



Acronym: COLUMBUS

Title: Monitoring, Managing and Transferring Marine and Maritime
Knowledge for Sustainable Blue Growth

Grant agreement n° 652690

Relevant knowledge gathered in the framework of COLUMBUS project to address MSFD-Descriptor 10

Marine Litter

September 2017

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CONTENTS

| | |
|---|----|
| EXECUTIVE SUMMARY..... | 5 |
| FP7 PROJECTS WITH KNOWLEDGE OUTPUTS RELATED TO MSFD-D10..... | 7 |
| HERMIONE..... | 7 |
| NANOPLAST | 9 |
| MARMICROTOX | 10 |
| ECSAFESEAFOOD | 12 |
| BIOCLEAN..... | 14 |
| COMMON SENSE | 16 |
| MARLISCO..... | 18 |
| PERSEUS..... | 21 |
| CLEANSEA | 26 |
| N-CHITOPACK | 31 |
| FP7 PROJECTS RELATED TO MSFD-D10 | 33 |
| SEABIOPLAS | 33 |
| EUFIR | 33 |
| CONTAIN..... | 34 |
| ENNSATOX | 34 |
| EFFACE..... | 35 |
| MARS | 35 |
| FP 7 MSFD CROSS-CUTTING PROJECTS | 37 |
| STAGES..... | 37 |
| CSA OCEANS | 37 |
| ODEMM | 38 |
| DEVOTES..... | 38 |
| PROJECTS FUNDED BY OTHER EUROPEAN PROGRAMMES RELATED TO MSFD-D10..... | 40 |
| CM | 40 |
| POSEIDOMM..... | 40 |
| Sea Litter Critters..... | 40 |
| UPCYCLING THE OCEANS..... | 41 |



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| | |
|--|----|
| UTOFIA..... | 41 |
| TOPIOS..... | 42 |
| MICRO..... | 42 |
| DeFishGear | 43 |
| 3R FISH..... | 43 |
| AMMOS | 43 |
| GHOST..... | 44 |
| MERMAIDS | 44 |
| MARELITT..... | 45 |
| BASEMAN | 45 |
| EPHEMARE..... | 45 |
| PLASTOX | 46 |
| WEATHER-MIC..... | 46 |
| MARLIN..... | 46 |
| Sustainable Cruise | 47 |
| GES-REG..... | 47 |
| RETRAWL | 48 |
| HAPPY SEALS..... | 48 |
| CITYWATER | 49 |
| NATIONAL PROJECTS | 50 |
| FISHING FOR LITTER INITIATIVES..... | 50 |
| PESCAL..... | 50 |
| NPB | 51 |
| DOS MARES | 51 |
| OMAR | 52 |
| Development of concepts and methods for monitoring and assessing selected anthropogenic pressures for the MSFD | 52 |
| ME5209..... | 52 |
| POIZON | 53 |
| A Sea of Plastic..... | 54 |
| Recyship..... | 54 |



| | |
|-------------------------|----|
| Meere ohne Plastik..... | 55 |
| ME5415: MLM | 55 |
| ME5307..... | 55 |
| FLIRT | 56 |
| SMRG | 56 |
| MarViva | 57 |
| MPA Sinis 6 | 57 |



EXECUTIVE SUMMARY

This dossier provides a broad overview on how the knowledge generated from the Seventh Framework Programme for Research and Development (FP7) mainly and from other programmes such as H2020, LIFE, INTERREG, etc. funded by the European Commission, have addressed the Marine Strategy Framework Directive (MSFD)-Descriptor 10. *Marine Litter*.

European Projects have been grouped into four groups: the first one “Projects with results related to MSFD-D10”, includes FP7 projects from which knowledge outputs (KO)* were identified following the COLUMBUS knowledge transfer methodology. The other three groups include European projects of high relevance for this topic, but in this case KOs were not analysed specifically but could be further explored in case they are considered for an in-depth analysis. The second group lists other FP7 projects dealing with marine litter for which KOs were not analysed yet; the third, FP7 projects that provide support to the implementation of the MSFD considering cross-cutting issues for all MSFD descriptors, and promoting the ecosystem approach and the achievement of the Good Environmental Status. Finally, the fourth group describe projects funded by other European programmes of relevance for Descriptor 10.

















In addition to this, the dossier includes a section listing national initiatives funded by Member States that specifically tackle issues related with litter in marine environments.

The main information sources that were used for developing this dossier were: The EurOcean [Marine Knowledge Gate](#), the COLUMBUS assignment of projects to its structure of Competence Nodes, the COLUMBUS deliverable 5.3 “Overview of FP7 projects relevant to major Marine and Maritime Regulations: MSFD, MSPD and CFP and Blue Economy activities”, the STAGES Project Deliverable “State of the Art Report - Theme 3 Disturbances”, The EurOcean Marine Knowledge Gate, CORDIS, LIFE Programme repository and JPI-OCEANS project database.

Below, this dossier is providing a basic description of each project (and knowledge outputs, when they were identified). The knowledge outputs were classified into 8 different research lines that were represented by the following colours and icons:



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| LEGEND | | |
|---|---|--|
|  |  | Impacts of marine litter |
|  |  | Monitoring systems |
|  |  | Mapping/distribution of marine litter |
|  |  | Quantification of litter |
|  |  | Bioplastics and other biomaterials |
|  |  | Biorremediation and mitigation |
|  |  | Best practices and policy |
|  |  | Raise awareness, training and engagement with stakeholders |

***Knowledge Output:** A unit of knowledge or learning generated by or through research activity. They are not limited to de-novo or pioneering discoveries but may also include new methodologies/processes, adaptations, insights, alternative applications of prior know-how/ knowledge. Definition from the MarineTT project, precursor of STAGES and COLUMBUS.



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FP7 PROJECTS WITH KNOWLEDGE OUTPUTS RELATED TO MSFD-D10

HERMIONE

TITLE: Hotspot ecosystem research and Man's impact on European seas

PROGRAMME: FP7 **THEME:** ENVIRONMENT

START YEAR: 2009 **END YEAR:** 2012



PROJECT COORDINATOR: NERC - Natural Environment Research Council (United Kingdom)

WEBSITE: <http://www.eu-hermione.net/>

Contact Information: ppew@noc.soton.ac.uk

Short Abstract: The HERMIONE project was designed to make a major advance in our knowledge of the functioning of deep-sea ecosystems and their contribution to the production of goods and services. This was achieved through a highly interdisciplinary approach (including biologists, ecologists, microbiologists, biogeochemists, sedimentologists, physical oceanographers, modelers and socio-economists) that integrated biodiversity, specific adaptations and biological capacity in the context of a wide range of highly vulnerable deep-sea habitats. The study sites include the Arctic, North Atlantic and Mediterranean and cover a range of ecosystems including cold-water corals, canyons, cold and hot seeps, seamounts and open slopes and deep-basins.

More info at: http://cordis.europa.eu/project/rcn/92899_en.html

MAIN KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Services/Tools

Short Title: [Eye on Earth: Map-Book collection on marine litter: Plastics and more, down to the deepest corners](#)

Description: HERMIONE, in collaboration with the European Environment Agency, has prepared a series of Eye on Earth-based interactive 'Map Books' that display the HERMIONE studies of anthropogenic impacts in the deep sea. The collection includes 4 map books, one of them focused on impact of marine litter.



2. RTD Protocol/ Technical manual



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Short Title: Standard protocol for logging litter data for scientific use (no link available) 

Description: Protocol for quantification and/or qualification of marine litter on deep-sea ecosystems and environments. The development of the protocol allow for more systematic assessment and was applied and tested by scientists in a series of selected HERMIONE study areas.

Knowledge Type: RTD protocol/technical manual

3. Others (briefings)

Short Title: [Marine litter: A hidden threat to deep-sea ecosystems; Deep-sea brief](#) 

Description: Deep sea briefing principally intended to serve as an initial information source for policy-makers and government advisors on the threat posed by marine litter in deep-sea environments.

Short Title: [Dangerous litter in the deep-sea - munitions. Deep-sea briefs](#) 

Description: Deep Sea briefing principally it is intended to serve as an initial information source for policy-makers and government advisors on the threat posed by marine litter in deep-sea environments.

4. Scientific publications

Short Title: [Increase of litter at the Arctic deep-sea observatory HAUSGARTEN](#) 

Description: Research paper focused on the quantification of litter on the deep seafloor over time. The authors analysed images from the HAUSGARTEN observatory (79 N) taken in 2002, 2004, 2007, 2008 and 2011 (2500 m depth) and found an increase in the abundance of litter and reported its composition.

Short Title: [Litter in submarine canyons off the west coast of Portugal.](#) 

Description: Litter abundance and composition were investigated using video footage and still images from 16 Remotely Operated Vehicle (ROV) dives in Lisbon, Setúbal, Cascais and Nazaré Canyons located west of Portugal. The authors found that litter was most abundant at sites closest to the coastline and population centres, suggesting the majority of the litter was land sourced. Plastic was the dominant type of debris, followed by fishing gear.



NANOPLAST

TITLE: A computational study of the interaction between nanoplastic and model biological membranes

PROGRAMME: FP7 **THEME:** PLEOPLE – Marie Curie Actions

START YEAR: 2013 **END YEAR:** 2016

PROJECT COORDINATOR: UNIGE - University of Genoa (Italy)

WEBSITE: not available

Contact Information: ferrando@fisica.unige.it



Short Abstract: This project address a key step of the interaction of nanoplastics with model biological membranes and aims at understanding the physical and chemical basis for their toxicity in all living organisms. It proposes a computational study of the interaction between polymers of everyday use and model lipid membranes. The main goal os this project was to identify possible physical mechanisms of damage to the cell membrane induced by the interaction with plastic nanofragments.

More info at: http://cordis.europa.eu/project/rcn/109293_en.html

MAIN KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Software / modelling tools

Short Title: Molecular-models for hydrophobic polymers (no link available)



Description: Molecular-models for two common hydrophobic polymers, namely polypropylene (PP) and polyethylene (PE). The authors used the models to study the interaction of polymer nanoparticles with lipid membranes. The authors considered both homogeneous membranes, constituted by a single type of lipid molecules, and laterally heterogeneous membranes, made of a mixture of different lipids phase-separating into liquid-ordered and liquid-disordered phases. The latter, while posing more challenges from a technical point of view, are more realistic models of plasma membranes, whose lipid composition is extremely rich.

Short Title: Characterization of the behaviour of three hydrophobic polymers (no link available)



Description: Characterization of the behaviour of three hydrophobic polymers in model lipid bilayers: Polyethylene, polypropylene and polystyrene (PS). Each of them, when interacting with the membrane core, showed different behaviour. These changes of membrane structure and lipid lateral organization are potentially dangerous for the overall functioning of the membrane in the



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MARMICROTOX

TITLE: Marine microplastics toxicity: investigating microplastics and their co-contaminants in marine organisms

PROGRAMME: FP7 **THEME:** PLEOPLE – Marie Curie Actions

START YEAR: 2014 **END YEAR:** 2016

PROJECT COORDINATOR:

WEBSITE: <http://epaquatic.org/marmicrotox/>

Contact Information: t.henry@hw.ac.uk



Short Abstract: The goal of this project is to assess abundance and type of microplastics in wild mussels collected from sites on the coast of Scotland, as well as to conduct laboratory studies to investigate 1) accumulation, absorption, and negative effects of microplastics in mussels, 2) trophic transfer of microplastics and pathophysiology in fish and 3) effects of microplastics on co-contaminant bioavailability.

More info at: http://cordis.europa.eu/project/rcn/189925_en.html

MAIN KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Scientific publications

Short Title: [Optimization of a standard method for extraction of microplastics in mussels](#)



Description: Development and optimization of a standard method for extraction of microplastics in mussels by enzyme digestion of soft tissues.

Short Title: [Study of nanoplastics & microplastics](#)



Description: Pristine Micro- and Nano-Plastics Readily Form Microorg-Agglomerations in Sea Surface Simulated Conditions

Short Title: [Study of the distribution and quantification of microplastics present in mussels along the Scottish coast](#)



Description: Microplastics have been found in most coastal areas where their presence has been investigated, but little is yet known about the abundance and types present on the Scottish coast. Preliminary (unpublished) results from Scotland show that microplastics can be found both among sediments and in the lumen of fish digestive tracts, especially near urban areas.

Short Title: [Study of the effects of microplastics in marine mussels and use of mussels to assess their presence in the Scottish coast.](#)



Description: Effects of microplastics in marine mussels and use of mussels to assess their presence in the Scottish coast.



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Short Title: [Investigation of the trophic transfer of microplastics](#)



Description: Gut passage of microplastics and bioavailability of co-contaminants associated with microplastics in organisms exposed via diet or aqueous phase.



