



# NATIONAL MARINE PARK OF ZAKYNTHOS

IN COLLABORATION WITH UNIVERSITY OF AEGEAN, DEPT. OF MARINE SCIENCE



1<sup>st</sup> Annual  
Report 2013  
- 2014

## CORALLIGENOUS SURVEY IN THE NORTH – EAST MEDITERRANEAN



**CIGESMED**



Seasera  
EUROPEA-NET

IN THE FRAMEWORK OF EUROPEAN PROJECT  
ANR12 SEAS 0001-01 - CIGESMED

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# CORALLIGENOUS SURVEY IN THE NORTH – EAST MEDITERRANEAN

## 1<sup>st</sup> Annual Progress Report

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### WORKING GROUP

Name	Affiliation	Specific tasks
Drosos Koutsoubas	NMPZ	<u>Project coordinator</u>
Laurent Sourbes	NMPZ	Report preparation, administrative and communication tasks
Charalampos Dimitriadis	NMPZ	Report preparation, communication tasks, field work
John Batzakas	Univ. of the Aegean	Report preparation, communication tasks, field work
Vasilis Gerovasileiou	Univ. of the Aegean	Report preparation, communication tasks, field work
Maria Sini	Univ. of the Aegean	Report preparation, communication tasks, field work
Dimitris Poursanidis	Univ. of the Aegean	Report preparation, field work
Zinovia Erga	Univ. of the Aegean / CNRS	Laboratory work

### NATIONAL MARINE PARK OF ZAKYNTHOS

[HTTP://www.nmp-zak.org](http://www.nmp-zak.org)

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Front page photos: F. Nikoloudakis

## 1. INTRODUCTION

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The current document is the first annual progress report (1<sup>st</sup> reporting period) of activities that were undertaken by the National Marine Park of Zakynthos as a subtask in the framework of the European Project CIGESMED according to deliverable requirements of the contract (Ref CNRS: DR12-JE 093 579) signed by NMPZ and CNRS. The first annual report includes the tasks and activities carried out from June of 2013 until February of 2014. The activities of the subtask 'Coralligenous Survey in the North – East Mediterranean' and their relation to the Work Packages (WP) of CIGESMED project are presented in Table 1.

**Table 1: NMPZ's activities and their relation to CIGESMED project WPs**

NMPZ Activities	Description	Connection to CIGESMED WP's
<b>Activity 1</b>	Coralligenous assessment and monitoring	<b>WP2</b> - <i>Coralligenous assessment and threats in the different basins</i> <b>WP3</b> - <i>Indicators' development and test</i>
<b>Activity 2</b>	Management tools	<b>WP4</b> - <i>Innovative monitoring tools</i> <b>WP6</b> - <i>Data management, mapping and assimilation tools</i>
<b>Activity 3</b>	Participatory process- Promotion -Public awareness activities	<b>WP5</b> - <i>Citizen science network implementation</i> <b>WP7</b> - <i>Outreach, dissemination and stakeholder engagement</i>

## 2. CIGESMED KICK OFF MEETING

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D. Koutsoubas, M.Sini and D. Poursanidis, members of the NMPZ work team, participated in the kick off meeting of CIGESMED project which was held at Heraklion, Crete from 17<sup>th</sup> to 19<sup>th</sup> of April 2013.

During the three day meeting they had the opportunity to meet with other project participants, and get acquainted with the project structure, organization, and deliverables. They attended a series of presentations focusing on the description of the different work packages, the presence of coralligenous habitats in France, Greece, and Turkey, the experience obtained from previous citizen science projects (i.e. COMBER), and the application of knowledge trees in information assimilation and data management. The NMPZ members exchanged ideas and technical knowledge regarding the study of coralligenous, contributed to the compilation of a generalized species list regarding flora and fauna of



coralligenous communities in Greece, and registered in the Tree of Knowledge – consortium competences. Finally, M. Sini gave a short presentation on the main features and functions of photoQuad, a layer-based image processing software developed at the University of the Aegean, as a potential tool for the assessment of coralligenous communities in the context of CIGESMED project (Figure 1).



