COASTAL DYNAMICS AND SEDIMENTARY CHARACTERISTICS OF THE AREA INFLUENCED BY THE RIVER SALSO'S HYDROGRAPHIC BASIN (SOUTH SICILY)

AMORE C., GEREMIA F., RANDAZZO G.

Istituto Policattedra di Oceanologia e Paleoecologia, Università degli Studi di Catania, Corso Italia, 55, 95129, Catania, Italia

Since the 1970's, within the framework of research on "Littoral Dynamics" financed by funds from the Ministry of Public Education and the Ministry for University Scientific and Technological Research, the Operative Unit of Catania University has carried out the study of Sicilian shorelines (AMORE *et al.*, 1988, 1993; BRAMBATI *et al.*, 1992; AMORE & RANDAZZO 1993a), focusing both on its submerged mouth apparatus and on the relation between riverborne material reaching the sea and its longshore distribution.

Within the philosophy of the River Unicum - one of a link between the apical part of the hydrographic basin, the coastal strip and the continental shelf in front of it - the Salso river was studied, which is the most important river in Sicily with a length of 132 km and a drainage basin of 2050 km^2, and which has its origins in the southern side of the Madonie Chain and flows close to Licata on the western limit of the Gulf of Gela.

The drainage basin of Salso River, with the carbonatic outcroppings of Complesso Panormide in the northern area, of the Numidic Flysch and of the Argille Scagliose in the central one and finally of the Chalky - Sulphurous Series in the southern one, is characterized by a solid load composed for 90% by pelitic material.

At present the mouth apparatus, which had been advancing until the 1960's, is strongly retreating because of the reduction of solid and liquid load and because of the enlargement of the port of Licata, which has deeply modified the littoral drift.

The morphology of the bottom in front of the mouth apparatus, which is slightly indented and not very homogeneous with those nearby, shows a wave - dominated "delta" (GALLOWAY, 1975), and was once definitely more pronounced. It has a gentle convexity on both sides which makes it comparable to the curved "deltas" of FISHER (1969).

The grain size spectra map (DOWLING, 1977) shows the maximum sedimentation in the eastern sector, due to the influence of the port of Licata; in fact the eastern quay protects the mouth apparatus from western storms. For eastern storms this quay determines a local circular current towards the East which erodes the shoreline and deposits in the shallower waters. In the deeper waters, instead, which are not directly influenced by the quay, the currents are always westward.

The textural characteristics of the sediments, shown on the basis of NOTA's classification (1958), have permitted the distinction of five facies: littoral, frontdelta, frontdelta - prodelta transition, prodelta and transition to the platform, characterized respectively by sands, pelitic sands, very sandy pelites, sandy pelites and pelites.

In the compositional characteristics of the sandy fraction, quartz prevails and its areal distribution seems due to the riverborne material instead of the longshore drift.

REFERENCES

AMORE C., BRAMBATI A., DI GERONIMO S., FINOCCHIARO F., GIUFFRIDA E., RANDAZZO G., 1988. Atlante delle spiagge italiane, Foglio 272 (Gela). C.N.R., P.F. Conservazione del suolo, Sott. Dinamica dei litorali, Roma.

AMORE C., GIUFFRIDA E., RANDAZZO G., 1993. Atlante delle spiagge italiane, Foglio 271 (Agrigento). C.N.R., P.F. Conservazione del suolo, Sott. Dinamica dei litorali, Roma. In stampa.

AMORE C., RANDAZZO G., 1993a. Textural features of sediments and temporal evolution of the littoral between Capo Passero and Capo Scalambri (South East Sicily). Coastal Zone 1993.

AMORE C., RANDAZZO G., 1993b. First data on the coastal dynamics and the sedimentary characteristics of the area influenced by the river Irminio's hidrographic basin (SE Sicily). International Symposium on Dynamics of Fluvial - Coastal System and Environmental Changes. San Benedetto del Tronto (Italia). 21 - 24/6/1993 .

BRAMBATI A., AMORE C., GIUFFRIDA E., RANDAZZO G., 1992. Relationship between the port structures and coastal dynamics in the Gulf of Gela (Sicily - Italy). Coastal Congress ICC - Kiel 1992.

DOWLING J., 1977. A grain size spectra map. *Jour. Sed. Petr.* 47, 1, 281-284.

FISHER W. L., BROWN L., SCOTT A., MC GOVERN J., 1969. Delta systems in the exploration for oil and gas : a research colloquium. Univ. Texas Bur. Econ. Geol. Austin.

GALLOWAY W. E., 1975. Process framework for describing the morphologic and stratigraphic evolution of deltaic depositional systems. In "Deltas: models for exploration". Broussard Ed., Houston Geol. Soc., 87-98.

NOTA D. J., 1958. Sediment of the Western Guiana Shelf. Thesis mededel. Landbouwhogeshool. Wegeningen. 98 pp.

THE BLACK SEA MUD VOLCANISM. ITS LITHOLOGY, GEOCHEMISTRY AND ORIGIN

Eugene I. BASOV

Moscow State University, Geological Department, Vorobjevy Gory, Moscow, 119899, Russia

In summer 1991 and 1993 aboard the R/V "Gelendzhik", the geological-geophysical investigations were carried out in the context of the UNESCO's Training and Education in Marine Science (TREDMAR) programme in the central part of the Black Sea.

Based on carrying out a number of analyses of sampled sediments and interpretation of geophysical data morphological features of the area, depositional environments, geochemistry, mineralogy and lithology of sediments and mud volcano breccia were studied.

The area of development of mud volcanism in the central part of the Black Sea is a very well displayed in relief through volcanic upbuildings of different shapes; the largest one are MSU and Yuzhmorgeologiya mud volcanoes (2.0 and 2.5 km in diameter, respectively).

The pelagic sediment shows the normal stratigraphic and lithological sequence of the deep-water Black Sea sediments, but at the same time displays a relationships with mud volcanism in this region, which is shown by the presence of slide and slump structures in sediments.

According to the morphological patterns of volcanoes, ages (by $\Delta^{14}C$ AMS) of halt of their activity and the lithological characteristics of breccia of mud volcanoes, at least two types of mud volcanoes in investigated area can be distinguished.

The first type is Tredmar type mud volcano which is active to-day and characterised by eruption of finer material (not coarser than sand fraction, less than 1mm) with dominance of minerals in breccia up to 90% of the sand fraction and high carbonate contents (10-12% $CaCO_3$) .

The second type is MSU and other studied volcanoes. They are characterised by mainly Upper Pleistocene and Holocene activity, the breccia mainly contains rock fragments which are represented by the coarse fraction (up to cobbles). In addition, the breccia contains a lowcarbonate content (usually less than 1% of $CaCO_3$).

The rock fragments from mud volcano breccia are represented by siltstones, sandstones and carbonate rocks. The dating by microfossil, pollen and spore and lithological analysis shows that siltstones were probably derived from the Maikopian formation (Oligocene-Lower Miocene) and sandstones may originate from Cretaceous (?) till Recent age.

The sediments from some cores were extremely gas-saturated and contained gas hydrates. The result of gas analysis demonstrate that methane makes up to 98% of the total gas composition. Supposedly, it is probably young biogenic gas that may be derived from Maikopian strata, which is extremely saturated by organic matter. The isotopic analyses of gas hydrates demonstrate stable volumes of $\Delta^{13}C$ from -63.3 to - 61.8‰, which also indicates the biogenic origin of gas hydrates.

All data show that this area of mud volcanism is active today and that the mud volcanoes located near to each other have different patterns of activity and sediment composition.

Finely, some idea of the mud volcanoes origin in the studied area is given.