Investigating the Oceans – evidence from the Marine Biological Association of the United Kingdom

Executive Summary

The Marine Biological Association of the UK is concerned about insufficient and fragmented funding and organisation of marine science in the UK, which may erode the leading role of Britain in Europe and worldwide. Welcome steps have been taken to reverse fragmentation (e.g. the Oceans 2025 programme of the Natural Environment Research Council [NERC] laboratories). While UK marine science benefits from the diversity of organisations carrying out marine research, each with particular and unique attributes, it is important to foster and maintain their coordinated activities through well-organised, consistent funding mechanisms. This is particularly the case for sustained observations essential to manage marine resources in a rapidly changing world and to contribute towards models of global environmental change enabling forecast of future states.

Background and sources of information

1. The Marine Biological Association (MBA) is a Learned Society established in 1884 with over 1000 members. It has run a Laboratory in Plymouth since 1888 where 60 staff now work. MBA staff have been at the forefront of investigations into the biology and oceanography of our seas since establishment. The results of the recent (2004-2005) Science and Management Audit (SMA) undertaken by NERC concluded that MBA science was mainly outstanding with some excellent. The account of the SMA (http://www.mba.ac.uk/PDF/SMAbackground.pdf) gives more information about the MBA, (see also the rest of the MBA website for general information www.mba.ac.uk).

2. The MBA welcomes the opportunity to contribute to the Select Committee inquiry. In the following submission, we draw especial attention to the importance of whole organism science in an ecosystem context including support of environmental protection and management, and the importance of long-term studies. The need to maintain a spread of expertise across a range of institutes and to knowledge transfer is emphasised.

3. The MBA draws the Committee’s attention to NERC’s recent Marine Review conducted in 2005 following the Science & Management Audits of all the NERC Marine Centres. CEFAS science has also been recently reviewed. This evidence may be of value although it is not fully available in the public domain.

4. The MBA has contributed to the development of Oceans 2025 which we believe is a sound and well-considered approach to NERC-funded UK marine science for the next 5 years involving all the NERC funded marine research institutes (see separate collective response by the Oceans 2025 Directors).
Organisation and funding of Marine Science

5. The MBA comments refer only to British and non-polar European waters. Marine science is organised under different sectoral and funding umbrellas: statutory-driven science and monitoring delivered by government departments and their agencies (e.g. FRS Aberdeen, CEFAS, EA, SEPA), strategic science largely funded by NERC via institutes and collaborative centres, and the university sector which derives funding from a variety of sources, particularly for blue skies responsive mode funding from the Research Councils. Thus there is considerable overlap on this spectrum from pure to very applied science and knowledge transfer. Whilst there has been progress towards a more coordinated approach to marine science (e.g. Oceans 2025 by the NERC laboratories) more integration across the sector as a whole would benefit scientists and funders by reducing unnecessary competition and duplication of effort. A more coherent approach would enable major issues to be addressed in the most cost-effective way. Government departments commissioning research, rather than letting competitive tenders, may be more appropriate in some areas, such as long-term sustained observations, pollution studies and fisheries management.

Role of the UK internationally

6. The UK is widely acknowledged as being second only to the United States in marine sciences. However, a more coherent approach to funding has led to countries such as Germany, France and the Netherlands challenging the UK’s lead role in Europe in certain sectors.

7. The competitive nature of British science does mean that UK scientists do well when bidding for European Framework funding because of extensive experience in grant writing and tendering. There is a risk that marine scientists in the UK spend too much time competing for funding rather than writing leading edge papers.

Support for Marine Science & Technology

8. There is some fragmentation of coverage in support of research in marine science and technology. Although the NERC supports most responsive mode (blue skies) and strategic research (e.g. the Oceans 2025 programme), there are also other funders. The Engineering and Physical Sciences Research Council (EPSRC) funds important areas such as coastal engineering and basic research relevant to marine science and technology. The Biotechnology and Biological Sciences Research Council (BBSRC) is responsible for biotechnological research and there is a risk that important developments in the use of products and genes from the great diversity of marine organisms is being neglected as it is in an interface area between NERC and BBSRC. Aquaculture research and development has suffered similarly. Research on the evolutionary and basic biology of marine organisms (e.g. genetics, development, behaviour) is also compromised by BBSRC’s focus on model organisms (i.e. fly, worm, yeast, Arabidopsis) eschewing the comparative approach. Recent changes in eligibility of different organisations for responsive mode funding may further lead to missed opportunities as a result of instructions to Research Councils by the Office of Science & Innovation. NERC have been very catholic and inclusive in their interpretation of these instructions in contrast to BBSRC who have excluded some leading organisations from direct responsive mode funding, although this is under discussion at present.

