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WP 8

Deliverable 8.2

## **D8.2: Annual publication of business-focused e-newsletters and final report synthesizing the MERCES business-focus e-newsletters as industry brief**

### **Marine Ecosystem Restoration in Changing European Seas MERCES**

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**LEAD BENEFICIARY: 11- UTARTU**

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#### **DISSEMINATION LEVEL**

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## Preface

Even though the MERCES project is drawing to a close, interest in the ecological restoration of marine ecosystems is expanding significantly. The EU and international governments are taking the restoration of degraded ecosystems and associated biodiversity and services very seriously. For example, the United Nations Decade on Ecosystem Restoration (2021-2030), the UN Decade on Ocean Science for Sustainable Development (2021-2030) and European Marine Strategy Framework (revised 2017) emphasize the importance of restoring marine and coastal ecosystems; and provide guidance how to meet the development of ocean resources in a sustainable manner. Many new projects are emerging that aim to innovative solutions for major ocean economic sectors, ranging from aquaculture, oil and gas installation to ocean energy (wind, wave, tidal ocean thermal energy and biofuels) (e.g. The EU Horizon 2020 project MARIBE - Marine Investment for the Blue Economy).

To address global restoration potential MERCES e-newsletters (2017-2020) focussed on increasing the awareness of the possibility to restore different marine ecosystems and to allow the rapid recovery of associated ecosystem services. Moreover, it is becoming apparent that restoration of marine ecosystems can be a business opportunity, thereby favouring sustainable green economic growth.

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## Introduction

MERCES WP8 facilitates and promotes multi-directional communication and knowledge transfer amongst key players in marine restoration, with a focus on industry and regulating authorities, driving new blue-growth business development by 1) stimulating new business opportunities for European marine environmental service companies; 2) knowledge transfer to businesses to give them a competitive edge; 3) learning from industry the art of the possible; 4) making the latest scientific advances in restoration easily understood for industry; 5) making European businesses aware of global opportunities in marine restoration. WP8 aims to be the ‘eyes and ears’ in how ecosystem restoration can promote new business opportunities identified in the European strategy for more growth and jobs, including a move to higher value niche coastal tourism through the restoration of the natural environment, and the restoration of fisheries through creative use of offshore renewable energy structures.

As part of the MERCES e-newsletters Business-focused e-newsletters were produced annually, addressing the latest research on restoration and related activities reported in the scientific literature, from shallow water to the deep sea. Each newsletter featured the latest planning and results from MERCES WPs and provided a platform for Business Club partners to state their views. The newsletters were mailed to all participants in the Business Club and available online in the MERCES Industry Portal throughout the project and beyond. The aim was to provide information on the latest science in a form that is easily understood. The e-newsletters also highlighted global business opportunities in marine restoration for European companies. To meet European Commission policies for growth and jobs, we targeted SMEs in the environmental management sector to boost their competitiveness. In particular, we focused on Small to Medium-sized Enterprises (SMEs) that, at present, support major coastal and offshore industries, to extend their business opportunities in ecosystem restoration. We monitored success through the number of new business case studies submitted to the MERCES e-newsletters and by the establishment of new collaborations and/or project ideas between industry and MERCES scientists. WP8 partners were co-leaders of science WPs and ensured the latest results from MERCES to be included in the e-newsletters. All e-newsletters were written in the style of industry briefs. In this final report we provide a short summary (a) of the most noteworthy content arising from the newsletters and (b) an overview of the content addressed in each newsletter, so that the reader is able to follow-up and locate further information on any desired content.

## Benefits of Newsletters

E-newsletters (newsletters hereafter) present a form online communication sent out to inform target audience of the latest news, tips and updates about a product, company or project development. The point of e-newsletters is to keep subscribers connected, engaged, and informed about what's new within the organization and often display completed milestones, progress and key performance indicators.

Newsletters strengthen, create, maintain and build relationships between stakeholders. This is because newsletters get right to an organization's target markets – to the people who have already shown interest in a product, are working with an organization or signing up to an organization's email list. By knowing the audience's preferences or interests, newsletters can address topics that the audience is interested in. Newsletters do this in a friendly, unobtrusive way, by informing and keeping the audience updated without overtly asking for a sale or contribution.

One big benefit of newsletters is that the sender designs all the content. As such newsletters can be used as an educational tool and a form of communication for policies and events. Newsletters can educate readers about new products, highlight employees, share successes and announce upcoming events or promotions. They even can serve as another advertising vehicle by offering coupons or specials only for those who read the newsletter, which is a smart way to track readership. If a company has received negative press or customer feedback, the newsletter is an ideal place to clear up misconceptions or explain a company's viewpoint.

