BRINGING GEOHERITAGE UNDERWATER

MAPPING IN THE SHALLOW WATER

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Introduction

A complete and accurate mapping of a coastal area necessarily includes both the description of the shore and of the underwater side of the coastline. However underwater mapping is strongly constrained by the diving time and the logistics of the diving itself.
Here we illustrate our experience of mapping the geoheritage in shallow waters (about 5 m depth) through simple snorkelling.
The survey was carried out in the framework of a UE's Leonardo project, in summer 2007. The snorkeling-based survey allowed to perform the first geomorphological and morphodynamic analysis of the the coastal area of the Lesvos Petrified Forest Geopark of Lesvos island and to highlight its peculiar features.

FIG. 1

Study area

Lesvos (northeastern Aegean Sea) is the third largest Greek island (area. 1,630 sm; coastline: 320 km).
The study was carried out in Sigri bay, (fig.1), in the protected area of the Lesvos Petrified Forest, characterized by a huge accumulation of large fossilized trees.
Apart from the fossil sites, geomorphosites in the Lesvos Petrified Forest Geopark , include volcanic, tectonic, karstic, erosional (tafoni) coastal and fluvial landforms (1).
The islet of Nissiopi acts as a natural breakwater in protecting Sigri bay against the waves coming from north.

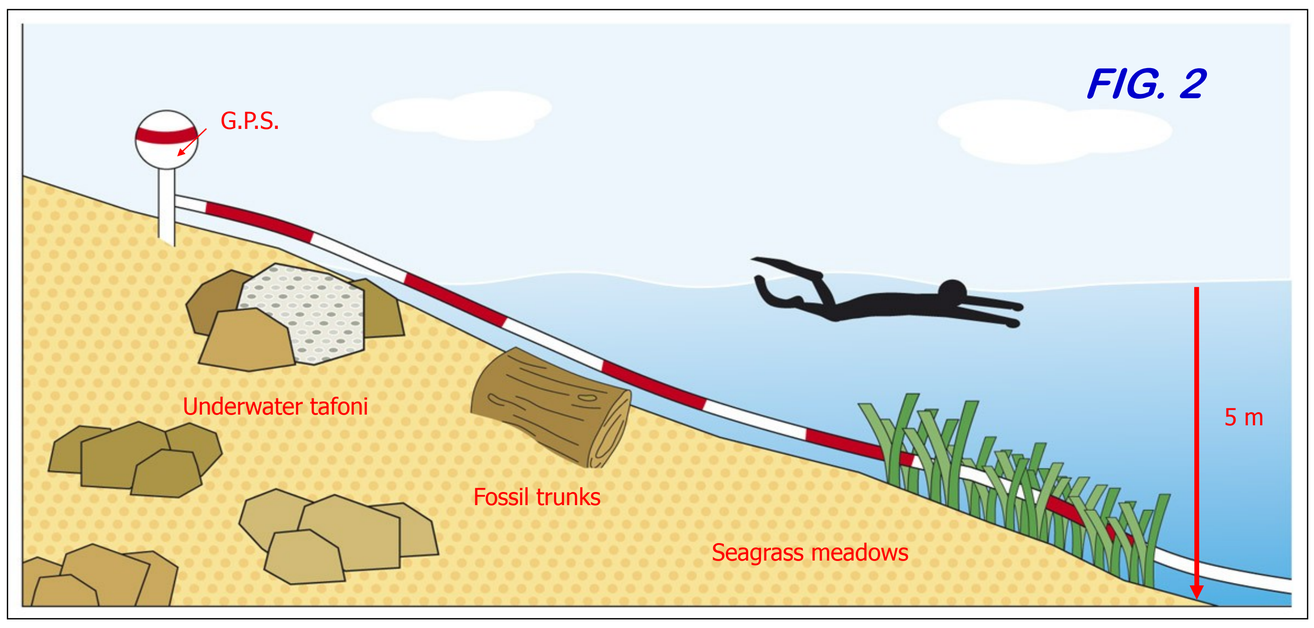


FIG. 2

Field activity

A total of 15 underwater transects, from shoreline until 5 m depth, were performed between June and August 2007 (Fig. 2). Any relevant position (starting and ending points of each transect, sampling sites, etc) was recorded using a GPS.
The features of the seafloor along each transect were recorded on a PVC slate during diving. Samples (3 for each transect) were collected for sedimentological analysis (fig. 3), in order to assess the hydrodynamics of the area .

