



# Marine Knowledge 2011-2013

## Background Document for Maritime Policy Member States' Expert Group on Marine Knowledge 23 February 2011

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## 1. SCOPE

The Commission's proposal for a financial regulation<sup>1</sup> allocates €2,500,000 to achieving the objectives of "marine knowledge 2020"<sup>2</sup>. The aim of this document is to justify this amount and how it is intended to spend it in order to obtain feedback from the Expert Group on Maritime Policy's subgroup on marine knowledge

## 2. BENEFITS OF BETTER MARINE KNOWLEDGE

The impact assessment for marine knowledge<sup>3</sup> established that we are failing to properly exploit the €1.5 billion of public money that EU Member States spend every year on monitoring our seas and oceans. The present fragmented nature of marine knowledge is a drain on the resources of all those who use marine data and a barrier to innovation. The assessment indicated that a properly integrated marine knowledge architecture for Europe could result in savings of €300 million every year to the private companies, researchers and public authorities who need marine data for their daily work.

The current inability of researchers and private companies to access marine data to develop new products and services – for instance in bioprospecting or coastal protection – is a block on innovation. The impact assessment conservatively estimated that these new products and services would be worth between €60 million and €200 million annually.

A better knowledge of the behaviour of the seas and oceans would reduce uncertainty. The conservatism that we need to build into sea-defences costs money. It is estimated that a 25% reduction in uncertainty in future sea-level rise alone would save €100 million annually in European coastal defences. Although climate change is going to raise temperatures on a global scale, it is not clear whether European regions will be hotter, cooler, drier or wetter. Without better ocean monitoring it will be impossible to reduce this uncertainty. A proper marine data architecture may be EU's most effective contribution to adaption to climate change in Europe.

## 3. WHAT HAS BEEN PRODUCED SO FAR – SETTING UP THEMATIC ASSEMBLY GROUPS<sup>4</sup>

The preparatory actions of the integrated maritime policy in the period 2008-2010 set up six thematic assembly groups whose aim is to assemble data of a certain type and make them available through internet portals. Due to the limited funding it was not possible to cover all the European waters. Instead each project covers two or three sea-basins. The groups are:

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<sup>1</sup> Proposal for a Regulation of the European Parliament and of the Council establishing a Programme to support the further development of an Integrated Maritime Policy, 29 September.2010, COM(2010) 494 final

<sup>2</sup> "Marine Knowledge 2020: marine data and observation for smart and sustainable growth" Commission Communication 8.September.2010 COM(2010) 461 final

<sup>3</sup> Impact Assessment for a European Marine Observation and Data Network 8.9.2010, SEC(2010) 998 final,

<sup>4</sup> Defined in section 5 of the Communication "marine knowledge 2020"

<b>thematic assembly group</b>	<b>start project</b>	<b>parameters</b>	<b>sea-basins</b>	<b>cost</b>
bathymetry	2009	water depth, coastline, wrecks	North Sea, Celtic Seas, Western Mediterranean, Ionian Sea and Central Mediterranean	€75,000
	2010		Iberian Atlantic coast, Bay of Biscay, Adriatic, Eastern Mediterranean	€1,200,000
geology	2009	sea-bed sediments including rate of accumulation or sedimentation, sea-floor geology (age, lithology, origin), boundaries and faults, rate of coastal erosion or sedimentation, geological events and event probabilities (landslides, volcanic, earthquake epicentres), seismic profiles, minerals (including aggregates, oil and gas).,	North Sea, Baltic Sea and Celtic Seas	€25,000
chemistry	2009	concentrations of chemicals relevant to Marine Framework Strategy Directive	North Sea, selected basins of Mediterranean, Black Sea	€700,000
biology	2009	observations of species from taxa relevant to Marine Framework Strategy Directive	North Sea, Bay of Biscay and the Iberian Coast	€850,000
physical habitats	2008	physical habitats using EUNIS classification	North Sea, Baltic, Celtic Seas and Western Mediterranean. .	€800,000

<b>thematic assembly group</b>	<b>start project</b>	<b>parameters</b>	<b>sea-basins</b>	<b>cost</b>
physics	2010	wave height and period; temperature of the water column; wind speed and direction; salinity of the water column; horizontal velocity of the water column ; light attenuation; sea level.	all European basins	€1,000,000
<b>TOTAL</b>				<b>€6,450,000</b>

These thematic assembly groups will in themselves provide useful information and this is important. First versions of the portal have been coming on-line during the summer of 2010. The data they have produced are a permanent legacy. However their main purpose was to test whether the concept works before scaling up to a magnitude that will be necessary to satisfy the needs of the user community. The aim is to progressively build on these prototypes to create a working system.