Compared with other advertising and marketing vehicles, newsletters are relatively inexpensive to produce. Most newsletters are sent electronically, eliminating the cost of paper and postage stamps. A two-page or four-page newsletter doesn't require the addition of a new employee but can be worked into existing employees' workloads. Once the newsletter's format and scope have been determined - perhaps even outlining recurring columns - the newsletter becomes even easier to produce as time goes on. Due to the many apparent benefits of newsletters; in the MERCES project, this format was chosen as one of the main tools of knowledge transfer between the industry and scientific community where ideas, advancements and on ground project updates about marine restoration can be shared.

## Synthesis of newsletters

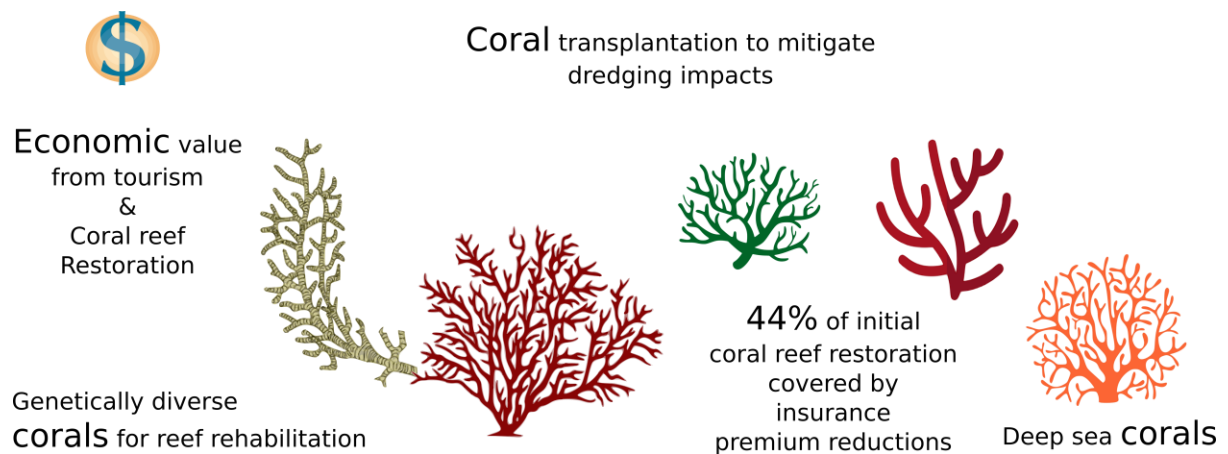
The MERCES Business e-Newsletters published in total 59 contributions (for details, see Annexes I-V). The most covered topics/study ecosystems through four newsletters were corals (n=7 out of 59), seagrasses (n=6), a combination of various coastal ecosystems (n=5) and politics and governance related contributions (n=4). Together these 4 topics represented 37% of the content within four newsletters. However, many more topics were addressed within the newsletters including oyster restoration and aquaculture with promising business opportunities; bioengineering of coastal wetlands; mitigating the impacts of port dredging; artificial reefs ('Biohuts') for fish nurseries as well as the potential of decommissioning offshore oil and gas structures as artificial reefs.

Using infographics (**Fig. 1-6**), brief descriptions of the restoration of corals, seagrasses, various coastal ecosystems and oyster beds, the use of Biodegradable Structures for Starting Ecosystems (BESE elements), and political and governance issues, we summarize what was reported in MERCES newsletters and highlight why these ecosystems are of great importance to ecological as well as socio-economic well-being.

### Corals

Corals are considered as one of the most diverse ecosystems on the planet covering approximately 0.1–0.5% of the ocean floor. It is estimated that almost a third of the world's marine fish are associated to corals through habitat provision or food-web interactions. More than 100 countries have coastlines with coral reefs and the livelihood of millions of people depend on coral reefs through seafood production, recreational possibilities, coastal protection as well as aesthetic and cultural well-being. About \$36 billion (annually) is related to coral reefs and their productivity to support marine and coastal tourism.

Within the MERCES project we reported results from recent cold and warm water coral restoration projects with cutting edge tools and technologies.

