MARS NEWSLETTER

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The European Marine Research Stations Network

Contents

INTRODUCTION

... from the MARS network president

The MARS network could celebrate its 15th anniversary this year, as 11 founding members lead by Pierre Lassere, defined "seaside laboratories" as the Marine Research Stations network in 1990. Their main goal was to direct the common scientific interest towards biodiversity. This initiative gained considerable impetus with the Rio-convention in 1992 and lead to the EU and UNESCO sponsored inauguration of the MARS network with 54 partners in Paris in 1996 with Carlo Heip as its first president. Due to his foresight and initiative, two major EU projects sprang from the MARSnet community: BIOMARE - "Implementation and networking of large scale, long term Marine Biodiversity research in Europe" and MarBEF - Marine Biodiversity and Ecosystem Functioning". The former built on the existing network and defined research issues and the latter was the first Network of Excellence in Europe to be continued at least until 2009. Under Professor Heip's guidance, important themes: Patterns, Functions and Societal services of Marine Biodiversity will be detailed and discussed and the results will solidify Europe's position in this worldwide research area.

The international view is typical for the MARS approach: close connections existed from the start with the National Association of Marine Laboratories (NAML), the North American sister organisation which now helps relate European initiatives within the Census of Marine Life, COML. You will read below on new initiatives with the UNESCO Man and the Biosphere Programme and about NaGISA aiming at a worldwide census of shore life.

Parallel to supporting project work, MARS has to concentrate on the role of the Marine Stations Network as observatories of the seas. A dense net all over Europe does exist capable of monitoring the status as well as the slow and the sudden developments and their causes in the species repertoire – on scales from genes to ecosystems. This can only be accomplished in a concerted approach relating local observations to effects of global change, since we are now in a world of rapid and drastic alteration of known environments. The influences of those alterations on human life have to be assessed as precisely as possible.

Fortunately, the EU has taken our pleas into account and its 7th Framework programme incorporates again important themes on marine biodiversity. To take these on, MARS should further enhance its impetus by integrating stations from the newly associated states, by opening up to universities with strong links to marine research and last, but not least, by identifying and promoting new research topics among those in physiology, ecological chemistry and new technologies. The MARS newsletter will give some highlights along these lines and may serve as a discussion forum at the same time.

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EDITORIAL

This is the 7th newsletter from the MARS Network. The last one appeared in Autumn 2003 and included the 4th and last newsletter of the EU – Concerted Action BIOMARE. At the same time, the network of Excellence MarBEF was under EU-revision and was finally inaugurated in March 2004 at Bruges. The installation of this large Network as a completely new instrument of EU funded research took much of the initiative and working time of many partners and institutes from the MARS community. Originally, it was planned again for practical reasons to combine the MarBEF newsletter and the MARS one, and in fact MARS issues were considered in its first edition. However, it became clear that MARS should maintain its long term – i.e. strategic perspective - in helping to structure new themes for the marine sciences in the European research area and therefore should run its newsletters parallel to projects with a necessarily limited life time. Accordingly, the 7th Newsletter now connects to the series in reporting on MARS events, prizes and awards. Furthermore, articles on current biodiversity research and new developments are integrated and more are invited for the next ones to come, which again should appear on an annual schedule.

The Editors

BIODIVERSITY: Ecology and Taxonomy

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Why a position paper?

A position paper on the role of marine stations for research in biodiversity, ecology and taxonomy, as proposed at the MARS Conference of Directors in Amsterdam in 2003, is now probably post hoc as we have so much advanced in the implementation of European research through the EU and the ESF (European Science Foundation) since then. Marine biodiversity has fared well in the 6th framework programme with several networks, integrated projects and STREPs dealing with it. The Responsive Mode Projects in the Network of Excellence MarBEF (Marine Biodiversity and Ecosystem Functioning) address a number of research questions in which marine stations play a fundamental role. The other Networks of Excellence (NoEs) Marine Genomics Europe and EurOceans, also based to an important degree on marine research stations, deal with molecular biodiversity, and ecology and biogeochemistry of pelagic systems respectively. These networks are also presented in this MARS Newsletter. In addition there is the EU Network of Excellence in taxonomy, EDIT, just being approved, and, though not restricted to marine taxonomy, certainly a new important player in the field. From the ESF side (the Eurocores programme) we just have Eurodiversity finishing the review of proposals, some of them including marine biodiversity (I hope), and we have Eurodeep in the pipeline, the European contribution to the Census of Marine Life. So things are already going well; we probably do not need basic position papers anymore since we now are forming a strong community on marine biodiversity in the European Research Area. Then, of course, being a strong community: noblesse oblige.

Why marine stations?

For what reasons have marine research stations been able to maintain themselves and what are their trump cards for the future? Those that have come to my mind are their:

- situation near the seaside with direct access to marine organisms and habitats
- geographical spread along the coasts of Europe
- combined often multidisciplinary expertise in many domains of science
- taxonomic expertise, in some cases, of the regional fauna and flora
- curation and maintenance of long time series, of crucial importance in the interpretation of a changing biosphere
- infrastructure, often of national importance and often networked in Europe. This infrastructure is educational, for instance collections and libraries, and for research with often unique facilities at the national level.
- role in education, especially of undergraduates, and training at an international scale
- strong networking, of course including the MARS network itself, which allows concertation (sorry for this French word, which has only recently appeared in EU English) and to speak with one and a potentially powerful voice at the European and international level.

What biodiversity science?

Some of the research questions that build on the infrastructure of the marine stations have been addressed in the different science and implementation plans that were discussed for the European Science Foundation and have served as an input into the 5th, 6th and hopefully 7th framework programmes. In general these questions are still open and still need to be addressed. The interested reader may find them at the following web sites:

- EMAPS Science Plan www.esf.org/generic/626/EmapsPlan.pdf
- Integrating Marine Science in Europe www.esf.org/publication/146/Marinescience.pdf
- Marine Biotechnology www.esf.org/publication/127/biotech.pdf
- Implementation of Marine Biodiversity Science www.esf.org/publication/151/marinebiodiversity.pdf

In general one could state that the study of marine biodiversity needs exploration, observation, adequate theory and the experiments to test it and modelling to allow for prediction. We also need to incorporate humans and human society in our research at an early stage, as exploiters and users of biodiversity but also as drivers of changes in society as a whole. This is quite a challenge and we are still far from reaching this objective.

Exploration and Observation

Simple exploration is required even in shallow waters, but most of all for microbes and for the deep sea. A basic requirement before one can assess the implications of changes in biodiversity is that patterns of biodiversity need to be better known. Research should begin with characterisation of Europe's biodiversity as fully as possible (from the level of genes to ecosystems). The approach was developed and formalised in the EU BioMare project (http://www.biomare.org), which could serve as the basis for this enormous challenge.

This could be done by compiling comprehensive inventories at a few sites and less comprehensive surveys at a larger number of sites, using standardised methods and protocols. Within BioMare a number of LTBR (Long-Term Biodiversity Research Sites) and ATBI (All Taxon Biodiversity Inventory) sites have been defined. These sites cover a number of key habitats across the geographical range of Europe (from the Canary Islands to Svalbard and from the Azores to the Eastern Mediterranean). Progress is now being made through a number of RMPs in MarBEF, although the idea of ATBI sites seems to have lost momentum. Perhaps it could be revitalised through cooperation with the taxonomy networks.

Besides the RMPs of MarBEF, a further development could be the participation in the EuroComl projects, especially in EuroNagisa, the European contribution to the worldwide Nagisa project (http/www.nagisa.coml.org) which will be discussed in 2006. The financing for these projects is difficult to obtain, but on the other hand most of the agreed work is possible with a very limited budget and only needs a dedicated person and a committed institute. We are en route to doing this and hopefully will get started within two to three years.

The establishment of a series of observatories for the marine environment has been a topic of discussion for many years and is apparently gaining momentum. The establishment this year of a governmental system, the Global Earth Observatory System, and the necessity to establish a series of measurements for biodiversity that can be made from space as well as on the ground will catalyse this development in the coming years. MarBEF will work together with the terrestrial network AlterNet and the taxonomy network EDIT, and perhaps with the microbiologists as well, to produce a position paper (another one) for the ESFRI (European Strategy Forum on Research Infrastructure) on how such a biodiversity observatory and infrastructure network could operate.

Part of this infrastructure should be Europe's classical taxonomic archives and specimen collections. Specimens are the physical witnesses of past biodiversity. These are regionally scattered and require integration into a common European biodiversity database. Europe is already taking a lead in measuring and understanding the biodiversity of the marine environment by identifying key species and their roles for pelagic, benthic, estuarine, abyssal and microbial environments. European science is uniquely qualified to do that. We also have the archives and the identification guides to the fauna and flora, often old and based on national territory, but we still do not have a programme that can make good use of this.

Theory and Experimentation

Adequate knowledge of the patterns of biodiversity needs to be combined with an understanding of the mechanisms for generating and maintaining marine biodiversity and of the role of biodiversity for ecosystem functioning. Marine systems are open and the genetic differentiation of populations, therefore, differs significantly from that in terrestrial systems (although water and wind are analogous vectors). Life-history traits of marine populations are very diverse and cannot easily be generalised. The reasons for this diversity are not understood and functional and historical explanations have to be explored. The genetic structure of populations as a function of the different types of dispersal and how genetic differentiation varies with changes in habitats and biodiversity also need to be studied. In this context, the use of molecular markers of functional processes in relation to changes in biodiversity must be explored. Results from these studies can be expected to lead to rationalised and more effective monitoring of change.

The potential impact of climate change on marine biodiversity cannot yet be predicted. Historic, well-documented changes in distributions are invaluable tools for understanding the effects of climate change, for instance through invasive species and changes in the food web. Another experimental approach would be to develop new mesocosms or 'Climatrons' to enable European marine scientists to investigate the long-term effects of different climatic regimes on the functional biodiversity and structure of contrasting marine ecosystems.

We are badly in need of more and adequate theory, especially when we compare marine environments with the advances that have been made in terrestrial systems, where long-term experiments have been ongoing for over a decade. Biodiversity at the species level is a function of complex interactions between species (competition, predation, parasitism, commensalism etc.) and between species and their environment (currents, temperature, food supply etc.). Classical ecological theory is not very good at explaining marine biodiversity and many of the observations or experiments needed to support it are simply impossible in the marine environment, except perhaps for intertidal and shallow subtidal areas. We need to combine species and biogeochemical approaches, but even then we will only be able to explain what we observe, and prediction is still far away.