**Figure 1: PHOTOQUAD Software presentation excerpts**

### 3. CIGESMED FIELD TRIP IN MARSEILLE

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V. Gerovasileiou and M. Sini, members of the NMPZ/University of Aegean work team, joined the CIGESMED diving workshop held in Marseille from 2<sup>nd</sup> to 4<sup>th</sup> of July 2013. The aim of the workshop was to give the chance to participants from Greece and Turkey to get acquainted with the well-developed coralligenous assemblages found at the Bay of Marseille for future reference and comparison with coralligenous communities found elsewhere.

Two diving fieldtrips were realized during which coralligenous habitats were photographed using quadrats of different size in order to check their efficiency. The participants also had the opportunity to attend the following presentations / discussions: a) Encrusting Coralligenous Rhodophyta – the main algal bioconstructors, by Marc Verlaque (CNRS – MIO), b) Basic principles towards the development of a coralligenous index (IndexCor), by Stéphane Sartoretto (IFREMER), c) Development of photographic and video tools, by Romain Bricout (CNRS associate), d) Hands-on application of photoQuad, by Maria Sini (NMPZ, University of the Aegean). Finally, a round table discussion took place regarding the main biotic, abiotic, and observer attributes that should be considered during future fieldwork and data analysis.

### 4. COMMUNICATION WITH LOCAL DIVE CLUBS

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During August 2013, NMPZ initiated communications with local dive centers and divers so as to obtain information regarding the presence of coralligenous

communities along Zakynthos Island coastline. The task included an initial presentation of the coralligenous habitats to the diving centers through the use of visual material (e.g. photos, video). After the briefing, the divers recommended several locations around Zakynthos coasts where coralligenous habitats could possibly be found. The obtained information was used to design the preliminary field survey in the NMPZ.

## 5. PRELIMINARY FIELD SURVEY IN NMPZ

For the establishment of suitable coralligenous study sites in Zakynthos Island (SW Ionian Sea, Eastern Mediterranean), a preliminary survey was conducted during September 2013 in three locations found at the SW part of the Island within the boundaries of the Marine Protected Area of the National Marine Park of Zakynthos (Figure 2). The choice of the locations was based on information provided by local diving centers and recreational divers, during dedicated interviews regarding the potential presence of coralligenous habitats along Zakynthos coastline. The locations of the examined candidate sites are presented in Figure 3.



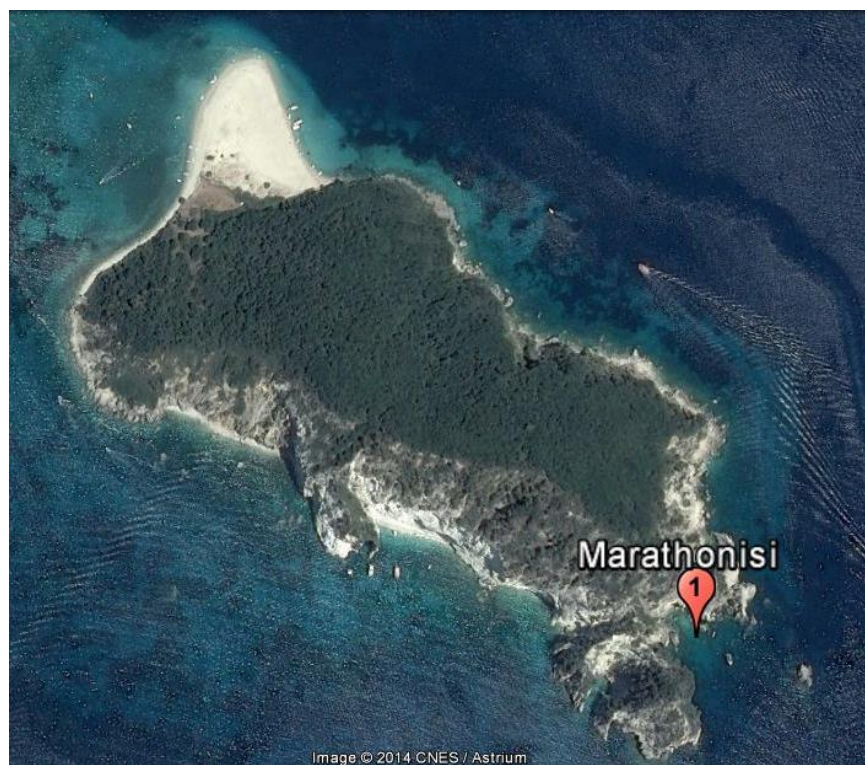
**Figure 2: The marine protected area of NMPZ including the zoning scheme of protection and the locations of the candidate sampling sites.**