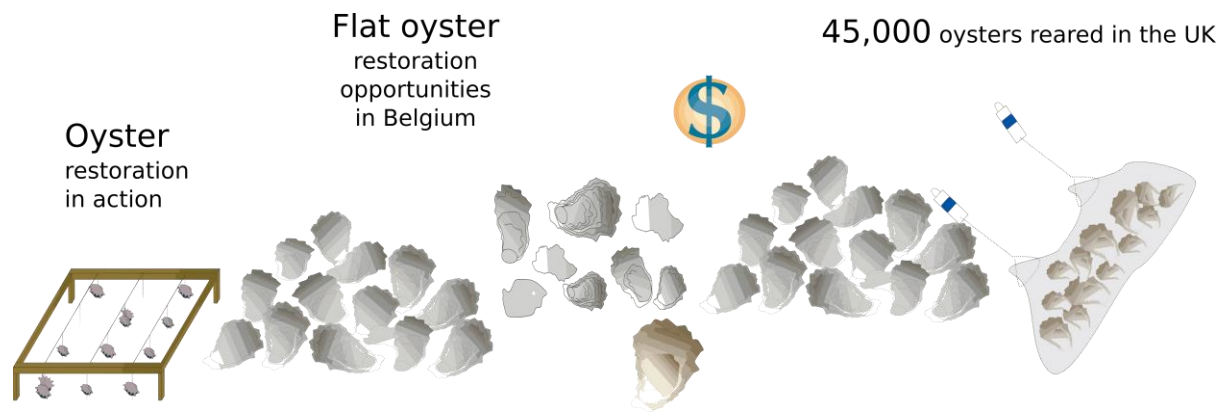


**Figure 1.** Coral ecosystem related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

## Oysters

The flat oyster (*Ostrea edulis*) is indigenous to Europe and once formed large reefs spreading out along almost all European coastlines. For centuries, these oysters supported flourishing ecosystems and supported oyster fisheries. Even the roman literature describes the collection of oyster spat (attached juveniles) from rocks and grow-out in ponds. Unfortunately, multiple factors, such as overfishing since the 18th century, cold winters in the 1960s and outbreaks of disease (e.g. *Bonamia*) in the 1980s devastated wild oyster reefs resulting in collapse of the stocks. This, in turn, made both harvesting of wild stocks and aquaculture of *O. edulis* impossible in most traditional rearing areas. Recently, renewed interest in the flat oyster has boosted the number of restoration projects and aquaculture.

In response to the state of the species and latest legislative measures, several *Ostrea edulis* restoration and management projects have been initiated across Europe. Accordingly, a study was carried out in 2018 to investigate the feasibility of native oyster restoration in the Belgian part of the North Sea.



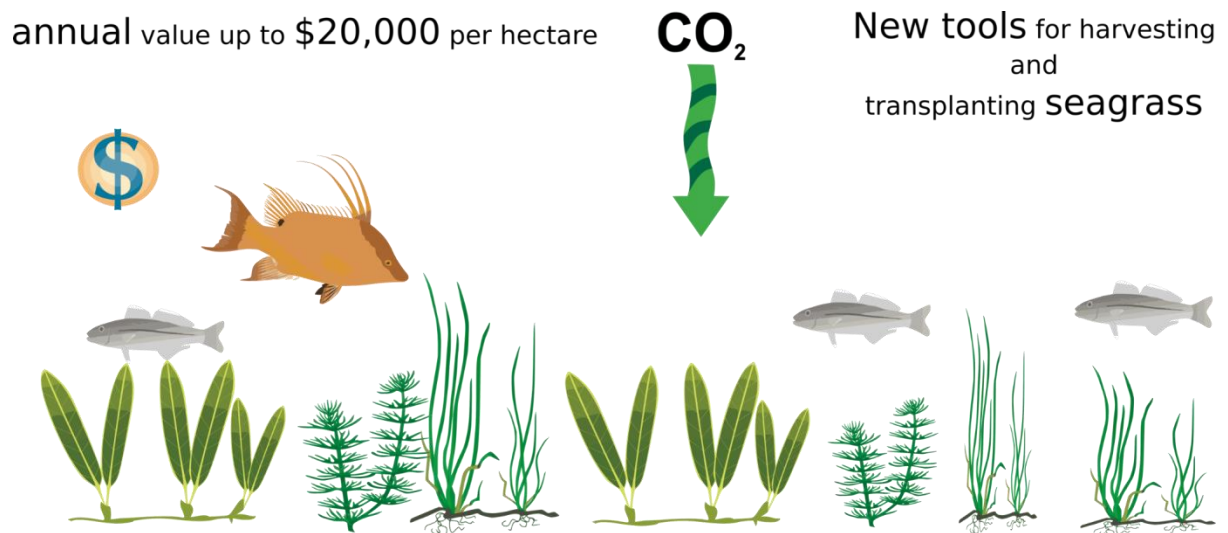
**Figure 2.** Various coastal ecosystem related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