Models

Models of marine food webs and interactions between food web structure and biogeochemical cycles are badly needed because they will allow for the predictions required to support different management options and strategies. Such models must be supported by adequate data on the characteristics of the different compartments necessary to describe the food web and on the strength of the interactions between them. We need models to quantify the role of marine biodiversity in providing goods and services in both relatively natural and more human-impacted environments, to determine the probable effects of natural and man-made changes in biodiversity on ecosystem goods and services and to provide a scientific rationale and tools for the proper management of living resources in European seas. Model development is an important activity in the NoEs and will be linked in the future to the activities of the Census of Marine Life and Diversitas.

Human society and socio-economics

Humans are now changing the biodiversity even of the open ocean, through climate change (temperature, currents, and acidification) and through fisheries. This is an amazing fact in view of the sheer surface and volume of the oceans and it was long considered highly improbable that the oceans could be changed at all.

These changes also require understanding of how altering biodiversity is linked to changes in global society. This can only be done when natural scientists start and continue discussion with socio-economic scientists on the links between human society and the natural oceanic world. It is a joint responsibility of natural and socio-economic science to provide a perspective on what changing biodiversity means for human society and how society could respond to biodiversity change.
Even on land, where the dramatic decline and extinction of so many plant and animal species are much more visible than in the oceans, there seem to be no efficient societal and political instruments capable of stopping this, since human interests are directly conflicting with the existence of a high diversity biosphere. On the other hand, very few people live in the oceans, and as in the case of Antarctica, large parts of it may still be conserved without great harm to people (or to politicians in search of votes).

Our responsibility is to make the public aware of what is happening, to provide the facts and to translate our specialised knowledge into public understanding.

CLIMATE CHANGE:
A role for network observations by European Marine Stations

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It is now widely accepted that the planet is currently experiencing a period of rapid climate change, primarily driven by human activities. The global average surface temperature has increased by 0.7∞C during the 20th Century. Globally, nine out of the ten warmest years on record were recorded in the decade 1990-2000 and 2003 was the warmest year since instrumental records began in 1860 (Houghton et al. 2001). Warming of the global climate is particularly evident in the northeast Atlantic. Sea surface temperatures (SST) around the European coastlines have also increased, with some areas exceeding the global average rise. Data for SST show that in the western English Channel there has been a 1∞C rise since 1990 - greater than any other change recorded over the past 100 years (Hawkins et al. 2003). Similar changes have been recorded in the eastern English Channel (Woehrling 2005).

It is difficult to predict how the climate will alter over the coming decades given the unknown response of society to the threat posed by climate change. Irrespective of the timescale and magnitude of response, some anthropogenically-mediated climate change is now inevitable. Global climate models (GCMs) predict an acceleration of the current warming trend during the first half of the 21st century as a response to continued anthropogenic emissions, and the Earth is expected to become warmer than at any period during the past 40 million years (Houghton et al. 2001). The UK Climate Impacts Programme (UKCIP) in conjunction with the Tyndall Centre for Climate Change Research and the Hadley Centre Meteorological Office has developed the HadCM3 Global Circulation Model. This model has been used to generate a number of UK climate change scenarios of relevance to northwest Europe. They are based on assumptions of future emissions of greenhouse gases and other pollutants. The UKCIP02 report presents four alternative scenarios derived from the HadCM3: Low, Medium-Low, Medium-High and High-Emissions, for three different time horizons (2020s, 2050s and 2080s). The baseline convention for the scenarios has been taken as the 30-year period 1961-1990 and forecasts are made relative to this period (Hulme et al. 2005).
The scenarios do not claim to be definitive - the climate of Europe may not change in exactly the way forecasted, but some key changes are likely to occur:

- Northeast Atlantic SST will rise between 0.5°C (Low) and 1.5°C (High).
- An increase in annual average SST is forecast under all 4 emissions scenarios in the next 20 to 80 years.
- Southern North Sea and English Channel SST may increase by between 1.5°C under the Low and 30C under High Emissions scenarios.
- Irish Sea SST will increase between 0.5°C (Low) and 2.5°C (High).
- Increases in wind speed of between 2 (Low) to 8 percent (High) in the southern North Sea and English Channel during winter and spring are predicted by the 2080s.
- There is little predicted change in wind speed during winter and spring in other coastal waters.
- Summer and autumn wind speeds are predicted to decrease by 10 percent off western Britain by 2080s under High Emissions scenarios

For sustainable stewardship of the seas, it is vital to separate local impacts from global environmental change. Thus the effects of climatic variability on the distributions of marine biota must be measured in order to understand and ultimately forecast changes in marine ecosystems (Fields et al. 1993). Climate change will alter the metabolism, physiological processes and behaviour of individual organisms, which influence adult growth and survival, reproductive output, phenology and recruitment success (Lewis 1996, Walther et al. 2002, Herbert et al. 2003, Sims et al. 2004). These will in turn influence the geographic distributions of species, and the abundance, structure and connectivity of their populations (Barry et al. 1995, Parmesan 1996, Thomas & Lennon 1999), ultimately resulting in changes in community structure and ecosystem functioning (Post et al. 1999, Walther et al. 2002). As climate warming continues a general pole-ward shift in species ranges is expected as species respond to the alteration of suitable 'climate space' that they can inhabit (Graham & Grimm 1990, Southward et al. 1995, Parmesan 1996). Climate change can also cause widespread 'local extinction' of species, which could lead to global extinctions in those species that are unable to adapt or respond to fluctuations in their physical environment (Grabbher et al. 1994).

As the most readily accessible marine habitat in Europe, rocky shores have been the focus of recording species distributions, starting with the 19th Century passion for the seashore. More formal charting of geographic distributions started in the first half of the 20th Century, with particularly valuable surveys being made in the 1930s, 1940s and 1950s, particularly by Fischer-Piette (1936, 1948, 1955) on the French, Spanish and Portuguese coasts in the 1950s by Crisp & Southward in Britain and Ireland (Southward & Crisp 1954, Crisp & Southward 1958). Rocky shores have been well studied: they are accessible and possess definable environmental gradients; most species are sessile or sedentary and easily surveyed non-destructively. Consequently, some of the best long-term data sets have been acquired for rocky shores – many in Britain and Ireland (Southward & Crisp 1956, Crisp & Southward 1958, Crisp 1964, Southward 1991, Southward et al. 1995). Furthermore, the biology of species and ecological interactions are well known from both laboratory and field manipulative experiments, aiding the interpretation of past change and future forecasts. Britain and Ireland straddle a biogeographic boundary between cold 'northern' boreal waters and warmer 'southern' Lusitanian waters. As a consequence many intertidal species are either at the northern or southern edge of their biogeographic ranges and will be particularly susceptible to changes in the climate. Thus the rocky intertidal of Europe provides an ideal system for studying the effects of climate in terms of alterations of geographic distribution of species and the mechanisms driving these changes. Similar sharp boundaries occur further south along the Basque coast of France and Spain and the north of Portugal (Fischer-Piette 1955, 1956).

Intertidal changes mirror those in the coastal shelf zooplankton distributions observed in the North East Atlantic and North Sea since the 1960s and 1970s (Beaugrand & Ibanez 2004). This pole-ward range extension and increase in abundance of southern species have been accompanied by the contraction of cold-temperate and sub-arctic species, indicating that large-scale alterations in biodiversity of the north east Atlantic have occurred in response to rapid warming of the shelf seas in this area.

In the English Channel increasing temperature appears to be the cause of increasing numbers of southern fish species (Stebbing et al. 2002) and earlier migration of squid (Sims et al. 2001). There is also evidence that in two separate assemblages of fish in SW England there were subsets of dominant species whose abundances were strongly linked to annual

mean sea-surface temperature (Genner et al. 2004). Furthermore there is a strong linkage between sea temperature and the composition of plankton assemblages. Edwards & Richardson (2004) and Richardson & Schoeman (2004) have shown that changes in phenology and in overall abundance of the phytoplankton are driven by climate change. These generalised findings build on the observations of Beaugrand et al. (2002) who related changes in abundance of plankton in the English Channel to inter-annual changes of climatic conditions from December to March.

Species are likely to respond to rapid temperature increases at different rates due to differences in thermal tolerances and modulating factors such as variations in lifespan and reproductive mode. Contractions and expansions of geographic range edges will lead to species both being lost from and introduced to assemblages. Changes in the relative abundance of "northern", cold-water/boreal and "southern" warm-water Lusitanian species will also alter assemblage composition. Such changes will in turn influence the outcomes of species interactions such as competition, facilitation and predation, ultimately altering the structure of communities and functioning of marine ecosystems (Davies et al. 1998, Case et al. 2005).

The MARS network of laboratories provides a fantastic opportunity to network time series observations of oceanographic conditions and marine biodiversity to measure the responses of marine ecosystems to global change. Excellent time series have been compiled at many of the MARS laboratories, especially at Helgoland and Wimereux. The challenge facing MARS is to sustain these observations and integrate them with modelling and process-oriented shorter term studies. Much work is underway via the MARBEF Network - but the EUROCEANS Network also has an important role to play. The work of individual stations can also be put into a broader context using the long term and spatially extensive database of the Sir Alister Hardy Foundation for Ocean Science. The ecosystem approach to management of Europe's seas can only be attempted if there is an integrated network of observatories. This is the subject of the article below by the new MARS president Fred Buchholz.

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EUROPEAN MARINE RESEARCH STATIONS: Observatories of the seas

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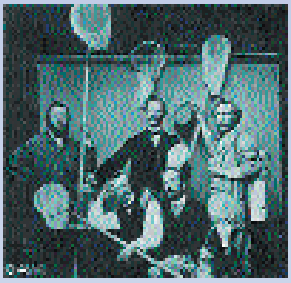
Marine research stations sprouted up all over Europe after Darwin had published "The origin of species…" (1859) and had shown that life originated in the sea. The first stations were established in France at Arcachon and Banyuls in 1863 and a suite of others followed fast. From the start, the new stations attracted many zoologists and botanists as documented in a photograph of 1865. It shows the Italian Pietro Marchi and Matthijs Salverda from the Netherlands with their German colleagues Anton Dohrn, Erich Haeckel, and Richard Greeff at Helgoland, working in the field before the Biologische Anstalt Helgoland was founded in 1892. The composition of this group demonstrates clearly that marine biology, as it developed from botany and zoology, began as a truly European field of science based on the exchange of new experience and knowledge among naturalists and often physicians who turned their heads to being "marine biologists" all across Europe. The European spirit in marine biology has been apparent from the start and was firmly based on the new marine research stations.