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ECSAFESEAFOOD

TITLE: Priority environmental contaminants in seafood: safety assessment, impact and public perception

PROGRAMME: FP7 **THEME:** KBBE – Food, Agriculture and Fisheries, and Biotechnology

START YEAR: 2013 **END YEAR:** 2017

PROJECT COORDINATOR: IPMA - Instituto Português do Mar e da Atmosfera



WEBSITE: <http://www.ecsafeseafood.eu/>

Contact Information: amarques@ipma.pt

Short Abstract: In order to increase seafood safety to consumers and reduce human health risks, ECsafeSEAFOOD aims to assess safety issues mainly related to non-regulated priority contaminants and evaluate their impact on public health. ECsafeSEAFOOD addresses these objectives with eight work packages (WPs) targeting priority environmental contaminants, including biotoxins from harmful algal blooms and marine litter.

More info at: http://cordis.europa.eu/project/rcn/105332_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Software / modelling tools

Short Title: [Online database about priority chemical contaminants \(literature sources and data\) in the marine environment](#)



Description: This online database collects all the information gathered from scientific literature and national and international monitoring programs concerning priority environmental contaminants. It is a useful monitoring tool for seafood risk assessment that enables to decide the contaminants to be monitored in seafood species.

2. Scientific publications

Short Title: [Effects of dietary microplastic exposure on the organ toxicity of a mixture of chemical contaminants in zebrafish](#)



Description: Effects of dietary exposure to microplastic and chemical contaminants on the organ toxicity of an aquatic animal model.

Short Title: [Environmental contaminants of emerging concern in seafood – European database on contaminant levels](#)



Description: The present paper reviews a selection of contaminants of emerging concern in seafood including toxic elements, endocrine disruptors, brominated flame retardants, pharmaceuticals and personal care products, polycyclic aromatic hydrocarbons and derivatives, microplastics and marine toxins.



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Short Title: [A critical view on microplastic quantification in aquatic organisms](#)



Description: The authors conducted a literature review on all available extraction and quantification methods. Two of these methods were used to evaluate the presence of microplastics in field-collected mussels (*Mytilus galloprovincialis*) from three different “hotspot” locations in Europe (Po estuary, Italy; Tagus estuary, Portugal; Ebro estuary, Spain).

3. Reports

Short Title: [Safe Sea Food – Guide for consumers](#)



Description: This Safe Seafood Guide aims to help consumers understand the benefits and risks associated with the seafood they eat. It includes recommendations to help reduce possible risks of seafood contamination.

Short Title: [Safe Sea Food – Guide for industry - Emerging chemical contaminants in seafood](#)



Description: This Safe Seafood Guide aims to assist the seafood industry, from harvesters and producers through to wholesalers, distribution, retailers and analytical laboratories, in assessing health risks associated with seafood provision.

Short Title: [Safe Sea Food – Guide for policymakers – Emerging chemical contaminants in seafood](#)



Description: This guide informs policymakers and food safety authorities of the latest seafood safety research results hoping this information will contribute to European science-based food safety regulation, specifically in relation to newly emerging chemical contaminants which have not yet been regulated.



BIOCLEAN

TITLE: New BIOtechnologiCaL approaches for biodegrading and promoting the environmEntal biotrAnsformation of syNthetic polymeric materials

PROGRAMME: FP7

THEME: KBBE – Food, Agriculture and Fisheries,

and Biotechnology

START YEAR: 2012

END YEAR: 2015

PROJECT COORDINATOR: UNIBO - (Italy)



WEBSITE: <http://www.biocleanproject.eu/>

Contact Information: fabio.fava@unibo.it

Short Abstract: BIOCLEAR intends to find smart and robust biotechnological solutions for the degradation and detoxification of: 1) Plastic waste existing landfills, 2) Plastic fragments entering waste composting and anaerobic digestors, 3) Plastic fragments occurring in marine habitats, thus contributing to mitigate the current impact of plastics in marine ecosystems.

More info at: http://cordis.europa.eu/project/rcn/104337_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. RTD Protocol/Technical manual

Short Title: Lab- and pilot-scale bioaugmentation protocols to improve native biodegradation of plastics under actual site terrestrial and marine conditions



Description: Lab and pilot-scale bioaugmentation protocols for intensifying (micro)plastics biodegradation in soils, composting/anaerobic waste treatment facilities and marine environments. Some protocols displayed limited or no bioremediation enhancements but the protocols developed for assessing the activity deserve scientific and technological interest.

2. Guidelines/ Standards

Short Title: Site-specific measures for mitigating plastic pollution in the Aegean Sea (no link available)



Description: Site-specific measures for mitigating plastic pollution and improving the environmental status of Aegean Sea.

3. Product

Short Title: Novel plastic-degrading bacteria/fungi (no link available)




Description: Novel robust bacteria and fungi able to partially degrade/transform films of plastics of polyethylene (PE)(5 cultures), polypropylene (PP)(5 cultures), polyvinyl chloride (PVC)(14 cultures) and polystyrene (PS) (1 cultures) as well as some of their additives (3-4 cultures).




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4. Scientific publications


Short Title: Scientific understanding to develop tailored mechanisms to degrade plastics (no link available) 

Description: Degradation mechanisms and potential towards PE (as well as LDPE and LLDPE), PP, PVC and PS plastic films and their additives by newly enriched/isolated, naturally-occurring bacteria and fungi obtained from plastic waste coming from landfills, industrial sites, composting and anaerobic digestion facilities as well as from the Aegean and the Northern seas. The mineralization of PS by *Penicillium variable* was demonstrated using ¹⁴C-labelled PS.


5. Others

Short Title: Pilot scale biological and hybrid physical/chemical-biological processes to biodegrade/valorise PE, PS, PP and PVC plastics (no link available) 

Description: Pilot-scale biological or hybrid chemical/physical-biological processes for the degradation of PE, PS, PP and PVC films. Remarkable biodegradation rate and extents were observed on PVC and, to less extents, on PE (LDPE, LLDPE) and PP plastic films

Short Title: New understanding of the potential of fungi and bacteria to degrade plastics (no link available) 

Description: Biodegradation potential and specificity towards polyethylene (PE)(and its variants Low Density PE (LDPE) and Linear Low Density PE (LLDPE)), polypropylene (PP), polyvinyl chloride (PVC) and polystyrene (PS) plastic films and their additives by newly enriched/isolated, naturally-occurring bacteria and fungi obtained from plastic waste from landfills, industrial sites, composting and anaerobic digestion facilities as well as from the Aegean and the Northern seas.

Short Title: Pilot scale pre-treatments to improve the potential of plastic degradation Mechanisms (no link available) 

Description: New, pilot-scale thermal, O₃-, gamma- and UV-based pretreatments lowering molecular weight and improving bioavailability and biodegradability of polyethylene (PE, LDPE, LLPDE), polypropylene (PP) and polystyrene (PS) plastics.



COMMON SENSE

TITLE: Cost-effective sensors, interoperable with international existing ocean observing systems, to meet EU policies requirements

PROGRAMME: FP7 **THEME:** ENVIRONMENT – Environment
(including Climate change)

START YEAR: 2013 **END YEAR:** 2017

PROJECT COORDINATOR:

WEBSITE: <http://www.commonsenseproject.eu/>

Contact Information: leimar@leit.at



Short Abstract: COMMON SENSE supports the implementation of European Union marine policies such as the Marine Strategy Framework Directive (MSFD) and the Common Fisheries Policy (CFP). The project, directly respond to requests for integrated and effective data acquisition systems and monitoring of the marine environment by developing innovative sensors. It is focused on GES Descriptors 5, 8, 10 and 11.

More info at: http://cordis.europa.eu/project/rcn/110790_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Prototype

Short Title: [COMMON SENSE Microplastics Analyzer and Mini Sea Sampling System \(MISS\)](#)



Description: The project has developed prototypes of in situ next generation marine monitoring sensors that will increase the availability of standardised data on microplastics and other parameters.

2. Reports

Short Title: [Report on how current and future monitoring efforts related to eutrophication, marine litter, contaminants and noise address MSFD needs effectively and efficiently \(deliverable 1.2\)](#)



Description: This report provides background information and an up-to-date status assessment on indicators and monitoring efforts concerning GES descriptors tackled by the COMMON SENSE project (D5, D8, D10 and D11).


Short Title: [Review on the available methodological standards and gaps to be covered in order to meet the MSFD requirements. \(Deliverable 1.1\)](#)



Description: The aim of this report is to provide an overview on the available methodological standards and gaps to be covered in order to meet the MSFD requirements for the descriptors/indicators tackled by the COMMON SENSE Project (D5, D8, D10, D11).




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Short Title: [Possibilities of integration of monitoring requirements by other EU and national legislation. \(Deliverable 1.3\)](#) 

Description: This report provides an inventory of regulations, directive and conventions having potential influence on sensors design, measurement and monitoring methodologies development having potential influence on sensors design processes.

Short Title: [Review of existing and operable observing systems and sensors. \(Deliverable 1.4\)](#) 

Description: Comprehensive analysis of the existing sensors and technologies currently widespread adopted in marine environment monitoring.

Short Title: [Analysis of relevant technical issues and deficiencies of the existing sensors and related initiatives currently set and working in marine environment. New generation technologies for cost-effect. \(Deliverable 2.1\)](#) 

Description: analysis of state-of-the-art solutions for the different sensors and data platforms related with COMMONSENSE project.

Short Title: [Procedures of sensors deployment methodology on physical supports/platforms. \(Deliverable 2.2\)](#) 

Description: definition of the characteristics and procedures of sensors deployment methodology on physical supports/platforms, possible needs and characteristics of the available platform.

3. Services/Tools

Short Title: Common sensor Web Platform (CSWP) 

Description: the CSWP is the software platform that will integrate the COMMON SENSE sensor data and observations and deliver them to the Web, in standard formats and through standard interfaces.

Link: The CSWP is illustrated in 4 Project deliverables:

<http://www.commonsenseproject.eu/images/CommonSense/Deliverables/D3.1.pdf>

http://www.commonsenseproject.eu/images/CommonSense/Deliverables/13-I-016_D3.2_Sensor_Data_Management_Module.pdf

<http://www.commonsenseproject.eu/images/CommonSense/Deliverables/CS-D3.3.pdf>

http://www.commonsenseproject.eu/images/CommonSense/Deliverables/D3_4.pdf



MARLISCO

TITLE: MARine Litter in Europe Seas: Social Awareness and CO-Responsibility

PROGRAMME: FP7 **THEME:** SIS – Science in Society

START YEAR: 2012 **END YEAR:** 2015

PROJECT COORDINATOR: Provincia di Teramo (Italy)

WEBSITE: <http://www.marlisco.eu/>
marlisco@provincia.teramo.it

Contact Information: d.calilli@provincia.teramo.it;



PROVINCIA
DI TERAMO

Short Abstract: MARLISCO's overarching goal is to raise public awareness, facilitate dialogue and promote co-responsibility among the different actors towards a joint vision for the sustainable management of marine litter across all European seas.

More info at: http://cordis.europa.eu/project/rcn/103611_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Reports

Short Title: [Understanding of the distribution quantities and types of marine litter.](#)



Description: The report aims to review the current state of information and understanding in the distribution, quantities and types of marine litter in European Seas.

Short Title: [Methods to Monitor and Assess Marine Litter](#)



Description: this report provides an overview and summary of possible approaches, internationally agreed monitoring methods and protocols.

Short Title: [Policies that may be applied to mitigate the impact of marine litter](#)



Description: This report examines which actions and policies specifically designed to deal with marine litter reduction may be associated with legally-binding or 'hard' mechanisms (implemented under international, regional, EU or national legislation) or non-legally-binding 'soft' mechanisms, under a range of formal or informal agreements.

Short Title: [Baseline evaluation of stakeholder perceptions and attitudes towards issues surrounding marine litter](#)



Description: The baseline evaluation provides a "snapshot" of societal awareness and perceptions about marine litter across Europe, and trends across a range of stakeholder groups.



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Short Title: [The MARLISCO Best Practice Guide](#) 

Description: This guide was developed to provide an overview of the types of activities that different stakeholders could implement to reduce marine litter.

Short Title: [How to communicate with stakeholders about marine litter - a short guide to influencing behavioural change](#) 

Description: This deliverable provides a guide to communicating with stakeholders about the issue of marine litter and influencing behavioural change.

Short Title: [Outcomes for each of the twelve national events and for all four regional seas](#) 


Description: This report evaluates the forum format as a tool to engage stakeholders across Europe. The report provides an overview of the MARLISCO marine litter fora and summarises their outcomes across Europe and within a regional seas context relating to regional seas conventions and activities with remits to issues of marine litter.

Short Title: [Evaluation of specific educational and outreach activities related to marine litter](#) 

Description: This report deliverable documents the development of four European-wide surveys to measure the impact of participation in specific outreach and educational activities on individuals' attitudes and behaviours regarding marine litter.

