

Morphological characterization of Cap Spartel, offshore Morocco

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By a geophysical approach, a preliminary study in Cap Spartel offshore was conducted by the oceanographic ship of the Royal Moroccan Navy "Abou al Barakat."

The study was conducted thanks a side scan sonar. The analysis of the profiles sonar made it possible to identify the sedimentary surface, and to determine the distribution of different types of seabed, and to have information on reliefs of the seabed.

The study area is characterized by:

- Rock Field: occupies 15% of the entire surface of the swept zone. The rock exposures take the form of large body of different size and variable shape, or the form of a rectilinear rock whole with a definite direction, or in the form of reef flats with weak escarpment.

The rock bars of ENE-WSW directions, identified on sonograms are probably extensions of known structures on the continent such as many folds direction N45 ° (El Foughali 1985, 1985 Griboulard, JAAIDS 1993).

- Mixed field: Presents 30% of the total area scanned. It's usually localized at the periphery of rocky bodies.

- Sandy Field: it's the largest area. It presents the different sedimentary structures, with a distribution correlate to the sequence of Beldersone 1982. There are:

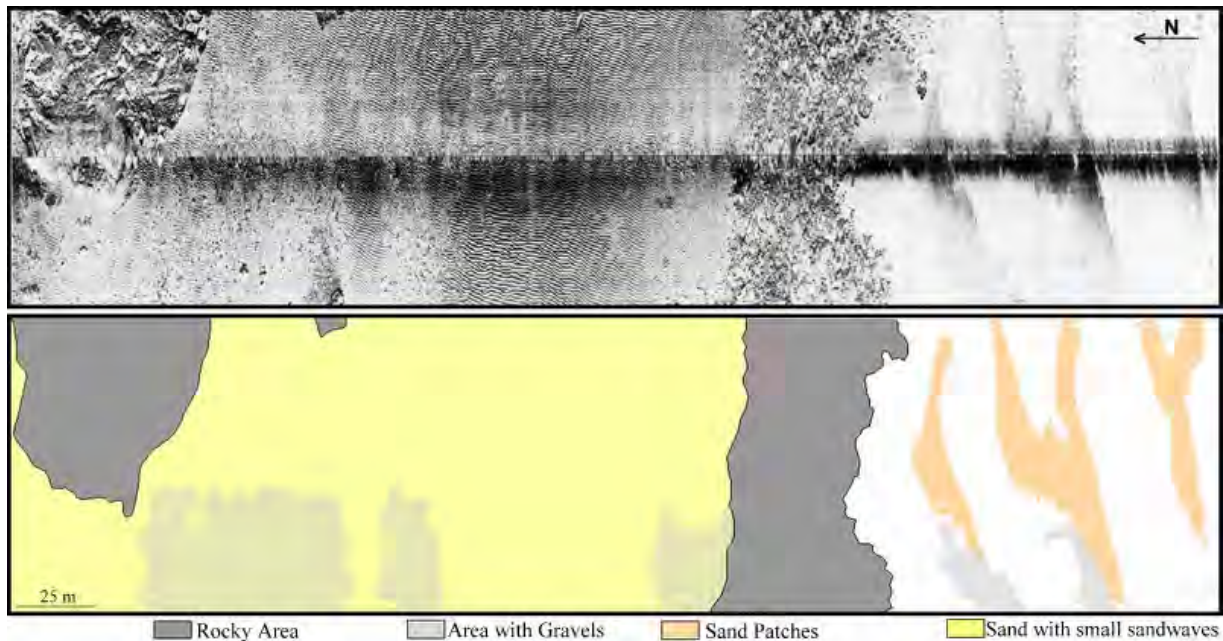
Structures perpendicular to the current, consisted by megaripples with wavelengths varying between 0,5 and 3 meters. And sand waves, Barkhan type, often superimposed by megaripples low wavelength.

Structures parallel to the current. Presented by sand patches with variable forms, sand ribbons with a length exceeding the 100 m sometimes, tidal bars arranged obliquely to the coast and others.

Sediment dynamics: orientation and morphology of various structures, such as sand waves, the marks of obstacles, are the best indicators of the direction of sediment transport (qualitatively). The sand waves, localised in the study area are oriented to ENE, the sediment transport, therefore, is logically directed to the ENE.

Acoustic techniques, applicable in mapping the bottom, have applications in the oil work. Because the knowledge of the relief and the type of bottom, are a major key element for

implementation of the stations the oil or the installation of the pipelines. Thus the good determination of the ground ensures safety and the reliability of the installations.



Sonogramme montrant un champ de mégarides ($L = 1\text{ m}$) entre deux corps rocheux. A droite de l'image, des placages sableux modelés par des mégarides de faible longueur d'onde

Sonar profile showing a field of small sandwaves ($L = 1\text{ m}$) between two rock areas. right of the image, Sand Patches with megaripples with low wavelength

References:

- Belderson, R. H. (1982). "Bedforms. In A.H. stride (editor), offshore tidal sands. Processes and deposits. Chapman and Hall, London." 27 - 57
- EL-Foughali, A. (1985). "Les grands traits structuraux et lithologiques de la marge marocaine de Tanger à Cap Cantin, Maroc." Bull. Inst. Géol. Bassin d'Aquitaine, Bordeaux, n° 38: 179-211.
- Griboulard, R. (1985). "Les grands traits structuraux et lithologiques de la marge marocaine de Tanger à Cap Cantin, Maroc." Bull. Inst. Géol. Bassin d'Aquitaine, Bordeaux, n° 38.
- Jaaidi, E. B. (1993). "La couverture sédimentaire post-glaciaire de la plate forme continentale Atlantique ouest-rifaine (Maroc nord-occidental) : exemple d'une séquence transgressive." **317:** 72-74.