Summary Paper
Science Priorities and Policy Recommendations

European Parliament, Brussels, 17 October 2005

The European Marine Scientific Research Event aims to raise awareness of marine science issues that will affect European society in the coming years. It is focussed within the context of current debate on future EU maritime policy and research funding. Below are some of the key scientific priorities presented at this event, to position the marine sciences within these EU policy decisions.

The messages in this paper are also reflected in the poster exhibit in the reception area.

CURRENT SCIENCE PRIORITIES

1. To understand the role of the ocean in the Earth system

This role manifests itself in long-term climate and short-term weather patterns as controlled by ocean circulation, which in turn responds to changes in global temperature, radiation budget and sea-level change. Oceans also interact with tectonic forces that gradually change the long-term ocean/land configuration or, short-term, cause environmental catastrophes.

Key examples and priority goals:

- Ocean circulation: ***improved assessment and prediction systems.***
  The North Atlantic is a crucial regulator in the global climate system.
- Tropical cyclones: ***better global forecasts.***
  Europe suffers indirectly in multiple ways from hurricanes and typhoons through global effects
- Tsunamis: ***a tsunami early-warning system for Europe***
  European coasts have been devastated in the past by tsunamis triggered by earthquakes, volcanic eruptions, slides.
- Ocean observatories: ***networking and strategies for ocean-wide research.***
  Local, regional and ocean observations are proven tools for these goals.

2. To maintain the ocean's ecosystem while continuing to exploit ocean resources

There needs to be a delicate balance between scientific, environmental, political and economical interests. An ongoing basic scientific theme is the assessment of biodiversity, as are the applied fields of fisheries development, innovative aquaculture, energy conversion, deep-sea mining, and fossil-fuel exploitation. Sustainable exploitation also needs to be based on a solid knowledge of ecosystem interaction, environmental compatibility, reliable estimates of resources, as well as prudent ocean governance.

Key examples and priorities:

- Aquaculture and fisheries: **a *new ecosystem approach to aquaculture.***
  Declining global catches are irreversible; current aquaculture is facing grave Problems.
- Resources from the sea: ***improved technical developments and assessment of environmental impacts.***
  Ocean energy derived from wind farms, tidal parks and gas hydrates could minimize greenhouse gas outputs.

3. To evaluate and mitigate human impact on the marine environment

Myriad problems have arisen due to human activities in and around marine environments. Predicting scenarios, developing counter measures, capacity building and coastal zone management are means by which human impact can be better understood and counteracted.

Key examples and scientific priorities:

- Acidity of the ocean: ***assessment of marine response to increased acidity.***
  Increased atmospheric carbon dioxide is causing irreversible effects.
- Invasion of alien species and chemicals: ***new monitoring strategies and evaluation of environmental and ecological effects.***
  Globalization accelerates the spread of biological species and increases the production of synthetic chemicals.
- Near-shore impacts: ***mitigating disturbance caused by change in morph-tectonics and increasing sea level.***
  Conflicting activities place pressure on coastal zone use.
- Temperate lagoons: ***implementation of the Water Framework Directive.***
  Over-fertilization and internal seafloor nutrient fluxes contribute to eutrophication.

4. To explore the deep-sea frontier

Without doubt, curiosity-driven science is the motor for long-term progress of any society. The ocean is the last frontier on Earth, with its vast expanse, hostile environments, and inaccessibility. Innovative deep-sea technology paces progress in science as well as provides spin-offs for industrial use. Blue biotechnology, sensor development, and the construction of new research tools and platforms are but a few of the numerous initiatives promoting successful exploration of the deep-sea frontier.

Key examples and scientific priorities:

- Deep biosphere: ***unravel survival and adaptation mechanisms and assess the effect on global environmental chemistry.***
  One-third of all living microbial organisms are found below the seafloor and constitute a wealth of new life forms.
- Pharmaceuticals: ***screen organisms living under extreme conditions and test new enzymes and chemicals***.
  New life forms metabolize at extremely high or low temperatures, in the presence of poisonous gases and the absence of oxygen.
- Marine environmental technology: ***network existing infrastructures and invest in new designs; under-ice research as a special challenge to Europe***.
  Innovative technology paces progress in science. High pressure, extreme temperatures, and the inaccessibility of the ocean environment requires special but costly technologies.

POLICY SUMMARY

The processes of discovery and innovation in marine research are **important in their own right** as well as being an integral part of European social, economic and political enterprise.

In today's competitive world, European marine research more than ever requires strong political backing in order to remain at the forefront of creating new knowledge, promoting RTD, as well as supporting governance and crisis management.

Therefore, concerning:

1. **Marine research funding.** In the short term, the most important decision for the EP and the Council must be to **support the Commission's proposed budget for FP7**. In the medium-term the importance of marine RTD should be given a more prominent standing in all relevant Commission funding programmes including the Research Framework Programme and the Competitiveness and Innovation Programme (CIP). To this end, a systematic dialogue between the Commission and all those concerned would be extremely important.

2. **The European Maritime Policy. Marine and maritime scientific research must be given its own chapter**. A well-worded chapter on marine RTD would allow the Maritime Policy to show itself as a future-orientated policy in line with current debates about the importance of strengthening European RTD. In contrast to many other maritime issues, the marine sciences can create new knowledge concerning future areas of economic and social importance.
   A prioritisation of marine RTD in the Maritime Policy would also provide a catalyst for bringing together the various "marine" and "maritime" RTD communities across Europe. No forum, including the technology platforms, allows for such an overarching interaction to date.
   The partners represented at this event look forward to an active dialogue with the European institutions on the topic of Europe's maritime future and to giving support to the proposed Maritime Policy.

For more information please contact:

Professor Erwin Suess
Managing Director
German Marine Research Consortium (KDM)
Markgrafenstraße 37
D-10117 Berlin
esuess@ifm-geomar.de