Short Title: [Marine Litter Targeted Brochure](#) 

Description: A brochure targeted to citizens, mainly in their professional capacity but also as individuals, has been developed entitled "Stopping marine litter together! Each and every one of us can contribute in keeping our coasts and seas litter free! ".

Short Title: [MARLISCO Recommendations for science and society interactions: A case study from ML](#) 

Description: This document encompasses the results of the MARLISCO effort to address this need, while distilling lessons learned and recommendations drawn by the project's innovative approaches to connect science to society, using the emerging threat of marine litter as a vehicle.

2. Scientific publications



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Short Title: [A novel best practices approach: The MARLISCO case, DeCyDe-4-MARLISCO](#) 

Description: Identification and evaluation of best practices that can effectively minimise the amount of marine litter in European Seas is presented. The practices served as a tool to enhance the active participation and build capacity in key actors through the implementation of the innovative, dedicatedly-developed decision support tool, DeCyDe-4-Marlisco.

Short Title: [MPB article Enhancing public awareness and promoting co-responsibility for marine litter in Europe: The challenge of MARLISCO](#) 

Description: This paper summarises MARLISCO's approach and highlights a selection of outcomes.

3. Services/Tools

Short Title: [Marine Litter database](#)  

Description: It is an interactive database, developed to collate all the litter data that partners have captured during the project as a result of the clean-up activities initiated to raise awareness about the marine litter issue. The database has been developed with an interactive map interface that allows the user to pinpoint the clean-up locations. The database also allows users to interrogate the data to get information on specific types of waste or specific locations.

4. Training activities/learning modules

Short Title: [MARLISCO Educational packs](#) 

Description: Educational material prepared to inform, sensitise and enable European teachers and students to take action to tackle the problem of litter in our seas and coasts.

Knowledge Type: Training activity / Learning module

Other KOs: 

[MARLISCO awareness exhibition](#)

[MARLISCO European Video Contest](#)

[Interactive web documentary: troubled waters](#)

[Animation: Sources & impacts of marine litter](#)

[Sea Dream Team: A serious game on marine litter for youngsters](#)



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PERSEUS

TITLE: Policy-oriented marine Environmental Research in the Southern European Seas

PROGRAMME: FP7 **THEME:** ENVIRONMENT –

Environment (including Climate change)

START YEAR: 2012 **END YEAR:** 2015

PROJECT COORDINATOR: HCMR - Hellenic Centre for Marine Research (Greece)

WEBSITE: <http://www.perseus-net.eu>

Contact Information: vpapath@hcmr.gr



Short Abstract: The overall scientific objectives of PERSEUS are to identify the interacting patterns of natural and human-derived pressures on the Mediterranean and Black Seas, assess their impact on marine ecosystems and, using the objectives and principles of the Marine Strategy Framework Directive as a vehicle, to design an effective and innovative research governance framework based on sound scientific knowledge.

More info at: http://cordis.europa.eu/project/rcn/102043_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Scientific publications

Short Title: [A comparative study of marine litter on the seafloor of coastal areas in the Eastern Mediterranean and Black Seas](#)



Description: Surveys in the Mediterranean and the Black Sea showed that the majority of floating litter items or debris collected on the sea bottom were made of plastic often exceeding the global average of 80%.

Short Title: [The situation of marine litter collected during demersal surveys in 2012 in the Romanian Black Sea area.](#)



Description: Romania, through the national pelagic and demersal fish species status evaluation program, was favoured by trawling operations performed on the seabed to obtain data which allowed the quantitative and qualitative assessment of such wastes in the areas of activity.

Short Title: [Marine litter distribution and density in the Mediterranean Sea, Noreastern Atlantic Ocean and Artic Ocean](#)



Description: First assessment of composition, spatial distribution and source of litter and microplastics from the slope to deep basins in European Seas



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Short Title: [MSFD complementary approach for the assessment of pressures, knowledge and data gaps in Southern European Seas](#)

Description: A meta-analysis of existing literature on pressure/impact/knowledge gaps summarized in tables related to the MSFD descriptors, discriminating open waters from coastal area is adopted (MSFD do not discriminate coastal vs open waters on the Initial Assessment). Moreover a comparative assessment of the Initial Assessments of five Southern European Seas (SES) countries has been also independently is performed.

Short Title: [Marine Litter Watch App as a Tool for Ecological Education and Awareness Raising along the Romanian Black Sea Coast](#)

Description: Marine Litter Watch offers tools to collect and share comparable data on marine litter on beaches. It also provides a platform for marine litter communities to come together, share their knowledge and co-create approaches to monitoring marine litter. NIMRD included in the programme surveys of three Romanian beaches.

Short Title: [Use of ROV for assessing marine litter on the seafloor of Saronikos Gulf \(Greece\): a way to fill data gaps and deliver environmental education](#)

Description: Visual census of marine litter on the seafloor of the Saronikos Gulf (Greece). The abundance and qualitative composition of benthic marine litter were investigated in two selected locations of the Saronikos Gulf with a ROV.

Short Title: [Marine litter on the Slovenian seafloor](#) (MSc Thesis)

Description: In this research, which is actually the first of its kind in Slovenia, is presented a draft methodology monitoring of waste on the seabed in the southeastern part of the Gulf of Trieste, with the help of diving and shooting observed waste on the seabed. The most common were plastic wastes, metal, rubber.

Short Title: Marine litter along the Romanian Black Sea Coast (no link available)

Description: Tiganov G., Galațchi M., Anton E., Oprea L., Coprean D., 2015. The Outline of Marine Litter Collected During Demersal Fishing Surveys in the Period 2011 - 2014 along the Romanian Black Sea Coast. The annales of "Dunarea de Jos" University of Galati. Fascicle VII – Fishing and aquaculture. ISSN – 4582: in press.



Short Title: [Marine litter on the floor of deep submarine canyons of the Northwestern Mediterranean Sea: The role of hydrodynamic processes](#)

Description: This study is based on direct observation of the seafloor by means of Remotely Operated Vehicle (ROV) dives and reports litter abundance, type and distribution in three large submarine canyons of the NW Mediterranean Sea, namely Cap de Creus, La Fonera and Blanes canyons. The ultimate objective is establishing the links between active hydrodynamic processes and litter distribution.

Short Title: [Assessment of Marine Litter in the Eastern Mediterranean Sea: A multi-perspective approach \(PhD Thesis\).](#)

Description: Marine litter was investigated in the underwater environment of selected areas in the Eastern Mediterranean (Greece, Cyprus) and the Black Sea (Romania). Different sampling methods were used, namely bottom and bottom trawl and underwater remote-controlled vehicles (ROV).

Short Title: [Analysis of submarine canyon systems in contrasting continental margins, and their role in the transport and accumulation of marine litter \(PhD Thesis\).](#)

Description: This PhD Thesis investigated six submarine canyons located in the central (Foix submarine canyon) and north (Cap de Creus, la Fonera and Blanes submarine canyons) Catalan continental margins, and in the continental margin of Southern California (Santa Monica and Redondo submarine canyons). The main aim has been to improve the understanding of sediment transport processes within the canyons, unveil the resulting morphologies, and illuminate their role in the transfer and accumulation of marine litter.

Short Title: [Mediterranean marine biodiversity under threat: Reviewing influence of marine litter on species.](#)

Description: The extent of marine litter in the Mediterranean Basin has been revealed by a new study. Researchers reviewed previous studies to show that the northwest Mediterranean Sea is a hotspot for plastic debris. They found that marine litter harmed 134 species in the Mediterranean Sea and call for more to be done to manage the growing problem of debris, especially plastics, littering the Sea.

Other links: <https://www.ncbi.nlm.nih.gov/pubmed/26183308>

2. Reports & guides

Short Title: Impact of pollution (including contaminants, litter and noise) on coastal ecosystems in the SES (deliverable 2.7) - (no link available)

Description: Not available



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Short Title: [PERSEUS Policy brief](#) 

Description: The PERSEUS Policy Brief focuses on translating the new knowledge gained into meaningful recommendations for policy makers so as to protect and manage the Mediterranean and Black sea.

Short Title: [Marine litter and unsustainable tourism as threads towards achieving CLEAN SEAS by 2020](#) 

Description: Results and final declaration after the Interactive Stakeholders Session “Blue Growth for Green Cities: Documenting Anthropogenic Impacts and suggesting Policy Options”, organized by PERSEUS within the “International Congress on Green Infrastructure and Sustainable Societies / Cities (GreInSus)” (Izmir, 8-10 May 2014), explored the relation of Marine Litter and Tourism as threats towards achieving Clean Seas by 2020.

Short Title: [Identified gaps on MSFD assessment elements](#) 

Description: The target of this deliverable (D5.2) is to synthesize and analyze the elements provided in the Deliverable 5.1 “Compilation of reviewed EU marine environmental status assessments” and discussed during the PERSEUS Umbrella Workshop (Barcelona, 22-23 January 2013), aiming to identify main methodological approaches and eventual gaps in data availability and knowledge

Short Title: Overview of the status of each MSFD indicator (Deliverable 5.3) – no link available 

Description: Overview of the status of each MSFD indicator regarding its capability to provide a coherent assessment through the Synthetic Tree Diagrams, by graphically showing the different methodological options considered by the respective EU countries in the Mediterranean and Black SeaS.

Short Title: [Clean Seas Communication & Outreach Best Practice Guide](#) 

Description: This guide is addressed to policy and decision makers, who are encouraged to integrate awareness raising and communication campaigns as a key policy measure with a view to stimulating the change in behaviour of citizens to adopt eco-friendly practices.

3. Others

Short Title: [Marine Litter Watch \(MLW\) Campaign](#) 

Description: PERSEUS recognizes Marine Litter as an important environmental threat. After participating in the pilot testing of the smartphone application Marine LitterWatch (MLW), developed by the European Environment Agency (EEA) during the summer season of 2013, PERSEUS is now creating an extensive survey network dedicated on beach marine litter, by launching the PERSEUS-MLW campaign.



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Short Title: [Marine litter - a growing threat in our seas](#)

Description: Marine litter in the Mediterranean and Black Sea.



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CLEANSEA

TITLE: Towards a Clean, Litter-Free European Marine Environment through Scientific Evidence, Innovative Tools and Good Governance

PROGRAMME: FP7 **THEME:** ENVIRONMENT –
Environment (including Climate change)

START YEAR: 2013 **END YEAR:** 2015

PROJECT COORDINATOR: VU-VUmc Foundation (Netherlands)

WEBSITE: <http://www.cleansea-project.eu/>

Contact Information: heather.leslie@vu.nl



Short Abstract: CLEANSEA aims to generate new information on the impacts (biological, social and economic) of marine litter, develop novel tools needed to collect and monitor litter and protocols needed for monitoring data (litter composition and quantities) and evaluate the impact of mitigation strategies and measures in order to provide options to policy makers in the EU.

More info at: http://cordis.europa.eu/project/rcn/106632_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Prototypes

Short Title: [Microplastics sampling equipment](#)

Description: Hyperspectral imaging and data analysis for detecting and determining plastic contamination in seawater filtrates.



2. Software / modelling tool

Short Title: Model for microplastic transport and for pelagic ecosystem with microplastic contamination in the North Sea (no link available)

Description: North Sea region models developed and run for i) microplastics transport from estuaries to the sea and ii) for the pelagic ecosystem under influence of microplastic contamination. (lead partner: Deltares)



3. Scientific publications



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Short Title: [Plastic litter in the Sea](#)



Description: On June 2013 a workshop at the University of Siena (Italy) was organized to review current knowledge and to clarify what is known, and what remains to be investigated, concerning plastic litter in the sea. The content of the workshop was designed to contribute further to the European Marine Strategy Framework Directive (MSFD) following an inaugural workshop in 2012. Here it is reported a number of statements relevant to policymakers and scientists that was overwhelming agreement from the participants.

Short Title: [Sea turtles as litter monitors](#)



Description: The analysis of existing data reveal the potential and suitability of some higher trophic level organisms (fish, turtles, birds and mammals) for monitoring the adverse effects of litter. Sea turtles appear to be useful indicator species.

Short title: [Exploring the potential of large vertebrates as early warning sentinels of threats to marine ecosystems, human health and wellbeing](#)



Description: Not available

Short Title: [Evidence that ventilation takes up microplastics in crabs](#)



Description: Ingested polystyrene microspheres were retained within the body tissues of shore crabs for up to 21 days following inspiration across the gill, identifying ventilation as a route of uptake of microplastics into a common marine nonfilter feeding species.

Short Title: [Micro- and nano-plastics and human health.](#)



Description: In this article, some of the most widely encountered plastics in everyday use are identified and their potential hazards listed. Different routes of exposure to human populations, both of plastic additives, microplastics and nanoplastics from food items and from discarded debris are discussed. Risks associated with plastics and additives considered to be of most concern for human health are identified. Finally, some recent developments in delivering a new generation of safer, more sustainable polymers are considered.