Photograph of five early European marine biologists on excursion at Helgoland in 1863

The "butterfly nets" should be noted as well, which in fact were the first plankton nets. Johannes Müller invented these and he coined the word "Auftrieb" meaning the upward drift. Later on, Victor Hensen had this word translated by a Kiel philologist into Greek and "the drifting about" became "Plankton." The use of the plankton net added a new dimension to biology. We may learn from this that gaining knowledge is directly coupled with the invention of new techniques. Nowadays, the marine stations are characterized by specialized equipment from sampling devices to diving and research vessels, as platforms also for cooperation, using and sharing sophisticated equipment. An important component from the start was that the early researchers instructed students directly while being involved in the learning process themselves. Today, intensive instruction with hands on work in the field and lab is still characteristic of marine stations.

Thus, the function of the stations has always been in providing instrumentation, observation and instruction. We may consider this as an enduring part of the cultural heritage of Europe. To guarantee this continuity we need every single marine station with its unique location, facilities and characteristics.

The advent of the biodiversity crisis was recognized in the Rio convention of 1992 when it became clear that a marine census was far from complete. Accordingly, networking of stations and knowledge appeared highly desirable. It was after Rio that the marine stations developed into "Observatories of the Seas." Species repertoires were not considered locally any more but on a European scale. Taxonomic data and evaluation systems were developed and shared, and molecular methods for determination perfected. Furthermore, local observations are now being used for analysis of broad scale changes on an ecosystem level along with experimentation for scenario building and prognostic modelling. The project BIOMARE (2000-2002) and most recently the Network of Excellence, MarBEF, will lead to further refinement in these approaches. The Marine Research Stations network will be a firm basis for the current tasks.

Like Meteorological Observatories, the Marine Observatories deliver a comparable and important service to the European society aimed at the changing marine ecosystem and the fate of its goods and services.

The quality of water and the aquatic environment are taken care of by the European Water Framework Directive. Working groups at marine stations are sharing their data and knowledge to contribute to the scientific basis of environmental evaluation in marine ecosystems. Starting from these, the Observatories of the Seas should extend their sentinel role for a continuous monitoring of environmental health to assess deleterious developments at an early stage in order to mitigate risks brought about by global change as well as anthropogenic impacts on marine systems. Furthermore, sustained oceanographic observations for ecosystem level management are needed. Such initiatives are asked for in the coming Framework Programme of European research. Equally, development of technology is asked for, and in this field the MARS network will be able to build on traditional expertise to help develop new observatory and analytical equipment, from molecular taxonomic identification devices over automated measuring buoys to remote sensing methodology to document large scale patterns of change in marine communities.

The European network of the Observatories of the Seas has a most efficient overseas counterpart in the North American Network of Marine Laboratories, NAML. The worldwide Census of Marine Life is developing a common basis with a European component currently being founded on this connection. In this newsletter the worldwide NaGISA observation system is introduced, as well as the oncoming Man and the Biosphere initiative from UNESCO, which are both developing a common European basis with the MARS network and will extend the worldwide outreach of marine biodiversity and ecosystem research at the same time.

The MARS network community is looking forward to challenging and exciting times.

THE EU NETWORK OF EXCELLENCE MarBEF: Marine Biodiversity & Ecosystem Functioning

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After a long history of preparation, starting with a meeting of the Marine Science and Technology Programme MAST of the European Commission in Sorrento in 1995, and with many meetings, reports and science and implementation plans in between, the Sixth Framework Programme of the EC finally gave the opportunity to start a truly European collaboration in the field of marine biodiversity in March 2004.

Selected from close to 15,000 expressions of interest, the Network of Excellence MarBEF: Marine Biodiversity and Ecosystem Functioning was among the hundred or so accepted proposals and now unites top marine scientists from 56 European institutes (17 countries). The network recently expanded with 23 new institutes as associated members.

What are the goals of MarBEF?

The MarBEF network unites scientists from marine research stations, all of them MARS members, from fisheries laboratories, museums of natural history, university teams and from socio-economic sectors and covers fields from ecology, taxonomy, biogeochemistry, microbiology and fisheries biology to economics, history and social sciences. This broad and unique expertise will allow for a new, holistic approach to marine biodiversity science and its applications.

The knowledge and expertise present in the scientific community can and should be available for consultation by a growing number of industries depending on the sustainable use and exploitation of marine biodiversity. This includes tourism, fisheries and aquaculture but also new industries that explore and commercialise marine genetic and chemical products.

The integration of research is important, not only for science itself, but also to support the legal obligations of the EU and its member states, for instance in the Convention for Biological Diversity, the OSPAR and Barcelona conventions and EU directives (e.g. Bird Directive, Habitat Directive, Water Framework Directive).

One final goal is to create lasting cooperation between marine scientists and institutes in Europe and one of the main objectives is to create a virtual European institute with a long-term research programme and dedicated links with governmental institutions, NGOs industry, and the public. MarBEF has a special outreach section that focusses on reaching the public at large, from school children to university students.

What are the activities of MarBEF?

MarBEF's main activities involve coordination of research, training, exchange and outreach activities. This includes the facilitation of access to resources: research vessels, sampling and/or analytical equipment, distributed computing facilities, mesocosms, web-based analytical and taxonomic tools, experimental facilities, databases, molecular laboratories, reference collections and libraries etc.

A major objective is to promote and undertake collaborative research on marine biodiversity and ecosystem functioning within the following three themes:

1. To understand how marine biodiversity varies across spatial and temporal scales, and between levels of biological organisation, in order to develop methods to detect significant change.

2. To generate theory, models and tests of the relationship between marine biodiversity (assessed at different levels of organization: genetic, traditional species, and functional groups) and ecosystem function through the integration of theoretical and modeling exercises, comparative analyses and carefully designed experimental tests.

3. To understand the economic, social and cultural value of marine biodiversity and hence develop the research base required to support the sustainable management of marine biodiversity including, for example, the monitoring of the health of marine ecosystems, the management of aquaculture, the conservation of marine biodiversity, the history of marine resource exploitation, and the leisure use of marine ecosystems.

What has been done until now?

The network is running for more than one year now. During the first year MarBEF has concentrated on the internal integration and setting up of the infrastructure to support the network's activities. A main effort has been devoted to the web page and the infrastructure required for data management. MarBEF is now responsible for the European Register of Marine Species and supports the European node of the Ocean Biogeographic Information System. MarBEF organized three training courses, has supported participation of its members in many workshops and symposia, and supported or organized several symposia itself, including the recent ASLO meeting in Santiago, the EGU in Vienna and the forthcoming Open Science Meeting of Diversitas in Oaxaca, Mexico.

MarBEF adopted a phased approach to address its research priorities. Each of the three themes described above started with the development of a Core Strategic Programme (CSP) - the major integration activity for joint research. At a later stage this top-down approach was combined with a (bottom-up) Responsive Mode approach, in which outstanding smaller scale projects that are relevant to MarBEF's objectives were proposed to fill in gaps or add to the overall programme. In this way smaller groups sharing a coherent research goal will closely and effectively work together in projects supporting the network as a whole, while the larger organisational structure ensures that the work remains relevant for the many different areas of marine biodiversity research and its applications.

Thanks to the support of many enthusiastic MarBEF members that were willing to develop and coordinate an RMP, the consortium succeeded in developing an integrated structure of 19 RMPs that not only covers the identified key areas for responsive mode, but will also be an important building block of the CSP. This scientific effort should establish MarBEF as a network and its member scientists as important players in the research fields concerned.

More information is available at our website: www.marbef.org.

MARINE GENOMICS EUROPE

Catherine Boyen

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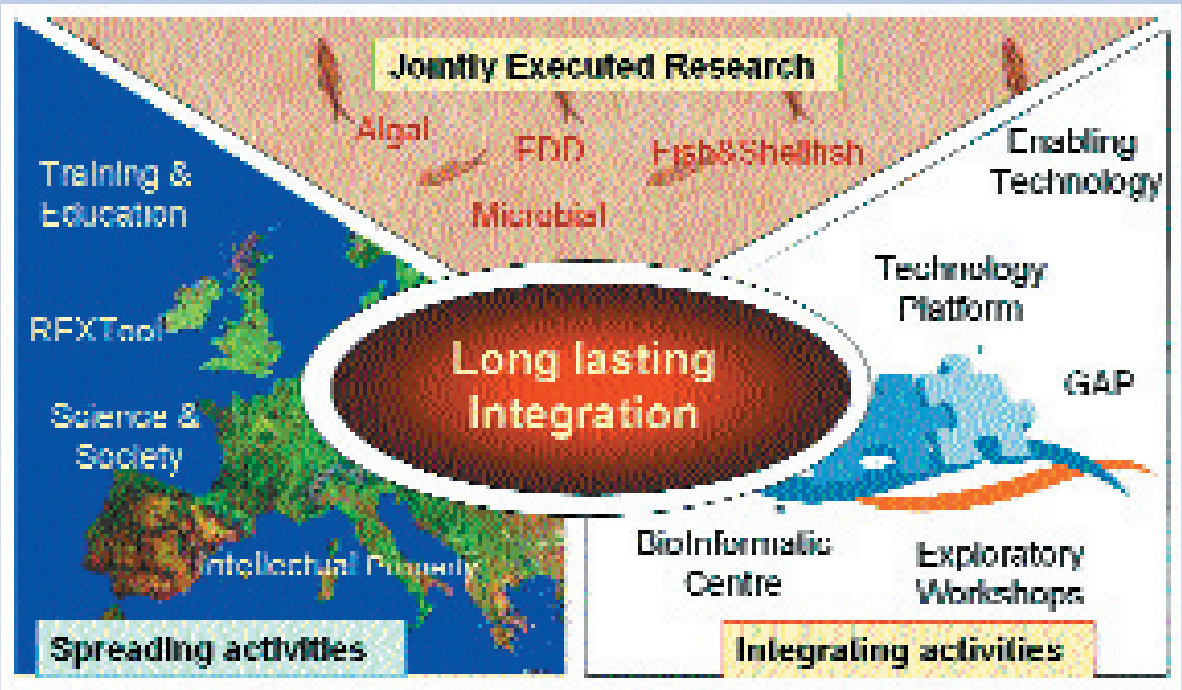
The major goal of the "Marine Genomics Europe" (MGE) Network of Excellence coordinated by Catherine Boyen, CNRS-SBR, France, is to promote, develop and spread a better understanding of the functioning of marine ecosystems and the biology of marine organisms throughout the European Union. The long-term target is to establish a durable European network capable of implementing high-throughput genomic approaches in the field of marine biology. The MGE Network of Excellence involves 45 institutions from 16 countries (14 state members and 2 non European states, ca 450 persons implicated). During the first year, MGE concentrated on four types of activity:

- Implementation of a proficient management structure
- Jointly Executed Research programs
- An Integration Program involving sharing of large-scale core facilities (MPI MG) and improving access to Large Sequencing Centers, developing joint enabling technologies (as the flagship projects: SYNCHIPS: "Combined micro-array hybridization and transposon mutagenesis to study the impact of environmental stresses on marine Synechococcus" and FICEL: "Functional genomics using marine fish cell lines and embryos"), creation of a common bioinformatics centre and gender actions.
- Spreading activities including teaching and training, web site development, brochure publication and popularization projects.