The work has generated some momentum. 53 organisations from 24 countries and 3 international organisations have participated in these groups. A complete list is provided in annex 1. The number will certainly grow as the coverage of sea-basins increases.

#### **4. PROPORTIONATE**

A public consultation confirmed that only the EU has the financial and legislative muscle to create the conditions for these benefits to be realised. What is needed is a sustained and coordinated effort. Previous attempts to improve matters through limited duration research projects have demonstrated technical solutions but the partnerships dissolved once the funding stopped.

The amount of money that is requested for 2011-2013, €22,500,000, represents a proportionate and manageable increase over the €6,700,00 spent on marine knowledge through preparatory actions in the period 2008-2010. At €7,500,000 per year it represents 0.5% of what Member States themselves are spending.

The marine knowledge initiative is not only about spending money but without EU money it will not succeed. It is not a sufficient condition but it is necessary.

#### **5. PROPOSAL FOR BUDGET**

The preparatory actions in 2008-2011 have already produced concrete results but, if we want to achieve the Commission's goals set out in its "marine knowledge 2020" Communication, the ongoing projects need to be enriched and maintained incorporating the experience gained so far. The costs are:

upgrade of thematic assembly groups.	€18,200,000	<p>In the period 2011-2013 it is planned to extend coverage of the six thematic assembly groups<sup>4</sup> set up under the preparatory actions to all sea-basins and to create a new group for human activity.</p> <p>By the end of the period the projects will have produced data layers with universal access for all of the Baltic, Bay of Biscay, Black Sea, Celtic Seas, Iberian Atlantic Coast, Macaronesia, Mediterranean and North Sea of</p> <ol style="list-style-type: none"> <li>1. bathymetry at a scale of one quarter of a minute and selected sea basins at a higher resolution.</li> <li>2. geology (sediments, strata, erosion, hazards) at a scale of 1 to 1 million</li> <li>3. physical measurements (wave height and period; temperature of the water column; wind speed and direction; salinity of the water column; horizontal velocity of the water column ; light attenuation; sea level)</li> <li>4. chemical concentrations of species relevant to Marine Strategy Framework Directive in water column, sediments and biota</li> <li>5. observations of biological species relevant to Marine Framework Strategy Directive.</li> <li>6. physical habitats</li> <li>7. human activity (aquaculture sites, windmill zones, pipelines, gravel extraction sites etc)</li> </ol> <p>These data layers include measures of confidence and highlight gaps where measurements are missing or where the data-owners refuse access. Because the data layers will be provided through procurement rather than grant procedures, they become public property and a permanent legacy of the projects.</p>
sea-basin checkpoints <sup>4</sup>	€3,050,000	<p>These are new. Each checkpoint will make an assessment of the fitness of purpose of all the data available in the sea-basin – from the thematic assembly groups, from the Global Monitoring for Environment and Security initiative, from the fisheries Data Collection Initiative. These data will be tested for fitness for purpose with different user communities. Gaps in monitoring networks will be highlighted. It is proposed to create a group for the North Sea in 2011, the Mediterranean in 2012 and the Baltic in 2013.</p>

prototype secretariat	€50,000	The secretariat should provide a focus for the European Marine Observation and Data Network and assume some of the administrative burden from the Commission. The functions would be: <ol style="list-style-type: none"> <li>1. Organising expert groups and project progress meetings - distributing agenda, writing minutes,</li> <li>2. Uploading content to the Maritime Forum</li> <li>3. Supporting the monitoring of the preparatory actions – providing a feedback on the deliverables that would feed into the Commission's acceptance procedure</li> <li>4. Setting up a "portal of portals". This would allow data from all the thematic assembly groups and sea-basin checkpoints to be accessed through a single gateway. It will be a one-stop shop for marine data for European waters.</li> </ol>
evaluation and assessment	€300,000	A study will contribute to the ex-post evaluation of the preparatory actions and the impact assessment for the regulation on marine knowledge planned for 2013
<b>grand total</b>	<b>€2,500,000</b>	

## 6. HOW THE PROPOSED ACTIVITY RELATES TO OTHER EU INITIATIVES

The relationship of maritime policy projects in other DGs is thoroughly explained in the "marine knowledge 2020" Communication which describes how the different initiatives fit together. The most important relationships are with:

- (1) the INSPIRE Directive (DG ENV) which sets out the basic standards for viewing and naming all spatial data including those related to the marine world.
- (2) the Global Monitoring for Environment and Security (GMES) initiative. The proposed activity supports the assembly of physical in-situ data that will be used to calibrate and validate satellite data and forecasting models produced by the GMES marine core service.
- (3) research projects from DG-RTD, many of which have provided test-beds and demonstrations for the technologies used.