Short Title: [Plastic hosts bacteria and may play role in their transportation](#)



Description: Bacterial community composition on plastics in seawater varies widely and differs from those of sediment and seawater, indicating that plastics represent a distinct environmental niche and shedding light on the possible role of plastic as transport vehicle for bacteria through the aquatic environment.



Short Title: River and shipping role in litter on Romanian coast (no link available) 

Description: Black Sea seabed monitoring shows ports, river input fisheries and shipping contribute to marine litter on the Romanian coast. (Poster “The Outline of Marine Litter Collected during Demersal Fishing Surveys Organized in the Period 2011 – 2014 along the Romanian Black Sea Coast” presented at the PERSEUS Project Conference “Integrated marine research in the Mediterranean and the Black Sea”)

Short Title: [Bacterial community profiling of plastic litter in the Belgian part of the North Sea](#) 

Description: In this study, sea floor MPL was sampled at different locations across the Belgian part of the North Sea to study bacterial community structure using 16S metabarcoding.

Short Title: [Economic instruments and marine litter control](#) 

Description: Literature review of economic and other instruments to reduce marine litter in the four regional seas. They were analysed following effectiveness multi-criteria (cost, effectiveness, indirect effects).

Short Title: [Do plastic particles affect microalgal photosynthesis and growth?](#) 

Description: Study of the potential effects of plastics on microalgae. The authors selected polystyrene particles, both negatively charged and uncharged, and three different sizes (0.05, 0.5 and 6 µm) for testing the effects of size and material properties.

Short Title: [The Outline of Marine Litter Collected During Demersal Fishing Surveys in the Period 2011 - 2014 along the Romanian Black Sea Coast](#) (no direct link available) 

Description: Black Sea seabed monitoring shows ports, river input fisheries and shipping contribute to marine litter on the Romanian coast. (Poster “The Outline of Marine Litter Collected during Demersal Fishing Surveys Organized in the Period 2011 – 2014 along the Romanian Black Sea Coast” presented at the PERSEUS Project Conference “Integrated marine research in the Mediterranean and the Black Sea”)

Short Title: [The Situation of Marine Litter Collected During Demersal Surveys in 2012 in the Romanian Black Sea Area.](#) 

Description: Romania, through the national pelagic and demersal fish species status evaluation program, was favoured by trawling operations performed on the seabed to obtain data related to marine litter on the sea bed. This allowed the quantitative and qualitative assessment of such wastes in the areas of activity.



Short Title: [Scientific paper portfolio](#)



Description: This deliverable aims to present and give access in a consistent manner to CleanSea project research scientific results, which have been or are about to be published as scientific papers in peer reviewed journals. It includes a list of scientific papers that are still in preparation or under review.

4. Reports

Short Title: [Availability of policy instruments to reduce marine litter](#)



Description: A wide range of economic policy instruments is available to prevent and reduce marine litter; their applicability (stand-alone or as part of a policy mix) depends on the specific conditions and circumstances.

Short Title: Willingness to pay for clean Black, North and Mediterranean Sea beaches
(no link available)



Description: Studies gathered evidence for a willingness to pay for clean Black, North and Mediterranean Sea beaches, indicating that marine litter on beaches negatively affects welfare and showing policy makers the potential benefits of measures to reduce marine litter.

Short title: Workshops and measures preferences expressed by stakeholders
(no link available)



Description: Regional Mediterranean participatory and National Spanish workshops on effectiveness and feasibility of measures addressing specific marine litter types at specific products life cycle stages. Results highlights stakeholder's preferences on measures to abate marine litter.

Short Title: [A Portfolio of Marine Litter Policy Options](#)



Description: This report provides a portfolio of policy options for the relevant authorities at multiple levels in the four EU marine regions: the Mediterranean Sea, Black Sea, Baltic Sea and the North East Atlantic. These options aim to prevent and reduce marine litter and, in particular, to support the implementation of the Marine Strategy Framework Directive¹ (MSFD).

Short Title: [Best practice examples of existing economic policy instruments and potential new economic policy instruments to reduce marine litter and eliminate barriers to GES.](#)



Description: This policy brief provides a critical review and assessment of potential measures to reduce marine litter. The focus of this brief is on existing economic instruments implemented in Europe. It aims to point to critical factors which influence the appropriateness and effectiveness of economic instruments.



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Short Title: [Best practices for marine litter reduction in the EU.](#)



Description: CleanSea partners catalogued and evaluated the potential of voluntary institutional arrangements, understood here as good and best practices, in reducing marine litter in the four European regional seas.

5. Product

Short Title: [Magazine what happens to marine litter it its effects](#)



Description: Magazine on project research findings quantities, fate and distributions of marine litter in the environment and biota, including eco-toxicological impacts, socioeconomic costs of marine litter, policy measures.

6. Multimedia

Short Title: [CLEANSEA Documentary Film](#)



Description: CleanSea documentary film (20 min) explores some of the impacts of marine litter - including even the micro-sized bits of plastic. We see how an interdisciplinary team thinks about the issue in ways that haven't been thought about before, and conclude that a combination of individual actions, technologies, voluntary measures by the private sector and government policies such as those promoting a circular economy are going to come in handy, but these activities are going to have difficulty to take root unless some more transformative changes take place in our social, political and financial systems.

7. Other

Short Title: Biota contamination (link to KO not available)



Description: Microplastic contamination of biota especially high in filter feeding marine and estuarine organisms demonstrated (lead partner: VU Amsterdam)



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N-CHITOPACK

TITLE: Sustainable technologies for the production of biodegradable materials based on natural chitin-nanofibrils derived by waste of fish industry, to produce food grade packaging

PROGRAMME: FP7 **THEME:** SME – Research for the benefit of SMEs

START YEAR: 2012 **END YEAR:** 2014

PROJECT COORDINATOR: MAVI SUD S.R.L (Italy)

WEBSITE: <http://www.n-chitopack.eu/project.html> **Contact Information:** info@n-chitopack.eu



Short Abstract: The project focuses on the use of bio-based materials (chitin waste material from the fishing industry) to offer a highly promising alternative to plastic food packaging. Chitin nano-fibrils are bacteriostatic, 100% bio-degradable and can be used by European packaging SMEs, and may contribute to increase their competitiveness in the market and to solving environmental challenges.

More info at: http://cordis.europa.eu/project/rcn/105848_en.html

KNOWLEDGE OUTPUTS DEALING WITH MARINE LITTER

1. Products

Short Title: Optimization of existing biodegradable materials from crustaceous by products and plant biomass (no link available)



Description: n-CHITOPACK improved the performance of existing packaging composites using CN (Chitin-Nanofibrils). Both flexible and rigid food packaging have been realized.

Short Title: Alternative bio-based packaging products (no link available)



Description: The n-CHITOPACK project has enabled the participant SMEs to pilot novel bio-based functional polymers and adapted processes for the production of both flexible and rigid packaging in the food industry market, as a more competitive alternative to existing bio-derived packaging.

2. Services/Tools

Short Title: Improved production process for the realisation of chitosan/ CN based materials (no link available)



Description: n-CHITOPACK packaging materials has been developed using patented process innovations: 1) production of CN in environmentally friendly and cost-efficient route; 2) setting-up a novel pilot installation to test the feasibility of continuous chitin food-film production 3) While being validated in food packaging production and in advanced medications, the process has had multiple exploitation routes and hence a vast commercial potential towards all the field of packaging.



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3. Scientific publications

Short Title: [Chitin-Hyaluronan Nanoparticles: A Multifunctional Carrier to Deliver Anti-Aging Active Ingredients through the Skin](#)



Description: The paper describes the process to produce Chitin Nanofibril-Hyaluronan nanoparticles (CN-HA), showing their ability to produce transparent films for food packaging



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FP7 PROJECTS RELATED TO MSFD-D10

SEABIOPLAS

TITLE: Seaweeds from sustainable aquaculture as feedstock for biodegradable bioplastics

PROGRAMME: FP7 **THEME:** SME – Research for the benefit of SMEs

START YEAR: 2013 **END YEAR:** 2015

PROJECT COORDINATOR: SINTEF Fisheries and Aquaculture (Norway)



WEBSITE: Not available **Contact Information:** julie.maguire@dommrc.com

Short Abstract: SEABIOPLAS proposes seaweeds from sustainable aquaculture for the production of biopolymers, or bioplastics, as polymers that are either bio-based or biodegradable. These offer advantages over traditional feedstocks, including higher productivities, no competition for land use, minimal water consumption while having similar sugar contents and contributing to the reduction of CO₂ emissions. SEABIOPLAS offers a complete integrated solution to the plastic SMEs stakeholders through the scientific knowledge provided by the RTDs, from the production of the feedstock in sustainable Integrated Multi Trophic Aquaculture systems, to the development of the biopolymers using innovative technologies of reduced environmental impact until the validation test of the seaweed-based polymers in greener plastic products (shrinkable and stretchable films, adhesives, plastic additives and coatings).

More info at: http://cordis.europa.eu/project/rcn/110672_en.html

EUFIR

TITLE: A European system for collecting and recycling discarded equipment from the fishing and fish farming industry

PROGRAMME: FP7 **THEME:** ICT – Information and Communication Technologies

START YEAR: 2012 **END YEAR:** 2015

PROJECT COORDINATOR: UiB - University of Bergen; Department of Fisheries and Marine Biology (Norway)



WEBSITE: Not available **Contact Information:** trud.berg@nofir.no

Short Abstract: This project will establish a system for collecting and recycling discarded equipment from the fishing and fish farming industry in Europe. We will accomplish this by establishing a network of cooperating entities from the waste owners through the transporters and the dismantling sites to the recycler and other end users. The project is a joint venture between three parties, Norsk Fiskeriretur who has taken the initiative to this project and by that making their Norwegian business idea European, Egersund Net who is a fish farming net producer in Lithuania and the Estonian plastic recycler Dago Plast. These three parties have been cooperating for some time already.

More info at: http://cordis.europa.eu/project/rcn/108917_en.html



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CONTAIN

TITLE: Container Security Advanced Information Networking

PROGRAMME: FP7 **THEME:** SECURITY – Security

START YEAR: 2011 **END YEAR:** 2015

PROJECT COORDINATOR: FOI - Swedish Defence Research Agency (Sweden)

WEBSITE: <http://containproject.com/>

Contact Information: pontus.svenson@foi.se



Short Abstract: CONTAIN will specify and demonstrate a European Shipping Container Surveillance system which will encompass regulatory, policy and standardisation recommendations, new business models and advanced container security management capabilities. CONTAIN will: 1. Support transport security stakeholders in managing container security threats as part of an integrated approach to the management of transportation networks; 2. Provide a coherent set of technology options for screening and scanning plus container-integrated sensor, communication and security technologies to monitor container movements and security related parameters in real time; 3. Enable ports to establish upgraded port container security processes and provide information feeds to port community systems and national and European security databases; 4. Provide information gathering validation, fusion and situation awareness services to establish dependable near real time corridor container traffic maps and their integration into a EU Container Traffic Map. This will be for use by organisations and systems established to promote and implement an integrated EU surveillance policy; 5. Assist policy makers at national and EU level to benchmark container security performance and formulate improvement policies.

More info at: http://cordis.europa.eu/project/rcn/100574_en.html

ENNSATOX

TITLE: Engineered nanoparticle impact on aquatic environments: Structure, activity and toxicology

PROGRAMME: FP7 **THEME:** NMP – Nano-sciences, nano-technologies, Materials and new Production Technologies

START YEAR: 2009 **END YEAR:** 2012

PROJECT COORDINATOR: University of Leeds (United Kingdom)

UNIVERSITY OF LEEDS



WEBSITE: <http://www.ennsatox.eu/>

Contact Information: A.L.Nelson@leeds.ac.uk

Short Abstract: ENNSATOX investigates the structure and functionality of well characterised engineered nanoparticles and their biological activity in environmental aquatic systems. An integrated approach will assess the activity of the particles in a series of biological models of increasing complexity. Parallel environmental studies will take place on the behaviour of the nanoparticles in natural waters and how they modify the particles' chemical reactivity, physical form and biological activity. An integrated theoretical model will be developed describing the environmental system as a series of biological compartments where particles transport between a) compartments by advection-diffusion and b) between phases by a transfer function. Following optimisation of the transfer functions a generic predictive model will be derived for the environmental impact of each class of nanoparticle in aqueous systems. A generalised understanding of the dependence of the nanoparticle biological activity on its



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structure and functionality will be obtained including the role and interaction of the biological membranes within organisms. ENNSATOX will generate: exploitable IP (devices and ecotoxicology predictive software package); set of standard protocols for assay of nanoparticle biological activity which can be later accredited; global dissemination of results; creation of an EU laboratory service; tools and data to inform EU Regulation and the EC's code of conduct for responsible nanosciences and nanotechnologies research.