**Figure 3: Locations of the three candidate sites in the NMPZ**

### **CANDIDATE SITE 1: Marathonisi Islet**

Coordinates: 37°40'57.43"N, 20°52'26.49"E



**Figure 4: Location of the candidate site at Marathonisi Islet**

Divers: Charalampos Dimitriadis (NMPZ), Fanis Nikoloudakis (Divers Paradise Dive club)



### Site description

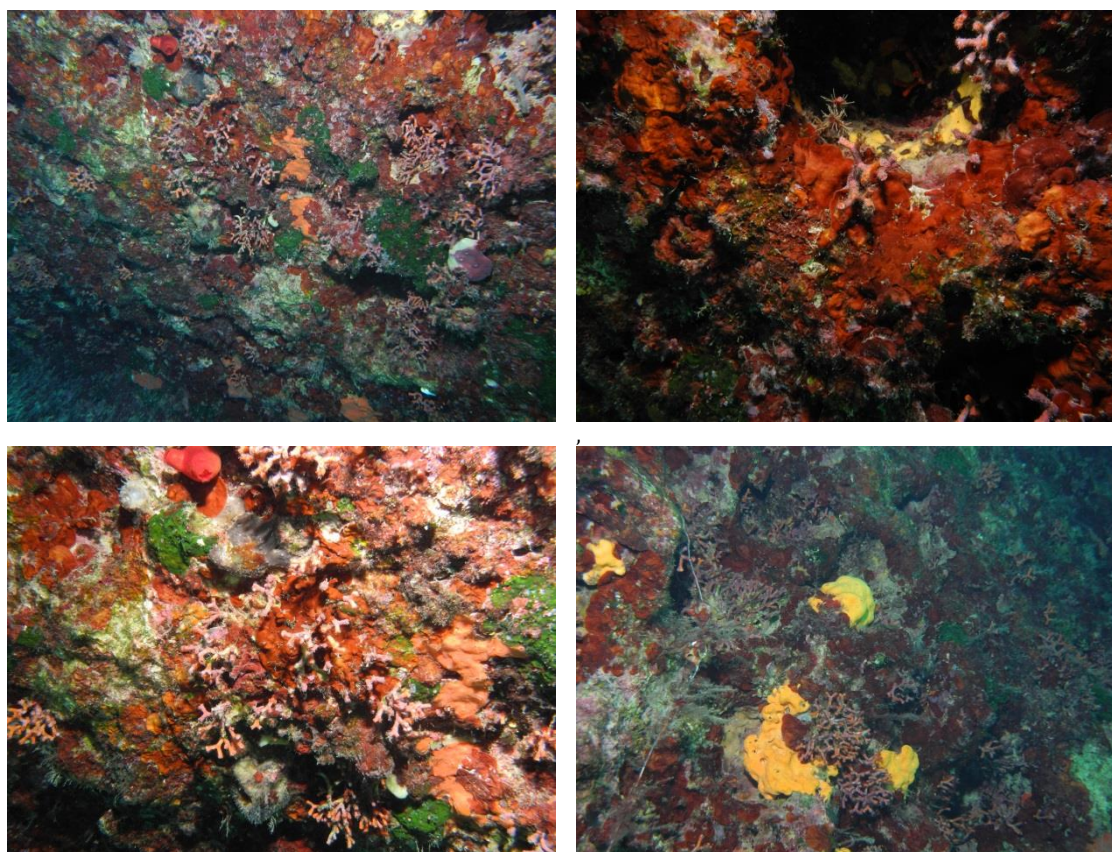
The site is located in zone B of the Marine Protected Area of the National Marine Park of Zakynthos (NMPZ). In particular, the candidate sampling site is situated at the southern part of Marathonisi Islet and starts at around 15 m depth (Figure 4). The underwater topography consists of different habitats (e.g. sandy beds and *Posidonia oceanica* meadows) whereas large boulders with overhangs and crevices are also present. This site is exposed to the prevailing South-Southeast and Southeast winds and is influenced by the water exchange of Laganas Bay with the open Ionian Sea.