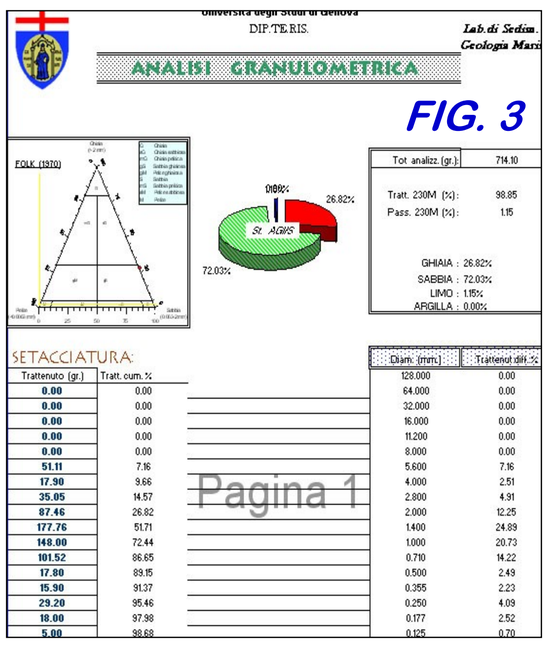
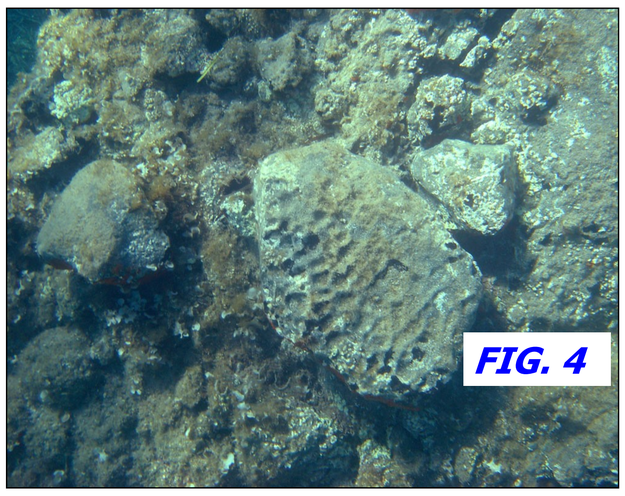


FIG. 3

Geoheritage

Important geomorphic features were recorded in Sigri bay such as:
Tafoni structures in the original position (fig. 4), fossil trunks (fig. 5) and beachrocks.
In addition, the segrass meadows (*Posidonia oceanica, Cymodocea nodosa and Alophila stipulacea)*, are an important bio-indicator of the quality of the shallow water marine ecosystem, especially in the northern part of the Sigri bay: here the *P. oceanica* meadow is organized as récif barrière (fig. 6), a particular structure that begins to be rare elsewhere in the Mediterranean Sea.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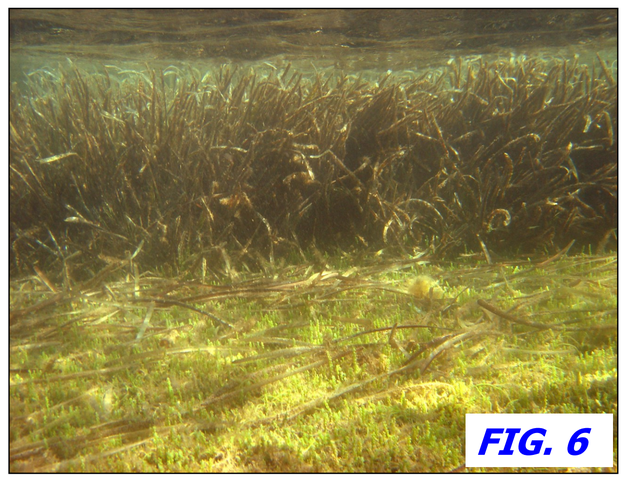
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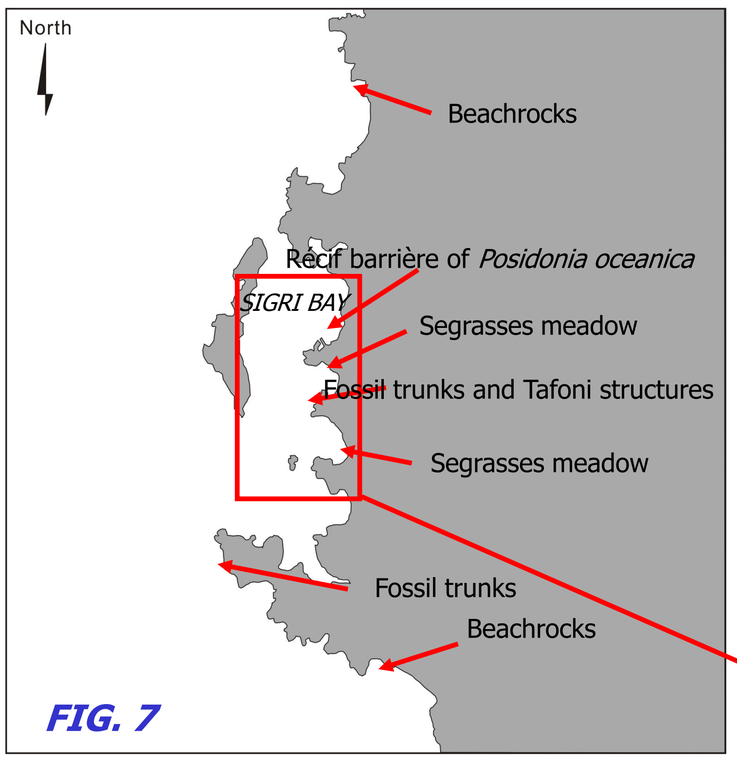