More info at: http://cordis.europa.eu/project/rcn/92741_en.html

EFFACE

TITLE: European Union Action to Fight Environmental Crime

PROGRAMME: FP7 **THEME:** SSH – Socio-economic Sciences and the Humanities

START YEAR: 2012 **END YEAR:** 2016

PROJECT COORDINATOR: Ecologic Institute (Germany)

WEBSITE: <http://efface.eu> **Contact Information:** berlin@ecologic.eu



Short Abstract: EFFACE will propose effective and feasible policy options for the EU to combat environmental crime. The recently adopted Environmental Crime Directive, the Ship-Source Pollution Directive, and the new provisions of the Lisbon Treaty have created new instruments and opportunities for increasing the effectiveness of EU measures against environmental crime through harmonisation and coordination. However, utilisation of these opportunities suffers from a serious lack of information on environmental crime: e.g. harmonisation measures based on the new Article 83(2) TFEU depend on the availability of reliable information on the impacts of environmental crime. EFFACE will help to address this gap by generating relevant information. Drawing on a combination of quantitative and qualitative approaches and data and an in-depth investigation of different types of environmental crime, EFFACE will provide an assessment of the main costs, impacts and causes of environmental crime in the EU, including those linked to the EU, but occurring outside its territory, complemented by a comprehensive analysis of the status quo in terms of existing instruments, actors and institutions. A SWOT analysis will identify strengths, weaknesses, threats and opportunities associated with the EU's current efforts to combat environmental crime. Feasible policy options for harmonisation and better coordination of actors will then be developed with the help of typologies of different approaches to harmonisation, sanctioning and strategic enforcement. These policy options will consider the use of policy mixes and innovative approaches to govern such mixes. Stakeholder involvement in EFFACE through interactive policy analysis will promote mutual learning with and among a broad range of stakeholders.

More info at: http://cordis.europa.eu/project/rcn/106252_en.html

MARS

TITLE: Managing Aquatic ecosystems and water Resources under multiple Stress

PROGRAMME: FP7 **THEME:** ENVIRONMENT



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Environment (including Climate change)

START YEAR: 2014 **END YEAR:** 2018

PROJECT COORDINATOR: UNI-DUE - University of Duisburg-Essen (Germany)

WEBSITE: <http://www.mars-project.eu> **Contact Information:** daniel.hering@uni-due.de

Short Abstract: MARS will support managers and policy makers in the practical implementation of the WFD, of related legislation and of the Blueprint to Safeguard Europe's Water Resources by ducting new research and synthesising existing knowledge concerning effects and management of multiple stressors in surface water and groundwater bodies; by advising the 3rd RMBP cycle and the revision of the WFD; and by developing new integrated tools for diagnosing and predicting multiple stressors in water resource management. The consortium includes 19 research institutes and five water boards and environment agencies. MARS will engage with on-going and finalised European initiatives addressing related topics, thus acting as an integrating project. Work will be organised at the scales of water bodies, river basins and Europe; at each scale there is a direct link to water managers and decision makers. Nested within the scale structure, we will employ a suite of methods: flume and mesocosm experiments to better understand the effects of selected stressor combinations with a focus on extremes and hydrological stress; linkage of abiotic and biotic models to predict effects of stressor combinations at a river basin scale; large-scale data analysis employing existing databases, but including additional variables, to gain a Europe-wide overview of stress, status and ecosystem services.

More info at:



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FP 7 MSFD CROSS-CUTTING PROJECTS

STAGES

TITLE: Science and Technology Advancing Governance of Good Environmental Status

PROGRAMME: FP7 **THEME:** ENVIRONMENT –

Environment (including Climate change)

START YEAR: 2012 **END YEAR:** 2014

PROJECT COORDINATOR: CETMAR, Spain



WEBSITE: <http://www.stagesproject.eu/>

Contact Information: mfernandez@cetmar.org

Short Abstract: The project has two overarching goals: i) to synthesise per major MSFD themes the information from research projects and ii) to develop a platform to ensure that the knowledge generated through European science and technology can be channelled to a broad range of relevant end users, to inform and facilitate implementation of the MSFD and the achievement of GES. To achieve this, STAGES will target a number of critical gaps in the knowledge transfer process. Firstly, STAGES will identify and synthesize relevant existing EU research results and make them available in a usable format for decision and policy making authorities. Through comprehensive scientific foresight targeted at MSFD knowledge gaps, STAGES will identify needs for further research. STAGES will also develop innovative solutions to achieve an effective collaboration between the broad range of stakeholders necessary to support MSFD implementation, including policy and governance, science, industry and civil society.

CSA OCEANS

TITLE: CSA Healthy and Productive Seas and Oceans

PROGRAMME: FP7 **THEME:** TRANSPORT –

Transport (including Aeronautics)

START YEAR: 2012 **END YEAR:** 2015

PROJECT COORDINATOR: Forskningsrådet - Research Council of Norway (Norway)



WEBSITE: <http://www.jpi-oceans.eu/>

Contact Information: ssr@rcn.no

Short Abstract: CSA Oceans aims to reduce the time for the Joint Programming Initiative on Healthy and Productive Seas and Oceans (JPI Oceans) to move to the operational phase by: Supporting the governance structures in its work to establish JPI Oceans; Proposing procedures and tools for cooperation; Facilitating the development of a Strategic Research and Innovation Agenda; Pressures on Seas and Oceans is recognized as a grand challenge providing an essential part of our wealth and well-being. Their vast resources offer a rare and significant potential for Blue Sustainable Growth. At the same time, the marine environment and its biodiversity are threatened by pressures from human activities and climate change. This calls for an integrated marine and maritime scientific approach to support ecosystem-based management of marine ecosystems and maritime activities. CSA Oceans project will take immediate actions to contribute to the development of the JPI Oceans Strategic Research and Innovation Agenda (SRIA) and an Implementation Plan (IPan) which provide the basis for joint trans-national actions based on variable geometry. The project will identify actions in areas where the JPI can add value to the



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European Research Area (ERA) at a level with far greater impact than simple joint calls. CSA Oceans will facilitate the implementation of JPI Oceans. It will propose tools, procedures and structures for long-term governance and operational cooperation of the Joint Programming activities and the possibility to assess its impact. The project will look for best practices and innovative solution to propose new ways of interaction. The aim is to enhance dialogue and transfer of knowledge from science to policy and other end-user in particular in relation to the Marine Strategy Framework Directive. When CSA Oceans expires it is expected to have built the momentum for European cooperation, thereby making JPI Oceans self-sustained.

ODEMM

TITLE: Options for Delivering Ecosystem-Based Marine Management

PROGRAMME: FP7 **THEME:** ENVIRONMENT –

Environment (including Climate change)

START YEAR: 2010 **END YEAR:** 2013

PROJECT COORDINATOR: University of Liverpool (United Kingdom)



WEBSITE: <http://www.liv.ac.uk/odemmm/>

Contact Information: leonie.robinson@liv.ac.uk

Short Abstract: The overall aim of the ODEMM project is to develop a set of fully-costed ecosystem management options that would deliver the objectives of the Marine Strategy Framework Directive, the Habitats Directive, the European Commission Blue Book and the Guidelines for the Integrated Approach to Maritime Policy. This will be achieved by: Providing a comprehensive knowledge base to support policy for the development of sustainable and integrated management of European marine ecosystems; Developing Operational Objectives to achieve the High-Level Policy Objectives set by the MSFD and the HD, and with reference to the proposed Maritime Policy; Identifying Management Options (individual management tools and combinations of tools) to meet the Operational Objectives; Providing a risk assessment framework for the evaluation of Management Options and to assess the risk associated with the different options; Conducting a cost-benefit analysis of a range of Management Options using appropriate techniques; Identifying stakeholder opinions on the creation of governance structures directed towards implementation of the ecosystem approach, and to elaborate different scenarios for changing governance structures and legislation to facilitate a gradual transition from the current fragmented management approach towards fully integrated ecosystem management; Documenting the steps necessary for the transition from the current fragmented management scheme to a mature and integrated approach, and providing a toolkit that could be used to evaluate options for delivering ecosystem-based management; Communicating and consulting on the outcomes of the project effectively with policy makers and other relevant user groups.

DEVOTES

TITLE: DEVelopment Of innovative Tools for understanding marine biodiversity and assessing good Environmental Status



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PROGRAMME: FP7 **THEME:** ENVIRONMENT

START YEAR: 2012 **END YEAR:** 2016

PROJECT COORDINATOR: AZTI-Tecnalia - Fundación AZTI-AZTI Fundazioa (Spain)

WEBSITE: <http://www.devotes-project.eu/> **Contact Information:** aborja@azti.es

Short Abstract: DEVOTES Project aims at improving understanding of human activities impacts (cumulative, synergistic, antagonistic) and variations due to climate change on marine biodiversity, using long-term series (pelagic and benthic). A major aim of DEVOTES is to test the indicators proposed by the EC, and develop new ones for assessment at species, habitats and ecosystems level, for the status classification of marine waters, integrating the indicators into a unified assessment of the biodiversity and the cost-effective implementation of the indicators (i.e. by defining monitoring and assessment strategies). DEVOTES is thus also intended to develop/test/validate innovative integrative modelling tools to further strengthen our understanding of ecosystem and biodiversity changes (space & time); such tools can be used by statutory bodies, Small Medium Enterprises and marine research institutes to monitor biodiversity, applying both empirical and automatic data acquisition.

More info at: http://cordis.europa.eu/project/rcn/105613_en.html



PROJECTS FUNDED BY OTHER EUROPEAN PROGRAMMES RELATED TO MSFD-D10

CM

TITLE: Prevention of Cosmetic-Induced Non-Communicable Diseases and Micro Plastics entering Food Chains with the CosmEthics- Health App

PROGRAMME: H2020 - SME-1 - SME instrument phase 1

START YEAR: 2016 **END YEAR:** 2017

PROJECT COORDINATOR: COSMETHICS OY – Finland

WEBSITE: not available **Contact Information:**

Short Abstract: CosmEthics, with its E-solutions, helps EU citizens to identify cosmetics products with potential hazard ingredients (EU Annex II prohibited chemicals, carcinogens, hormones, allergens), and helps them to find better alternatives based on scientific research and user tailored preferences (allergies, vegan, plastics).

More info at: http://cordis.europa.eu/project/rcn/207145_en.html

POSEIDOMM

TITLE: Photochemistry at the Ocean's Surface: Effects and Interactions of Dissolved Organic Matter with Microplastics

PROGRAMME: H2020 - MSCA-IF-EF-RI - RI – Reintegration panel

START YEAR: 2016 **END YEAR:** 2018

PROJECT COORDINATOR: UNIVERSITA' DEGLI STUDI DI SIENA, Italy

WEBSITE: not available **Contact Information:**

Short Abstract: POSEIDOMM will investigate the influence of microplastics on the photochemical and biological processes in the sea-surface microlayer (SML). We will verify the effect of microplastic pollutants on the formation of a surface-active biofilm, the implications for microbial cycles and for the photochemical generation of reactive chemical species and labile organic compounds. The goals of POSEIDOMM are to provide a chemical and biological characterization of the microplastic-biofilm aggregates in the SML, to quantify the photochemical cycling of such aggregates and to identify the implications of this cycling on gas exchange and on the microbial carbon cycle. This will be achieved through a trans-disciplinary approach combining innovative spectroscopic and biological analyses to study the SML in controlled microcosms and in-situ mesocosm studies. Through a close cooperation with leading European partners, POSEIDOMM will close major gaps in our understanding of the interaction of micropollutants with marine biological processes and atmospheric gas exchange.

More info at: http://cordis.europa.eu/project/rcn/202161_en.html



Sea Litter Critters

TITLE: A compact, unmanned, renewables-powered and self-sufficient vessel able to pick up marine litter and to treat it on board for volume reduction and energy recovery

PROGRAMME: H2020 **THEME:** SME-1 - SME instrument phase 1



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START YEAR: 2016 **END YEAR:** 2016

PROJECT COORDINATOR: IRIS SRL



WEBSITE: not available **Contact Information:** not available.

Short Abstract: The project intends to explore the feasibility of introducing to the market Sea Litter Critters, a compact, unmanned, renewables-powered and self-sufficient marine litter collection and treatment vessel based on a patent pending device treating waste thermally with plasma technology and no harmful emissions. This device is designed to operate near the shores especially nearer tourist facilities substituting the mechanical collection of litter currently adopted. By picking up litter (plastic debris mostly) near the point of entry, Sea Litter Critters contribute to minimising the pollution risks linked to plastic in the sea, where plastic items become brittle and break down into small particles, but basically never dissolve.

UPCYCLING THE OCEANS

TITLE: High quality clothes made from marine plastic litter

PROGRAMME: H2020 **THEME:** SME-1 - SME instrument phase 1

START YEAR: 2015 **END YEAR:** 2015

PROJECT COORDINATOR: ECOALF SL

ECOALF

WEBSITE: <https://ecoalf.com/upcycling-the-oceans/> **Contact Information:** not available.

