

merces

restoring **marine** ecosystems

Fabio Rossetto - InforMare

NEWSLETTER03

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restoring marine ecosystems

EDITORIAL

Citizen Science is an important aspect of MERCES, since one of the aims of the project is to disseminate the results to the largest audience possible (both experts and non-experts) and to engage our society at different levels on the topic of marine restoration. This new issue of the MERCES newsletter is dedicated to **Citizen Science**, with a featured story on the collaboration between researchers and SCUBA divers to save an iconic seascape in the Medes Islands (Spain) and in the Gallinara Island (Italy). During the first two years of the project several activities have been carried out, including field work in different pilot study areas, international meetings and several initiatives dedicated to young students. The main outputs are summarized here. This newsletter reports also on important upcoming events, where members of the MERCES consortium will be present to communicate the results of the project. Finally, you will find a selection of papers from MERCES' output and beyond, with short commentaries from the authors. Happy reading and keep tuned, much more has to come!

Prof. Roberto Danovaro
MERCES Coordinator

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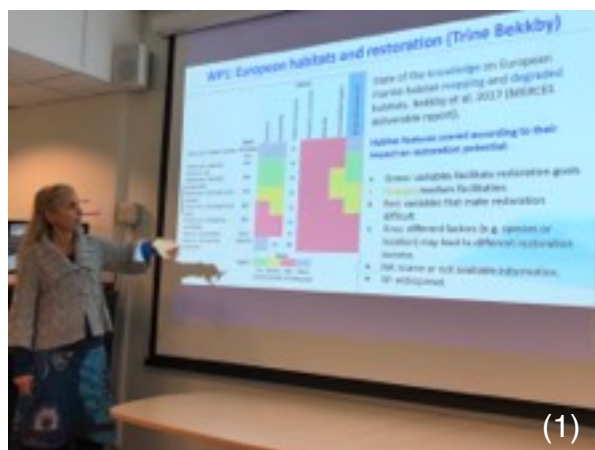
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Some updates from MERCES

Busy months for MERCES partners! After an intense summer season spent in the field, winter has been dedicated to the analysis and integration of data, planning for the upcoming work or presenting first outcomes to wider audiences (all of this while still monitoring progress in launched restoration experiments and pilots).

Engagement with industry representatives, governmental organisations and policy/decision makers helps MERCES to disseminate results as soon as they are available, and to receive important feedback to incorporate in upcoming activities (e.g. 1, [NIVA](#) presenting updates on the habitat properties relevant for restoration success to territorial managers and policy makers in Oslo). Raising awareness in local communities is also central to building support and positively influence behaviour - as efforts throughout the MERCES consortium show (e.g. 2, [PFM - ZAGREB](#) has been repeatedly in the news for the translocation of largest and endemic Mediterranean bivalve *Pinna nobilis* as a pilot for marine restoration). Still, everything stems from continuous field and lab work (e.g. 3, underwater work to assess performances of seagrass restoration in the Baltic Sea by [ÅAU](#), [UTARTU](#) and [NIVA](#)), and team discussion of outcomes (e.g. 4, [WU](#), [AAU](#) and [HCMR](#) meeting in Amsterdam discussing and choosing MERCES restoration cases to be assessed on the backdrop of existing policies).



(1)



(2)



(3)



(4)

First MERCES business club webinar - available to all

The first MERCES webinar entitled “Getting Better Value from our Coasts” took place Friday, 15 February 2018. Organised by [NIVA](#), moderated by [DSES](#) and hosted by [GRID-Arendal](#) and the [Marine Ecosystems Services Partnership](#), it was the first of a series intended to bring together businesses, policy makers, decision takers and scientists with an interest in marine ecosystem restoration.

The first webinar, which is archived and visible to the wider public, primarily covered two themes: “Valuing multiple Eelgrass ecosystem services in Sweden - Fish production and uptake of Carbon and Nitrogen”, and “Using 3D computer graphics to convey restoration goals to decision-makers and the general public”.