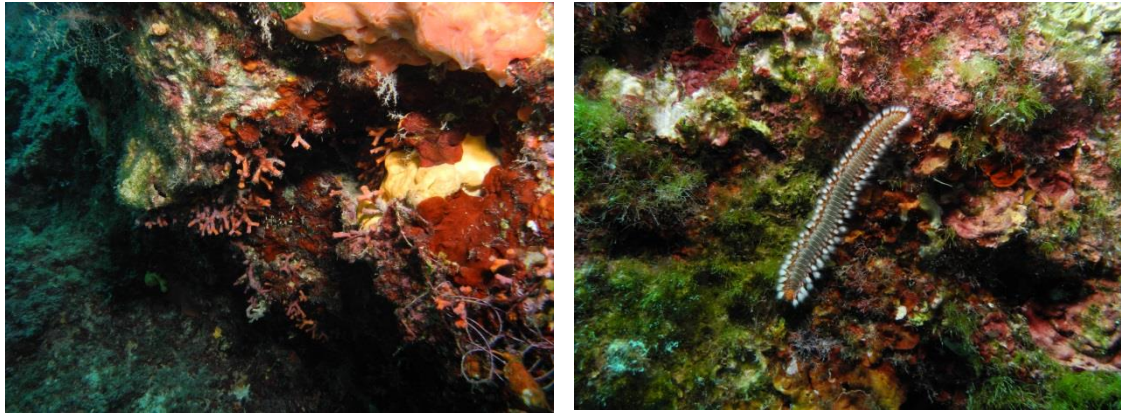
### Human Pressures

The preliminary survey and previous studies that have taken place in this area indicate the presence of ghost nets and abandoned long lines, as well signs of potential disturbance due to intense recreational diving activity.

### Characteristic photos

Depth 15 – 20 m





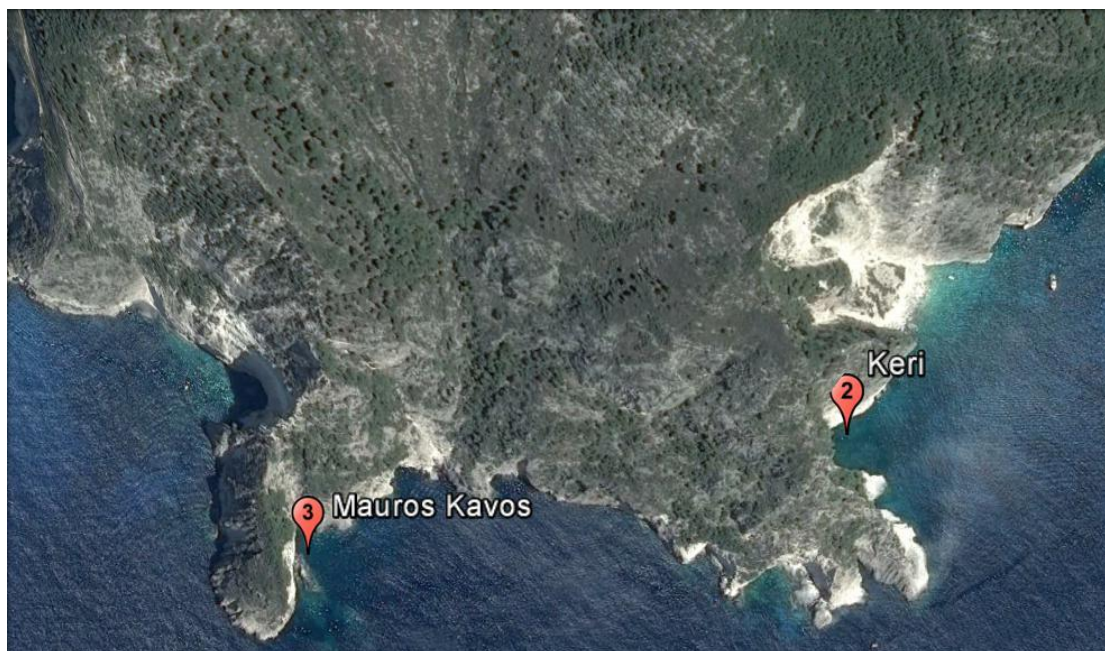
**Figure 5: Typical coralligenous communities that can be found at candidate site 1**