Short Abstract: ECOALF is an SME that design and market high quality textile products and accessories made of recycled materials (bottles, fishing nests, tyres, coffee, cotton...). The main objective of the project is to produce and sell fabrics and clothes made from marine plastic litter, by recycling and industrial methods to convert these plastics into high properties textiles. To contribute to mitigate the marine litter problem, ECOALF proposes to implement a collaborative scheme with fishermen's organisations (agreements already signed) to collect plastic from seas; to implement an industrial process that includes waste management, pellets production and additivition, spinning and fabrics, and clothes manufacturing; and to distributions and marketing the new products in Europe.

UTOFIA

TITLE: Underwater Time Of Flight Image Acquisition system

PROGRAMME: H2020 **THEME:** SME-1 - SME instrument phase 1

START YEAR: 2015 **END YEAR:** 2018

PROJECT COORDINATOR: SINTEF



WEBSITE: <http://www.utofia.eu/> **Contact Information:** Jens.T.Thielemann@sintef.no

Short Abstract: UTOFIA will offer a compact and cost-effective underwater imaging system for turbid environments. Using range-gated imaging, the system will extend the imaging range by factor 2 to 3 over conventional imaging systems, while at the same time providing video-rate 3D information. This will fill the current gap between short-range, high-resolution conventional video and long-range low-resolution sonar systems. UTOFIA offers a new modus operandi for the main targeted domains of application:



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marine life monitoring, harbour and ocean litter detection, fisheries and aquaculture stock assessment, and seabed mapping.

TOPIOS

TITLE: Tracking Of Plastic In Our Seas

PROGRAMME: ERC **THEME:** ERC-STG - Starting Grant

START YEAR: 2017 **END YEAR:** 2022

PROJECT COORDINATOR: UNIVERSITEIT UTRECHT

WEBSITE: not available **Contact Information:** not available



Universiteit Utrecht

Short Abstract: This project will make breakthroughs towards closing the plastic budget by creating a novel comprehensive modelling framework that tracks plastic movement through the ocean. Building on well-established previous work to follow generic water parcels through hydrodynamic ocean models, this project will modify these 'virtual' parcels to represent pieces of plastic by, for the first time, simulating fragmentation, sinking, beaching, wave-mixing and ingestion by biota. The new parameterisations that underpin this modelling will be based on field data and new coastal flume wave tank lab experiments. The simulated plastic particles will be tracked within state-of-the-art hydrodynamic ocean models, in order to compute maps of pathways and transports around our oceans and on coastlines and in biota. This numerical modelling will be used to evaluate a broad suite of scenarios and test hypotheses, including where the risk to marine biota is greatest.

The results from this project will inform policymakers and the public on which countries, for example, are responsible for which part of the plastic problem, crucial for mitigation and legal frameworks. It will also inform engineers on where and how to best invest resources in mitigating the problem of plastic in our ocean.

More info at: http://cordis.europa.eu/project/rcn/207862_en.html

MICRO

TITLE: Risk Assessment of micro-plastics in the Channel/North Sea Region

PROGRAMME: INTERREG IVa 2 SEAS **THEME:**

START YEAR: 2012 **END YEAR:** 2014

PROJECT COORDINATOR: Institute for Agricultural and Fisheries Research (ILVO) - Oostende, Belgium

WEBSITE: <http://www.ilvo.vlaanderen.be/micro/EN/Aboutmicro/Activities/tabid/6595/Default.aspx>

Contact Information: not available.

Short Abstract: The objective of this project is the monitoring of microplastics at the 2 Seas Region, based on modeling, observations (abiotic to inventarize the microplastics, and biotic data to assess impact-gathered and integrated during the project), lab experiments and mathematical models. The aims within the MICRO project concern scientific, educational expertise and exchange and raising the public and scientific awareness regarding the presence of microplastics in the Marine Environment. The study on



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risk and impact evaluation of microplastics will lead to mitigating action to reduce the problem and to involve sectors like mariculture, fisheries, and waste treatment companies.

DeFishGear

TITLE: Managing Aquatic ecosystems and water Resources under multiple Stress

PROGRAMME: IPA ADRIATIC Cross Border Cooperation 2007-2013

START YEAR: 2013 **END YEAR:** 2016

PROJECT COORDINATOR: National Institute of Chemistry (Slovenia)



National
Institute of Chemistry
Slovenia

WEBSITE: <http://www.defishgear.net> **Contact Information:** andrej.krzan@ki.si

Short Abstract: The DeFishGear Project originated as a response to the need for dealing effectively with the issue of marine litter in the Adriatic-Ionian macroregion, towards litter-free coasts and sea. It aims to facilitate efforts for integrated planning to reduce the environmental impacts of litter-generating activities and ensure the sustainable management of the marine and coastal environment of the Adriatic and Ionian Seas. The DeFishGear approach to combat marine litter entails sharing scientific knowledge and obtaining accurate, coherent and comparable scientific data that will ultimately facilitate the implementation of coordinated and multi-sectoral actions.

3R FISH

TITLE: Integral Management model of recovery and recycling of solid waste from the fishing and port activities

PROGRAMME: LIFE07 ENV/E/000814

START YEAR: 2009 **END YEAR:** 2012

PROJECT COORDINATOR: CETMAR (Spain)



CETMAR
CENTRO TECNOLÓGICO DEL MAR

WEBSITE: not available **Contact Information:** mfernandez@cetmar.org

Short Abstract: The overall objective of the 3R-FISH project was to minimise the environmental impact of the most significant fishing industry solid wastes (i.e. fishing nets, polystyrene, and batteries/lighting devices) on water and seabed quality, and to promote the sustainable development of fishing and port activities. The project aimed to reduce the quantity of solid waste discharged into the marine environment and landfilled or incinerated as urban waste, by supporting the environment and landfilled or incinerated as urban waste, by supporting the proper use and recycling of equipment used in the fishing industry and by developing and implementing a sustainable system of management, treatment, disposal and recycling.

More info at:

http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=3287&docType=pdf

AMMOS



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TITLE: Integrated information campaign for the reduction of smoking related litter on beaches

PROGRAMME: LIFE

START YEAR: 2013 **END YEAR:** 2015

PROJECT COORDINATOR: MEDITERRANEAN SOS Network

WEBSITE: <http://www.life-amos.gr/en/> **Contact Information:** info@medsos.gr



Short Abstract: The project aims to implement an integrated information campaign for the prevention/reduction of smoking-related litter in coastal areas of Greece. Given the extended coastline and the number of visitors it attracts, the main causes of the problem include an ignorance of the environmental impacts of discarded butts amongst smokers, a lack of integrated approaches in tackling the problem and an absence of appropriate, user-friendly and affordable infrastructure. The aim of the project is to advance a change in behavior through the combined use of technology and awareness-raising practices in order to prevent coastal pollution from cigarette butts, thus protecting the marine and coastal environment, safeguarding public health and contributing to the implementation of the relevant EU legislation.

GHOST

TITLE: Integral Management model of recovery and recycling of solid waste from the fishing and port activities

PROGRAMME: LIFE

START YEAR: 2013 **END YEAR:** 2016

PROJECT COORDINATOR: Consiglio Nazionale delle Ricerche (Italy)

WEBSITE: <http://www.life-ghost.eu/index.php/en/> **Contact Information:** luisa.daros@ismar.cnr.it



Short Abstract: The project GHOST - co-funded under the LIFE + Biodiversity Instrument of the European Union, promotes concrete measures to preserve and improve the ecological status of the rocky habitats (Tegnùe) in the north Adriatic Sea. The impacts of abandoned, lost or discarded fishing gears (ALDFG) on marine biodiversity will be evaluated and the removed gears/nets processed to identify appropriate procedures for recycling/reuse. The economic value of the ecosystem benefits resulting from ALDFG removal/reduction will be also considered. A Code of Conduct will be drawn up and negotiated with fishermen to sensitize them about this issue. Finally a regulation addressing various issues associated to sustainable management of ADFG will be proposed as a reference tool for local managing authorities in order to mitigate/prevent environmental and economic damages highlighted by the project.

MERMAIDS

TITLE: Mitigation of microplastics impact caused by textile washing processes

PROGRAMME: LIFE+

START YEAR: 2014 **END YEAR:** 2019

PROJECT COORDINATOR: Consiglio Nazionale delle Ricerche (Italy)

WEBSITE: <http://life-mermaids.eu/> **Contact Information:** unknown



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Short Abstract: The multidisciplinary consortium of the MERMAID project is aiming to mitigate the environmental impact of micro and nanoplastic particles resulting from laundry wastewater on European (sea) ecosystems. It does so by demonstrating and implementing innovative technologies and additives for laundry processes and textile finishing treatments. MERMAIDS is not dealing with developing new technologies, but aims to apply already developed scientific-technological knowledge.

MARELITT

TITLE: Pilot Project: Removal of marine litter from Europe's Four Regional Seas

PROGRAMME: Funded by the European Commission (DG Environment)

START YEAR: 2013 **END YEAR:** 2015

PROJECT COORDINATOR: Milieu Ltd - Law and Policy Consulting

WEBSITE: <http://www.marelitt.eu/> **Contact Information:** marinelitter@milieu.be

Short Abstract: MARELITT is an EU-funded project, aiming at identifying good practices for the removal of litter and derelict fishing gear from the sea. After assessing existing marine litter removal projects in Europe's four regional seas, MARELITT is supporting seven organisations in setting up their marine litter removal or derelict fishing gear removal projects. The experience gained through this process is gathered in the MARELITT Toolkit.



BASEMAN

TITLE: Defining the baselines and standards for microplastics analyses in European Waters

PROGRAMME: JPI-Oceans Joint Actions

START YEAR: 2016 **END YEAR:** 2018

PROJECT COORDINATOR: Alfred Wegener Institute
Helmholtz Centre for Polar and Marine Research

WEBSITE: <http://www.jpi-oceans.eu/baseman/> **Contact Information:** Gunnar.Gerdt@awi.de

Short Abstract: The overall goal of this interdisciplinary and international collaborative research project, is to overcome this problem through a profound and detailed comparison and evaluation of all approaches from sampling to identification of MP. Our collaborative research project combines experienced MP scientists (from different disciplines and countries) in a cutting edge project addressing the JPI Oceans (JPI-O) pilot call "Ecological aspects of MP in the marine environment". Our project tackles two major topics: 1) "The validation and harmonization of analytical methods" which is indispensable for 2), the "Identification and quantification of MP". The results of the project will equip EU authorities with tools and operational measures that may be applied to describe the abundance and distribution of MP in the environment. Such tools will permit JPI-O evaluation of member state compliance with existing and future monitoring requirements.



EPHEMARE

TITLE: Ecotoxicological effects of microplastics in Marine Ecosystems



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PROGRAMME: JPI-Oceans Joint Actions

START YEAR: 2016 **END YEAR:** 2018

PROJECT COORDINATOR: University of Vigo, Spain

WEBSITE: <http://www.jpi-oceans.eu/ephemare> **Contact Information:** vvidal@uvigo.es



Short Abstract: EPHEMARE aims to examine the adsorption of chemicals on microplastics, their ingestion, trophic transfer and chemical release, and a wide array of ecotoxicological effects on invertebrates and vertebrates and to communicate the findings of the project to the public, relevant national and international authorities and decision makers. The project is looking for active collaboration with Industry to facilitate mutual learning towards addressing issues associated with microplastics in our oceans.

PLASTOX

TITLE: Direct and indirect ecotoxicological impacts of microplastics on marine organisms

PROGRAMME: JPI-Oceans Joint Actions

START YEAR: 2016 **END YEAR:** 2018

PROJECT COORDINATOR: SINTEF



WEBSITE: <https://www.sintef.no/projectweb/plastox/> **Contact information:** Andy.Booth@sintef.no

Short Abstract: The PLASTOX project will investigate the ingestion, foodweb transfer, and ecotoxicological impact of microplastics, together with persistent organic pollutants (POPs), metals and plastic additive chemicals associated with them, on key European marine species and ecosystems. The project will combine field-based observations, laboratory tests, mesocosm and manipulative field experiments to study the ecological effects of microplastics.

WEATHER-MIC

TITLE: How microplastics weathering changes its transport, fate and toxicity in the marine environment

PROGRAMME: JPI-Oceans Joint Actions

START YEAR: 2016 **END YEAR:** 2018

PROJECT COORDINATOR: Helmholtz-Zentrum für Umweltforschung UFZ, Germany



WEBSITE: <http://jpi-oceans.eu/weather-mic/about> **Contact Information:** annika.jahnke@ufz.de

Short Abstract: The project aims to assess how weathering processes influence the transport, fate and toxicity of microplastics (MPs) and their leachates in the marine environment.