## Seagrass

Seagrass ecosystems are critical for fish nursery and diet, carbon and nitrogen sequestration, coastal protection and biodiversity, yet they are one of the world's most threatened ecosystems. Seagrass is disappearing in many parts of the world at an alarming rate. Nearly 30% of the global seagrass area has been lost since the early 1900s and in some parts of the Swedish coast even more than 60% of seagrass has vanished since the 1980s. Such a significant decline is often related to management actions when short financial gain is prioritized over long-term sustainable solutions.

Seagrass beds are impacted by multiple stressors including nutrient pollution, sediment run-off, overfishing, dredging, and coastal development (docks, marinas, etc.). The global loss of seagrass ecosystems has led to a decline in key ecological functions and associated ecosystem service. This in turn negatively impact fisheries industry that is directly related to human well-being in the form of food, employment and revenue.





**Figure 3.** Seagrass ecosystem related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

## BESE elements

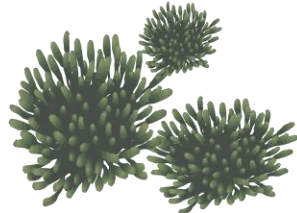
Despite the significant loss of seagrass and other coastal ecosystems; new tools such as Biodegradable Elements for Starting Ecosystems (BESE elements) might be able to mitigate human impact and provide effective restoration options. To test the applicability of biodegradable matrix structures for ecosystem restoration as part of the MERCES project, an international consortium consisting of developers, scientists, manufacturers and end users investigated the efficiency of the BESE elements to restore e.g. peat, saltmarsh, seagrass and shellfish reef habitat across Europe. The results show that nature-based restoration solutions that mimic properties of existing ecosystems can work effectively if applied at appropriate locations, proper spatial scales and a suitable manner of construction.

For example, global effort with MERCES partners, included conducting similar experiments on seagrasses across different climate zones (tropical and temperate seagrass) to investigate broad-scale patterns between seagrass and BESE elements. Results are showing that for seagrass; below-ground structures, that mimic root mats, facilitated transplant survival the most through stabilizing the sediment.

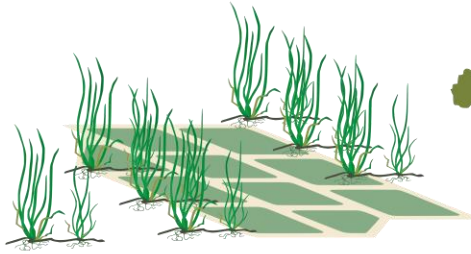


BESE elements: **Nature** based restoration systems  
that mimic the properties of  
ecosystems

Saltmarsh & Mussel  
restoration in action



Underground mats for stabilizing  
seagrass roots



Mangrove seedlings  
within BESE structure



**Figure 4.** BESE elements related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

## Various coastal ecosystems

Coastal areas, both intertidal and subtidal, are key for the economic development of our society. More than 60% of human population live near the coasts and a wide array of economic activities are developed there; tourism, fishing, transportation and power generation. There is a need to protect and restore coastal marine ecosystems against degradation while developing economic activities in these populated areas.

For example, marine and coastal tourism was the second-largest ocean-related economic sector in 2010, second only to offshore oil and gas. Ocean tourism includes beach tourism, recreational fishing, swimming, snorkeling, sports diving, whale watching, and cruises. The collective direct value of ocean tourism is estimated to be \$390 billion (2010) of which some \$36 billion (annually) is related to coral reef tourism. Ocean tourism is projected to be the most important marine industry by 2030.

Within MERCES; 128 sites distributed across 12 European countries were studied, including seagrass meadows, macroalgae beds, seamounts (with different coral species), coralligenous assemblages and kelp forests. As of September 2019, 44% of the selected case study sites were restored successfully. Overall results showed that seamounts had the highest success rate (75%), followed by coralligenous assemblages (58%), macroalgae beds (45%), seagrass meadows (34%) and kelp forests (25%).



## Coastal modification to fight against climate change



**Figure 5.** Various coastal ecosystem related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

### Policy and governance

Outlining relationships between ecosystem services, restoration potential and business opportunities can help resource users build their understanding and appreciation of the links between economies, social and cultural values and natural infrastructure. It can also help decision makers prioritize often limited conservation resources and rehabilitation measures.