The major projects conducted during the first year within the JER programme are:

- Microbial Node (R. Amann, MPI Bremen, De) to focus on organisms that are of major importance for the functioning of marine ecosystems: shotgun sequencing of cytophagal (Genoscope), microarray, proteomics tools, metagenomics investigation of extreme marine sites
- Algal Node (H. Moreau, CNRS, Fr) to focus on ambitious genomics integrating programme structuring the community around complete sequencing genome of multicellular brown alga Ectocarpus (Genoscope), development of highly polymorphic microsatellite markers (SSR) on micro & macro species, oligo-microarrays
- Evolution, Development & Biodiversity Node (M. Thorndyke, KMRS, Se) to integrate "evo-devo" research with modern ecological genetics and biodiversity approaches to evolutionary and ecosystem functional studies: construction of genomic and cDNA libraries, development of neutral markers from several organisms, gene arrays, phylochips developed and used for building a database for sequence information and M-OTU identification.
- Fish and Shellfish Node (A. Canario, CCMAR, Pt) to assemble a set of genomics tools for exploration of physiological, ecological and economic models for evolutionary studies, biodiversity and resource management: cDNA libraries from a large set of tissues of fish & shellfish species, development of high-throughput genotyping technologies; investigation of the impact of natural and anthropogenic environmental stress and sex determination.

http://www.marine-genomics-europe.org/



EXPLORING SYNERGIES WITH THE UNESCO MAN & THE BIOSPHERE (MAB) PROGRAMME

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UNESCO is glad to announce that there have been recent developments in exploring synergies between its Man and the Biosphere Programme, known as MAB, and the MARS Network. To explain the logic behind this potential cooperation, it is necessary to present some of the background about MAB and its World Network of Biosphere Reserves.

The MAB Programme was launched by UNESCO in 1970 as the first governmental efforts to lay the scientific basis for improving people's relationships with nature. One of the "inventions" of MAB is the "biosphere reserve" concept, designed to encourage countries to designate sites for MAB work.

Today, biosphere reserves are defined by MAB as "areas of terrestrial and coastal-marine ecosystems which are internationally recognized for promoting and demonstrating a balanced relationship between people and nature". Biosphere reserves combine functions of the conservation of biodiversity, fostering sustainable development and providing logistic support for research, monitoring, training and education related to local, regional and global conservation and development issues. A zonation scheme is proposed, consisting of core-protected areas, buffer zones and transition areas. More information on biosphere reserves and the MAB Programme can be found on www.unesco.org/mab.

As of June 2005, the World Network of Biosphere Reserves consists of 482 biosphere reserves designated in 102 countries. From the operational point of view, the World Network functions through regional groupings. The EuroMAB network is the largest, comprising 42 countries and more than 220 biosphere reserves, but of which only some 40 cover the coastal marine interface. Recent EuroMAB meetings have highlighted the need to define a coastal and marine biosphere reserve strategy, including research projects to consolidate existing sites and establish new ones.
In 2004, Professor Pierre Lasserre, former Secretary of the MAB Programme and Member of the MARS Board, was invited by UNESCO-MAB to help design such a strategy, and in particular to explore the synergies between biosphere reserve managers and academic personnel of marine research stations in Europe. His work was based on the premise that in Europe, scientists and their specialized networks must now more than ever enter into the "social demand" arena, investigating how decisions regarding nature conservation and regional development are made, and who they affect. He considered that there were now strong reasons for reinforcing cooperative initiatives between existing networks with complementary conceptual targets and geographical distribution.

As a result, the Expert Meeting on "Ecological Science and Biosphere Reserves to Help Nature Conservation Practitioners and Society to Set Priorities in Coastal and Marine Areas in Europe" was organised as a joint effort of UNESCO/MAB and the European MARS (Marine Research Stations) Network/MarBEF (Marine Biodiversity and Ecosystem Functioning) Network of Excellence. The meeting took place at the UNESCO Regional Office for Science and Technology for Europe in Venice on 12-13 May 2005.

This meeting was attended by some 20 specialists from the two communities; i.e. MAB biosphere reserves and the MARS-MarBEF Networks, with representatives of relevant organisations such as the Council of Europe, and the Global Terrestrial Observation System (GTOS). A special effort was made to enable participants to learn about each other's programmes and to identify themes of common concern.

The expert meeting concluded that considerable synergies could be built in a "win win" fashion, which can be summarised as follows:

For MARS/MarBEF, MAB can contribute in the following ways:

- improving the interface between research and management in general;
- helping to make society better understand the importance of basic scientific research on biodiversity and ecosystem functioning in general and long-term observation, and their relationships with questions of potential economic concern, as well as the complex array of disturbances derived from invasive species, coastal pollution, and the more insidious impacts of acidification of the oceans through CO_2 rise;
- providing a long-term, internationally recognised platform for promoting dialogue between scientists and policy makers, allowing science to become more policy relevant and ipso facto, more attractive for governments and private investments in research and monitoring;
- adding on to the list of sites used in the MARS/MarBEF work for applying research and monitoring protocols, thereby improving the knowledge base;
- promoting the identification and designation of new biosphere reserves in hitherto under-represented geographical areas, and thereby opening opportunities for cooperation with new institutions.

For MAB/biosphere reserves, MARS/MarBEF can contribute in the following ways:

- bring more and better quality science into management decisions in individual coastal and marine biosphere reserves;
- making local scientific research and monitoring more relevant to international programmes and endeavours, and streamlining local scientific efforts to become more coordinated and integrated;
- providing a network of expertise for scientific advice, particularly on expanding MAB activities in the coastal and marine environment;
- providing a structure for gaining access to EU funding for cooperative work.

The expert meeting agreed that an open-ended Task Force should be formed to continue developing the coupling of the MAB and MARS/MarBEF networks and in synergy with other partners, as appropriate.

The added values of such a task force were seen to be:

- improving dialogue between nature conservation practitioners and academic research workers;
- improving the degree of practical application of research results;
- bridging the local, national and international levels;
- pooling of resources and expertise towards common research and monitoring goals;
- reaching a general common understanding of terms such as "sustainability" or "indicators";

- improving the application of the "sustainable use" dimension of Natura 2000 in coastal and marine environments;
- mobilising new partners to implement the EU Marine Strategy.

It is expected that this Task Force will meet end 2005/early 2006.

UNESCO MAB takes this opportunity to thank MARS for this constructive meeting.

More information can be obtained from the UNESCO MAB Secretariat at Paris (j.robertson@unesco.org) and at the UNESCO ROSTE Office in Venice (p.pypaert@unesco.org).

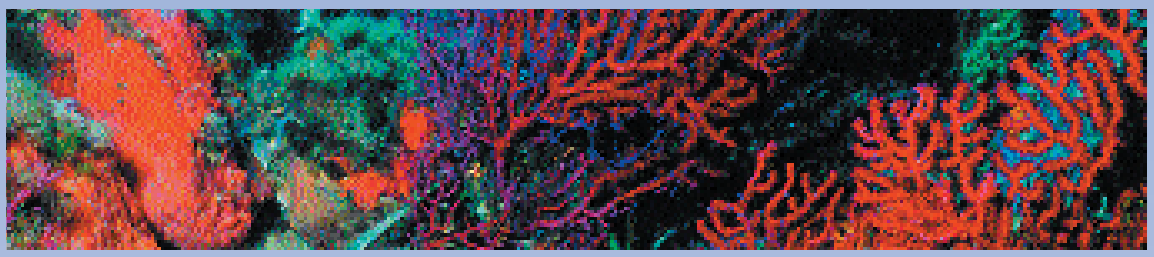

PHOTO J.G. HARMELIN

EUROPEAN NETWORK OF EXCELLENCE FOR OCEAN ECOSYSTEMS ANALYSIS (EUR-OCEANS)

Assessing the Impact of Climate Change on Marine Ecosystems, including Living Resources

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The oceans currently undergo major trials, resulting both from the over-exploitation of marine resources by man, which deeply perturbs ocean ecosystems, and from global warming, which enhances oceans drift. In order to define a basis for sustainable development at the level of the planet Earth, it is high time for us to develop tools to better forecast the evolution of ocean ecosystems facing global change. This is the main objective of the European Network of Excellence EUR-OCEANS, which started in January 2005 with the financial support of the European Commission. In order to achieve such an objective, a major modelling effort must be made, allowing the convergence of three scientific communities who are not used to collaborating until now: physical oceanographers and chemists, marine biologists, and experts in modern approaches to fisheries management. EUR-OCEANS will take into account the reactions of marine systems both at the regional and the global scale, by considering systems of relevance with respect to their sensitivity to climate change and/or their importance for fisheries: the North Atlantic Ocean and its adjacent seas (Mediterranean and Baltic Seas), the polar oceans (Arctic and Antarctic), and coastal upwelling systems (from Portugal to South Africa).

