# Microphysiography of the Strait of Messina

*by*

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**Abstract**

Rough rocky bottom scoured free of sediment by tidal currents forms the Strait of Messina floor in depths less than 100 m. Sediment waves deposited by decreasing ocean currents lie at each end of the strait in 100-300 m. Beyond 400 m stratified ooze covers the sea floor except in submarine canyons where sediment waves occur.

**Résumé**

De violents courants de marée maintiennent libre de sédiments le fond rocheux et accidenté du Détroit de Messine jusqu'aux profondeurs de 100 m. Plus bas, de part et d'autre du détroit, des dunes hydrauliques témoignent de la décroissance de ces courants. En-dessous de 400 m des vases stratifiées couvrent le fond à l'exception des canyons où persistent des dunes.

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Four basic types of microphysiography are observed in the Strait of Messina : **1.** Smooth soft sediment bottom with subbottom layering is found beyond the 400 m isobath. This type is characteristic of stratified sediment. **2.** Smooth hard bottom without subbottom echos on 3.5 kH echograms. This is the caracteristic bottom type on the continental slopes bounding strait in depths less than 400 m. Faint hyperbolae suggest small scale roughness. Clay and ooze are apparently absent from such areas. **3.** Sediment waves. Found at intermediate depths from 200 to 300 m on either flank of the sill and in the axes of canyons at greater depths. Sediment waves are probably composed principally of sand and fine gravel since current velocities observed in these regions are sufficient to remove all finer sediment. **4.** Rough rocky bottom. Characterized by irregular hyperbolae. Principally found on the Scillian half of the sill in depths less than 100 m. Individual features on single profiles appear as pinacles. However, side scan sonographs indicate that most are short, steep-sided ridges. Photographs and visual observations indicate that these are areas devoid of all sediment finer than coarse gravel.

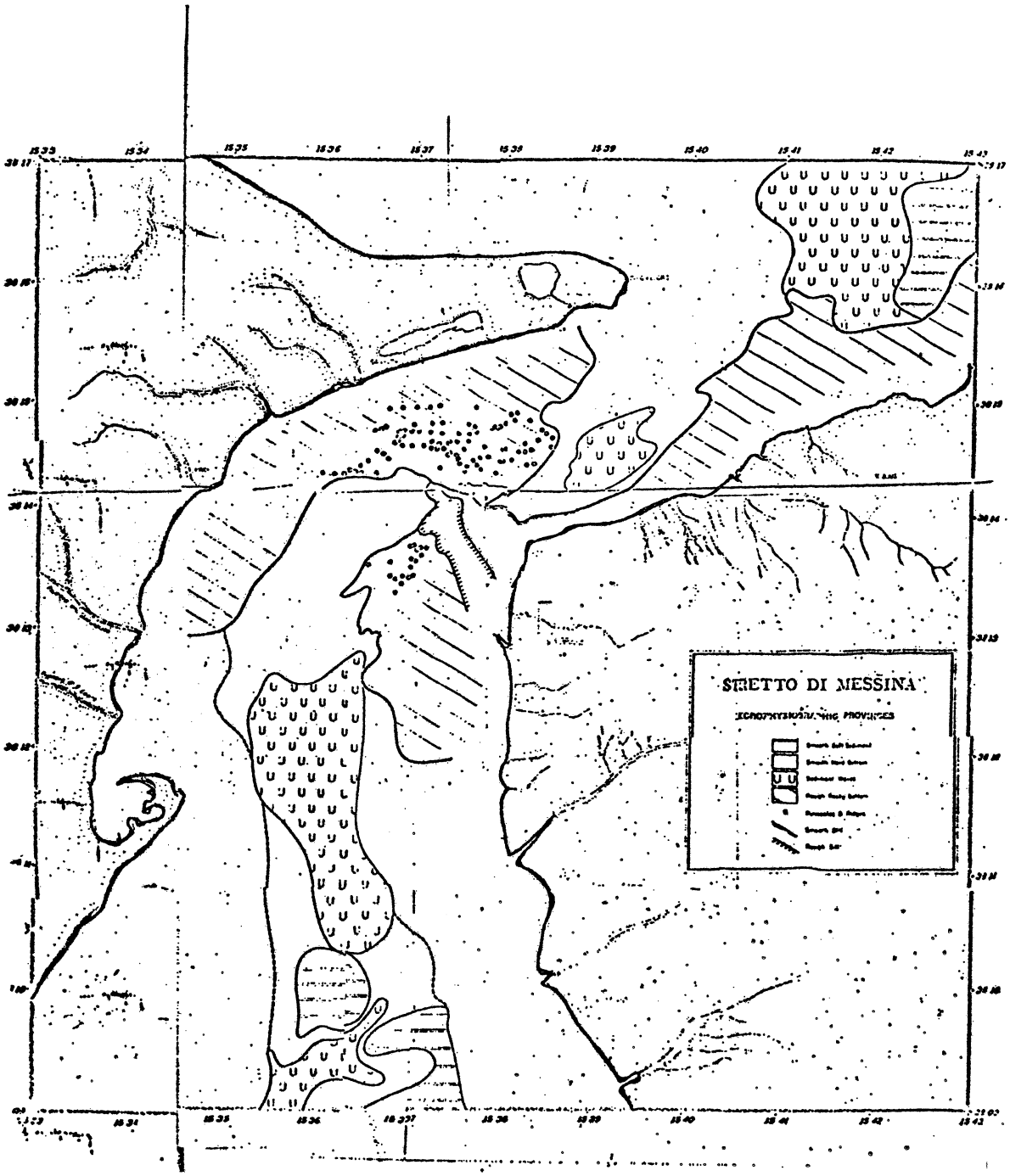
Type 4 is found where the strong tidal currents sweep back and forth across the sill, remove all loose sediment and erode the underlying rock. Type 3 is found at each flank of the sill where current velocities decrease sufficiently for the temporary deposition of sand. Type 2 is found where currents sweep the walls of the straits and Type 1 is found when tranquil conditions allow the deposition of stratified ooze. The microphysiography reflects the succession of bed forms associated with the decrease in current velocity with increased distance from the point of maximum constriction of the strait.

## Discussion

***Hieke :*** What is the biological content of the sediments of the Strait of Messina?

Reply by ***Pr. Selli :*** The canyon is filed by turbidites. They contain reworked material.

*Rapp. Comm. int. Mer Médit.*, **23**, 4a, pp. 237-239, 1 fig., (1975).


STRETTO DI MESSINA

***Caston :*** I should like to ask Professeur NESTEROFF some questions concerning the hydraulic dunes he has discussed from the Strait of Messina.

1. Has he determined the orientation of the dunes?
2. What is their wavelength and height?
3. What current speeds have been measured in the area of the dunes?
4. How does he know that they move?
5. If they move, what rates of movement have been determined?
6. What proof is there that the dunes serve as a means of transport for sand from the Strait of Messina to the canyons?

***Réponse :*** Les dunes atteignent 40 m de haut. Les courants atteignent 4 à 5 nœuds puis 2 nœuds dans la région des dunes. Les dunes bougent car les sédiments sont propres et usés. Lorsque les sédiments sont stables ils sont encroutés. Enfin nous rappelons que lors du tremblement de terre de Messine en 1908 les cables sous-marins ont été coupés par les courants de turbidité.