## **CANDIDATE SITES 2 & 3: KERI – MAVROS KAVOS**

Coordinates:

Site Keri: 37°38'46.15"N, 20°50'9.80"E

Site Mavros Kavos: 37°38'42.32"N, 20°49'48.90"E



**Figure 6: Candidate sites at Keri and Mavros Kavos locations**

Divers: Charalampos Dimitriadis (NMPZ), Fanis Nikoloudakis (Divers Paradise Dive club)

### **Sites description**

Both sites are situated at the SW part of Zakynthos Island, close to the westernmost boundaries of the NMPZ. The area is characterized by cooler water temperatures in comparison to Laganas Bay, possibly due to the direct exposure



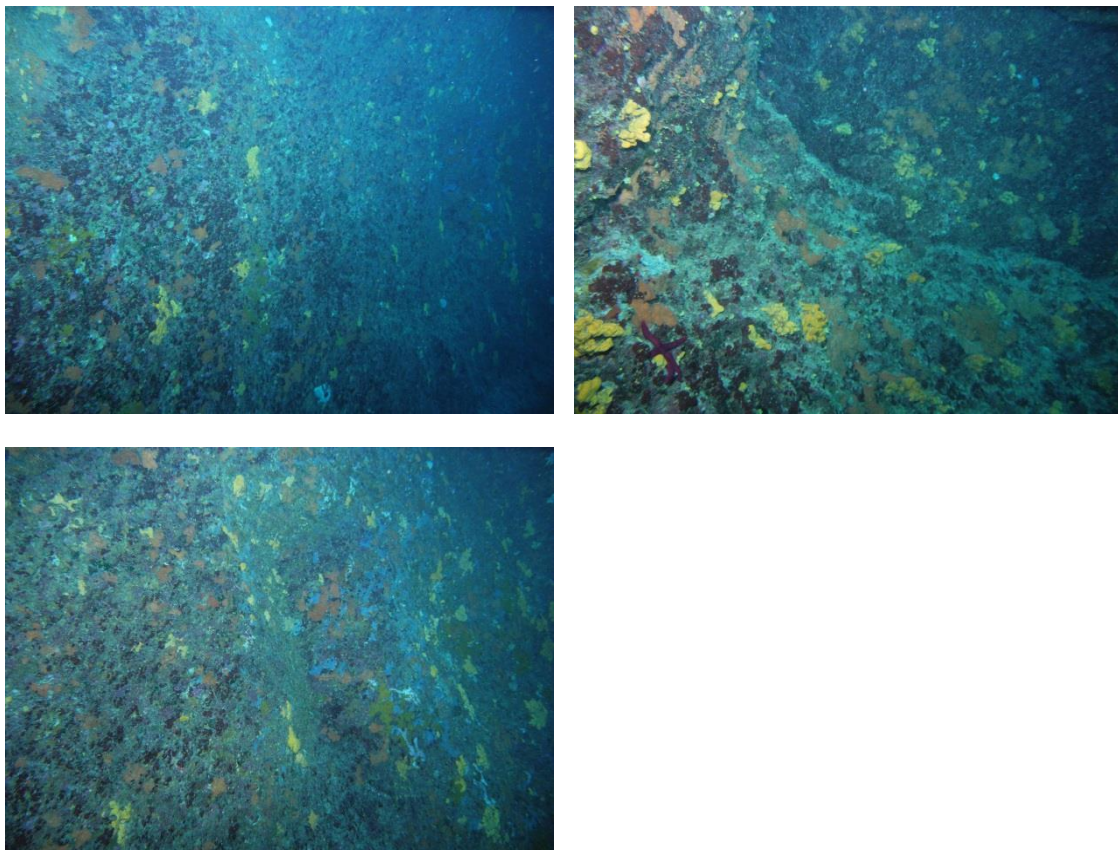
to the open Ionian Sea and the local wind driven upwellings. The topography of both sites is characterized by extensive vertical rocky walls with crevices, overhangs and numerous submerged caves. Rocky cliffs starting from 100 – 150 m above sea level drop vertically to depths of 30 – 40m. These geomorphological features account for the increased shadowy conditions observed locally over the greatest part of the day. At both sites depth of sciaphilic – coralligenous communities were recorded from 10 to 30 m.