EUR-OCEANS gathers 160 scientists, from 66 marine research institutes and universities in 25 countries. The network will receive financial support of 10 million euros from the European Commission, for 4 years, the additional funding contributed by the participating institutes being estimated at 30 million euros. One of EUR-OCEANS original features is to create and collaborate with a network of 13 aquariums in Europe, which will take on the dissemination of results to a broader audience (around 13 million visitors annually). It is scheduled that EUR-OCEANS will lead in 2009 to the creation of a European multi-site research institute.

At the international level, EUR-OCEANS is directly relevant to the International Geosphere-Biosphere Programme (IGBP) and its new initiative IMBER (Integrated Marine Biogeochemistry and Ecosystem Research), of which it could well become the European component. It is worth mentioning that the international project office of IMBER will be based at the European Institute of Marine Studies, IUEM (University of Western Brittany, National Centre for Scientific Research) in Brest. EUR-OCEANS also develops relationships with the USA in particular. Among the first initiatives, the BASIN workshop (Basin-scale Analysis, Synthesis, and INtegration) has been held in March 2005 in Reykjavik, Iceland, upon an initiative of the NSF (National Science Foundation) and EUR-OCEANS. This workshop has laid the foundations of an ecosystem approach to fisheries management in the North Atlantic and sub-Arctic oceans.

EUR-OCEANS is coordinated by Paul Treguer (IUEM, Brest) and Louis Legendre (CNRS, Villefranche).
http://www.eur-oceans.org

ASSESSMENT OF CHANGES OF BIODIVERSITY IN COASTAL HABITATS AT GLOBAL SCALE

The Nagisa Project and Its Possible Linkages To Marbef

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Understanding the ecological, economical and societal consequences of changes in spatial and temporal patterns of biodiversity is of overwhelming interest for ecological research, policy and public opinion. This is a consequence of the increasing rate at which species are lost from ecosystems worldwide. At a global scale, anthropogenic threats to biodiversity include climate change, overexploitation of resources, introduction of alien species, destruction of natural habitats and introduction of pollutants into the environment. All these problems are particularly relevant in marine coastal areas, which host some of the most complex and diversified ecosystems, from temperate rocky shores to tropical coral reefs, areas where most of the human population is concentrated. These systems are heavily exposed to various sources of anthropogenic disturbance due to their location at the interface between the terrestrial and marine environment. Baseline studies and standardized monitoring protocols are urgently needed to investigate patterns of changes of biodiversity in coastal areas at large spatial and temporal scales and to identify suitable procedures for mitigating human impacts. The NaGISA project is specifically devoted to address these issues.

NaGISA is the acronym for Natural Geography in Shore Areas and refers to the Japanese word meaning the narrow coastal zone where the land meets the sea. It is an international collaboration funded by the Sloan Foundation, having as the main purpose the definition and application of standardized simple protocols for global scale and long-term inventorying and monitoring coastal biodiversity from the high intertidal zone to 20m depth. NaGISA is one of the first attempts to fulfil the field the goals of the Census of Marine Life (CoML),encouraging international cooperation for collecting standardized data on biodiversity at a global scale that could be usedfor implementing and developing ecological theories and addressing practical problems. NaGISA designed a system of 5° lat x 5° long boxes covering the whole map of the world. Three areas were established within each box and three sites were selected within each area. Sites included one Core Site to be monitored over the next 50 years and two Satellite Sites to be sampled at least once before 2008. Sites consist of portions of shore 10-75 m long, chosen as being as pristine as possible, continuous, stable, accessible and related to historical sampling areas. At each site, replicate samples will be collected at high- mid- and low- intertidal heights and at 1, 5, 10 and, where possible, 15 and 20 m depth. Sampling will focus on rocky shore intertidal and subtidal assemblages of algae and invertebrates and on sea grass beds. Sampling will include non-destructive (photography and visual estimation of abundances) and destructive (collection of all organisms from defined areas, establishment of core samples in sea grass beds) techniques and measurements of environmental variables such as surface and bottom temperature of the water and type of sediment. Data collected over the course of the NaGISA project will contribute to the Ocean Biogeographic Information System (OBIS), an online global atlas for accessing and mapping marine biodiversity through the integration of biological, physical and chemical data.

The International Headquarters of NaGISA is located at Kyoto University, Japan (Seto Marine Biological Laboratory) and Regional Centres are in the Pacific, the Caribbean and the Atlantic. Regional Centres coordinate the activities of local research groups, a combination of universities, institutions, schools and other communities. The Western Pacific Centre is organized in Kyoto University (Prof. Yoshihisa Shirayama). The Eastern Pacific Centre is at the University of Alaska Fairbanks (Dr. Brenda Konar and Dr. Katrin Iken). The Caribbean Sea Centre is at the Central University of Venezuela in Caracas (Dr. Paula Spiniello). The North Atlantic Centre is organized at the University of Pisa, Italy (Prof. Lisandro Benedetti-Cecchi).

Euro-NaGISA - As the NaGISA Regional Centre for the North Atlantic, the group of Marine Ecology at the University of Pisa is charged with coordination and integration of national centres in Europe, located in the Mediterranean, United Kingdom, Portugal, Baltic and North Sea

(Euro-NaGISA). The most pressing activities for the near future include the organization and execution of field work, organization of international workshops, submission of proposals for fundraising, preparation of papers to be published in peer-reviewed journals and execution of demonstrative and educational programmes at a local scale.

The most important point is that NaGISA activities in Europe can build on existing networks and established collaborations, such as Euro-CoML (the European implementation of CoML, chaired by Prof. Graham Shimmield), MARS (The European Marine Research Stations Network chaired by Prof. Fred Buchholz), BIOMARE (EC-funded action to Implement and network large-scale, long-term Marine Biodiversity Research in Europe) and MarBEF. In particular, NaGISA activities will integrate with the MarBEF responsive mode project LargeNet (Large scale and long term networking on the observation of global change and its impact on marine biodiversity), aimed at investigating long term and large scale changes in biodiversity along latitudinal and longitudinal gradients across Europe and at formulating and testing hypotheses about causal processes. Euro-NaGISA is also relevant to the BIOFUSE (Effects of biodiversity on the functioning and stability of marine ecosystems) Responsive Mode Project of MarBEF, which investigates the relationship between biodiversity and the functioning and stability of ecosystems. These interlinks will contribute to collect quantitative data on marine biodiversity in Europe at finer resolutions and at broader scales than have been achieved by previous projects. This will improve our knowledge of the relationship between biodiversity and ecosystem functioning, with fundamental theoretical and practical implications for management and conservation of the unique habitats and species that occur along European shorelines.

STATION MARINE D'ENDOUME

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The Station Marine d'Endoume (SME) was established in Marseille, France, by Professor A.F. Marion in 1889. Under the direction of Professor J.M. Pérès (1948-1982) the SME expanded rapidly with the addition of new buildings, the development of graduate courses and the expansion of pluridisciplinary research activities, acquiring an international reputation in marine sciences.
Nowadays, the SME is part of the "Centre d'Océanologie de Marseille" (COM), which includes over 200 people, located half at the SME near the sea and half on the university campus of Luminy (Université de la Méditerranée). The COM (director I. Dekeyser) is composed of 3 research laboratories (UMR) and one entity in charge of common technical and scientific services (UMS 2196) associated with the CNRS (Centre National de la Recherche Scientifique). The laboratory "Diversity, Evolution and Functional Marine Ecology" (UMR 6540, director J.P. Féral) is mostly located at the Station Marine d'Endoume, whereas the "Laboratory of Microbiology, Geochemistry and Marine Ecology" (UMR 6117, director R. Sempéré) and the "Laboratory of Oceanography and Geochemistry" (UMR 6535, director B. Quéguiner) are mainly based on the university campus. The SME also hosted 2 research laboratories of the "Institut de Recherche pour le Développement"- IRD (UR 103 CAMELIA on Tropical lagoon functioning, and UR 167 CYROCO on Cyanobacteria).

The SME benefits from its geographical position in the Gulf of Lions (NW Mediterranean), between the Rhone delta and the renowned "Calanques" rocky limestone coast, and has access to many emblematic Mediterranean biotopes (Posidonia seagrass beds, underwater caves, coralligenous drop-off,...), some of them recognized as reference and focal sites at a European level. Current research at the SME is focused on priority topics such as marine biodiversity and functional ecology, in relation to disturbance such as the terrigenous input of the Rhone River, biological invasions and consequences of climatic changes, primarily in coastal areas.
The scientific approach balances the use of direct and long-term observations, taxonomy, population surveys, in situ and ex situ experimentations and molecular tools that are used to investigate species evolution, phylogeny, population genetics and adaptations to disturbances in marine organisms. Biological models most particularly studied include keystone sessile invertebrates of the Mediterranean rocky communities (sponges, gorgonians, red coral) and some mobile organisms (mysids, polychaetes and fish) that react strongly to climatic changes.

PHOTO J.G. HARMELIN

The Station Marine d'Endoume and the "Armandia", one of the 2 SME research vessels

As part of the SOMLIT national program, long-term monitoring of various seawater parameters (T, S, O, pH, MES, Chla, ...) is performed regularly at several sites near Marseille to study the seasonal and long term variability of the ocean hydroclimate.

Many other scientific and social activities (courses, conferences, educational activities for school children) are held at the SME. Recently, a summer training course on Diversity, Phylogeny and Ecology of Porifera, funded by the CNRS, MarBEF and IRD, gathered 40 persons from 16 European and overseas countries at the SME for 2 weeks in July 2005.

On 20 May 2005, a decision was taken to close 3 out of 4 of the buildings of the SME. A marine station is the only place where most aspects of many research topics can be studied together, thanks to the availability of natural running seawater and direct access to the studied ecosystems. In a context of ever increasing pressures on the coastal zone and of biodiversity loss, both the density and importance of the network of European marine stations form essential support for the management of the coastal environment (scientific expertise, logistic support for monitoring, long-term series, experimentation and identification, testing and calibration of indicators…). It is certainly not the appropriate time to close the Station Marine d'Endoume, without any functional alternative.
The Station Marine d'Endoume is part of the French national Marine Research Stations Network (RNSM) and the European Marine Research Stations Network (MARS).

For further information:
http://www.com.univmrs.fr/.

PHOTO T. PÉREZ

Participants of the summer course on Sponges (July 2005) ready to dive in the SME cove to collect specimens.