A fuller account is provided in "Marine Knowledge 2020" and its impact assessment.

## **7. HOW IT RELATES TO NATIONAL APPROACHES**

The architecture set out in the marine knowledge 2020 Communication is a distributed one. It relies on marine data being archived and curated at appropriate national centres, preferably with appropriate certification procedures. The UK with the MEDIN approach, France with Coriolis and others are beginning to set up the necessary infrastructure.

## ANNEX 1 PARTNERS IN THEMATIC GROUPS 2008-2010

Subcontractors are not included here. The number is an indication of the sea-basins covered so far. The number involved in 2011-2013 will certainly be larger – probably by a factor of more than two.

Belgium	Flanders Marine Institute/Vlaams Instituut voor de Zee(VLIZ) Royal Belgian Institute of Natural Sciences University of Liege - GeoHydrodynamics and Environment Research (ULG) Belgium;
Bulgaria	Institute of Oceanology Bulgarian Academy of Science (IO-BAS)
Cyprus	University of Cyprus-Oceanography Centre (OC)
Denmark	Danish Environmental and Planning Agency (BLST) Danish Hydraulic Institute (DHI) Geological Survey of Denmark and Greenland National Environmental Research Institute (NERI-MAR)
Estonia	Geological Survey of Estonia
Finland	Geological Survey of Finland,
France	Bureau de recherches géologiques et minières Collecte Localisation Satellites (CLS) Institut Français de Recherche pour l'Exploitation de la Mer (Ifremer) Service Hydrographique et Oceanographique de la Marine (SHOM).
Georgia	Iv. Javakishvili Tbilisi State University (TSU-DNA)
Germany	Alfred Wegener Institute for Polar and Marine Research (AWI) Bundesamt für Seeschifffahrt und Hydrographie (BSH-DOD), Federal Institute for Geosciences and Natural Resources University of Bremen (UniHB)
Greece	Hellenic Centre for Marine Research (HCMR)
Ireland	Geological Survey of Ireland Marine Institute (MI)



Italy	ETT srl Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS) Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA)
Latvia	Latvian Environment, Geology and Meteorology Agency
Lithuania	Lithuania institute of Geology and Geography
Netherlands	ATLIS Deltares Mariene Informatie Service 'MARIS' BV NIOZ Royal Netherlands Institute for Sea Research (NIOZ) etherlands Institute of Ecology; Centre for Estuarine and Marine Ecology (NIOO-CEME)
Norway	Geological Survey of Norway Norwegian Marine Data Centre - Institute of Marine Research (IMR),
Poland	Polish Geological Institute
Romania	National Institute for Marine Research and Development "Grigore Antipa" (NIMRD)
Russian Federation	All Russian Research Institute of Hydro-meteorological Information - (RIHMI-WDC) P.P. Shirshov Institute of Oceanology Russian Academy of Science (SIO-RAS)
Spain	Instituto Español de Oceanografía (IEO)
Sweden	Geological Survey of Sweden Sveriges Meteorologiska Och Hydrologiska Institut (SMHI) Swedish Environmental Protection Agency
Ukraine	Institute of Biology of the Southern Seas, National Academy of Sciences of Ukraine (IBSS NASU) Marine Hydro-physical Institute (MHI)

United Kingdom	<p>Joint Nature Conservation Committee Support Co</p> <p>NERC, National Oceanography Centre Southampton (NOC)</p> <p>NERC, British Geological Survey, Edinburgh (BGS)</p> <p>NERC British Oceanographic Data Centre, Liverpool (BODC)</p>
United States	Rutgers University; Institute for Marine and Coastal Sciences (IMCS)
International	<p>International Council for the Exploration of the Sea (ICES)</p> <p>The Global Biodiversity Information Facility (GBIF)</p> <p>UNEP/GRID-Arendal</p>



## ANNEX 2: IMPLEMENTATION PLAN

The Commission proposal for a financial regulation for maritime policy earmarks €2.5 million for marine knowledge. This is €7.4 million for 2011, €6.35 million in 2012 and €8.75 million in 2013. For this amount we could propose the following work schedule.