### **Human Pressures**

The preliminary survey and previous studies that have taken place in these areas indicate the presence of ghost nets and abandoned long lines, as well signs of potential disturbance due to intense recreational diving activity.

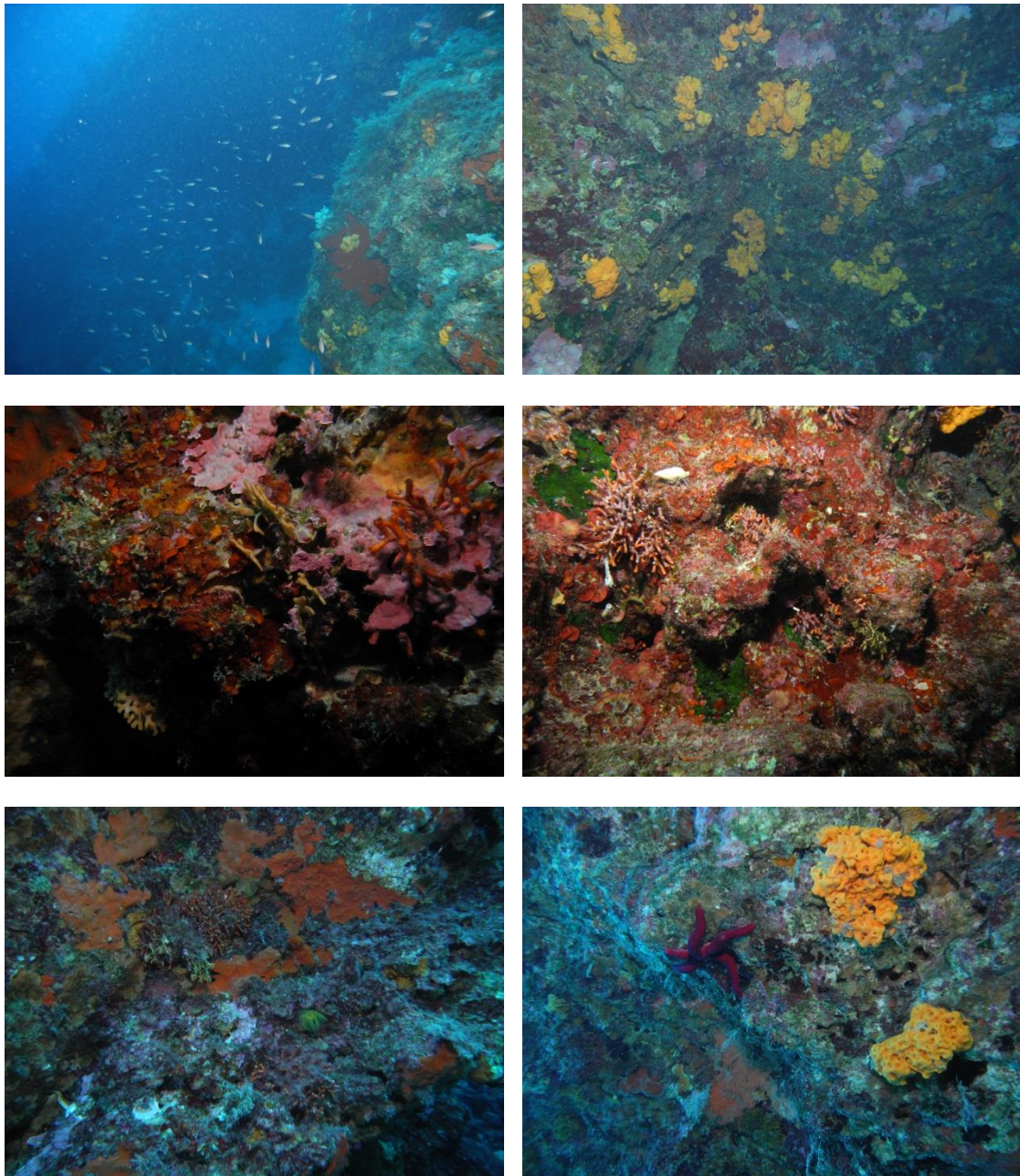
### **Characteristic photos:**

#### **Site KERI – Depth 15 -30m**



**Figure 7: Typical coralligenous communities that can be found at candidate site 2**

**Site MAVROS KAVOS - Depth 12-30 m**



**Figure 8: Typical coralligenous communities that can be found at candidate site 3**



## Species list from the preliminary survey

A total of 42 species were encountered during the preliminary survey (Table 2).

