

Report on the decision about the two survey areas to be selected to test UUV-based monitoring system

Activity 5.1 - Individuation of the study areas -
Potential of UUV technology for biodiversity
study activity

WP5 - Ecosystem protection and sustainable
fisheries

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Abstract

WP5 is dedicated to the exploitation of the findings of the underwater drone system in surveying seabed. The previously available scientific information on the Adriatic benthic and demersal biological communities has been reviewed by the scientific partners, in order to identify two areas suitable for the tests on the drone developed in WP4. The choice considered several aspects, including the occurrence of NATURA 2000 sites, environmental and logistic constraints that limit traditional surveying techniques, the expected biodiversity and biological communities. Two sites have been selected, one located in the Croatian side of the Adriatic and the other in the International Waters area.

Premises

Due to its high biodiversity, with more than 6000 different plant and animal species and large number of endemic species, the Adriatic Sea is classified as special biogeographical area of Mediterranean Sea.

Even though the Adriatic is an oligotrophic sea and certain areas have different levels of primary production, the total annual catch of marine organisms is higher than 150 000 tons per year, which represents almost 15% of the total catch in the Mediterranean Sea.

Intensive exploitation of living resources must inevitably affect the natural balance of the entire ecosystem, which generally result in negative changes in the composition of benthic and demersal communities and demographic structure of the commercially important populations.

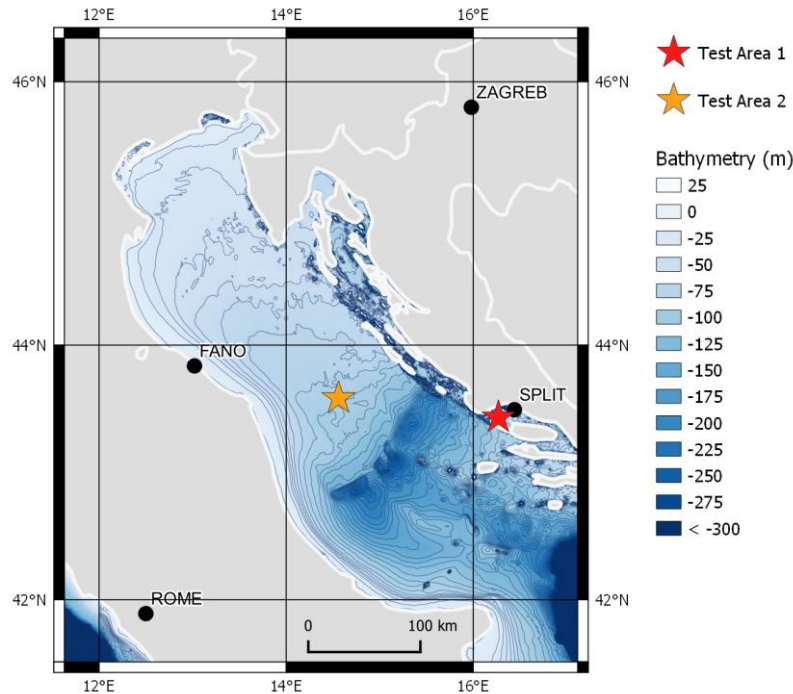


Figure 1 – Bathymetric map of the Adriatic Sea (GSA 17), with location of the chosen test areas.

The Institute for Oceanography and Fisheries (henceforth: IOF) and the Laboratory of Marine Biology and Fishery have a long tradition of research activities in the Adriatic Sea, covering various aspects of the state of natural resources. All existing historical data on the state of natural resources and fishing effort from the IOF research activities were collected by overviewing the IOF database. Furthermore, the work teams conducted a comprehensive analysis of national and international scientific literature with aim to overview the existing relevant data related to the fishing resources.

In the light of this review, two areas are proposed to test the usage of innovative underwater drone systems for surveying and describing the benthic communities. The two areas are respectively located in the Croatian side of the Adriatic and in the International Waters area. They are complementary and characterised by different features.



Figure 1

presents the bathymetry map of the Adriatic Sea with the location of the proposed investigated areas.

Figure 2 – Map of planned area in Croatian side of GSA 17.

Test Area 1

In Croatian side, the proposed trawling and UUV investigated area is located in the Channel between islands of Šolta and Drvenik. There are several reasons why this area is selected for this type of survey.

Firstly, there are three potential Natura 2000 sites (

Figure 2) mainly proclaimed because of Posidonia meadows. Majority of available data on the distribution and quality status of these habitats within these sites is poor. Priority habitat for further research are Posidonia oceanica meadows (Posidonia meadows), as this is EU priority habitat and habitat important for various ecosystem services, also related to fishery (fish feeding and breeding area). Posidonia meadows in these areas are usually present in coastal strip up to 100 m from the coast (sometimes bit more or less). In particular, it is planned to collect information about:

- Exact surface and position of the meadow (georeferencing/mapping);
- Depths of the lower limit of the meadow - expected depth is 25-30 m;
- Type of the lower limit (progressive, regressive...);
- Depths of the upper limit of the meadow (if possible).

