

NEWSLETTER05

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EDITORIAL

The MERCES project aims at engaging a wide and multidisciplinary community of scientists, public institutions, private companies. The scientific products of the project are expected to be of interest for industrial stakeholders, policy makers and public administrations, as well as a public audience from either environmental and socio-economic sectors, and EU citizens at large.

The engagement with stakeholders and attracting the interest of new generations of scientists is presently one of the priorities of MERCES.

The involvement of such a wide community of actors and stakeholders encourages exchange experiences, the identification of strengths, weaknesses and best practices for future restoration actions on marine ecosystems. MERCES is working to develop new techniques and technologies, and disseminate widely information, knowledge and know-how. The results of MERCES provide vital information for expanding the Blue Growth agenda in Europe and for defining new strategies for the coming decade (the European Union's five Europe 2020 Strategy objectives - on employment, innovation, education, social inclusion and climate/energy).

MERCES works hard to have an important impact also on a large number of young scientists, as well as engaging with all levels of education. Our mission is also to promote in the multidisciplinary stakeholder community the awareness of the potential of marine restoration in providing healthy seas for them and their children, as well as providing them with new job opportunities in environmental sciences.



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Some updates from MERCES - from the field

MERCES is working hard to restore a variety of degraded marine habitats across Europe, including seagrass habitats in Estonia and kelp forests in Norway.

To such an end, *Mytilus-Zostera* field experiments were set up in summer 2017 and 2018 in the West Estonian Archipelago Sea, northern Baltic Sea in less and more exposed sites (photo 1). The experiments showed that the success of seagrass *Z. marina* restoration is highly site-specific. In less exposed site, there are experimental plots where the shoot density of seagrass has increased remarkably since the plots were established.

In Norway, a restoration experiment is ongoing at a barren site where degradation is due to overgrazing by sea urchins. Here, kelp has been transplanted to re-build the complex habitat structure typical of kelp forests and facilitate natural propagation through spore supply (photos 2 and 3). Preliminary results show high survival of transplanted kelp and a significant recovery of understory kelp and algae.



Some updates from MERCES - from the team

The second MERCES annual meeting took place in Barcelona from the 23rd to the 25th of May 2018, welcoming about 70 participants including members of the Consortium, members of the project Advisory Board and invited speakers. Forty oral contributions and 15 posters were presented. The meeting has been an excellent occasion to discuss the progress of the project's activities, open fruitful discussions and develop new collaborations among the partners of the Consortium, as well as within and between project's components.

The meeting also hosted an open session with the presence of Prof. Jordi Cortina-Segarra (Chairing the European Chapter of the Society for Ecological Restoration) with the talk "The Society for Ecological Restoration to promote the science and practice of ecological restoration", Sr. Sergi Tudela (General Director of the Fisheries and Maritime affairs, Catalan Government) presenting "Initiatives on coral conservation and restoration of coralligenous habitats in Catalonia", and James Aronson (SER International and member of the MERCES Advisory Board) with the talk "The SER Standards need input from MERCES". The Open Session stimulated a general discussion on the importance of ecological restoration in marine ecosystems and the need of a support from policy, economy and society.

Enter the theme of this fifth MERCES newsletter!



Ocean Literacy - an international partnership based on tools and actions

Ocean Literacy means understanding the Ocean's influence on human life and how human life influences the Ocean. Of course, Ocean Literacy is key to the translation of research into tangible impacts - if these are not embraced by society, positive change can not occur.

Based on this principle and following the guidelines provided by the international Ocean Literacy Framework, MERCES is developing an Ocean Literacy program focusing on the specific themes of the protection and of the restoration of marine environments. But we are not alone! To broaden the scope of our program beyond the network of MERCES, and to cover a variety of important complementary topics, we are teaming up with several other research projects - first and foremost, our "sister projects" <u>SponGES</u> and <u>ATLAS</u>.

The first product of this collaboration is the "<u>SponGES and MERCES Teachers</u>' <u>Workbook</u>", a modular manual rich in information, supporting materials and links to external resources. The manual is currently available in English and Spanish, and will be also translated in Portuguese and Italian. Primarily intended as a tool to accompany school teachers in their Ocean Literacy activities, the manual is actually fit for any audience willing to discover more about marine life, environments and research.