MARLIN

TITLE: Baltic Marine Litter

PROGRAMME: Central Baltic INTERREG IVA Programme 2007-2013

START YEAR: 2011 **END YEAR:** 2013

PROJECT COORDINATOR: Keep Sweden Tidy



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WEBSITE: <http://www.projectmarlin.eu> **Contact Information:** jessica.angstrom@hsr.se

Short Abstract: The project intended to increase knowledge of the Marine Litter situation in the Baltic Sea. The project also aimed to contribute to the reduction of Marine Litter through a combination of awareness raising actions on Marine Litter among local policy makers and relevant stakeholders, the media and the broader public, and through capacity building measures in local municipalities and NGOs to address the issue of Marine Litter in environmental management routines. Raising awareness of the issue of Marine Litter was done by harnessing the expertise gathered within the MARLIN network to engage stakeholders in a joint education and information campaign, as recommended by the HELCOM Baltic Seas Action Plan. Capacity building was brought about through a pilot implementation of the common guidelines for Marine Litter assessment developed by the United Nations Environment Programme.

More info at: <http://projects.centralbaltic.eu/project/447-marlin>

Sustainable Cruise

TITLE: Sustainable Cruise

PROGRAMME: LIFE+

START YEAR: 2011 **END YEAR:** 2014

PROJECT COORDINATOR: MEDCRUISE

WEBSITE: not available **Contact Information:** aimilia.papachristou@medcruise.com

Short Abstract: Sustainable Cruise aims to reduce and recycle solid waste generated on board cruise ships and it aims at the total disposal or re-use of residual matter. The Sustainable Cruise project aims to demonstrate the potential for waste prevention, recovery and recycling on a cruise ship, focusing on the detection, testing, evaluation and dissemination of best available techniques and approaches for three onboard waste streams: (i) packaging; (ii) biodegradable waste; and (iii) paper; and three horizontal issues: (i) energy efficiency; (ii) onshore rubbish disposal; and (iii) normative consistency and pre-certification.

More info at:



GES-REG

TITLE: Good environmental status through regional coordination and capacity building.

PROGRAMME: INTERREG IV A- Central Baltic

START YEAR: 2011 **END YEAR:** 2013

PROJECT COORDINATOR: Marine Systems Institute at
Tallinn University of Technology

WEBSITE: <http://gesreg.msi.ttu.ee/en> **Contact Information:** urmas.lips@msi.ttu.ee

Short Abstract: GES-REG was concerned with the northeastern part of the Baltic Sea and ran between 2010 and 2012. The project provides results on the initial assessment of Finnish, Estonian and Latvian Marine Areas of the northeastern Baltic. The Finnish Environment Institute (SYKE) undertook a small scale pilot study on marine and beach litter to fill certain knowledge gaps. Experimental studies tested the different potential of various zooplankton taxa to ingest microplastics in an effort to observe possible



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negative impacts on the food web and to determine if ingested plastic particles pass through the animals or block the digestive tract. Field studies were also conducted to investigate the occurrence and composition of microplastics in the open waters of the Gulf of Finland. Therefore GES-REG has the potential to contribute to GES assessment, specifically Indicator 10.1.3 *“Trends in the amount, distribution and, where possible, composition of micro-particles (in particular micro-plastics)”*.

More info at:

RETRAWL

TITLE: Recycling of plastic and metal from trawl and net

PROGRAMME: CIP Eco-Innovation initiative of the Competitiveness and Innovation Framework Programme (CIP).



START YEAR: 2014 **END YEAR:** 2016

PROJECT COORDINATOR: PLASTIX A/S

WEBSITE: <http://plastixglobal.com/retrawl-in-brief/>

Contact Information: info@plastixglobal.com

Short Abstract: The objective of RETRAWL is to upscale an innovative recycling technology, which transforms used maritime waste into high quality plastic and steel commodities. Closing the loop by adding value to both specific plastics and metal waste by using state of the art technology meeting all international requirements will contribute to move from a linear into a more circular maritime economy. At the same time the technology offers huge potential to globally resolve an emerging part of the marine debris issues, namely ghost nets, not only causing severe harm to sea life and the marine environment but also accounting for considerable economic damage.

HAPPY SEALS

TITLE: Happy seals

PROGRAMME: CIP Eco-Innovation initiative of the Competitiveness and Innovation Framework Programme (CIP).

START YEAR: 2015 **END YEAR:** -

PROJECT COORDINATOR: The European Seal Centre (ZHC Pieterburen), The Netherlands



WEBSITE: not available **Contact Information:** niek@zeehondencreche.nl

Short Abstract: An unique partnership agreement has been reached recently between the European Seal Centre (ZHC Pieterburen), Groningen Seaports, WasteFreeOceans and WFO partners Plastix and GreenWavePlastics. Based on the experiences gained in close cooperation with Belgian WFO partner SDVO (Foundation for Sustainable Fishery Development) since 2012, the above partners will start to pro-actively collect obsolete fishing gear, starting in the Dutch ports of Lauwersoog, Delfzijl and Eemshaven as off early 2015. Other Dutch ports will be connected to the project during the months to come, following the Belgian example. The project partners warmly welcome the support of the fishermen, fishing and other maritime industry and other stakeholders, working jointly towards a Waste Free Waddensea.



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More information: <http://plastixglobal.com/activities/happy-seals/>

CITYWATER

TITLE: Benchmarking water protection in cities

PROGRAMME: LIFE

START YEAR: 2012 **END YEAR:** 2015

PROJECT COORDINATOR: CHEC - City of Helsinki Environment Centre (Finland)

WEBSITE: www.citywater.fi **Contact Information:** satu.viitasalo-frosen@hel.fi



City of Helsinki

Short Abstract: The 'CITYWATER' project will be based on the Baltic Sea Challenge Initiative, which will be used as a demonstration for the project implementation. The initiative links a network of more than 170 actors, including cities and municipalities, companies, universities and associations. The overall objective of the project is to implement and facilitate environmentally relevant and cost-effective voluntary water protection measures in cities and municipalities in the Baltic Sea Region in order to improve the state of coastal waters. General working procedures will be improved by increasing environmental communication and knowledge in cities and municipalities in the region in order to ensure continuous work for quality improvement of local waters. Voluntary water protection work will be promoted and facilitated using the principles of the Baltic Sea Challenge initiative, with the goal of improving beneficiaries' and stakeholders' knowledge and communications on Baltic Sea protection. The project will also assess the environmental impact and cost-benefit ratio of different water protection measures and of different activities that cities and municipalities carry out with regards to the Baltic Sea. This is connected to the need to monitor the impact of project actions and to compile the results from the project with the help of a toolbox.

More information: <http://www.kg.eurocean.org/proj.jsp?load=100142>



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NATIONAL PROJECTS

FISHING FOR LITTER INITIATIVES

TITLE: Fishing for Litter

PROGRAMME:

START YEAR: 2002 **END YEAR:** -

PROJECT COORDINATOR: KIMO International

WEBSITE: <http://www.kimointernational.org/fishing-for-litter/>

Contact Information: info@kimo.shetland.org



Short Abstract: KIMO coordinates a project called Fishing for Litter — an imaginative yet simple initiative that aims to reduce marine litter by involving one of the key stakeholders, the fishing industry. KIMO provides fishing boats with large bags to collect marine litter. When the fishing boats come into port, they can unload the bags of litter. These bags are collected regularly and the rubbish is recycled or disposed of on land. This reduces the volume of debris washing up on our beaches and the amount of time fishermen spend untangling their nets. The initiative not only involves the direct removal of litter from the sea, it also raises awareness of the problem in the fishing industry. Fishing for Litter is currently operating in the UK, the Netherlands, Sweden and the Faroe Islands and has been endorsed by OSPAR as a model for their members to adopt.

National initiatives launched:

- Belgium: Stichting voor Duurzame Visserijontwikkeling, Fishing for Litter Belgium (2007-)
- The Netherlands: KIMO The Netherlands-Belgium, Fishing for Litter (2002 -)
- UK: KIMO, Fishing for Litter:
 - Scotland (2005 -)
 - South West England (2008 -)
 - Isle of Man (2007-)
- Faroe Islands: KIMO Faroe Islands, Fishing for Litter (2013 -)
- Sweden: KIMO Baltic, Fishing for Litter (2011-)

PESCAL

TITLE: Sustainable Fishing in Clean Fishery

PROGRAMME: Funded by the Spanish Ministry of Agriculture and Fisheries, Food and Environment

START YEAR: 2012 **END YEAR:** 2014

COUNTRY: Spain **PROJECT COORDINATOR:** CETMAR

WEBSITE: not available

Contact Information: mfernandez@cetmar.org



Short Abstract: The aim of this project is two-fold. The two main actions share a generic goal of collecting objects from fishing which are out of use and other waste from the seabed during the ordinary tasks of the fishing fleet. This is to provide evidence that there are large amounts of this type of solid waste in the seas that could have a serious ecological impact. The project also aims to test a strategy of protocols and



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practices around the guardians of the sea concept between the Spanish fishing sectors and show its potential as an activity that is complementary to the current investigation.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101309>

NPB

TITLE: Nada pola Borda: limpando os fondos mariños

PROGRAMME: National – Funded by General

Secretariat of the Sea of the Spanish Government (Spain)

START YEAR: 2009 **END YEAR:** 2010

COUNTRY: Spain **PROJECT COORDINATOR:** CETMAR

WEBSITE: not available

Contact Information: mfernandez@cetmar.org

Short Abstract: Collection and management of solid waste from sea beds or floating in the sea, in the Galician Rías and in the continental shelf of Galicia. The participant ships carried ashore waste hooked on the riggings during their ordinary fishing tasks. Afterwards, waste was properly classified and managed on land.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101360>



DOS MARES

TITLE: Deep-water submarine canyons and slopes in the Mediterranean and Cantabrian seas: from synchrony of external forcings to living resources

PROGRAMME: MICINN National Plan I+D+i

START YEAR: 2011 **END YEAR:** 2013

COUNTRY: Spain **PROJECT COORDINATOR:** UB- University of Barcelona

WEBSITE: <http://proyecto2mares.wordpress.com/>

Contact Information: miquelcanals@ub.edu

Short Abstract: The project is structured along three Axes of Activity, each of them corresponding to a Workpackage (1: Characterization of external forcings and abiotic conditions; 2: Links between abiotic conditions, populations and pelagic and benthopelagic resources; and 3: Links between abiotic conditions, populations benthic resources), and consists of two working areas: the submarine canyons of Aviles and Blanes, in the Cantabrian Sea and the Mediterranean Sea, respectively, and the adjacent continental slopes. From the physical science viewpoint, the effect of external forcings and the transfer of matter and energy to the deep ecosystem will be investigated synchronously in the two areas.

Knowledge Outputs:

- [Effects of natural and anthropogenic processes in the distribution of marine litter in the deep Mediterranean Sea](#)

More info at: <http://www.kg.eurocean.org/proj.jsp?load=102575>



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OMAR

TITLE: Observatorio Ambiental

PROGRAMME: Funded by Fundación Biodiversidad

START YEAR: 2008

END YEAR: 2009

COUNTRY: Spain

PROJECT COORDINATOR: CETMAR



WEBSITE: not available

Contact Information: mfernandez@cetmar.org

Short Abstract: Creation of an environmental observatory on the impact of the solid waste generated by aquaculture activities, fishing and port on the marine environment. In addition, this study will provide information and advice on new techniques for the use of wood and resins in the maritime construction, with particular emphasis on innovation and minimisation of the environmental impact in its use.

Knowledge Outputs:

- [Environmental Good Practices Manual in Fishing, Aquaculture and Harbour Activities](#)
- [Proposal of Clean Point in Harbours](#)
- [Diagnosis and approach to situation of solid waste in Galician ports](#)
- [Battery recycling guide](#)

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101310>

Development of concepts and methods for monitoring and assessing selected anthropogenic pressures for the MSFD

TITLE: Development of concepts and methods for monitoring and assessing selected anthropogenic pressures for the MSFD

PROGRAMME: UBA Federal Environment Research Plan (UFOPLAN)

START YEAR: 2012

END YEAR: 2014

COUNTRY: Germany

PROJECT COORDINATOR: AquaEcology GmbH & Co. KG



WEBSITE: not available **Contact Information:** duerselen@aquaecology.de

Short Abstract: Main objectives of the project will be the identification of pressure and impact descriptors for which assessment systems are not yet available, such as D2 (non-indigenous/'invasive' species), D6 (sea-floor integrity), D7 (hydrographical conditions), D8 (contaminants) and D10 (marine litter). Existing deficits have to be identified along with possible solutions, for example by developing respective assessment systems. Moreover, an overall assessment of the concept of good environmental status according to the MSFD will be developed, with regard to the results of recent MSFD projects. This work will also include the examination and specification of the indicators of the individual impact descriptors. A further aim of the project will be the definition of quantitative environmental targets and subsequent operationalization of the respective indicators. Based on the recent assessment work and on existing monitoring programmes, a monitoring concept will be developed in order to effectively ensure the success of the future assessment.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=100895>

ME5209



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TITLE: Using Northern fulmars as an ecological monitor of marine litter in line with indicators set for MSFD Descriptor 10

PROGRAMME: International SNS-Fulmar study –

Funded by DEFRA and the Dutch Government

START YEAR: 2010 **END YEAR:** not available

COUNTRY: The Netherlands **PROJECT COORDINATOR:** IMARES - Wageningen UR; Institute for Marine Resources and Ecosystem Studies (Netherlands)

WEBSITE: not available **Contact Information:** jan.vanfraneker@wur.nl

Short Abstract: Abundance of marine litter, in particular plastics found in the stomachs of beached seabirds (Northern Fulmar - *Fulmarus glacialis*), is used to monitor changes over time and regional patterns in marine debris. This project was initiated in the North Sea and is a formal monitoring tool for the Ecological Objectives (EcoQOs) of OSPAR. It has also become the example of a 'living' indicator for Good Environmental Status (GES) in the European Marine Strategy Framework Directive (MSFD).