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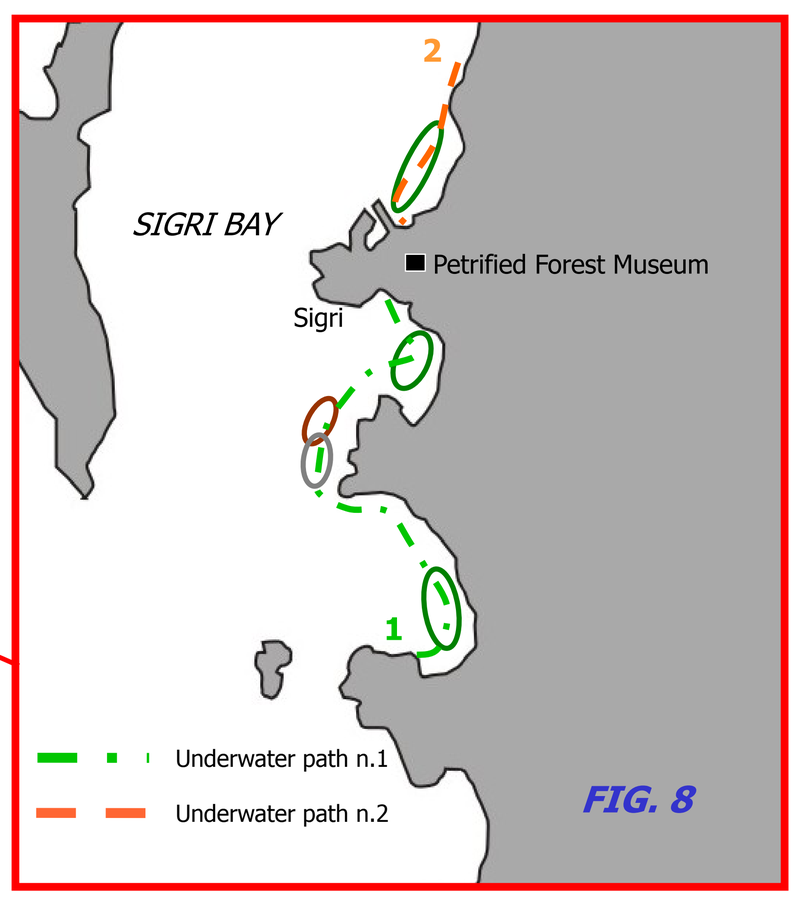

FIG. 8

The underwater geoheritage's map

The coast of Western Lesvos is presently preserved from the mass tourism keeping intact its wild landscape. Our experience resulted in a relevant amount of data useful to generate a map of the sites of particular interest (fig.7); besides the scientifi intererest such maps can be used for touristic purposes (2), showing the most enjoyable underwater paths with the lowest impact to the natural landforms and ecosystems. In figure 8 two hypothesis of underwater paths exploring the most beautiful sites of the Sigri coast are indicated, one passing_through seagrasses meadows, tafoni and fossil trunks fields, the second one, shorter, passing all around the beautiful *P. oceanica* rècif barrière and it's incredible bio-diversity.

What's the next?

The positive experience in Sigri Bay can be transferred to other sites of particular natural value. The coast of Piani D'Invrea (Ligurian Sea, NW Mediterranean), included in the territory of Beigua Geopark, is certainly among the most potentially interesting area: it has already an important "on land" Geoheritage(3) that could be greatly improved by getting knowledge of the underwater features.

References
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