MARS TRAVEL AWARD
Winners 2002 Reports

Sending MARS institution:

University of the Azores,
Department of Oceanography & Fisheries
Cais de Santa Cruz
9901-862 Horta – Azores,
Portugal

Receiving MARS institution:

Marine Biological Association:
The Laboratory
Citadel Hill,
Plymouth,
PL1 2PB, Devon, UK

Rogério R. Ferraz Management of limpets in the Azores

With the 2003 MARS Travel Award, I was able to stay at the Marine Biological Association of the United Kingdom - (MBA) for two weeks (from 23 February to 9 March). The main goal of this visit was to discuss methods to improve the management of limpet exploitation in the Azores with Stephen J. Hawkins (SJH).

In order to improve the present management of limpet exploitation in the Azores, I am preparing a master's thesis with the objective of implementing Geographical Information Systems to this fishery. One of the first steps in this study was the creation of Marine Protected Areas (MPA) for limpets on all of the islands. The localities chosen for these were based on past experience and knowledge. However, with the accumulation of new data it might be necessary to propose new locations in the future.

During my stay at the MBA I was able to present and discuss all the details of the thesis with SJH, who helped me to solve some of my problems. My main problems related to the methods used to test some of my hypotheses. SJH indicated some studies to me where very simple methods had been used that could be applied to my case study. In the Azores, the limpet densities seem to be higher in places with higher wave exposure, and to test this hypothesis I will need to estimate, or at least define, the areas in Faial and Pico Islands with higher wave exposure. I will use the method proposed by Thomas (1986) that is based on wind velocity, direction, duration and the effective fetch. During this year I will prepare and develop my thesis and I hope that by the end of this year or in the beginning of 2005 I will be able to return to the MBA for a week or two in order to make the final analysis and interpretations and to discuss the results with SJH and his team.

During the period I stayed in Plymouth, I finished the preparation of a manuscript that will be submitted to the ICES Journal of Marine Science. The paper presents a method that helps us to estimate the biomass of limpets on each island. This method is based on the realisation of sampling snorkelling dives around the islands for the capture of limpets. In each dive, our technician simulates the professional activity during 30 or 15 minutes (depending on sea conditions and limpets densities). The catch, after being sampled, is then used to estimate the density of limpets in each sampled site. With random sampling sites around the island it is possible to estimate the absolute population of the island. The preparation of this paper was much improved by access to the National Marine Biological Library, where I could find lots of references to articles useful for carrying out the data analysis and the discussion. It was very important that this paper was prepared in the MBA, since I was able to discuss it with SJH every day, which was important for the quality of the paper. The manuscript is now in the process of final reviews before submission for publication.

During my stay I got to know several scientists who work on coastal management and I used the opportunity to discuss with them some of my ideas and at the same time they gave me some interesting ideas that will help me in the elaboration of my master's thesis. I am very satisfied with my stay at the MBA. I was able to experience a different reality of marine research, and I made important contacts for my future work.

I would like to thank all the MBA staff, specially Stephen Hawkins, for the wonderful days I spent there, the Department of Oceanography and Fisheries of the University of the Azores for the authorisation to visit the MBA, and Helen Rost Martins for all the help with English and scientific corrections and advice since I have worked in marine biology. Finally I would like to thank MARS for the opportunity made possible with this award.

Oksana V. Anikeeva Soft-shelled foraminiferain the Black Sea, with an emphasis on Allogromiina

During my tuition in Southampton Oceanography Centre under the supervision of Prof. Gooday, I studied monothalamous soft-shelled foraminifera. Monothalamous (single chambered) foraminifera are important members of the meiofauna in many coastal and deep-sea settings. They include species in which the cell wall is composed of either organic or agglutinated material. According to recent classifications (e.g. Sen Gupta, 1999; Lee et al., 2000), the former belong to the Order Allogromiida and the latter to the Order Astrorhiziida. In many of the smaller species, the wall is also soft and flexible. Biologists often overlook such species because they are unfamiliar and, in many cases, undescribed. At the same time, they are of little interest to the geologists who normally study foraminifera because they have little fossilisation potential. However, recent research has created a considerable upsurge of interest in monothalamous foraminifera. Faunal studies have demonstrated that allogromiids and astrorhiziids are often abundant and diverse in coastal and deep-sea settings, while molecular and ultrastructural studies have demonstrated that the traditional morphology-based classification of monothalamous foraminifera is largely artificial. In particular, phylogenetic clades based on small subunit ribosomal DNA (SSUrDNA) gene sequences often include a mixture of agglutinated and organic walled species, suggesting that there is no real distinction between allogromiids and astrorhiziids. These results have led to an improved understanding of the early evolutionary radiation of foraminifera.

In SOC, I studied monothalamous foraminifera from the different regions of the Black Sea. We identified 4 species that are new for the above-mentioned basin, and at least 5 species that belong to genera previously unknown to science. We have described (Sergeeva, Anikeeva, Gooday, in press) one of the new Black Sea monothalamous foraminifera, *Tinogullmia hyaline*. The next paper is devoted to unknown species (genera) and it is in the process of completion now. We used a compound photomicroscope, which allowed examining the structure of allogromiids in detail. It is very important especially for specimens that inhabit a high-level oxygen zone – they have a distinctive sign: a lot of spherical bodies inside, which are poorly distinguishable. Moreover, we have taken digital photographs of the new allogromiids from the Black Sea.

The second part of my stay in SOC was to study the biology of live monothalamous soft-walled foraminifera. The samples for this investigation were taken from the intertidal zone of the Hamble Estuary at Warsash (Hampshire, England). After washing (by sea water) through the sieve (1 mm diameter of mesh) we picked up live allogromiids with the aid of a binocular microscope and put them on a Petri dish with seawater kept cool in a dish of ice. The faunal analysis showed the presence of species new to science. However, we couldn't examine feeding and reproduction processes of these animals due to their inactive behavior. The only behaviour that we could observe was a pseudopodial movement.

One of the most important (and previously unknown to myself) aspects of my work under the supervision of Prof. Gooday was familiarization with molecular methods of species identification (for monothalamous soft-shelled foraminifera only). It is not enough to identify allogromiids on morphologic features only. For full identification of this foraminiferal group we need to supplement our investigations with DNA analysis.

We also compared *Vellaria pellucidus* (Gooday, 1992), which was described from Vellar Estuary, Bay of Bengal (holotype is kept in the Natural History Museum in London), with similar species from the Black Sea. Comparison with the holotype didn't reveal morphologic distinctions in the basic characteristics (shape of test, aperture, surface of shell, inside structure, measurements), so we made certain that this Black Sea species is also *Vellaria pellucidus*.

In Southampton Oceanography Centre library, we accessed literature on these organisms. We also visited the library of the Natural History Museum in London, where I found an article from a Bulgarian researcher on the Black Sea's monothalamous foraminifera (Valkanov, 1969), which was important for future work. I have also learnt how to make the permanent models of monothalamous foraminifera with the use of slide-beads that allows these brittle animals to be kept in good condition (not flat).

So, I am very grateful to the organizers of the MARS Travel Award for Young Scientists, who allowed me to become more efficient during my stay in SOC. I would like also to thank Prof. Gooday for experienced and patient teaching.

Sending Institute

Institute of Biology of the Southern Seas
Dr N.G. Segeyeva & Dr A.R. Boltachev
Nachimov Avenue 2, 99011, Sevastopol,
Crimea, Ukraine

Receiving Institute

Southampton Oceanographic Centre
Prof. Andrew Gooday Waterfront Campus,
European Way, Southampton SO14 3ZH, UK

MARS TRAVEL AWARD Winner 2002 Report

Katerina Sevastou

Meiofaunal biodiversity in the oligotrophic environment of the Mediterranean Sea

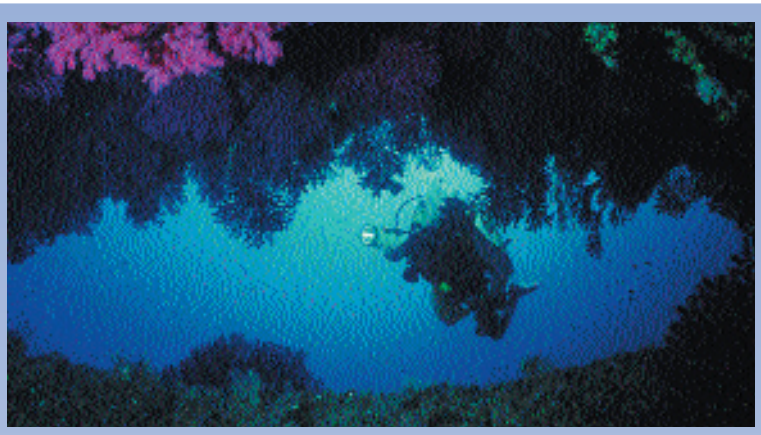

PHOTO J.G. HARMELIN

Through the MARS Travel Award, I was given the opportunity to visit in February 2004 the German Centre for Marine Biodiversity Research – Senckenberg Research Institute (DZMB). Although the five week period in DZMB was not enough to fulfil the whole set of goals that were defined and described in my application, the main objective, a significant contribution to the knowledge of meiobenthic copepod diversity of the Eastern Mediterranean Sea, was achieved.

During my visit I had the opportunity of having full access to the excellent microscopy facilities and the unique systematics literature archive of both DZMB and the closely collaborating Zoosystematics & Morphology Section of the University of Oldenburg, which enabled careful and accurate identifications of the species encountered in samples collected from sandy beaches in Crete. I was also able to have access to the comprehensive and up-to-date MONOCULUS Library and therefore, the possibility of enriching my personal literature collection with copies of rare reprints. The greatest benefit though, during my stay in Germany, was the privilege to work with passionate, leading scientists in the field of harpacticoid copepod taxonomy. Their guidance, knowledge and support were an enormous help in resolving many taxonomical problems which had arisen during the course of my PhD studies and a unique opportunity for furthering my experience and improving myself in the systematics of harpacticoid copepods.

For my research visit in DZMB I did not travel alone. I carried with me hundreds of permanent preparations of benthic copepopds along with many harpacticoids fixed in formalin and quite a lot of problems, questions and worries on their systematics. At the end of my visit I was glad to realize that we had managed to work out most of them and once I was back in Crete I was able to compile my benthic copepod species list. The persistent monthly samplings of three sandy beaches over a year revealed almost 100 species distributed in 23 families, 18 of which are new to science.