Knowledge Outputs:

- [Fulmar Litter EcoQO monitoring along Dutch and North Sea coasts in relation to EU Directive 2000/59/EC on Port Reception Facilities: results to 2009](#)
- [Plastic ingestion by the Northern Fulmar \(*Fulmarus glacialis*\) in Iceland](#)
- [Monitoring plastic ingestion by the northern fulmar *Fulmarus glacialis* in the North Sea](#)

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101976>



POIZON

TITLE: Microplastics and persistent pollutants - a double threat to marine life

PROGRAMME: Funded by FCT Fundação para a Ciência e a Tecnologia (Portugal)

START YEAR: 2010 **END YEAR:** 2014

COUNTRY: Portugal **PROJECT COORDINATOR:** FFCT/UNL - New University of Lisbon; Foundation of the Faculty of Science and Technology

WEBSITE: not available **Contact Information:** psobral@fct.unl.pt

Short Abstract: This proposal investigates the presence of plastic particles in the ocean, in particular those below 5mm in diameter - the so-called microplastics. Microplastics result from the fragmentation of plastics due to photochemical degradation and abrasion. Microplastics are persistent, they can be found anywhere in the water, floating, suspended and on the bottom or stranded along the coastline. They have the potential to act as vectors for the transfer and exposure to persistent organic pollutants (POP) to marine organisms as they are easily confounded with food/prey items. Persistent organic pollutants (such as PCB, DDT and PAH) are highly toxic and due to their hydrophobic properties and prevalence at the surface microlayer, they adsorb readily to microplastics and present a long-term threat to marine life, not only due to possible mechanical obstruction of the digestive tract following ingestion, but also due to toxic effects of POP.

Knowledge Outputs:

- [Monitoring of a wide range of organic micropollutants on the Portuguese coast using plastic resin pellets](#)



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- [Plastic marine debris on the Portuguese coastline: A matter of size?](#)
- [Organic pollutants in microplastics from two beaches off the Portuguese coast](#)

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101716>

A Sea of Plastic

TITLE: A Sea of Plastic: Are plastic particles toxic to fish?

PROGRAMME: FORMAS - Swedish Research Council (Sweden)

START YEAR: 2013 **END YEAR:** 2016



COUNTRY: Sweden **PROJECT COORDINATOR:** University of Gothenburg

WEBSITE: not available **Contact Information:** bethanie.carney@bioenv.gu.se

Short Abstract: Plastic particles (PPs) on the macro and micro scale are increasing in the environment, both as a result of increased industrial production and product usage, as well as breakdown of larger plastic debris. These particles contain numerous organic pollutants including plasticizers. Little is known about the effects of PPs in fish. This project aims to answer the question: Are plastic particles toxic to fish? We can infer from studies with other plastics and nanoparticles that many effects are possible, ranging from mechanical (i.e. obstruction of the alimentary track and damage to gill membranes) to toxic (i.e. hormone disruption, induction of oxidative stress, immune system effects) but the toxic effects remain unknown. This study will address uptake routes of PPs in fish; effects in gill and intestinal epithelium; tissue damage; transfer of chemicals from PPs to various tissues in fish; toxic effects including hormonal disruption, oxidative stress, reproductive effects and genotoxicity; and the use of biomarker methodologies to identify affected gene and protein pathways. Knowledge of the fate of PPs in fish will aid in understanding the fate of PPs in the natural environment and therefore be useful in determining actions to minimize negative impact.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101499>

Recyship

TITLE: Pilot project of dismantling and decontamination of ships out of use

PROGRAMME: LIFE

START YEAR: 2009 **END YEAR:** 2013

COUNTRY: Spain **PROJECT COORDINATOR:** Reciclauto Navarra SL (Spain)

WEBSITE: <http://www.recyship.com/> **Contact Information:** mgarcia@reciclauto.es



Short Abstract: The objectives of the RECYSHIP project are to: Develop a technically and economically feasible, safe and environmentally sound methodology for the dismantling and decontamination of end-of-life vessels; Re-analyse European and national legislation in order to ensure the acceptance of the principles of the Basilea Agreement, as well as general and specific environmental principles for end-of-life vessels; Assess the methodologies for decontaminating and dismantling end-of-life ships that will take into account the technical, environmental and labour standards. As a result of this analysis, prototypes will be developed; Develop a pilot test in a properly equipped shipyard in the southwest of Europe, where the prototype will be validated; Create a coastline capacity and impact study for Spain and Portugal. Homogenous land units will be drawn up for these two countries; develop an integrated management system.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=100133>



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Meere ohne Plastik

TITLE: Meere ohne Plastik

PROGRAMME:

START YEAR: 2010 **END YEAR:** Unknown

COUNTRY: Germany **PROJECT COORDINATOR:** NABU

WEBSITE: <https://www.nabu.de/natur-und-landschaft/aktionen-und-projekte/meere-ohne-plastik/index.html> **Contact Information:** Kim.Detloff@NABU.de



Short Abstract: The focus of the project is to assist fishermen to eliminate waste from the sea and improve waste management at ports. The project raises awareness particularly in the sectors of fisheries and water sports. It organizes cleaning activities of marine litter from beaches and riverbanks, and supports the environmental monitoring of the North and Baltic seas. It develops measures to prevent the entry of waste into the sea in coastal communities and promotes best practices for improving waste management in ports.

ME5415: MLM

TITLE: Marine Litter Monitoring

PROGRAMME: Science and Research Projects DEFRA

START YEAR: 2010 **END YEAR:** 2013

COUNTRY: UK **PROJECT COORDINATOR:** CEFAS

WEBSITE: Not available **Contact Information:** Not available



Short Abstract: The objective of this project is to develop a future monitoring programme for the assessment of marine litter, capable of answering questions posed in the MSFD to identify the quantities of litter in the marine environment, the major processes that control the entry and / or removal of litter from the oceans and the transformations that occur during the lifecycle of any given litter item. This proposal will address: Amount and composition of litter in the water column, including floating and suspended litter, and accumulation on the sea floor.

ME5307

TITLE: Further development of the EMECO datatool to produce a common system for assessment of good environmental status for the MSFD

PROGRAMME: Funded by DEFRA

START YEAR: 2011 **END YEAR:** 2013

COUNTRY: United Kingdom **PROJECT COORDINATOR:** DEFRA CEFAS - Department for Environment, Food and Rural Affairs; Centre for Environment, Fisheries and Aquaculture Science (United Kingdom)

WEBSITE: <http://www.emecodata.net/> **Contact Information:** jo.foden@cefas.co.uk



Short Abstract: This project set out to build on prior Defra-funded work to develop an assessment and reporting system for the European Marine Strategy Directive. The initial developments funded by Defra focused on the North Sea and eutrophication with more recent work extending to the observatory infrastructure to the UK Western Shelf region. An application had previously been developed (the EMECO



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datatools) to provide a mechanism for efficiently providing the improved evidence base for future assessments of eutrophication. The Datatool application, accessible via the EMECO (www.emecodata.net) or the Western Shelf Observatory (www.westernshelfobservatory.org) websites, provides a transparent method for integration of data from different platforms (e.g. buoys, satellites, ships) from different agencies and countries. The application efficiently renders integrated data into a form amenable to assessment and specifically calculates the level of confidence in information created. It makes best use of all available data not just that resulting from Defra funded monitoring programmes. The project builds on the principles that have enabled the successful application of the observatory to eutrophication, and are now extended to cover the broad requirements of the MSFD but with a focus on the descriptors for litter and commercial fisheries. Implementing the MSFD will require the integration of data, assessment of each of the descriptors of Good Environmental Status and the subsequent efficient reporting to the relevant EC authorities. The application specifically aimed to provide a cost effective, transparent and efficient method to providing the improved evidence required in support of the implementation of European policies where the evidence may be subject to legal scrutiny in the European Courts.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101977>

FLIRT

TITLE: CEFAS Microplastic Method Development

PROGRAMME: Cefas Internal Seedcorn

START YEAR: 2016 **END YEAR:** 2017

COUNTRY: UK **PROJECT COORDINATOR:** CEFAS

WEBSITE: www.nature.com/articles/srep44501 **Contact Information:** Kim.Detloff@NABU.de



Short Abstract: A new approach is presented for analysis of microplastics in environmental samples, based on selective fluorescent staining using Nile Red (NR), followed by density-based extraction and filtration. The dye adsorbs onto plastic surfaces and renders them fluorescent when irradiated with blue light. Fluorescence emission is detected using simple photography through an orange filter. Image-analysis allows fluorescent particles to be identified and counted. Magnified images can be recorded and tiled to cover the whole filter area, allowing particles down to a few micrometres to be detected. The solvatochromic nature of Nile Red also offers the possibility of plastic categorisation based on surface polarity characteristics of identified particles. This article details the development of this staining method and its initial cross-validation by comparison with infrared (IR) microscopy. Microplastics of different sizes could be detected and counted in marine sediment samples. The fluorescence staining identified the same particles as those found by scanning a filter area with IR-microscopy.

SMRG

TITLE: Scottish Microplastic Research Group

PROGRAMME: Funded by MAST, Marine Alliance for Science and Technology Scotland, UK

START YEAR: Unknown **END YEAR:** Unknown

COUNTRY: UK **PROJECT COORDINATOR:** University of West Scotland

WEBSITE: not available **Contact Information:** Brian.Quinn@uws.ac.uk



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Short Abstract: The SMRG is a formal body under the MASTS umbrella comprising of all of the Scottish research groups working on the various aspects of microplastics, for the development of a cohesive research strategy to provide authoritative advice to the Scottish Government. To communicate effectively between groups working within this field, avoiding research replication and to ensure method development, sampling strategies & locations and quality control are harmonised to produce data suitable for submission under the relevant legislative frameworks (OSPAR, MSFD).

MarViva

TITLE: MarViva

PROGRAMME:

START YEAR: 2015 **END YEAR:** 2015

COUNTRY: Spain **PROJECT COORDINATOR:** The Catalan Waste Agency

WEBSITE: http://residus.gencat.cat/es/ambits_dactuacio/tipus_de_residu/brossa-marina/projectes/projecte-marviva/ **Contact Information:**



Short Abstract: Following Waste Free Ocean Europe's successful Fishing for Litter operations in Barcelona in 2011, the Catalan Waste Agency, the Fishermen's Guild and Barcelona Port successfully set up a pilot project to fish for litter across Catalonia involving local fishermen. The project aimed to raise awareness of this problem among the public in general and fishermen by investigating the quantity, type and features of waste in the sea. This project involved a year-long analysis of the marine waste collected by fishermen in their nets during their work days. Once in port, the fishermen deposited their rubbish in a container, after which it is then weighed, quantified, photographed and classed. The fishermen trained by WFO in 2011 will also participate in the Marviva project.

MPA Sinis 6

TITLE: Collaboration for the management of the Regional network of sea turtle rescue centres

PROGRAMME: Funded by the Italian Ministry of the Environment.

START YEAR: 2012 **END YEAR:** 2013

COUNTRY: Italy **PROJECT COORDINATOR:** CNR-IAMC –

National Research Council; Institute for Coastal Marine Environment (Italy)

WEBSITE: not available **Contact Information:** angelo.perilli@cnr.it



Short Abstract: MPA Sinis 6 aims to assess the effects of plastic ingestion by marine turtles as an Indicator of GES (10.2.1 "Trends in the amount and composition of litter ingested by marine animals (e.g. stomach analysis)"). This project is in line with the development of a quality environmental objective for the impact of Marine Litter on sea turtles in Europe which is currently under consideration.

More info at: <http://www.kg.eurocean.org/proj.jsp?load=101951>



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