Moreover, the three "sister projects" have embarked in a touring exhibition that will be hosted at five locations on the two sides of the Atlantic Ocean (and right in the middle of it). The first leg of the exhibition was organised in conjunction with the 4th World Conference on Marine Biodiversity, held in Montreal from the 13th to the 16th of May 2018. Featuring installations with samples from the Atlantic Oceans and the Mediterranean Sea, two microscopes, copies of the Teachers' Workbook and printed/digital material from the three projects, the booths in Montreal received students, educators, researchers and professionals in the different fields of marine and maritime research and technology. A 3D experience developed in the frame of the ATLAS project was also available and much sought after!







The second leg of the touring exhibition was held in Gijón, from the 19th to the 23rd of November 2018. The exhibition took advantage of the local Science Week, and of the kindness of researchers and technicians at the Spanish Institute of Oceanography. The event saw the participation of about 15 classes from primary and secondary schools, for a total of about 350 pupils entertained with a combination of installations and activities focused on the ocean and on marine sciences. The Science Week was also the occasion to launch new modules of the Teachers' Workbook, and to make them available not only in English but also in Spanish. The next leg of the touring exhibition will be in the Azores!



Besides this, of course, MERCES' members continue to propose local Ocean Literacy activities. For instance, a marine biology course for secondary-school students has been carried out in Ancona, with the aim of increasing their knowledge on the marine environment and raising awareness about the delicate theme of conservation of marine biodiversity. Material dedicated to teachers and students was also produced in order to support the teaching and embracing of science, technology and research, including a fairy tale and an underwater guide of the species at risk or overexploited of the Mediterranean Sea. Finally, specific fieldwork activities have also been organised for university students of the International Master of Marine Biology at the Polytechnic University of Marche.

For more information about MERCES' work based on Ocean Literacy check out the Education and Training, or the Outreach Materials pages of the MERCES website!



Second MERCES business club webinar - available to all

The second MERCES webinar, aired on September 25th, focused on "<u>Private</u> <u>Finance in Marine Ecosystem Restoration</u>". The webinar is part of a series aimed at bringing together businesses, policy makers, decision makers and scientists with an interest in marine ecosystem restoration - the final goal is not just to demonstrate its technical feasibility, but also to facilitate its practical implementation in the real world.

The core of the webinar included two short talks followed by a discussion with the audience. The talks and speakers (both from the MERCES project) were:

- "Identifying private financing mechanisms for marine ecosystem restoration" by Rolf Groeneveld, Wageningen University, Environmental Economics and Natural Resources Group, and
- "Private financing potentials for marine ecosystem restoration: a kelp-urchin case in Northern Norway" by Wenting Chen, Norwegian Institute for Water Research.



Rolf Groeneveld noted that, traditionally, governments have been the dominant source of finance of ecosystem restoration, including marine ecosystems. Recent developments, however, have seen the growth of private sources of finance for restoration and conservation of biodiversity. In the webinar, he detailed the major sources of such private finance, the institutional and biophysical obstacles to such finance, and the mechanisms that have been developed to overcome these obstacles.

Wenting Chen provided details of a specific case study where private finance had played an important part in restoring kelp forests on the coast of Norway. Kelp barrens caused by sea urchin grazing have dominated the Northern coast of Norway in the last forty years. There have been various initiatives from private industry to make commercial use of sea urchins while at the same time restoring kelp forest in the region. In the webinar, she discussed private financing potentials for kelp-forest restoration in Northern Norway and the experience NIVA had in collaborating with industry.

Missed the webinar and wish to know more? We got you covered! All MERCES webinars are freely accessible through the GRID-Arendal YouTube channel. Check it out <u>here</u>!





MERCES at SER conference 2018 - Restoration in the Era of Climate Change

Some MERCES members participated in the Society for Ecological Restoration Europe Conference in Reykjavik, last September 2018. This year, the event was dedicated to ecological restoration in the era of climate change and was attended by over 400 people, representing 48 countries from all over the world. Nearly 200 oral talks presentations and over 80 posters were presented. Six workshops and one open Climate Forum took also place.

