SUB BOTTOM CHARACTERISTICS AND SEDIMENTS OF THE GULF OF S. EUFEMIA CONTINENTAL SHELF (SOUTH TYRRHENIAN SEA)

by P.Gallignani,Marine Geology Laboratory,CNR - Bologna.

ABSTRACT. In the Gulf of S.Eufemia continental shelf the first tens of meters of the sub bottom show a covering of recent sediments and a "substratum",separated by an erosion surface. The shelf sediments are muds except sand near the coast and clayey sand with microfaunas of shallow water environment at the outcrops of the "substratum".

RESUME. Dans le Golfe de S.Eufemia les premières dizaines de mètres du trefond du plateau continental montrent une couverture de sédiments récents et un"substratum" séparés par une surface d'érosion. En général les sédiments sont vases,excepté du sable près de la côte et du sable argileux avec microfaunes indiquant un milieu d'eau peu profonde en correspondance des affleurements du "substratum".

During the T73 and T74 cruises run by the LGM in the South Tyrrhenian Sea,low frequency (3.5 kHz) echo-sounding profiles and coring stations were carried out in the Gulf of S. Eufemia to study its sub bottom characteristics and sediments. The continental shelf of this area is narrow and steep;the width varies from 2.5 to 10 Km,the dip from 0°55' to3°00',and the shelf edge ranges in depth from 110 to 170 m. The first tens of meters of terrains below the bottom always display two distinct units - a) a covering of recent sediments, and b) a "substratum" - separated by a discontinuity surface well referable to the post-würm transgression. In the northern part of the area the covering shows its maximum thickness coastward with various episodes of sedimentation. Several meters of thickly but discontinuously layered sediments lie immediately below the sea-floor,followed by acoustically nearly-transparent sediments. Finally there are materials probably coarser down to the contact with the "substratum" which has strata inclined with de same dip of the first tract of the continental slope. The discontinuity surface shows a rough morphology clearly of erosional origin and its outcrops on the sea-floor cause small ridges acting as dams in retaining the sediments. In the central

part of the area the "substratum" outcrops only at the shelf edge. Coastward the first meters of the covering are made up of the above-mentionned thickly but discontinuously layered materials, followed by regularly stratified sediments whose trend goes with the sea-floor. The erosional surface shows a morphology gentler than in the northern part and the "substratum" presents a less pronounced discordance with the covering. Small squeezed structures, probably mudlumps, were noted in the sub bottom of the outer shelf. The covering has their smallest thickness in the southern part of the area were, however, the general setting of the shelf is more similar to the northern part.

During our cruises the cores were collected only at depth exceeding 40 m; nevertheless previous studies demonstrated that from the coast to a depth of 20 m there is sand forming the typical modern nearshore sand prism followed seaward by muddy sediments. The cores BP3 (length 346 cm, depth 42 m) and BP12 (length 332 cm, depth 80 m), collected into the thickly but discontinuously layered sediments, contain silty clay in places rich in sulphides and organic matter, with intercalations of clayey silt and loam and numerous laminations. The sharp and sometimes eroded limits of the intercalations and the lamination point out a current assisted sedimentation of the materials carried into the sea by the torrents and the "fiumare" during the flood periods. The core BP13 (length 62 cm, depth 106 m), collected at an outcrop of the "substratum", is composed of clayey sand whose coarser fractions are completely made up of organogenic debris. The base of the core contains rounded and smooth pebbles with large reworked Miliolids. Also the unreworked forms (Elphidium crispum, Cibicides lobatulus, Discorbis mamilla, all frequents) indicate a very shallow water environment. Nevertheless planktonic Foraminifera are also present indicating a certain distance from the coast. The core BP37 (length 240 cm, depth 125 m), collected at the shelf edge, reached the surface of the "substratum". Infact below 227 cm of silty clay lies a gravelly sand with smooth rounded pebbles of quartz, micaschist and granite with a microfauna nearly exclusively benthonic. The constant scarcity of planktonic Foraminifera could point up a quite near coastline. Particularly in the uppermost samples the association is of a rather cold type and does not still belong to the Holocene.