The importance of natural resources in the context of regional as well as global governance is emphasized by the decision from the United Nations to declare 2021 -2030 to be the Decade of Ocean Science for Sustainable Development (UN Decade).

The core objective of the UN Decade is to improve the transfer of scientific knowledge to regions and groups with inadequate capacity and capability; particularly Small Island Developing States and the Least Developed Countries. As capacity building in ecological restoration is needed particularly in the coastal zone of developing and small island states the UN has also created the UN Decade for Ecosystem Restoration (2021-2030) to run concurrently with the UN Decade on Ocean Science. The UN Decade programmes, in their quest to mobilize resources and technological innovation to deliver key societal outcomes, are essential if successful large-scale restoration efforts are to be introduced. An open mind will be required to 1) build the capacity of scientists, institutions and industries, 2) develop

innovative science, techniques and tools to restore degraded marine ecosystem, and 3) educate resource users to use, maintain and adapt to the new integrate environmental management tools.

Global objectives such as the UN decadal goals will be addressed by Regional Seas governing bodies, such as The Baltic Marine Environment Protection Commission – also known as the Helsinki Commission (HELCOM). HELCOM’s vision for the future is a healthy Baltic Sea environment with diverse biological components functioning in balance, resulting in a good ecological status and supporting a wide range of sustainable economic and social activities. The Black Sea Commission shares vision with HELCOM while covering a regional sea in the southern part of Europe.

Elements of capacity development addressed in policy context can help to support restoration professionals and other stakeholders to think holistically in time, space and scale; moving from small scale marine ecosystem or taxa to the ocean-wide scale where diverse stakeholder interests can be considered, as well as societal trade-offs and socio-ecological heterogeneity attained.



**Figure 6.** Policy and governance related restoration topics addressed within MERCES newsletters (2017-2020). Photo source: <https://ian.umces.edu/imagelibrary/> & google image open source svg files.

# Annex I: Link and Contents of Business e-Newsletter, March 2020

Presents results and findings from: [http://www.merces-project.eu/sites/default/files/MERCES\\_BusinessNewsletter\\_04\\_HQ.pdf](http://www.merces-project.eu/sites/default/files/MERCES_BusinessNewsletter_04_HQ.pdf)

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3	Results of the ACCOBAMS survey of abundance and distribution of cetaceans in the Black Sea	2020	Regional seas	Black Sea	Cetaceans
4	Why is there so little policy support for re-using oil and gas installations as reefs in the North Sea?	2020	Regional seas	United Kingdom	Oil and gas installations

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<b>13</b>	The search effective nature-based restoration solutions that work	2020	Applications	Netherlands	BESE
<b>14</b>	Creating wetland habitat to deal with impacts of climate change – 5 years on	2020	Applications	United Kingdom	Various marine ecosystems
<b>15</b>	Is there economic value from tourism for coral reef restoration?	2020	Advancing knowledge	Global	Coral reef
<b>16</b>	Flat oyster aquaculture and restoration in offshore environments	2020	Advancing knowledge	Belgium	Oysters
<b>17</b>	The value of marine ecosystem restoration - Financing coastal resilience by combining nature-based risk reduction with insurance	2020	Advancing knowledge	Global	Coral reef
<b>18</b>	Recovery of mangrove ecosystem carbon stocks in abandoned shrimp ponds	2020	Advancing knowledge	Thailand	Mangrove
<b>19</b>	On the valuation of coastal restoration in the UK	2020	Advancing knowledge	England	Saltmarsh
<b>20</b>	Algal Forest Restoration In the MEDiterranean Sea (AFRIMED)	2020	Advancing knowledge	Mediterranean Sea	Algae

<b>21</b>	The Essex Native Oyster Restoration Initiative	2019	Applications	United Kingdom	Oyster
<b>22</b>	Urchinomics: The economics of restorative aquaculture	2019	Applications	company	Urchins
<b>23</b>	Protection and restoration combined: the experience at the Porto	2019	Applications	Mediterranean Sea	Marine protected area
<b>24</b>	Visualizing restoration of intertidal ecosystems	2019	Applications	company	Ecosystems
<b>25</b>	Human activities and pressures on key European marine habitats: An analysis of mapped resources	2019	MERCES project research	European	Human pressures
<b>26</b>	Ecological restoration of cold-water coral populations	2019	MERCES project research	Mediterranean Sea	Coral
<b>27</b>	Assessing ecological effects of restoration using dynamic food web modelling	2019	MERCES project research	Mediterranean Sea	Food web