9. Considerable funding is also available from Government departments and agencies for policy-driven science. This diversity of funding sources enables much applied research and knowledge transfer.
The state of UK research and skills base

10. We are concerned that whole organism science and especially the science needed to support marine environmental protection and management is in decline and that the retention of both taxonomic (including alpha taxonomy and identification) and survey skills needs to be addressed.

11. Much of the concern about human impacts on our seas relates to inshore areas and undertaking surveys and maintaining monitoring programmes must rely on teams of experienced ecologists working on the shore and from small vessels. We see a reluctance to undertake whole organism ecological surveys such as the Marine Nature Conservation Review of Great Britain which was finished prematurely in 1998. Broad scale mapping projects are important but conservation action requires information on the species and habitats (as biotopes) present in the seas around Britain. Gaps in knowledge need to be filled.

12. There is also expertise in many small coastal laboratories or university departments with strong marine biological expertise. We are concerned that Defra seems over-reliant on the ex-fisheries laboratories as their ‘traditional’ source of information from whom to commission survey work.

13. There is a shortage of oceanographic and ecological modellers in the UK. There are also difficulties in recruiting scientists with particular skills such as molecular biology, and environmental geophysical sciences. As a consequence many research laboratories have a high proportion of non-UK scientists, although this reflects the open door policy of the UK scientific community to European and international scientific integration.

Use of Marine sites of special scientific interest

14. We find the reference to “marine sites of special scientific interest” confusing as SSSI is a statutory designation that is rarely used for and is not designed to protect marine features. However, we do feel that marine protected areas (mpa’s) could provide scientists with the opportunity to study marine ecosystems that are as close as possible to natural conditions (reference or control sites) as well as protecting threatened and important features. With the prospects of a Marine Bill with spatial planning at its core, provisions for mpa’s should be made. Identifying those mpa’s should use criteria developed by the recent Review of Marine Nature Conservation (RMNC) and not rely on provisions for the Habitats Directive which is poorly developed for marine habitats and species.

15. Research that will help to manage and protect important features for marine natural heritage is often indicated in Biodiversity Action Plans, although many ‘worthy’ species do not qualify because of ‘insufficient information’ predominating in the selection procedure. A new tranche of Biodiversity Action Plans is in preparation at the moment, supported by the RMNC ‘Nationally Important MarineFeatures’ list. This time around, we need any commitments made by research councils to undertake research to be fulfilled as they were not in the last tranche.

Climate change on the oceans

16. Concerns about climate change impacts have ‘re-vitalized’ interest in long-term biological and oceanographic data sets – many of which were closed-down in the mid 1980s to make way for marine science that was more fashionable at the time. There is a strong case to ensure both the maintenance of existing schemes and the establishment of new schemes that will help us to understand the rate at which our seas are changing and to what extent those changes are the result of human activities. There is particular need to separate broad scale low-amplitude global change from regional and local impacts. The work being undertaken needs to be shared and complementarity is important – networking and agreeing to collaborative projects through groups.
such as the Defra Marine Environmental Change Network are essential. Sustained observation is at the core of the Oceans 2025.

17. Monitoring is not sufficient in itself. Process-based studies integrating molecular and cellular mechanisms through to whole ecosystems are required in order to forecast future environmental states and enable adaptional approaches to dealing with climate change.

Knowledge Transfer

18. We feel that knowledge transfer from the science community to policy advisors and to industry is not as strong and well-structured as it could be. Obviously, there is skill needed in getting complex concepts across to non-scientists but that needs to be done; not least because there is a danger of duplication and therefore unnecessary expense. The Marine Climate Change Impacts Partnership is an example of good practice. The UK, however, does far better than its European neighbours in transferring information from academic and government scientists to policy makers.

19. We draw the attention of the Committee to the leading work that has been undertaken in the UK to provide the structures and criteria that are essential in cataloguing our very varied seabed environment and establishing criteria to identify protective measures. That work has been undertaken especially under the auspices of the Joint Nature Conservation Committee and has been highly influential in establishing common classifications and approaches to protection in Europe and the north Atlantic. The UK should continue to lead within Europe on knowledge transfer related to marine environmental protection and management.

Yours sincerely

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