Man's Impact on the Romanian Coastal Zone

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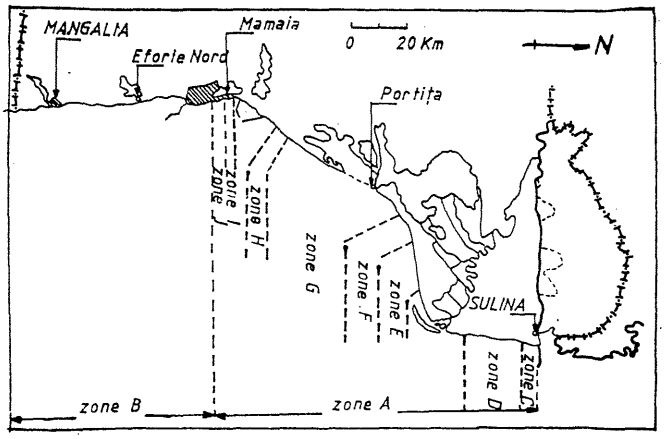
Generally, until man's impact on coastal processes, the discharge of sediment has exceeded the erosion potential, the delta extended seaward and the other beaches of the zone A were enriched with sand.



Two major and distinct sediment types are found in the Romanian Shore Zone. The first sediment type consist of sand, silt and clay which are brough to the sea by the Danube. In the past, fine sediments from Danube have provided a major portion of the sediment that fill the beach of the zone A up to 87% on the beach and up to 95% in the nearshore zone.

The second type consists of calcareous suite sediments (shell fragments and other organic material that predominantly fill the beaches of the zone B up to 98% on the beach and up to 80% on the nearshore zone.

Man's intervention beginning with hydrotechnical constructions on rivers, with construction of the harbors and with the extention seaward for 9km of the Sulins Channel. The utilization of the sand from beaches for constructions and industry, pollution of the sea are the other interventions too.

Man's impact has resulted in a partial loos of Danube as an important sediment source for the delta and for the beaches of zone A. As a consequence, the action of waves and currents, which have remained undiminished, are in the process of eroding and changing the configuration of the coastline of the zone A.

The beginning in 1975 of a series of beach profiles, from Sulina to South to Mangalia, was an essential part of erosion study. Repeated surveys along these profiles have proved to be the most effective means of monitoring the erosion. Comparison of the beach profiles shows the rate of the shoreline change from year to year.

The modifying distances of the coastline are presented in the following table :

The Zone	from 1962 to 1978 *	from 1978 to 1987 *
C	310; 22	110; 59
D		- 12; - 22; - 47
E	- 102; 16; - 33	- 53; - 21; 0
F	27; 147; 162; 99; 65; 35	17; 7; 24; 20; 1; 13
G	1;- 34;- 131;- 87;- 72;- 21;- 10	- 1; - 40; - 54; - 60; - 56; - 32
H	100; 82; 190	48; 39; 7
I		- 3; 14; 1
J		- 26;- 4;- 17;- 7;- 20;- 26;- 36;- 10

*The profiles are distributed uniform by plotted zones in the figures
-erosion; accretion

The yearly rates show the accelerating of erosion and that the coastline has retreated about 70% as the lenght of the coast.

In the zone B there are predominantly the cliffs that separates the cells seaward with a typical transport of the sediments. The coast has a relative stability in case of this particular beach. The waves periodical erode the cliff. Numerous structures have been built along the coast of the zone B to widen beaches for recreational use and to prevent cliff erosion, and others to provide harbors.

Geophysical Studies and Crustal Structure of the European Geotraverse - Southern Segment

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The structure of the crust in the Ligurian Sea and the Sardinia Channel was investigated by the EGT-S (European Geotraverse-South) seismic experiments in 1985 and 1987. The resulting refraction and wide-angle reflection seismic data indicate a stretched continental crust in the eastern part of the Ligurian Sea. The ocean-continent boundary can be seen at water depths of nearly 2,000 m. The Pg and PmP arrivals can be clearly identified. The P-wave velocity of the sedimentary layers is about 2.5 km/s and 4.1 to 4.5 km/s. The continental-oceanic crust boundary is characterized by a marked change in the amplitude and velocity behaviour in the seismic sections. The most heavily stretched segment of the continental crust is 17 km thick, and the crust thickens towards the Italian coast to about 30 km. The oceanic crust is approximately 10 km thick. The upper mantle velocity under the continental crust is 7.5 km/s, as established by previous investigations. The oceanic crust has an upper mantle velocity of 8.0 km/s (Fig. 1).

The profile shot in the Sardinia Channel shows an 18 km thick stretched continental crust in the central part. The sedimentary cover reaches a depth of 6 km below sea-level and is 4 to 5 km thick. It consists of two main layers, one of recent sediments with 2.2 km/s, while the lower sediment velocity varies between 3.8 and 4.2 km/s. Strike-slip movements and shearing along the southward dipping faults are responsible for the present day geometry of the crust in this area. Our results show that the shear zone previously identified across the Kabylia structure and the Sardinia Channel is located south of an observed crystalline high in the central part of the profile. This shear zone divides the profile into two parts, the southern one being the most heavily stretched. These two profile segments are presented and the geological evidence discussed.

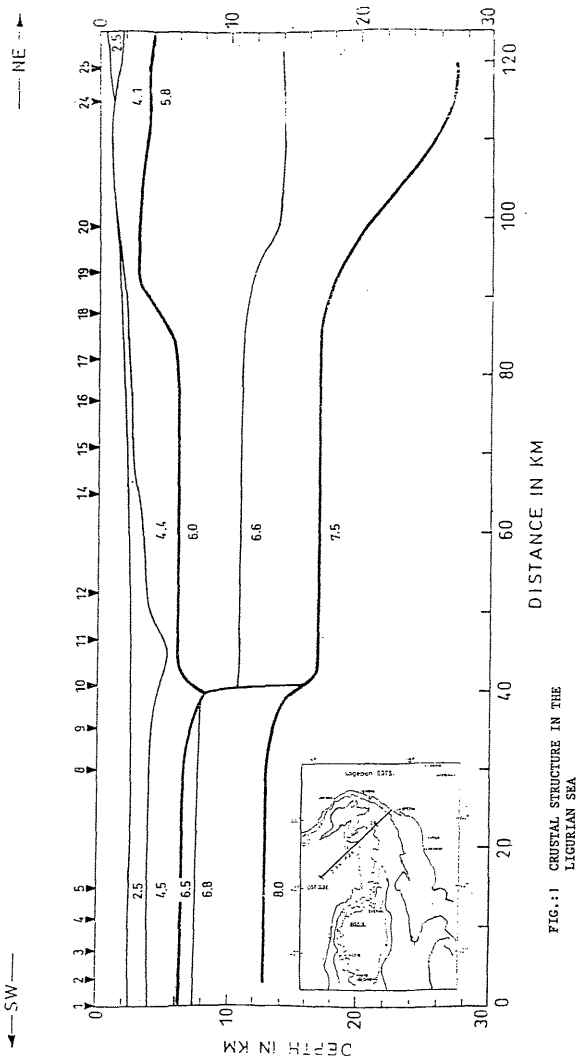

FIG.:1 CRUSTAL STRUCTURE IN THE LIGURIAN SEA