CONTRIBUTION
OF THE
INSTITUTO ESPAÑOL DE OCEANOGRAFÍA
TO THE GREEN PAPER ON MARITIME POLICY PRESENTED BY THE COMMISSION OF THE EUROPEAN COMMUNITY

"Towards a Future Maritime Policy for the Union"

MARCH, 2007

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Europe is surrounded by various seas and oceans. The waters of the four seas and two oceans under European Union (EU) jurisdiction span around 6 million sq. km., representing 50% of its territory. The coastline of the 20 Member States bathed by the Arctic Ocean, North Sea, Baltic Sea, Atlantic Ocean, Mediterranean Sea and Black Sea has a length of around 68,000 km, and this coastal belt hosts almost half of the Union's population; therefore, our coastal areas, our shores and our seas suffer from the effects of the development of human activity.

These seas and oceans play a crucial role in strategic issues and in the defence and security of Europe. Furthermore, other sea-related activities such as energy production, sea transport and shipping, leisure activities and seaside tourism, as well as the extraction of live resources - fishing, aquaculture or genetic material - are essential for meeting the European economic and social objectives indicated in the Lisbon Agenda.

The Spanish Institute of Oceanography (IEO) is grateful to the Commission for the definition of a Maritime Policy for the Union in which science and marine research play an essential role. The conservation of the marine ecosystems and their biodiversity coupled with the sustainable extraction of natural resources, the need to avoid and control the impact of human activities on the marine environment and a whole series of issues related with the improvement of knowledge, technological development and innovation are the challenges posed before the IEO and the European marine scientific community in general.

The experience accumulated by the IEO during its 93 years of history, not to mention its spirit and mission, endorse its capacity to tackle Maritime Policy development with the most promising perspectives, given that it is an excellent opportunity to continue on the path of scientific excellence in the field. Its acknowledged leadership capacity in the development of Marine Sciences in Spain and its status as foremost European institution in marine R+D+i, make possible its interaction in any joint developments with other national,

European or other Member State organisations or institutions for the optimum implementation of the EU Maritime Policy.

This document has been drafted as an input to the consultation process of the Commission in regard to the development of a future Maritime Policy for the EU. In compliance with the mission and objectives of the IEO, our responses centre mainly on how marine science and technology can contribute towards the development of a prosperous European maritime economy based on knowledge and on recommendations regarding activities we consider necessary to ensure its dynamism and evolution.

1. INTRODUCTION

The development of an integrated maritime policy will provide new opportunities and pose new challenges to the scientific community in regard to oceans and seas. The waters under European jurisdiction span the Arctic Ocean, North Sea, Baltic Sea, Atlantic Ocean, Mediterranean Sea and Black Sea, also including the jurisdictional waters of the outermost European islands/regions which feature a highly important variety of singular ecosystems.

The adoption of a maritime policy based on the integrated management of our oceans and seas and on the principle of sustainability, while focusing on the ecosystem, is an urgent need for European marine waters. This policy offers an opportunity to integrate the vast plethora of regulations that cover the EU maritime interests, while at the same time developing new ways to protect and conserve the marine environment and enhance the maritime heritage, while encouraging the sustainable exploitation of our seas and oceans. The sea should be considered as a whole, and should be managed accordingly; any sustainable maritime policy must hinge on the most farsighted approach to the sea and its resources.

On the other hand, the Commission must be aware that any attempt to promote co-operation between the stakeholders and to co-ordinate national, regional, local and private policies and initiatives requires high determination and leadership skills. This new approach must overcome many difficulties especially when it comes to pooling interests and sidestepping any obstacles generated by the dominating sectors. In order to converge the different approaches, there is a need to improve dialogue between the parties, develop R+D+i policy and maritime training, establish clear objectives and find more efficient channels for operational changes.

The formulation of an integrated maritime policy, based on sound scientific and technological development, will pose new challenges to the marine scientific community. The slogan of the current German EU Presidency for its research and education policies - “Success through Research” - is an important concept given that the investment in research and development, as well as transfer of know-how to policymakers and companies generating added-value products and services, is essential to improve and boost maritime economy.

2. RETAINING EUROPE'S LEADERSHIP IN SUSTAINABLE MARITIME DEVELOPMENT

2.1. A Competitive Maritime Industry

The competitiveness of the maritime industry should be boosted through the rapid transfer of discoveries and developments resulting from marine research.

The exploitation of maritime resources requires specific spearhead technology. Europe has the necessary research teams and knowledge to develop the sustainable exploitation of renewable and non-renewable marine resources, offshore operations, oceanographic technology and marine and coastal engineering. Technological development and the improvement of research competitiveness in this sector should be a priority within the European Maritime Policy.

