of abundant fluvial input (Crati river, with torrential regime).

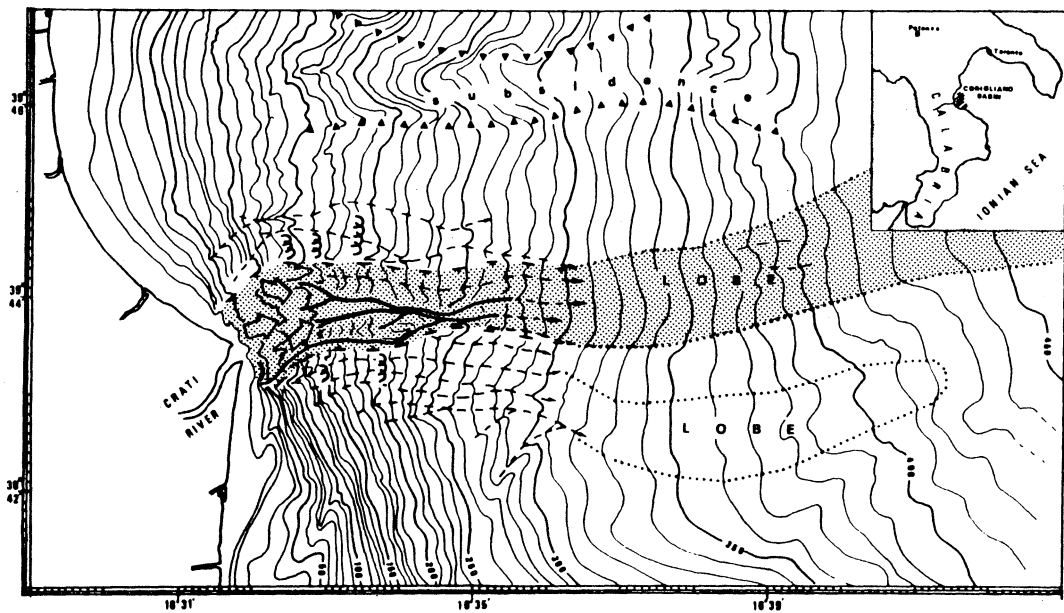
Resume: le "Crati Fan" (Golfe de Tarente), actuellement en croissance dans une aire tectoniquement active, peut nous donner un exemple utile de sedimentation tourbiditique actuelle dans un ancien bassin sous-marin. Le systeme est petit, relativement peu profond (200-450 m), deformé par des failles et sous l'influence d'apports fluviaux abondants (Crati river a regime torrentiel). Les lobes depositionnels de la "outer fan" sont constitués de sable et vase, lies aux terminaisons des canaux et des levees, et l'extention depasse de 60% la longueur du conoide.

The Crati Fan is growing in the nearshore Corigliano Basin, an embayment of the Ionian Sea bordered by a narrow and steep (1-3 deg) shelf. The basin is located in the Taranto Gulf on a pile of nappes or thrust sheets at the inner margin of southern Apennines Foredeep. The Taranto Valley cross the Gulf of Taranto from NW to SE and marks the thrust front; the Apulian foreland forms the NE side of this valley and the nearby land. The rugged topography is furtherly complicated by recent (still active) extensional tectonics; one of the downthrown blocks is the Corigliano basin (maximum depth 450 m). Within the basin, and its margin, a considerable smoothing of topography has been operated by recent sedimentation (rates as high as 6 mm/y).







A detailed analysis of collected data (echo-sounding and seismic profiles, sediment samples and bottom photographs) suggests that the Crati submarine fan is small (75 sqKm), steep (30'-3°) and relatively shallow-water (200-450 m) system. The Fan is characterized by multiple, leveed channels merging down dip into long depositional lobes. It is remarkable for being young (probably not older than 6,000 y), active and connected with a delta (coarse-grained, torrential type) on the shelf. Fan thickness and volume area are quite small (3 Km). The most prominent features of its relief are the channels and the levees. The shape of the fan is distorted and elongated E-W (16 Km length, 4-5 Km width), because of confinement in a narrow depression of probably tectonic origin. The fan gra-

dually merges updip with the slope at about 190-200 m deep with no defined apex. Its distal ends coincides with the basin end: a true basin plain does not exist because of the slumping bottom. Turbidite-free areas flanking the fan are called basinal s.l.

The most significant aspect of the Crati fan is that its mud cover does not reflect Holocene abandonment or semi-activity, but a mud-rich, active system fed by a river. The fan seems to be active since the end of the Holocene trasgression, with feeding channels heading into the mouth of a single-channel delta. The delta plain and littoral drift trap most of the coarse stream load, but a part of it escapes seaward, and finds its way through the tributary gullies. The whole mud load, on the contrary, settles out on the fan and adjoining basin. It is driven either by surface plumes (northward) or by turbidity currents (eastward i.e., down-slope). This river-fed submarine fan, in essence, occupies the position of a prodelta area with respect to the delta system. It is, consequently, a trap for mud with additional, sporadic sand supply via gravity flows.



BATHYMETRY and SCHEMATIC MORPHOLOGY of CRATI FAN

 Main active system,
  Tributary channels of main valley
 Major channel,
  Minor channel,
  Channel terminus,
  slump.