The webinar was attended by 64 participants from Belgium, Bulgaria, Croatia, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Malta, Netherlands, Norway, Portugal, Romania, Sweden, and the UK, including 21 companies. New members signed up for the MERCES Business Club following the webinar.

Missed it in February? Check it out on the [GRID-Arendal website](#) or on the MERCES website ([Business club section](#)). Enjoy!



Harnessing the power of **Citizen Science** for marine restoration

They say “as vast as the sea” and, taking about two thirds of our planet surface, the ocean is in fact quite large - and it's pretty deep, too! Problem is, when areas of the ocean are in trouble, it usually means they are quite large areas to fix.

How can this be done?
Enter marine restoration.

Marine restoration actions must be designed according to each situation and local conditions. Sometimes, actions shall be taken at great depth, where only machines can operate. Sometimes, however, actions shall be taken at depth where humans can work - often SCUBA divers. The ability of humans to manipulate organisms and objects underwater at the fine scale is still unique, which is certainly a plus. Nonetheless, the work of divers is constrained by the time they can actually spend underwater. Where the problem of marine restoration is scale, it is often linked to our ability to cover that scale in the limited time frame allowed.

Yet, there is another important saying, i.e. “the sea belongs to all of us”. And this is where divers, even when they are not technicians nor scientists, can play a crucial role in serving the same environments they enjoy so much exploring. Divers can lend themselves to marine restoration operations, under the direct and indirect supervision of specialised professionals - one of the several nuances of Marine Citizen Science.



Fabio Rossetto - InforMare

frommerces

It is not just a proposition and good intentions - MERCES has already taken advantage of this opportunity. Recreational SCUBA divers and diving instructors have been engaged in the pilots for the restoration of Mediterranean coralligenous, after a short training by [CSIC](#), [UB](#) and [UNIVPM](#). The pilots, established in Spain (Medes Islands) and Italy (Gallinara Island), entailed the preparation and transplantation of hundreds of gorgonians. Thanks to the help of a dozen dedicated Citizen Scientists, transplantation at each site could be completed in just one day of field work, something impossible to achieve with the sole efforts by MERCES staff!

Participation of trained volunteer divers and diving professionals has generated more than simple manpower while launching the pilots. They are now the stewards of such diving sites, help monitor restoration progress and champion marine restoration with fellow divers. Plus, understanding how marine habitats get degraded (and realising how difficult it is to restore them) reinforced the ambassador role of diving enthusiasts and professionals for environmentally-friendly diving behaviour.

Welcome, Marine Citizen Science!!

For more information about MERCES' work based on [Citizen Science](#) and/or in the Mediterranean coralligenous check out pages 12 and 13 in this newsletter!