**Table 2:** Species recorded in the candidate sampling sites of Zakynthos Island.

	Keri	Mavros Kavos	Marathonisi
<b>Rhodophyta</b>			
<i>Amphiroa rigida</i> J.V. Lamouroux, 1816			+
<i>Amphiroa cryptarthrodia</i> Zanardini, 1844			+
<i>Liagora viscida</i> (Forsskål) C.Agardh, 1822			+
<i>Peyssonnelia</i> spp	+	+	+
<i>Peyssonnelia</i> cf. <i>bornetii</i>	+	+	+
<i>Peyssonnelia squamaria</i> (S.G. Gmelin) Decaisne, 1841		+	+
<i>Peyssonnelia rosa-marina</i> Boudouresque & Denizot, 1973			+
<i>Peyssonnelia</i> cf. <i>rubra</i>	+	+	+
<i>Mesophyllum</i> sp.	+		
<i>Mesophyllum alternans</i> (Foslie) Cabioch & M.L.Mendoza, 1998		+	+
<i>Tricleocarpa fragilis</i> (Linnaeus) Huisman & R.A.Townsend, 1993			+
<b>Chlorophyta</b>			
<i>Pseudochlorodesmis furcellata</i> (Zanardini) Børgesen, 1926			+
<i>Palmophyllum crassum</i> (Naccari) Rabenhorst, 1868	+	+	+
<b>Foraminifera</b>			
<i>Miniacina miniacea</i> (Pallas, 1766)		+	
<b>Porifera</b>			
<i>Acanthella acuta</i> Schmidt, 1862	+		
<i>Agelas oroides</i> (Schmidt, 1864)	+	+	+
<i>Aplysilla rosea</i> (Barrois, 1876)			+
<i>Axinella damicornis</i> (Esper, 1794)	+	+	
<i>Cacospongia mollior</i> Schmidt, 1862			+
<i>Chondrosia reniformis</i> Nardo, 1847		+	
<i>Cliona schmidtii</i> (Ridley, 1881)			+
<i>Crambe crambe</i> (Schmidt, 1862)	+	+	+
<i>Fasciospongia cavernosa</i> (Schmidt, 1862)			+
<i>Petrosia (Petrosia) ficiformis</i> (Poiret, 1789)	+		+
<i>Phorbas tenacior</i> (Topsent, 1925)	+		
<i>Spirastrella cunctatrix</i> Schmidt, 1868	+	+	+
<i>Terpios gelatinosa</i> (Bowerbank, 1866)			+
<b>Cnidaria</b>			
<i>Caryophyllia</i> sp.		+	
<i>Eudendrium</i> sp.		+	+
<i>Leptopsammia pruvoti</i> Lacaze-Duthiers, 1897	+		+
<i>Madracis pharensis</i> (Heller, 1868)		+	+
<b>Mollusca</b>			
<i>Rocellaria dubia</i> (Pennant, 1777)			+
<b>Annelida</b>			
<i>Hermodice carunculata</i> (Pallas, 1766)			+
<i>Myxicola infundibulum</i> (Montagu, 1808)			+
<i>Protula tubularia</i> (Montagu, 1803)		+	
<b>Bryozoa</b>			
<i>Adeonella</i> sp.	+	+	+
<i>Myriapora truncata</i> (Pallas, 1766)	+	+	+
<i>Rhynchozoon neapolitanum</i> Gautier, 1962		+	
<i>Schizomavella</i> sp.		+	
<b>Echinodermata</b>			
<i>Echinaster sepositus</i> (Retzius, 1783)			+
<i>Ophidiaster ophidianus</i> (Lamarck, 1816)	+	+	
<b>Tunicata</b>			
<i>Halocynthia papillosa</i> (Linnaeus, 1767)			+

## Remarks

Based on the observations of the preliminary surveys, coralligenous assemblages at Marathonisi site were only found as enclaves in overhangs and crevices. On the other hand, the western sites of Keri and Mavros Kavos could potentially be used as sampling sites of Zakynthos, as defined by the geomorphological characteristics (i.e. steep vertical walls) and the associated benthic communities. The scarcity of rich coralligenous communities observed may be due to the prevailing oligotrophic conditions that characterize both the S. Ionian and S. Aegean Seas. Considering this peculiarity, further site investigation is recommended in order to determine the optimum location/s.