Unfortunately, the time I could spend in DZMB was not enough to allow us to work on the description of the new harpacticoid species. But we did have the time through many fruitful discussions to set the basis for future collaboration not only on the taxonomy of benthic copepods but also on their ecology. Thus, both sides are currently seeking funds for a further visit in DZMB in order to complete the goals of my first visit and produce several joint publications, mainly on the description of the new harpacticoid fauna of the Eastern Mediterranean.

Sending MARS member Institute:

Institute of Marine Biology of Crete (IMBC)
P.O. Box 2214,
71003 Heraklion,
Crete,
Greece.

Receiving MARS member Institute:

Forschungsinstitut SENCKENBERG–
Deutsches Zentrum fur Marine Biodiversitatsforschung
Schleusenstraße 1,
D-26382 Wilhelmshaven,
Germany

Additional travel grants were awarded to:

Katharina Reichert
Hard-bottom littoral communities: Development and application of new approaches in monitoring marine biodiversity at Helgoland (German Bight, North Sea)

Sending MARS Institution
Biological Institute at Helgoland (BAH)
of the Alfred Wegener Institute,
Foundation for Polar and Marine Research (AWI),
27483 Helgoland, Germany.

Receiving MARS Institution
The Marine Biological Association (MBA).
The Laboratory, Citadel Hill,
PL1 2PB Plymouth,
Devon, United Kingdom.

Ylenia Carotenuto
Using novel molecular methods to quantify selective in situ-feeding by common marine copepods in mesocosms and natural ecosystems.

Sending MARS Institution:
Stazione Zoologica "A. Dohrn",
Villa Comunale 1,
80121 Naples, Italy

Receiving MARS Institution:
University of Bergen, UNIFOB AS,
Department of Biology,
Bergen High Technology Centre,
Dr. Jens C Nejstgaard,
PO Box 7800,
5020 Bergen,
Norway

Agata Weydmann
Does genetic diversity of Arctic fauna depend on the life strategy?

Sending MARS Institution:
Institute of Oceanology, Polish Academy of Sciences, Postancow Warszawy 55,
81-712 Sopot, Poland

Receiving MARS Institution:
Centre d'Océanologie de Marseille,
Station Marine d'Endoume,
Rue de la Batterie des Lions,
F-1300 Marseille, France

Applicant:
Institute of Oceanology, Polish Academy of Sciences, Postancow Warszawy 55,
81-712 Sopot, Poland
E-mail: agataw@iopan.gda.pl

The Future of Marine Research Stations in Europe

AMSTERDAM 25-26 NOVEMBER 2003

Present: P. Mathy (Bruxelles EU), J. Mees (Oostende BE), S. Moncheva (Varna BG), A.B. Josefson (Roskilde DK), H. Kuosa (Hanko FI), G. Boeuf (Banyuls s/m FR), J.-C. Dauvin (Wimereux FR), J.-P. Féral (Marseille FR), M. Glass (Villefranche s/m FR), B. Kloareg (Roscoff FR), P. Lasserre (Paris FR), D. Vaulot (Roscoff FR), F. Buchholz (Helgoland DE), O. Kinne (Oldendorf DE), D. Schiedek (Rostock DE), K. Wiltshire (Bremerhaven DE), A. Eleftheriou (Heraklion GR), F. Boreo (Lecce IT), A. Ianora (Napoli IT), P. Magni (Torregrande IT), J. De Leeuw (Yerseke NL), C. Heip (Yerseke NL), H. Hummel (Yerseke NL), P. van Avesaath (Yerseke NL), A. Johannessen (Bergen NO), A. Szaniawska (Gdynia PL), J.M. Weslawski (Sopot PL), R. Serrão-Santos (Horta PT), A. MALEJ (Piran SI), S. Hawkins (Plymouth UK), G. Shimmield (Oban, UK).

Apologies: F. Bonhomme (Sète FR), J. Marks (Den Hagen NL), H. Ojaveer (Tallinn, Estonia), M. Thorndyke (Fiskebäckskil, SE), M. Vincx (Gent, BE).

Sixteen European countries were represented, mostly from Western Europe. The absence of Spain was underlined.

Introductive talks and a point on the programmes

After the opening of the conference, Carlo Heip summarized the previous Conference of Directors in Venice (2000). Major roles in marine biodiversity studies including molecular approaches and ecosystem functioning, genomics, cell biology and development studies, marine stations as observatories of the marine environment, experimental facilities and access to infrastructures, training and mobility were pointed out.

Some weaknesses were also underlined such as failed interactions between research and decision makers or isolation, marine stations being generally far from industry and sometimes from universities.

Heip then introduced the programmes realised thanks to the MARS network and the marine stations.

The way towards a European joint action on marine biodiversity was long and difficult, and in absence of true national support which, when existing, were mainly directed towards the 'terrestrial continent'. Concerning the marine realm, the step started in 1993-94, under the aegis of ECOPS and the ESF, to lead to a "grand challenge" for a European co-operation on marine sciences (Strömberg et al. 1995). It was a false start. In 1996, the network of the European marine stations (MARS) was created (http://www.marsnetwork.org).

A workshop supported by CEC/MAST, EERO and MARS led to an inventory of the 'marine biodiversity' actions carried out and programmed in the countries of the European Community (Warwick et al. 1997). A working group supported by ESF-EMaPS and MARS worked out finally a European action plan on marine biodiversity (Heip et al. 1998). This same group then established the basis of a European network (Heip & Hummel 2000). To concretise this network, it answered a European call for proposal. The project was selected and financed. BIOMARE was launched the following year.

BIOMARE (implementation and networking of large scale, long term MARine BIOdiversity research in Europe) is a concerted action programme that proceeded during the 5th European FP, in 2001 and 2002. The objective was to establish the infrastructure and the conditions required for research on marine biodiversity in the long term and on a European scale. This action was financed by the EU program 'energy, environment and sustainable development' (support for infrastructures) and was coordinated by NIOO-CEMO, Yerseke, NL (C. Heip and H. Hummel).

Twenty one laboratories or institutes, mainly members of the MARS network, took part in BIOMARE. BIOMARE had 3 principal objectives which were achieved thanks to 3 work packages (WPs):

1. To select recognized reference sites and to establish a network as a basis for long-term large-scale research on marine biodiversity in Europe (WP1 led by R. Warwick, Plymouth Marine Laboratory, UK)
2. To make an inventory and to choose internationally recognized and standardized measurements and to evaluate the relevance of indicators and indices of biodiversity and to propose a number of agreed indicators in Europe (WP2 led by J.-P. Féral, then based at the Observatoire Océanologique Banyuls-sur-Mer, FR)
3. To acquire means of dissemination and accessibility of the results and network management of research in marine biodiversity (WP3 led by M. Costello and C. Emblow, Ecological Consultancy Ltd. Services, Dublin, IE).

At the international level, associated right from the start with three global initiatives, IBOY (International Biodiversity Year Observation), DIVERSITAS and CoML (Census of Marine Life), the BIOMARE concerted action drew worldwide attention as being a major effort to coordinate biodiversity research at a European scale and beyond.

The methodology in each of the WPs was similar: inventory, review and evaluation made by the WP leaders after consultation with the members of BIOMARE. Regional meetings and workshops were organized to discuss the choices, the recommendations and the drafting of the intermediate reports. The decisions were made by the Scientific Steering Committee after general meetings. The 3 'selected regions' were: Atlantic Ocean + Arctic, the Mediterranean + Black Sea and the North Sea + the Baltic.

The results are consigned in 2 published books and 1 CD on which one finds notably the Internet site of BIOMARE (WP3).

The first book (WP1) describes 100 research sites on all the European coasts, which constitute the logistic and scientific skeleton of the network. Only 12 of them are sites of reference, selected as being less possibly impacted by the human activity and representative of the European coastal habitats. These sites of references with a certain number of focal sites will be more particularly the frame of intensive surveys (LTBR sites: long term biodiversity research sites). The majority of these sites are close to marine stations, which can provide the infrastructure required for the operations of monitoring, exploration and experimental work (Warwick et al. 2003).
The second book (WP2) is devoted to the indicators of biodiversity. It presents the current situation of European policy in relation to this matter, a strategy for the choice of the indicators according to the target to reach. It also gives a catalogue of used or recommended indicators and a European consensus as to their reliability and utilisation. The challenge was to build a scientifically solid system of interest to

the scientist as well as to the environmental manager or general public. This book is a first step (Féral et al. 2003).

Reports and CD are available on request to H. Hummel <h.hummel@nioo.knaw.nl>. The cost is €30 to cover the mailing expenditure

BIOMARE (http://www.biomareweb.org) generated 2 Euro-conferences (ESF), in Greece and Holland, 1 electronic conference M@RBLE(http://www.vliz.be/marble) on the marine biodiversity in Europe, 1 other joint action MARBENA (http://www.vliz.be/marbena) 'Creating a long term infrastructure for MARine Biodiversity research in the European economic area and the Newly Associated states' and 1 European network of excellence MarBEF (http://www.marbef.org) 'Marine Biodiversity and Ecosystem Functioning', within the 6th EC-FP, the kick off meeting of which will be held in Bruges (17-19 March 2004).
BIOMARE also published a newsletter (http://www.biomareweb.org/newsletter.html).

Perspectives and the roles of the MARS institutes

The aim of the Amsterdam conference of directors was to give complementary issues concerning the future of marine research stations in Europe.

Contributions were presented by:

1. Pierre Mathy. DG Research, EC, BE: Marine research and the framework programmes of the EC.
2. Pierre Lasserre, UNESCO and MAB, FR: MARS may become a NGO under UNESCO
3. Fred Buchholz, AWI, Helgoland, DE: The role of the MARS network in the future
4. Bernard Kloareg, Roscoff, FR: 6th FP NoE Marine Genomics
5. Carlo Heip, Yerseke, NL: 6th FP NoE Marine Biodiversity and Ecosystem Functioning – MARBEF
6. Jan Marcin Weslawski, Gdansk, PL: The rise of central and eastern Europe, strength and weakness
7. Paolo Magni, Oristano, IT: The MAMA project (Mediterranean network to Assess and upgrade the Monitoring and forecasting Activity in the region) = first MedGOOS project.
8. Alenka Malej, Piran SLO: UNEP Mediterranean action plan
9. Ricardo Serrão-Santos, Horta, PT: Research and implementation of the Natura 2000 directives, and beyond, in the Macaronesian Archipelagos (Azores, Madeira and the Canaries).
10. Carlo Heip, Yerseke, NL: The Census of Marine Life (CoML).
11. Daniel Vaulot, Roscoff, FR: Oceanic pico-plankton: from ecology to genomics
12. Steve Hawkins, Plymouth, UK: Long term changes in the Western Europe.
13. Karen Helen Wiltshire, AWI, DE: 40 years of time series – PANGAEA a Network for Geological and Environmental Data (www.pangaea.de)
14. Gilles Boeuf, Banyuls-sur-Mer, FR: Does physiological research still need sea side laboratories?
15. Fernando Boero, Lecce, IT: What's going on in the Mediterranean?
16. Jan de Leeuw, Den Burg, NL: POGO, Partnership for Observation of the Global Ocean.

