

PROPOSAL OF AGREEMENT UPON CARTOGRAPHICAL PARAMETERS RELEVANT TO THOSE MEDITERRANEAN AREAS CHARACTERISED BY COASTAL BENTONIC BIOCECENOSIS

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Generality

It has long been recognized within the field of science that a common methodology for mapping *Posidonia Oceanica* meadows is required. This protocol aims at fixing cartographic parameters, methods of investigation and precise navigation systems that can be employed as references for the future activities along the coastal areas and the coastline.

Consideration

The study of benthonic organisms is fundamental for the evaluation of the environment in which they live. The only useful device to evaluate the growth or the regression of some populations is that of analysing objectively the state of health of biocenosis using well defined cartographic methods.

Indeed, the descriptions should be based upon the use of symbols (for instance, symbols concerning various biocenosis or

different types of sea bottoms).

Maps of a suitable scale and a common geodetic system of reference should be employed in order to accomplish a correct cartography.

Finally, the cruises to collect data should be carried out using equipment suitable to the environment.

Convention

In order to standardize the activities, we have fixed the following guidelines:

PROJECTION maps should be developed according to Mercatore's projection along the medium parallel of each.

SCALE mapping scales should be normally chosen among 1:10,000 to 1:25,000. Smaller values are not significant from a qualitative point of view because they can not provide a scientific evaluation of the phenomena. The definition of thematic ma-

Type of survey	Depth Z	Methods	Positioning systems
quantitative	Z < 10 m.	remote sensing / side scan sonar (*)	differential GPS
qualitative	50 < Z < 10 m.	side scan sonar	differential GPS
	Z < 10 m.	independent diving on transect	geodimeter
	50 < Z < 10 m.	independent diving on transect	geodimeter

(*) Evaluations from satellite images analysis can be taken into consideration in broad areas.

ps is influenced by the chosen scale. Two mapping scale classes will be used according to bathymetric data sources. For instance, for sounded data provided by the Italian Navy Hydrographic Institute the recommended scale is from 1:10,000 to 1:25,000; for data obtained during specific oceanographic survey, should be used a scale from 1:500 up to 1:10,000.

GEODETIC REFERENCE. WGS 84 seems to be a suitable geodetic reference. It can be used as a precise standard reference system for mapping positions acquired by using GPS systems. Position data collected during previous surveys and using different references (ED 50 and ROMA 40) should be converted to WGS 84 even at the cost of some conversion errors.

COLORS. Colors must be used in order to obtain a better representation of different sediment types (related to granulometry) and communities in the infra-littoral part.

SYMBOLS. Symbols are required by the «Normalisation des symboles pour la représentation et la cartographie des biocénoses benthiques littorales de Méditerranée» (Meinész, *et al.*, 1983).

METHODS. For *Posidonia* meadows mapping surveys must be divided into two different categories: quantitative and qualitative operations. Quantitative surveys are utilized for the mapping of meadows con-

tours, referred to the infra-littoral morphology. In this phase, particular data collection inside the meadows is not necessary and might be accomplished, because of the low level of information, by non-professional scientific divers.

In the case of collection of some characteristic data (density, size and number of leaves; presence/absence of flowers and fruits; macroscopic morphological sea-bed characteristics), the information provided will be considered only if it is gathered by divers with adequate training and is carried out by universities, marine search centers or scientific diving schools recognised by the Oceanography Communities. The qualitative survey is intended to improve knowledge of the meadows areas identified during a quantitative campaign. Seabed characteristics must be reported in accordance with the previously described standard; the participation of fully qualified personnel (scientific divers) is mandatory. Search and navigation systems methods are reported in the following table. Bathymetric data acquisition must be performed in accordance with directives of the Italian Navy Hydrographic Institute directives.

DATA MANAGEMENT. The Navy Oceanographic Centre (CEMOC) will create digital or standard (on paper) maps based on data collected by Research Institutes, Universities, Italian Navy diving teams and Hydrographic Ships.