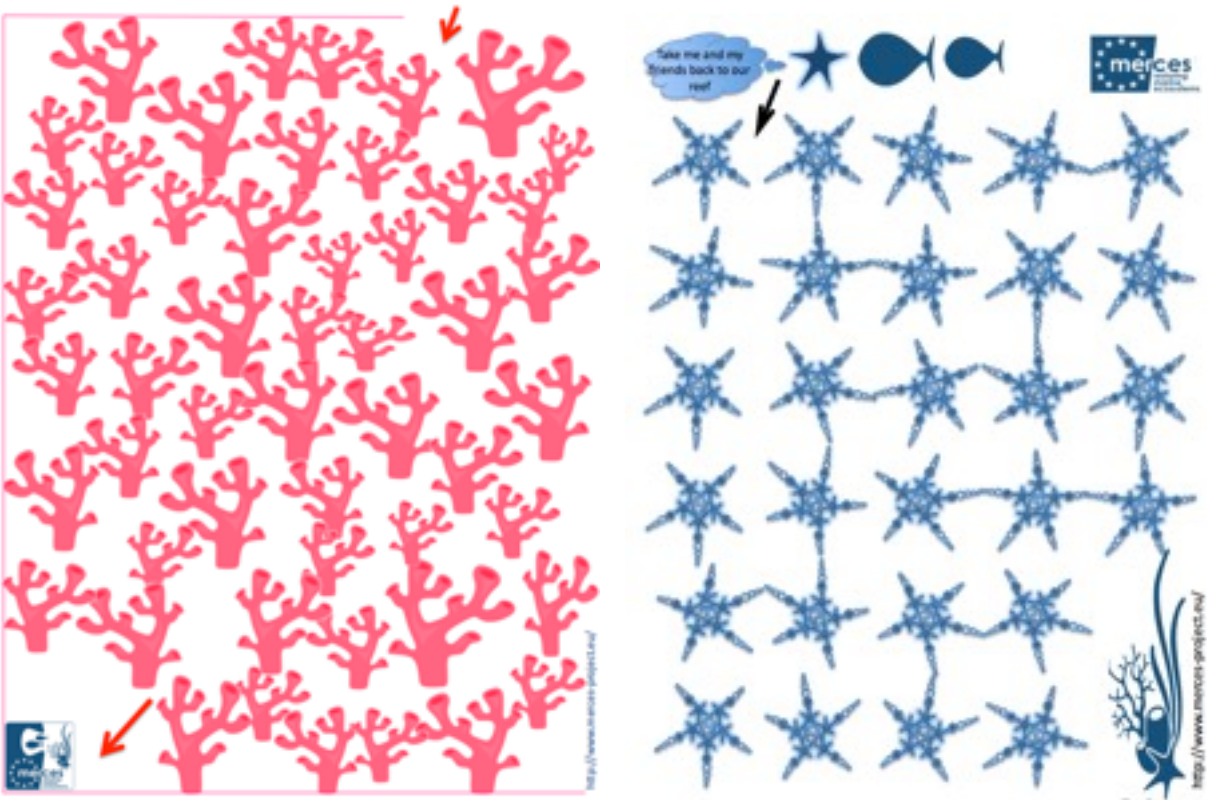


Bringing the sea into the classroom

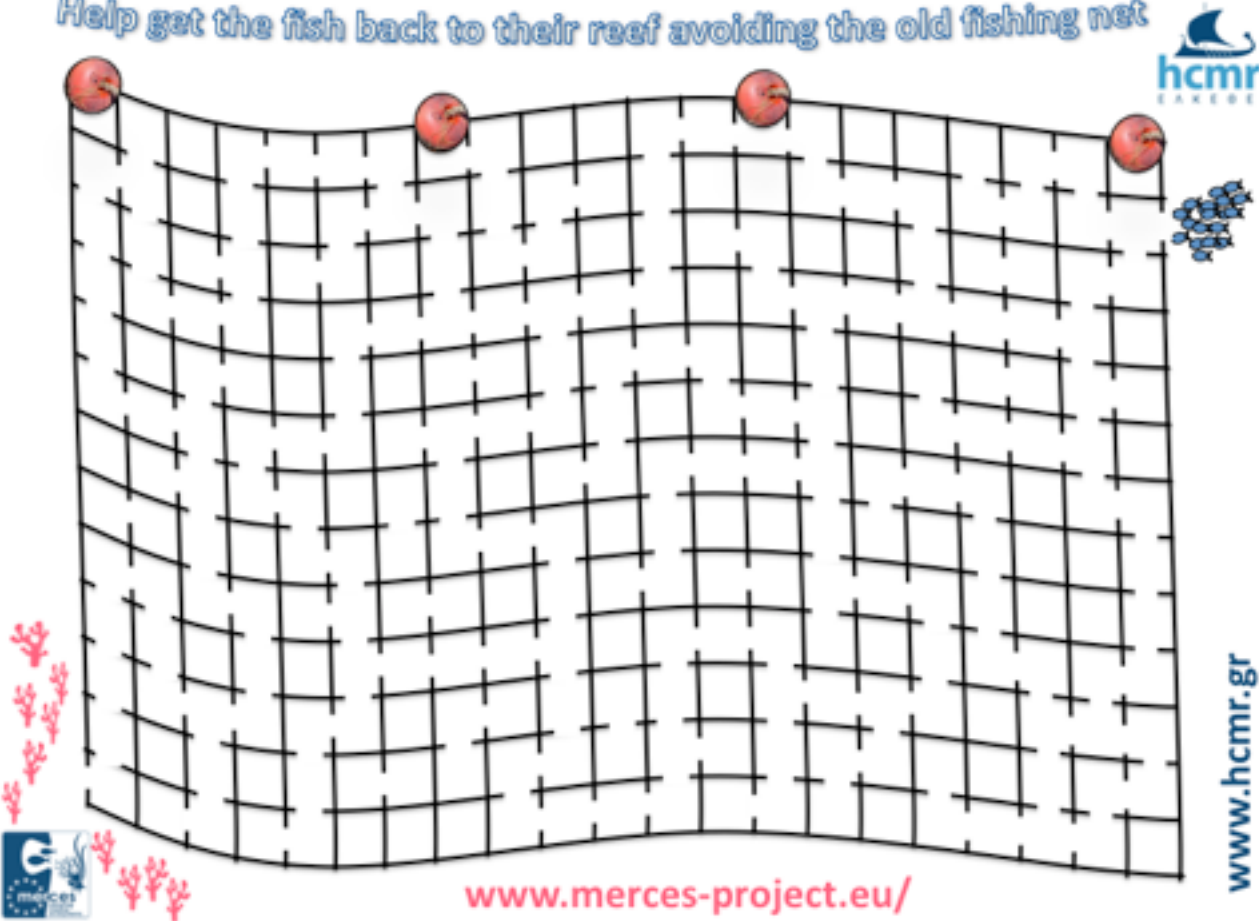
While trying to fix current environmental problems (also) through marine restoration, making sure the next generation will be wise enough to minimise human footprint on the ocean is of paramount importance. Ideally, why not instil some interest in science as well?