A foremost priority of the marine research institutes and their current and future scientific programmes should be the transfer of knowledge in regard to matters of interest for the different sea-related sectors, including SMEs, which should be furthered both by the EU administration and by national governments. In order to improve and optimise this know-how transfer, suitable mechanisms should be implemented and/or developed for the transfer of marine technology.

The different marine R+D+i sectors: marine research institutes, universities and industries, including SMEs, should pool efforts for the formulation and regulation of scientific programmes which improve competitiveness of the marine industry based on sustainable development and social values.

2.2. The Importance of the Marine Environment for the Sustainable use of our Marine Resources

Conservation and Protection of the Marine Environment. Marine Strategy

The oceans are a highly complex system that is difficult to comprehend. An understanding of the processes which take place in the marine ecosystem require the use of the most advanced technologies and observation resources *in situ* as well as the application of the latest developments in remote detection. Europe is highly competent in this field and in the drafting and processing of the data obtained which, moreover, should be stored, maintained and updated under the best conditions.

At the same time, the sustainable use of marine resources requires ongoing information on the demands of society and on the different natural supplies. The compilation, storage, circulation/exchange, processing and study of a large quantity of information and data are essential in order to ensure a balance between social demands and natural supply. Databanks, ongoing compilation of information and data and control and monitoring networks are essential for providing the suitable and necessary information. The

compilation and study of scientific data and responsible research is essential for the protection of the marine ecosystems, the establishment of Marine Protected Areas (MPAs) and to guarantee sustainable and beneficial exploitation of the resources and to respond to any specific challenge related with natural phenomena (cyclones, earthquakes, tsunamis, etc.), or with the catastrophes generated by human activity both in the innermost and outermost regions of Europe.

Of utmost importance in this context is the development and implementation of a "European Marine Observatories Network"; these would be physical infrastructures and/or marine reference sites addressing research and study of regional waters to promote a better understanding of the marine environment, and a network of national databanks which store and maintain any set of marine data or information generated by the scientific programmes developed by research institutes or any other marine R+D+i organisations, and which also serve to further comprehension and dialogue among the scientific community, policymakers and end users, including industry and commerce. These structures should be responsible for ensuring the collection, drafting, processing, study, accessibility, sustainability, quality, standardising and convergence of data and information, as well as the interaction between the different established systems (Common Fisheries Policy, European Marine Strategy, etc.).

The creation of these operational infrastructures will be essential for the reliable assessment of the state of Europe marine environment necessary to support the "*good ecological status*" as required by the European Marine Strategy (EMS) which the IEO fully endorses as the environmental pillar of the future Maritime Policy. To maintain and improve the conditions of the resource on which all maritime activities centre - that is, the ocean - is the cornerstone of the EMS, as it constitutes the framework for the protection and conservation of the marine environment, for the prevention of its deterioration and to ensure its restoration when affected, applying an ecosystem-based management and supported by acquired scientific knowledge.

2.3. Remaining at the Cutting Edge of Knowledge and Technology

Maritime industry, marine research and oceanography are highly dependent on the most advanced technologies. On many occasions, the harsh working conditions suffered by marine scientists prompt the need to boost the development of innovating technologies of easier implementation. In most cases, these new methodologies are designed through the application of a scientific response to social demands.

Research on future sea-related technological developments should be strengthened especially in the field of new sensors for application in control and measurement devices (physics, bio-analysis, chemistry and nanotechnology) used particularly for *in situ* readings of oceanographic parameters; in the field of new materials for their use in marine industries, especially deposit-proof, corrosion-proof or aging-proof materials; in the field of new sampling and measuring systems and in the field of development of new components for these devises or to improve communications.

In any case, in order to promote new advances and improve the competitiveness of the industry, it is essential to establish and implement marine technology transfer mechanisms.

The creation and development of a European Network of Marine Research to co-ordinate specific tasks and make recommendations regarding the application of directives, acting as reference and carrying out regional studies on climate change, fishing research (CFP-DCR) or quality assessment of the marine environment (EMS), etc., endorsed by the current marine research institutions and organisations of the Member Countries, would be extremely positive. For this, it is necessary to stimulate clustering among European research groups, improve inter-institutional relations and unify current co-operation and co-ordination mechanisms. The support of the EU administration for the creation of this Network would be highly beneficial for the advancement of European marine sciences, without forsaking participation of these marine research institutions in the different international agencies and bodies. Nevertheless, the priority for this development will be to guarantee scheduling and budgeting in order to carry out ambitious projects which maintain European marine research at the cutting edge at world-wide level.

