



EUROPEAN COMMISSION

MEMO

Brussels, 8 May 2014

Blue Economy Innovation: examples of EU marine research

The European Commission today set out proposals to support "Innovation in the Blue Economy" (see [IP/14/536](#)) by creating an information platform on marine research in the European Union, sharing already available data and completing a detailed sea-bed map of European waters by 2020, among other measures. Through its research and innovation programmes, the European Union is already supporting marine research to the tune of around €350 million a year.

In addition, the Joint Research Centre – the European Commission's in-house science service – is providing support to marine and maritime policies. JRC research in this field includes for instance trend analysis for climate change investigations, the assessment of the environmental status of marine waters and fish stocks, the provision of economic analysis of the fisheries sector or the development of new technologies and modelling approaches for sustainable fisheries.

This MEMO provides examples of EU-funded marine research.

BONUS (EU budget contribution: up to €50 million)

The Baltic Sea, a unique and threatened habitat, is vital to the economies of the eight surrounding EU Member States. The BONUS initiative (set up under Article 185 of the EU treaty) is a €100 million fully-integrated research and innovation programme undertaken jointly by the EU and the Baltic coastal states to provide the necessary scientific knowledge to ensure a better ecosystem and sustainable economic activities. The initiative runs its own calls for funding.

PERSEUS (EU budget contribution €13 million)

Policy-oriented marine **E**nvironmental **R**esearch for the **S**outhern **E**uropean **S**eas (PERSEUS) is a research project that assesses the dual impact of human activity and natural pressures on the Mediterranean and Black Seas. As well as identifying gaps in data and knowledge, it has developed two citizen science campaigns, spotting jellyfish and monitoring marine litter on beaches. The latest phase of the [marine litter campaign](#) was launched on May 1, 2014.

STAGES (EU budget contribution €1.0 million)

The STAGES project supports implementation of the Marine Strategy Framework Directive by highlighting research that furthers the directive's goal of achieving good environmental status (GES) in Europe's waters. STAGES aims to ensure that all stakeholders are made aware of any new advances in knowledge on GES. Of more than 4 000 research projects surveyed (1 500 EU and 2 500 from the Member States), almost 800 projects indicated relevance to the MSFD. It has also held workshops to identify gaps in knowledge requiring further research.

TASTE (EU budget contribution €1.2 million)

TASTE is an SME-driven project with the main goal of developing flavour ingredients from three edible brown seaweeds (*Ascophyllum nodosum*, *Saccharina latissima* and *Fucus vesiculosus*) with the potential to replace sodium in food products that traditionally contain high levels of salt. The project partners recently tried out prototype flavours in frankfurter sausages, Icelandic-style fish cakes and breads.

PLANTPACK (EU budget contribution €950 000)

Food packaging coatings (on paper wraps, cartons and cardboard) are essential to providing a physical barrier to protect food products in the packaging container during storage and transportation. Current packaging coatings are based on petrochemical derived waxes and polymers. However, with increasing petroleum costs and recent instability and volatility in some oil producing countries, the food packaging sector is searching for an alternative reliable and sustainable coating product. The PlantPack project involving four SMEs aims to develop a sustainable, eco-friendly food packaging coating product made from seaweed extracts and starch, which will be applied to paper and cardboard in the form of a spray.

MIRACLES (EU budget contribution €9 million)

Microalgae are a promising feedstock for sustainable supply of commodities and specialties for food and non-food products. Despite this potential the implementation is still limited which is mainly due to unfavourable economics. Major bottlenecks are the lack of available biomass at acceptable costs and the absence of appropriate biorefinery

technologies. The four-year MIRACLES project aims to resolve these hurdles by development of integrated, multiple-product biorefinery technologies for production of high value specialties from microalgae. New industrial strains for extreme locations will be selected via bio-prospecting. The project includes development of sustainable biorefinery designs, scenarios and business plans aiming for full valorisation of algal biomass.

URBANWAVES (EU budget contribution €1.9 million)

Events such as the 2011 earthquake and tsunami in Japan illustrate the vulnerability of urban regions, ports and nuclear plants to coastal floods. With their European Research Council Starting Grant, Prof. Tiziana Rossetto and her team will build a unique tsunami generator in a 100 metre flume, designed for testing and quantifying the effects of tsunami waves on built environments and the performance of coastal defences. This research will make a strong contribution to the future of building design. (For more on this project, watch the video on tsunami defence [here](#)).¹

MULTIWAVE (EU budget contribution €2.0 million)

Prof. Frederick Dias's ERC Advanced Grant examines the fundamental mechanisms underlying the physics of rogue waves. An ERC "Proof of Concept" grant will allow his team to produce finely-attuned sensors for a buoy specially designed to measure 'rogue waves' in extreme sea conditions. This project will combine research on the physics of extreme waves with recent developments in buoy design in order to optimise the new technology for waves of high amplitude and steepness. Commercial applications could include marine renewable energies, shipping, marine forecasting, and ocean observation.