## 6. SCIENTIFIC MEETING BETWEEN NMPZ AND HCMR AND FIELD SURVEY IN THE NORTH AEGEAN SEA

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V. Gerovasileiou, member of the NMPZ work team, T. Dailianis and G. Chatzigeorgiou, members of the HCMR work team, met in the framework of a scientific meeting organized by HCMR, the leading collaborator of CIGESMED WP 5, in the framework of COMBER citizen science project, on the 12<sup>th</sup> of October, in Thessaloniki. The two teams had the opportunity to discuss about the development of the CIGESMED citizen science network, in NMPZ and the rest of Greece.

On the 13<sup>th</sup> of October they dived in typical coralligenous communities of the North Aegean Sea, in Chalkidiki Peninsula, and identified typical assemblages and species, marking the differences and similarities with communities of the NW Mediterranean, the South Aegean and Ionian seas.

## 7. PRELIMINARY WORK FOR CITIZEN SCIENCE

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The preliminary work for the citizen science component of the project included actions towards the development of a network that will bring together the local dive centers and recreational divers with the scientific group of NMPZ. Diving activity in the Marine Protected Area of NMPZ A is well developed. Four dive centers are operating in the area for more than a decade and a close collaboration of the MPA with the dive centers has recently been established for the co-management of the diving activity. Rough estimations considering the diving activity in the NMPZ suggest that more than 10.000 dives are taking place in this area per year, including both visitor and local resident divers. Hence, the establishment of a citizen science network for the monitoring of coralligenous in Zakynthos Island is feasible and further work towards the development of a cost-



effective, reliable, user friendly and sustainable in the long term scheme should be considered.

The preliminary design of the citizen science network was discussed with the leading collaborator of CIGESMED WP 5 (HCMR members) during two scheduled meetings (October 2013 and February 2014) in order to establish the basic principles of the citizen science network development. In this respect, future actions for the establishment of the CIGESMED citizen science network have been planned in close collaboration with HCMR.

## 8. PRELIMINARY FIELD SURVEY IN CRETE

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In the framework of setting up a common monitoring network of coralligenous stations in Greece, M. Sini and D. Poursanidis, members of the NMPZ/University of Aegean work team, joined members of the HCMR team in order to investigate potential sites in Crete. The fieldtrip was organized by HCMR from 12<sup>th</sup> to 18<sup>th</sup> of November 2013. The NMPZ members participated in the dive trips, collected photographs and samples of marine fauna and flora, and contributed to species identification. The two teams discussed about their future collaboration in the realization of the various CIGESMED project tasks (e.g. sampling, monitoring, and citizen science network development).

## 9. SUMMARY OF ACTIVITIES PROGRESS

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During the first year of project's activities implementation several difficulties have been met and successfully resolved. Considering the activities of the current project, NMPZ progress is in line with the requirements that are described in the Technical Annex of the relative contract.

Summary of activities progress of the present project in relation to CIGESMED work packages is provided in the following table.

NMPZ Activities	CIGESMED WP's	NMPZ PROGRESS
<b>Activity 1</b> <i>Coralligenous assessment and monitoring</i>	<b>WP2</b> - <i>Coralligenous assessment and threats in the different basins</i> <b>WP3</b> - <i>Indicators' development and test</i>	Preliminary field survey and candidate site selection, preliminary biodiversity assessment of coralligenous communities, preliminary identification of the possible threats and sources of disturbance, collaboration with national partners (HCMR) of CIGESMED project
<b>Activity 2</b> <i>Management tools</i>	<b>WP4</b> - <i>Innovative monitoring tools</i> <b>WP6</b> - <i>Data management, mapping and assimilation tools</i>	Not relevant to the current reporting period
<b>Activity 3</b> <i>Participatory process - Promotion - Public awareness activities</i>	<b>WP5</b> - <i>Citizen science network implementation</i> <b>WP7</b> - <i>Outreach, dissemination and stakeholder engagement</i>	Communication with local dive clubs, preliminary actions for citizen science network development, collaboration with national partners (HCMR) of CIGESMED project

# CIGESMED