Kudos to MERCES partners, like [CONISMA](#) and [HCMR](#) pictured below, for their Ocean Literacy programmes with kids of all ages, in the frame of formal educational settings as well as through open days, hands-on activities and fun games. Can you get through the mazes?





Help get the fish back to their reef avoiding the old fishing net



www.merces-project.eu/

www.hcmr.gr

MERCES at the OECD workshop in Naples

The Organisation for Economic Co-operation and Development (OECD) workshop on “Innovation for a sustainable ocean economy: Linking economic potential and marine ecosystem health through innovation”, co-organized by Stazione Zoologica Anton Dohrn and OECD-CSTP, was held in Naples (Italy) on 10th-11th October 2017. The workshop examined how scientific advances and innovation are contributing to the development of major marine and maritime activities, while helping in protecting and restoring ecosystems. In this context, four major issues for the future of the seas and ocean were discussed: 1) the greening of shipbuilding and marine infrastructures; 2) the decommissioning of marine platforms; 3) the pivotal role of science and technology in enhancing maritime spatial planning; and 4) innovation as the key force driving the potential emergence of a marine ecosystem restoration industry. Session 4 was introduced by a question: what are the prospects for a marine ecosystem restoration industry driven by science and innovation? The discussion was moderated by MERCES' coordinator Roberto Danovaro and the project was present with two contributions: one by [IMAR-UAz](#) on the potentiality of the ecological restoration in deep-sea ecosystems and one by [DSES](#) on the transfer of marine restoration knowledge to the Industry.



MERCES at the BlueMed CSA Coordinator's meeting

The aim of the [BLUEMED initiative](#) is facilitate the connection of relevant projects and initiatives of the whole Mediterranean area, so that results are shared and uptaken and actions are implemented. The BlueMed CSA Coordinator's meeting (11-12 January 2018, Malta) was expected to result in a clusterization of different EU projects and initiatives with focus on the Mediterranean basin. To this regard, MERCES coordinator Roberto Danovaro was invited to present the project aims and give an overview of the different pilot actions of marine restoration in the Mediterranean basin. Among the key challenges identified by BluMed in the next future, MERCES outputs can contribute to Mediterranean Sea Ecosystems: services, resources, vulnerability and resilience to natural and anthropogenic pressures.