2.4. Innovation under Changing Circumstances

Climate Change

Oceans and seas are basic components of the earth's climatic system while possessing the singularity that their physical, biological and bio-geochemical characteristics can be affected by climate change, to the extent of modifying their ecological structure and functions. The nature and scale of environmental and economic impact of climate change prompt the need to establish specific European research programmes on climate and the development of a strategy to forecast the effects of climate change in the marine environment and ensure co-ordination with international research programmes on this subject.

The main challenges in this context have to do with environmental change and social circumstances. On the one hand, natural sciences identify and forecast environmental change and the need for innovation, while economic sciences pinpoint the social and economic changes which take place or have taken place. The 7th Framework Programme defines the primary issues for the marine scientific community and prioritises "to make sure that there is effective co-ordination between the priority matters and scientific areas in cut-across issues such as sea-related sciences and technologies". Nevertheless, the European Maritime Policy must be taken into account and ratified within the Financial Framework of the EU and in the different European funding mechanisms, Structural Funds, Competitiveness and Innovation Programmes and in the R+D Framework Programmes.

2.7. The Regulatory Framework

The future of Fishing and Aquaculture

The United Nations Food and Agriculture Organisation (FAO) estimated in 2004 that 76% of the world fishing resources were either exhausted, over-exploited or under recovery. Everyday there is evidence that the extraction capacity is higher than desirable to achieve sustainable exploitation of marine resources. Moreover, the marine environment is not only being modified by overfishing or by the impact of fishing techniques on the sea bed or on the benthonic fauna and flora, but also by the climate change and other anthropogenic factors (for example, pollution).

The development of fishing research is essential to acquire the necessary knowledge to formulate suitable recommendations and pertinent scientific assessment. Strategic alliance and co-operation between the fishing industry, oceanography, fishing research, marine ecology, socio-economic researchers, marine research institutes and associations will favour improvement in the sustainability of resources.

The commitments deriving from the Johannesburg summit of 2002 (approach based on ecosystems, establishment of Marine Protected Areas and sustainable production levels) can only be reached through spearhead fishing research. Future fishing research should also take into account habitat-related aspects and their management and integration, from an ecosystemic viewpoint of stocks and through oceanographic, biochemical and biodiversity-related research. All this must come in conjunction with greater cohesion between the Common Fisheries Policy and existing (Habitat and Birds directives, Natura 2000 Network, etc.) or future marine legislation (Marine Strategy Directive).

Meanwhile, the EU Maritime Policy must provide greater support to the development of aquaculture based on sound research and complying with current legislation (alien species, hygiene, health/disease management, impact assessment, etc.). The compilation and integration of the existing legislation on aquaculture in a common policy must be the legal framework needed for the development and sustainability of this activity.

3. MAXIMISING QUALITY OF LIFE IN COASTAL REGIONS

3.2. Adapting to Coastal Risks

The sea conceals a great quantity of threats for human beings and for material assets; many of these dangers are of natural causes, such as erosion, storms, floods and tsunamis, but others are clearly prompted by human activity, such as climate change, pollution, etc., and require urgent and direct intervention if we want to avoid serious consequences in the decades ahead.

Demographic growth and development of coastal areas has increased the risk level in these areas. Therefore, there is a need to grant greater consideration to associated risks and how to avoid them, to applying a preventive approach and innovative planning. Research plays an important role in risk forecast and prevention: the fostering of land planning projects in coastal areas, the integration of vulnerability assessments of coastal zones, including the

compilation of data to draft forecast models, the development of risk indicators, the promotion of multidisciplinary research activities (include marine pollution studies), the transfer and interchange of information with all the stakeholders and the reinforcement of synergies between decision makers and marine research institutions in order to improve knowledge and adopt common strategic goals for the greater safety of people and assets.

3.4. Managing the Land/Sea Interface

The co-ordination of the multiple uses of the coastal zone in an integrated manner is one of the requisites for the success of any global maritime policy. That is why we believe that the European Maritime Policy should boost and complement existing initiatives in the practical management of coastal areas.

The management of the land-sea interface and the role of an Integrated Coastal Zone Management (ICZM) as the link between science and policy and as an instrument to identify the main issues and conflicts in the Land/Sea interfaces for coastal regions.

Hence, the support of interdisciplinary research is essential in order to boost the activities of ICZM and spatial planning, as well as to further the implication of stakeholders in the development of norms and coastal management in order to reach a process that is as transparent as possible.

4. PROVIDING THE TOOLS TO MANAGE OUR RELATIONS WITH THE OCEANS

4.1. Data at the Service of Multiple Activities

Marine Data

As indicated in the Green Paper, an understanding of the competing uses which concur in the sea demands more detailed data and greater knowledge of maritime activities, as well as of the repercussions of such activities on resources. The existence of reliable data is important not only for economic operators but also for the regulation of the sector and decision-making, resulting in a sound and sustainable EU maritime policy.