Task	What could be done in 2011-2013	2011 €000s	2012 €000s	2013 €000s	Total €000s
Upgrade thematic assembly groups:	of <b>Chemical layers</b> Increase coverage to entire European waters. The main chemical substances relevant to the Marine Strategy Framework Directive are included in the first version. It is not feasible to significantly expand the number of substances treated. Unless feedback from the first version reveals any obvious shortcomings, the group will assemble the same species. This could start from 2011 onwards	3,400			3,400
	<b>Human activity layers</b> This includes aquaculture sites, windmill zones, pipelines, gravel extraction sites - anything except fishing which is dealt with separately under the data Collection Framework. These were not dealt with in the preparatory action under EMODNET but are an essential input for assessments under the Marine Framework Strategy Directive and for Marine Spatial Planning. It would be useful to start as soon as possible in order to provide early input for these initiatives. We will ask for complete European coverage.	2,100			2,100

Task	What could be done in 2011-2013	2011 €000s	2012 €000s	2013 €000s	Total €000s
	<b>Biological layers</b> The present project is based on EUROBIS so already has coverage beyond the sea-basins required in the tender. A continuation would require some thought as to how abundance and biodiversity can be extracted from the observations. The budget indicated is indicative and for maintenance of current approach. To do a thorough job for biological parameters is beyond the scope of the available budget so we may need to wait till after 2013.			2,000	2,000
	<b>Bathymetry/hydrography</b> We now have coverage of all sea basins except Baltic, Black Sea and Macronesia on a ¼° (or 500 metre) grid. We need to complete the coverage in the first phase and move to higher resolution in selected sea-basins in the second. The sea basins selected will depend on availability of data and extent of surveys. We will learn this from ongoing projects so cannot prepare specifications till 2012 at the earliest.	1,100		5,000	6,100
	<b>Geology</b> With the available budget we can complete coverage <sup>5</sup> of European seas at 1 to 1 million scale. This could be started immediately and would only be delayed due to lack of budget. The work is relatively straightforward as the national geological surveys can access the data and have the expertise to process them.		2,800		2,800

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<sup>5</sup> By complete coverage, we mean that all sea-basins will be covered. There will certainly be gaps where no data is available.

Task	What could be done in 2011-2013	2011 €000s	2012 €000s	2013 €000s	Total €000s
	<p><b>Physics</b> We cannot expect results till 2012 so a follow-up project is not needed till 2013. On the face of it, assembling physical data is less complex than for geological, chemical or biological data although we cannot be sure till the results of the first project are available.</p> <p><b>Physical habitats</b> Other sea-basins are being covered through territorial cooperation projects. A contribution from maritime policy budget could cover maintenance.</p>		800	1,000	1,000
Sea-basin checkpoints	<p>These are a new feature of EMODnet. The work involves assembling data from thematic assembly groups as well as GMES and the fisheries Data Collection Regulation and determining how well they meet the needs of stakeholders. They will identify gaps in the monitoring network. Covering 3 out of the 5 basins – Atlantic, Baltic, Black Sea, North Sea, Mediterranean – in the 3 years might be feasible. North Sea should be first because this is where we have most data. The Mediterranean then the Baltic could follow. We can assume €750,000 for the smaller seas and €1,500,000 for the Mediterranean</p>	800	1,500	750	3,050

<b>Task</b>	<b>What could be done in 2011-2013</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>Total</b>
		<b>€000s</b>	<b>€000s</b>	<b>€000s</b>	<b>€000s</b>
secretariat	The work requires: (1) expertise in the subject matter – to assess the quality of the preparatory actions (2) limited secretarial support to arrange the meetings (DG-MARE would still pay the expenses) (3) IT skills to prepare a data portal. It could be handled by two full time equivalents and start in 2012 (in second year of project) and last for 3 years (the final year would be in the new financial framework). It could also be a Framework contract with the work chosen each year.		950		950
evaluation and assessment	To assess outcome of preparatory action and revisit the calculations and assumption made in the 2009 impact assessment		300		300
<b>Total</b>		7,400	6,350	8,750	22,500

This means four tenders to be issued each year which is manageable, particularly since the specifications for many of them can be based on those of previous efforts.