A MERCES paper highlighting the scientific relevance of Citizen Science:

Local Ecological Knowledge indicates temporal trends of benthic invertebrates species of the Adriatic Sea

by Azzurra Bastari, Jacopo Beccacece, Francesco Ferretti, Fiorenza Micheli and Carlo Cerrano

In the Adriatic Sea, shifts in benthic community structure have been attributed to multiple stressors, from the effects of climate change to the impacts of commercial fishing. Some fishing practices, such as bottom trawling, have caused a widespread decline in exploited fish stocks. Bottom trawling is also expected to have negative impacts on benthic habitats, usually structured by and hosting a large array of invertebrate species, which provide important ecological services to fish and commercial invertebrate stocks. However, in contrast to commercial species for which long-term time series of the abundance exist, data on these habitat-forming invertebrates are scarce, as they are usually caught as bycatch and discarded. Therefore, there is great uncertainty about their long-term trends, and if these populations are stable or declining.

Here we used interview surveys conducted with bottom-trawling fishers of the central Adriatic Sea to gather local ecological knowledge on megabenthos abundance occurring in their fishing domain, as an alternative source of information to conventional fisheries data. We interviewed 44 fishers, from the most important ports of the Marche region of Italy, to understand how megabenthic species have changed in abundance within the area since the 1980s. Specifically, we asked fishers to provide qualitative abundance scores for 18 invertebrate species in five phyla (Porifera, Cnidaria, Bryozoa, Mollusca, and Echinodermata) based on their recollection of these species' presence in bycatch. We stratified responses in homogeneous temporal periods and geographic sectors of the study area, and analyzed their response with mixed effect ordered logistic regression models in order to evaluate spatiotemporal changes in the perceived abundance of each species.

Our analysis suggests that the abundance of the sponge *Geodia cydonium*, the molluscs *Pecten jacobaeus*, *Atrina fragilis*, *Neopycnodonte cochlear*, and the group of holothurians, have declined. From fishers' perceptions, only the bryozoan *Amathia semiconvoluta* has increased.

Local ecological knowledge can provide important information on environmental change and can highlight species and ecosystems at risk when conventional scientific data are scarce or absent. This approach can be expanded to other regions of the Adriatic and broader Mediterranean Sea to reconstruct change of this heavily exploited marine region.

Read this Open Access paper on the [Frontiers in Marine Science website](#).

A MERCES paper about restoration in the Mediterranean coralligenous:

Accounting for life–history strategies and timescales in marine restoration

by Ignasi Montero-Serra, Joaquim Garrabou, Daniel F. Doak, Laura Figuerola, Bernat Hereu, Jean-Baptiste Ledoux, Cristina Linares

Understanding the drivers of restoration success is a central issue for marine conservation. Here, we explore the role of life–history strategies of sessile marine species in shaping restoration outcomes and their associated timescales. A transplantation experiment for the extremely slow–growing and threatened octocoral *Corallium rubrum* was highly successful over a relatively short term due to high survival and reproductive potential of the transplanted colonies. However, demographic projections predict that from 30 to 40 years may be required for fully functional *C. rubrum* populations to develop. More broadly, a comprehensive meta–analysis revealed a negative correlation between survival after transplanting and growth rates among sessile species. As a result, simulated dynamics for a range of marine sessile invertebrates predict that longer recovery times are positively associated with survival rates. These results demonstrate a tradeoff between initial transplantation efforts and the speed of recovery. Transplantation of slow–growing species will tend to require lower initial effort due to higher survival after transplanting, but the period required to fully recover habitat complexity will tend to be far longer. This study highlights the important role of life history as a driver of marine restoration outcomes and shows how demographic knowledge and modeling tools can help managers to anticipate the dynamics and timescales of restored populations.

Read this Open Access paper on the [Conservation Letters website](#).

comingsoon

May 13-16, 2018. 4th World Conference on Marine Biodiversity, Montréal (Canada).

Sep 9-13, 2018. Conference of the Society of Ecological Restoration Europe 2018, Reykjavik (Iceland).

Sep 9-14, 2018. 15th Deep-Sea Biology Symposium, Monterey (USA).

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