On the other hand, the improvement and circulation of marine data will also afford new possibilities to producers of high technology in the maritime sector and will improve the efficiency of different activities such as marine research, marine resource management, or reduce existing doubts regarding oceanic processes and climate change, thus improving current forecasting systems.

The creation of a “European Marine Observation and Information Network”**,** based on the infrastructures and data collection networks already existing in the Member Countries and endorsed by the different institutions embracing and integrating data collection systems, which are fragmented at present, is essential for the future of the Maritime Policy and for

the development of any sea-related scientific or management activity such as Marine Strategy or Climate Change. This Network, which will significantly improve interoperability, as well as long-term data maintenance and access, will have the objective – as indicated in the Commission's document – of constituting a source of primary data for providing forecasting and monitoring services to public authorities, maritime services and related industries, researchers and/or any other stakeholder.

In this same context, the development of an "EU Atlas of the Seas" will represent a substantial contribution to the development of all the maritime sectors and their governance, which will also demonstrate European scientific and technological capacity and boost the integration between economic and social sciences and marine research. Mapping of the European waters and sea beds will be of utmost importance for the analysis of the ecosystems, spatial planning, the study of maritime climate and safety at sea. In a more far-reaching sense, if this atlas would include – in addition to oceanographic data – data on ecological features, climate, resources, sea-bed geology, pollution, environmental quality, sea transport, etc., and information on archaeological sites and the maritime heritage, it will not only serve as educational material to explain the complexities of the oceans and maritime activities, but also as a tool to further and improve knowledge of the sea, its resources and activities, and to contribute towards recovering the maritime heritage and strengthen the maritime identity of Europe.

Furthermore, the development of marine research as cornerstone of the future Maritime Policy requires, in addition to databases and observation networks, a great variety of highly specialised and expensive infrastructures: oceanographic ships, satellites, communication systems and computers, laboratories and other experimental facilities, etc., which are estimated to absorb 50% of the investment in marine research. It is for this reason that we believe in the need to rationalise the use of these installations and infrastructures through sharing, and hence recommend the creation of an office for the co-ordination of these infrastructures at European level.

5. MARITIME GOVERNANCE

Bearing in mind that European Maritime Policy has to fall within a general framework, its application has to take into consideration the geographic reality of Europe, which includes continental territory and outermost islands and regions. The structure and intensity of maritime activities and the ecological characteristics of European waters vary considerably from one sea to the other; hence, the management of the European marine environment and its economic activities has to be based on an ecosystem approach regional planning, as proposed in the Marine Strategy.

In the development of this European policy and the better governance of oceans and seas, and in order to provide competitive and innovating recommendations, it is essential that the European marine scientific community develops its skills independently, establishing medium-term and long-term priorities and ensuring the necessary infrastructures to carry out their research and development programmes. This independence will allow the

scientific community to acquire the best experience and skills to recommend and develop products that meet the demands of all the maritime sectors and favour the sustainable socio-economic development of the European Union. To reach such independence, the administrative rules and mechanisms of the call for tenders and contracting requirements of the Framework Programmes and Committees must be improved.

P R O P O S A L S:

- ***To promote and encourage the transfer of knowledge and research results in subjects of interest for the different maritime sectors***

- ***To favour the clustering of research institutes and industries in order to improve European potential in the development of maritime research and technology***

- ***To establish a European Marine Observatories and Reference Sites Network to set standards in marine research, support the administration in decision-making and act as cornerstone for sea-related conservation and protection activities***

- ***To create a European Network of Marine Research endorsed by the existing marine research organisations and institutions of the Member Countries***

- ***To develop and enhance simulation models, existing information, data on climate change and marine pollution and their effects, and promote the use of oceanography and marine research as essential tools to improve forecast and reaction capacity***

- ***To promote fishing research projects which integrate studies on ecosystems, the environmental effects of fishing, socio-economic information, fleet management and long-term planning***

- ***To apply a preventive approach and innovative planning based on sound marine research to avoid, prevent or mitigate natural or human induced risks and dangers in coastal areas***

- ***To support interdisciplinary research and complement existing marine institutes initiatives in order to boost the activities of Integrated Costal Zone Management and spatial planning***

- ***To establish a "European Marine Data and Information Network" based on the infrastructures and data collection networks already existing in the Member Countries and endorsed by the different marine research institutions***

- ***To map the European waters and sea beds and develop the "EU Atlas of the Sea" as a contribution to the development of all the maritime sectors and their governance***

- ***To promote the coordination for the sharing of marine infrastructures and equipments in Europe***

- ***To manage the European marine environment and its economic activities through an ecosystemic approach to regional planning***

- ***To improve the access of the scientific community to the calls for tenders and other advisory mechanism of the European administration***

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