MERCES joined in the section "Coastal/marine restoration", moderated by James Aronson - member of SER International and of the MERCES Advisory Board. The project presented outputs on pilot restoration actions in hard bottom habitats, on the principles of restoration in deep-sea habitats, and on the legal, policy and governance frameworks in the ecological restoration of marine ecosystems.





selectedpapers

A MERCES paper on successful restoration, and associated costs

Restoration of a canopy-forming alga based on recruitment enhancement: Methods and long-term success assessment

by Jana Verdura, Sarta Sales, Enric Ballestreros, Maria Elena Cefalì, Emma Cebrian

Marine forests dominated by macroalgae have experienced noticeable regression along some temperate and subpolar rocky shores. Along continuously disturbed shores, where natural recovery is extremely difficult, these forests are often permanently replaced by less structured assemblages. Thus, implementation of an active restoration plan emerges as an option to ensure their conservation. To date, active transplantation of individuals from natural and healthy populations has been proposed as a prime vehicle for restoring habitat-forming species. However, given the threatened and critical conservation status of many populations, less invasive techniques are required. Some authors have experimentally explored the applicability of several non-destructive techniques based on recruitment enhancement for macroalgae restoration; however, these techniques have not been effectively applied to restore forest-forming fucoids. Here, for the first time, we successfully restored four populations of Cystoseira barbata (i.e., they established self-maintaining populations of roughly 25 m²) in areas from which they had completely disappeared at least 50 years ago using recruitment-enhancement techniques. We compared the feasibility and costs of active macroalgal restoration by means of in situ (wild-collected zygotes and recruits) and ex situ (provisioning of lab-cultured recruits) techniques. Mid/long-term monitoring of the restored and reference populations allowed us to define the best indicators of success for the different restoration phases. After 6 years, the densities and size structure distributions of the restored populations were similar and comparable to those of the natural reference populations. However, the costs of the in situ recruitment technique were considerably lower than those of the ex situ technique. The restoration method, monitoring and success indicators proposed here may have applicability for other macroalgal species, especially those that produce rapidly sinking zygotes. Recruitment enhancement should become an essential tool for preserving Cystoseira forests and their associated biodiversity.

Read this Open Access paper on the Frontiers in Plant Science journal website.



selectedpapers

A MERCES paper about discourses & uncertainties in marine restoration

Governing marine ecosystem restoration: the role of discourses and uncertainties

by Kristen Ounanian, Eira Carballo-Cárdenas, Jan P.M. van Tatenhove, Alyne Delaney, K. Nadia Papadopoulou, Christopher Smith

Governing marine environments has evolved from dominant interests in exploitation, allocation, conservation, and protection to restoration. Compared to terrestrial and freshwater environments, restoration of and in marine ecosystems presents a new mode of intervention with both technical and governance challenges. This paper aims to enhance understanding of the important factors at play in governing marine ecosystem restoration. Discourses of marine ecosystem restoration are an important factor which shape how the restoration activity is governed, as discourses structure how actors and coalitions define problems and their approaches to solutions. The article produces a conceptual model of the discourses of marine ecosystem restoration, built on two dimensions: (1) the degree of human intervention and (2) motivations for restoration. Together, these dimensions create four broad restoration discourses: "Putting Nature First," "Bringing Nature Back," "Helping Nature support Humans," and "Building with Nature." Moreover, marine ecosystem restoration is confronted with different forms of uncertainty, such as incomplete knowledge, unpredictability, and ambiguity, which must be managed by actors participating in restoration initiatives. The article's overall contribution is the synthesis of these components, which illuminates the specific governance challenges under various circumstances.

Read this paper on the Marine Policy journal website.



comingsoon

23 February - 2 March, 2019. ASLO 2019. Aquatic Science meeting. Planet water: challenges and successes, San Juan (Puerto Rico).

25-28 April, 2019. 6th International Conference on Coastal and Ocean Engineering, Bangkok (Thailand).

15-16 May, 2019. 4th International Conference on Coastal Zones & Ocean Sciences, Tokyo (Japan).

May, 2019. 3rd MERCES annual meeting, Paris (France).

7-12 July, 2019. 17th Meiofauna Conference, Évora (Portugal).

24-28 September, 2019. 8th World Conference on Ecological Restoration, Cape Town (South Africa).







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