GLOBALSEIS and **Multimermaid** (EU budget contribution €2.7 million)

Prof. Guust Nolet's ERC project is developing a worldwide network of marine-based seismic-wave sensors that can produce a much better picture of deep-earth structures. To achieve this, the team has scattered a few 'mermaid' prototypes: autonomous floating devices equipped with hydrophones that listen carefully to the seismic tremors coming from deep in the earth. They reach depths of up to 2 000 metres, where they drift along with the deep-ocean currents. They have already recorded earthquakes with magnitude 6 on the Richter scale, of which there are on average two each week. Applications range beyond geoscience: encompassing everything from tracking groups of whales to locating aircraft "black boxes".²

DUSTTRAFFIC (EU budget contribution €2 million)

Billions of tonnes of dust are blown from the Sahara over the Atlantic Ocean every year. This dust powerfully affects the atmosphere and contributes to global warming, which in turn can lead to desertification and increased production of dust. Despite this, we understand very little about the impact of this process. This ERC project, led by Dr Jan-Berend Willem Stuur, applies a new approach, which involves experimenting with seven sediment-trap moorings, each equipped with a dust-collecting surface buoy. These will be placed directly under the core of the Saharan dust plume. The aim is to better quantify the dust's spatial and temporal dispersal patterns, fluxes, and its environmental impact. The results of these experiments should offer a breakthrough in our understanding of Saharan dust deposition and its effects on marine ecosystems.

¹ See also this article : <http://phys.org/wire-news/159793072/ucl-and-hr-wallingford-collaborate-to-construct-europes-largest.html>

² See the Euronews reportage: <http://www.euronews.com/2014/01/20/fishing-for-earthquakes-a-new-wave-in-seismology/>.

CARBONSINK (EU budget contribution €1.9 million)

One solution to the problems posed by climate change is to take CO₂ out of the atmosphere and store it in the natural environment: below the ocean floor or in the oceanic crust. This method of carbon sequestration is popular because it would place carbon into semi-permanent storage, but existing research into what will happen to carbon when it is dissolved is inconclusive. The objective of Dr Alexandra Turchyn's ERC project is to resolve the fate of carbon deposited in marine sediments.

EURO-ARGO (EU budget contribution €6 million)

The European Commission has recently granted the EU Research Infrastructures legal status to Euro-Argo, the European contribution to the international Argo programme – a global array of autonomous instruments deployed over the world ocean and reporting near real time subsurface ocean properties to a wide range of users via satellite–. As [European Research Infrastructure Consortium](#) (ERIC) Euro-Argo is now a key player in the international global Earth observing systems. The consolidation of ocean observations by this infrastructure will enable a sustainable exploration, exploitation and protection of the oceans and will enhance the European [COPERNICUS](#) Earth observing programme.

Joint Research Centre

Using satellite technology to assess the marine environment

In order to better understand the inner workings of the diverse seas and coastal systems in Europe and globally, the JRC has established and maintains an integrated data system which processes, analyses and archives quality-controlled satellite-derived ocean colour data products. The resulting maps on the phytoplankton biomass and carbon productivity provide useful information on the structure and functioning of the food web, from algae to commercially exploited fish populations in European seas and global oceans.

The JRC also takes part in the European Metrology for Earth Observation and Climate (MetEOC) project, which focuses on standardisation of remote-sensing measurements for climate applications. In particular, it supports the European standardisation process on traceability of radiometry for long-term measurement of climate variables, which include ocean colour. This variable is used to investigate marine ecosystems and their response to climate change.

Such ocean colour data are moreover used to track the potential presence of top predators through habitat maps that are updated daily. This new JRC habitat model helps to protect endangered fish stocks and to sustainably manage fisheries. The tool provides daily, monthly, seasonal and annual maps for more than a decade of potential feeding habitat of predators such as the Atlantic bluefin tuna, the European hake and fin whale in the Mediterranean Sea.

- More information on ocean colour: http://oceancolour.jrc.ec.europa.eu/data_portal/oc_portal/
- More information on fish habitat: <https://fishreg.jrc.ec.europa.eu/fish-habitat>

Online data to support the Common fisheries policy

The JRC collects and maintains fisheries data reported by EU Member States under the Data Collection Framework (DCF). The resulting datasets are used by the [Scientific, Technical and Economic Committee for Fisheries \(STECF\)](#) to provide scientific advice in the decision making process related to the Common Fisheries Policy. Through the new JRC "Scientific Fisheries Data dissemination tool" the scientific community, policy makers and authorities have access to online fisheries data about catches, fishing effort and the fishing fleet that so far have been available only in aggregated and text format in the STECF reports. In this way, data can be explored through interactive tables and graphs and can be downloaded in disaggregated format for further analysis, according to the user's specific needs.

More information:

- [MEMO/14/336](#): Questions and Answers on innovation in the blue economy
- [IP/14/536](#): EU eyes oceans innovation as source of sustainable growth
- Scientific fishery data: <https://fishreg.jrc.ec.europa.eu/web/datadissemination/home>

For more success stories in the marine aquaculture area:

http://ec.europa.eu/research/infocentre/success_stories_en.cfm?item=Agriculture%20%26%20food&subitem=Marine%20resources%20%26%20aquaculture