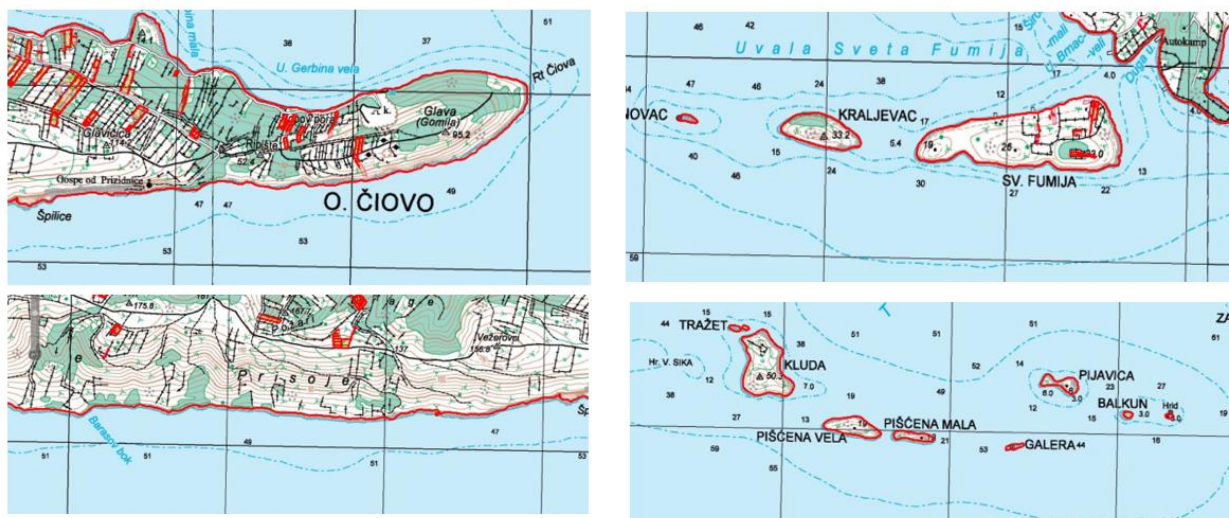


Figure 3 - Topographic map of the investigated area.

Secondly, this area, which is fishing zone G in Croatian territorial waters, is known as very important fishing ground for bottom trawl and small-scale fisheries (mainly set nets and long lines). The key species in the catches are hake, red mullet, Pandora, anglerfish, European squid, etc. Also, in this area is high concentration of juveniles of different demersal species.

Considering that surveys will be conducted in third semester of the project – from January to June 2020, the channel will be closed for any type of fishing activity (due to a fishing ban in the warm part of the year), which is a benefit for UUV vehicle that will be tested in that area.

Finally, from previous researches (including MEDITS surveys for over 20 years in that same area), occurrence of obstacles is well known in this part of Croatian territorial waters. Thusly, it is not likely to encounter this type of problems during trawling and UUV deployment.

Likewise, the depth of the sea in this area will make it easier to locate the drone in case of a problem or loss of contact with the vessel.

The area will be investigated for precision bathymetry, composition and distribution of benthic communities, quantitative and qualitative composition of the catch by trawling (to represent demersal communities) and demographic structure of the commercially most important species. The data collected by trawling will be compared with the UUV data, at the same time and area. Also, in the proposed area, additional investigation will be made to describe status of key species in NATURA 2000 areas.

Test Area 2

The Laboratory of Marine Biology and Fishery of Fano identified an area located in the International Water, around 30 NM off the coast of the Marche Region. Fishermen know well this area, which they call “Scogli di Pedaso”.

The zone is characterized by a rugged bottom with depth ranging between 70 and 80 meters; although well-known to fishermen, the area and the habitat are almost unknown from a faunistic point of view. Depth, distance from the coast and poor tracks on nautical charts are all factors of interest that inspired the choice of this area to demonstrate the potentials of the underwater drone in the study of the benthic community, also on deep and rough bottoms.

The study includes the following phases:

- Survey with echo-sounder in the area “Scogli di Pedaso”;
- Elaboration of a morphological map of the area;
- Survey with conventional equipment (net, buckets, dredges) of benthic communities;
- Survey with the UUV to confirm the benthic communities;
- Development of the first biodiversity map of the area.

The timing will be scheduled according to the drone availability, after all preliminary stages are performed.

The interest in checking benthic community on the proposed zone depends on its peculiar features; as a matter of fact, in the area, organisms that are typical of muddy bottoms inhabit near organisms typical of hard bottoms.

Furthermore, a fairly detailed cartography of the bottom does not exist for this area, so it will be a meaningful test for the navigation and mapping capabilities of these new UUV technologies, in poorly known environments, far from the coast.