SWATH MAPPING SYNTHESES OF DEEP MEDITERRANEAN SEA BASINS : A PARTNERSHIP BETWEEN SEVERAL NATIONAL OCEANOGRAPHIC INSTITUTIONS, COORDINATED BY CIESM AND IFREMER

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Abstract

Swath mapping of most of the deep Mediterranean Sea basins is currently progressively completed by several national Oceanographinc/Hydrographic Institutions from Southern Europe. The CIESM Marine Geosciences Committee and Ifremer DRO mapping office have jointly promoted and pilot compilations and publication of synthesis maps of the Eastern and Western Mediterranean basins, These maps reveal many geological characteristics (tectonic, volcanic, sedimentologic, geochemical) imprinted on the sea floor. The first map (Eastern Mediterranean), already published in 2001, is now progressively upgraded using new data sets; the second one (Western Mediterranean) is a new synthesis based on swath data originating from Italian, Spanish and French Institutes and laboratories.

Key words: Mediterranean basins, swath bathymetry synthesis

Introduction

Since about 10/12 years systematic swath mapping surveys (including bathymetry, and often acoustic bottom reflectivity) have been conducted in the deep Mediterranean sea, particularly in its Eastern basins, and more recently in the Western ones. These data have been collected for two main purposes : (a) for each country to obtain a better knowledge of their EEZ; (b) a better understanding of the complex and active sedimentary, geochemical, volcanic, and tectonic processes operating concurrently in the Mediterranean marine spaces.

These data have been systematically recorded by different national oceanographic and hydrographic Institutions or Laboratories from Europe (France, Greece, Italy, the Netherlands and Spain mainly) most of the time in the framework of national programs.

In 1999 the CIESM Marine Geosciences committee has promoted an unformal cooperation between several laboratories willing to cooperate in producing compilations of swath data to better image, at a basin scale, the various active processes shaping the seafloor of the Eastern Mediterranean Sea. Ifremer DRO mapping office has been volunteer to act as the necessary technical advisor and practical support for these compilations. A first set of two maps (bathymetry and acoustic imagery), at a scale of 1/1.500.000, has been produced in 2001 (1). These maps illustrate the startling changes brougth to the knowledge and understanding of deep basins by mapping using swath systems. They particularly reveal a completely new view (and greatly help to a better understanding) of most of the major physiographic features (Mediterranean ridge, Nile cone, etc.) of the deep basin.

During the last CIESM congress (Monaco, September 2001) a round table on swath mapping of the Mediterranean sea has concluded on the great scientific interest and necessity to: (1) promote, if possible, a compilation, at the scale of 1/1.500.000, of available sawth data for the Western Mediterranean Sea.; (2) up-grade, as far as possible and using all new data made available by partners willing to participate, the Eastern Mediterranean sea compilation.

We present here the state of the art concerning these two attempts.

Eastern Mediterranean Sea compilation (see Fig. 1)
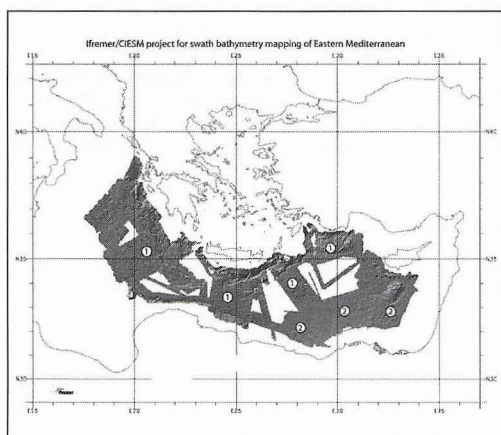

Fig. 1. Present stage of the Eastern Med Sea multibeam bathymetric compilation.

A detailed map of the Egyptian margin has been published in 2003 (2). Recent data recorded in 2001 and in 2003 (Fanil, Blac and Nautinil expeditions, respectively) by different French laboratories (Géoscience-Azur, Villefranche; Legem, Univ. Perpignan; Ifremer DRO-GM, Brest) will be incorporated to the compilation, as well as a few swath data, mainly from the Aegean sea, to be potentially provided by HCMR (Greece). Moreover it is hoped that complementary data will be obtained during a new french survey already scheduled in late 2004.

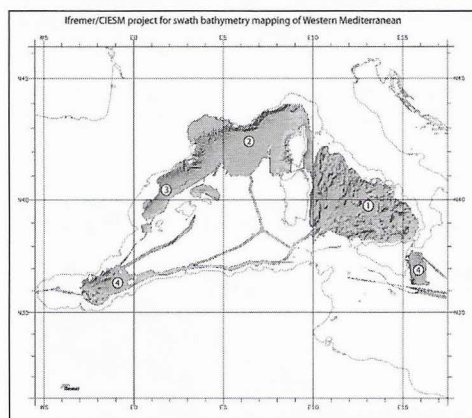## Western Mediterranean Sea compilation (see Fig. 2)

Fig. 2. Present stage of the Western Med Sea multibeam bathymetric compilation.

Different Institutions (ISMAR Bologna, Italy; Ifremer and IUEM, Brest, France; IEO, Madrid, GRC, Barcelona and IACT, Granada, Spain) have agreed to provide DTM, at a 500 m grid spacing, extracted from their own swath surveys (and processing) in Western Mediterranean sea, to Ifremer DRO-GM mapping office in charge to construct an homogenous synthesis which will be the first multibeam echo-sounding derived map for the Western Mediterranean Sea.

The two maps (upgraded Eastern and new Western Mediterranean), at a scale of 1/2.000.000, should be jointly published by CIESM and IFREMER in late 2004. It is also anticipated to publish a map of the whole Mediterranean sea at a scale of 1/4.000.000.

These documents, the first multibeam bathymetric maps of a complete oceanic space, will greatly improve our global knowledge of the Medtereanean sea floor and of its different geological processes.

Finally we anticipate that such an open, and productive, collaboration will progressively widen to others laboratories and Institutions, and lead to a mapping, as complete as possible, of the deep Mediterranean basins. We also hope that data from shallower areas (continental shelf and uppermost slope) will soon be made available to produce a complete picture of the Mediterranean sea and thus provide a necessary link with the still evolving adjacent onshore domains.

References

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