<b>28</b>	An evaluation of restoration policies and practices	2019	MERCES project research	European	Policy and governance
<b>29</b>	Valuing Marine Ecosystem Services	2019	MERCES project research	European	Ecosystem services
<b>30</b>	Algal Forest Restoration In the MEDiterranean Sea (AFRIMED)	2019	Advancing knowledge	Mediterranean Sea	Algae
<b>31</b>	The feasibility of native oyster restoration in the Belgian part of the North Sea	2019	Advancing knowledge	Belgium	Oyster
<b>32</b>	River restoration for securing associated marine ecosystem components and the basis for their sustainable use	2019	Regional seas	Baltic Sea	Rivers
<b>33</b>	Improving the knowledge on the cetaceans populations in the Black Sea	2019	Regional seas	Black Sea	Cetaceans
<b>34</b>	Restoring coastal fisheries using artificial habitats	2018	Applications	France	Biohut

<b>35</b>	Coral reef restoration - The ‘Coral Engine’: the way for local communities to manage the long term and large-scale supply of genetically diverse corals for reef rehabilitation	2018	Applications	Netherlands	Coral
<b>36</b>	Collaborative restoration of deep-sea corals between fishermen and scientists	2018	Applications	Azores	Deep sea corals
<b>37</b>	Working with recreational diving businesses for marine ecosystem restoration: a promising partnership and business opportunity	2018	Applications	Mediterranean Sea	Recreational diving business
<b>38</b>	Rescuing seagrass beds - Project Indre Viksfjord (Norway)	2018	Applications	Norway	Seagrass
<b>39</b>	Restoration of marine ecosystems using natural biodegradable materials	2018	Applications	Netherlands	BESE
<b>40</b>	Kelp restoration – the seeded gravel approach	2018	Applications	Norway	Kelp
<b>41</b>	Review of best practice and economic costs of marine ecosystem restoration	2018	MERCES project research	Global	Restoration



<b>42</b>	Review of international governance structures and legal frameworks	2018	MERCES project research	Global	Policy and governance
<b>43</b>	Review of stakeholder perceptions on marine restoration	2018	MERCES project research	Europe	Stakeholder perception
<b>44</b>	Building industries at sea: 'Blue Growth' and the new maritime economy	2018	Advancing knowledge	Europe	Maritime economy
<b>45</b>	Assisted Evolution' to make restored coral communities resilient to bleaching events	2018	Advancing knowledge	Australia and Hawaii	Coral
<b>46</b>	Can bivalves help in seagrass restoration	2018	Advancing knowledge	Europe	Seagrass and bivalves
<b>47</b>	The management and restoration of eelgrass meadows: the zorro programme	2018	Advancing knowledge	Sweden	Seagrass
<b>48</b>	Private finance of kelp restoration	2018	Advancing knowledge	Norway	Kelp
<b>49</b>	Understanding and communicating best practices for river restoration in the Baltic Sea region	2018	Regional seas	Baltic Sea	River restoration

<b>50</b>	Coral transplantation to mitigate dredging impacts on coral reefs for a port development	2017	Advancing knowledge	Guadeloupe (France)	Coral
<b>51</b>	Innovative eelgrass restoration techniques: the NOVAGRASS project	2017	Advancing knowledge	Denmark	Seagrass
<b>52</b>	Valuing multiple eelgrass ecosystem services: fish production and uptake of carbon and nitrogen	2017	Advancing knowledge	Sweden	Seagrass
<b>53</b>	The importance of carbon budgets in marine ecosystem conservation and restoration	2017	Advancing knowledge	Global	Blue carbon ecosystems
<b>54</b>	Marine ecosystem restoration and management options for port operators	2017	Advancing knowledge	United Kingdom	Port
<b>55</b>	Delivering large habitat restoration schemes	2017	Advancing knowledge	United Kingdom	The Wildfowl and Wetlands Trust
<b>56</b>	Restoration of deep-water gorgonian forests on the Mediterranean continental shelf	2017	Advancing knowledge	Mediterranean Sea	Gorgonians

<b>57</b>	The importance of restoration actions in coastal marine habitats	2017	Advancing knowledge	Mediterranean Sea	Coastal ecosystems
<b>58</b>	Rigs to reefs? How oil and gas platforms might assist biological communities	2017	Advancing knowledge	Global	Oil and gas installations
<b>59</b>	Coordinated action by HELCOM to restore the rivers and streams of the Baltic Sea region	2017	Regional seas	Baltic Sea	Rivers