General discussion: action points

The discussion focused on how to organize MARS and its institutes for the future: how to make the role of marine institutes more explicit and visible.

Instead of making separate proposals in the field of marine research, it was proposed to make chains of institutes around strategic issues.

For each of these issues a strategic paper can be composed, including general policies, using FP6 or EPBRS, and anticipating FP7. In this way MARS can serve as a (non-governmental) ERA net, being a consultable think-tank and actor in policy issues, e.g. advising committee members and national representatives, thereby influencing the content of the national and international (e.g. the 7th FP) research agenda.

The following themes (research priorities) are proposed (in brackets those who will write a paragraph on what it is about and what do we have):

1. Biodiversity, including taxonomy and ecosystem functioning (roles of human activity and climate change) (Heip)
2. Marine genomics and molecular biology (Vaulot & Kloareg)
3. Marine model organisms and natural products (Boeuf)
4. Climate change problems (Hawkins, Buchholz, Dauvin)
5. Sustainable ecosystems and human factors (Austin)
6. Marine stations as observatories (including vessels and mesocosms) (Hawkins, Buchholz)

For each theme the contributing institutes can be listed, making the role of marine stations in these themes explicit. For such, the existing MARS/BIOMARE inventory on institutes can be helpful. The list can be extended with overviews of culture collections (Alginate) and existence of time-series.

Communication, i.e. outreach, is important to make the role of MARS and marine stations visible. Several ideas to support this are proposed, such as:

1. strengthen the links with other organizations (link with MAB, EMMS), and eventually harmonize together the strategy for public outreach
2. give the science to managers, e.g. emphasize the role in nature conservation (e.g. on basis of the above research priority "Sustainable ecosystems and human factors")
3. prepare publications of interest for the public, e.g. an encyclopaedia of organisms in the North Sea
4. make unified CDs and/or posters (text in different languages can then be inserted)
5. organize a competition with a sailing trip of 1 day on a research vessel as a prize
6. make a list of courses with special prices for MARS members
7. support a series of grants
8. combine efforts in Marie Curie applications
9. organise Summer school and regular university courses

MARS Business

Membership
The members are the Marine Stations. It was proposed that under certain conditions, inland laboratories /universities may participate. In this case they must have been sponsored by or associated with a marine laboratory. There was no proposition of associate members. The category of "Associated members" is not functional anymore and can be deleted.

Fee
The fee is now €500 for full membership. For certain countries, this may represent a large amount of money. Special support or exceptional status should be sought for these countries. Three categories of laboratories / institutes will be distinguished and the membership fees will be respectively:

€150 for labs with less than 20 total personnel
€250 for labs with 20-50 total personnel
€500 for labs with more than 50 total personnel

A symbolic fee (€100 for 2 years) should be asked from the Eastern and Central Europe countries.

Special actions
In specific areas some special actions should be initiated because of a low number of members. Firstly towards Spain since it is absent in MARS (action: Ricardo: Canaries, Boeuf: Mediterranean Spain). Secondly towards East Europe (Lasserre, Malej: twinning East-West, North-South). A discussion about sites out of Europe such as French Departments (e.g. La Réunion, Guyane) should be continued during the next MARS executive meeting. An e-mail list will be made by the VLIZ (Mees).

External relations
1. **ESF/ESF marine board:** MARS will be invited as a guest organisation to the meetings of the Marine Board for the open agenda points.
2. **CoML:** a EuroCoML is now firmly established, chaired by Ulf Lie, Bergen, NO
3. **MAML:** MARS is on the mailing list. However, nothing happened recently.
4. **DIVERSITAS:** A marine biodiversity cross cutting theme is to be developed. It will be discussed by the SSC in April 2004 in Paris.
5. **IMBER (Integrated Marine Biogeochemistry and Ecosystem Research):** The science plan was on the web during some weeks for discussion. It has been submitted to SCOR/IGPB for approval www.igbp.kva.se/obe/recentupdates.html

Outreach
The web page and newsletter are downloadable from the MARS website.

MARS travel awards
This only concerns young scientists (max 35 years old) of regular members (full payment institutes). They will travel from one MARS lab to another MARS lab. The sum of €6000 was distributed in 2003 for 2 grants and 2 half grants. Instead of 2 "MARS Travel Awards for Young Scientists" for the future 3 awards can be offered, where 1 award will be given to a candidate from Eastern and Central Europe.

MARS medal of honour
The MARS medal of honour 2002 was awarded to Professor Otto Kinne, for his longstanding contribution to the marine science community. The medal was handed during the banquet of the conference of the directors.

Financial situation
The financial report was approved during the meeting of the SSC in Barcelona (02/03/03).

Because of the positive financial situation, €10,000 Euro can be deposited in a bank account with a high interest rate.

Other financial points
Cost of the secretariat: max €16000/ yr
VLIZ web page conception and updating: €2000/ yr
Advertisement in the Parliament journal: €4554

Summer course
10-17 May 2004: Baltic Course on Adaptive Strategies of Benthic Animals in Tidal and Non-tidal Systems, organised under the colours of Gdansk University (Poland) in cooperation with CEME-NIOO, the Netherlands. Contact: H. Hummel.

Elections
Mandate 2004-2007
The following people were nominated to the electoral commission (replacing G. Bernardi, A. Eleftheriou, J.-P. Féral, C. Skora & C. Heip)

President :
Fred Buchholz (Helgoland, DE)
Mireille Harmelin-Vivien (Marseille, FR) Adrianna Ianora (Naples, IT)
Vangelis Papathanassou (Athens, GR)
Anna Szaniawska (Gdansk, PL)

Co-opted:
Pierre Lasserre
(Paris, FR, international affairs)
Mike Thorndyke
(Fiskebäcskil, SE, infrastructure and transnational access)

Secretary:
Herman Hummel (Yerseke, NL)
Past president:
Carlo Heip (Yerseke, NL)

PHOTO J.G. HARMELIN

MINUTES OF THE MARS MEETING IN BRUGES, 17 MARCH 2004

The participants at the meeting were Fred Buchholz (President), Carlo Heip (Past President), Stephen Hawkins (Vice-President), Herman Hummel (Executive Secretary), and the newly elected members Adrianna Ianora (replacing Giorgio Bernardi) and Mireille Harmelin-Vivien (replacing Jean-Pierre Feral)

The agenda for the meeting in Bruges was to discuss:

- the minutes of the last meeting in Amsterdam where the new Executive Committee (EC) was elected
- new research themes
- problems regarding communications
- global observations
- connections with other associations
- summer schools/student awards
- external organizations (NAML, CoML etc)
- Conference of Directors, next MARS EC

The minutes in Amsterdam were discussed and it was decided that Herman Hummel should be re-elected as the Executive Secretary of MARS. Treasurer and Secretary should be combined and therefore the main administration of MARS should remain in Holland at Yerseke. This year, the financial aspects of MARS will have to be audited during the coming yearly auditing of the Yerseke Institute.

With regards to new research themes, the MARS conference in Venice had already emphasized the importance of promoting studies on the physiology of marine organisms, considering this a key theme for the MARS network. The importance of this theme was further stressed at the MARS meeting in Amsterdam where Gilles Boeuff gave an oral presentation on how marine stations can be important sites for studies on cell and molecular biology. In Bruges, it was agreed to continue to support this theme, and try to identify new themes for future studies within the MARS network. It was concluded that research on marine genomics and biodiversity are presently well defined within the MARS network and should continue to be key areas of research also in the future. It was therefore suggested that the co-ordinator of the NoE on Marine Genomics be co-opted as member of the MARS network.

New themes to be defined for the MARS network could also include marine biotechnology with a focus, for example, on how to improve productivity in aquaculture, to identify new compounds for application in medicine and the chemical industry, and to develop bioremediation strategies for applications in Europe's coastal oceans. This theme should be covered by a half-page report (position papers / state of the art) to be written for the next MARS Newsletter.

Bioindicators were also considered, but the EC members decided that the subject has already been covered in the past, and should therefore not be listed as a priority theme for MARS member institutions.

Chemical ecology was also identified as a rapidly emerging new field of research with a strong impact on biodiversity and biotechnology research. It was suggested that Allan Cembella, the newly appointed senior scientist to occupy the position on chemical ecology at AWI, could be approached by Fred to write an article on this subject for the next MARS Newsletter.

Deep-sea biology was also identified as an important area of research for the future and it was decided that Ricardo Santos should be co-opted as a new member of the EC to cover this area of research and to balance the committee with someone from the Iberian Peninsula.

Six topics were discussed at the MARS meeting in Amsterdam, being:

- Biodiversity, including taxonomy (Heip)
- Marine genomics and molecular biology (Vaulot & Kloareg)
- Marine model organisms and natural products (Boeuf)
- Climate change problems (Hawkins, Buchholz, Dauvin)
- Sustainable ecosystems and human factors (Austin)
- Marine stations as observatories (Hawkins, Buchholz).

For each of these topics a half-page overview could be presented in the coming MARS Newsletter.

With regards to Global Observation, the POGO network comprising about 25 oceanographic institutions, including several MARS members, has recently issued at a meeting in Yokohama a document for the Earth Summit in Tokyo in April 2004. POGO covers the open oceans but there is a gap for coastal observatories. The EC concluded that MARS would be an ideal organization to establish this type of observing activity in Europe. It was suggested that a MARS representative should attend future meetings of this group but this suggestion was not retained. The number of "fixed" research stations in coastal European waters should first be increased. It was also suggested that stations with long-term time series of data would be ideal sites for this type of global observation. The EC therefore decided that it would be best for MARS to become active in the Global Observing System only when the agenda is ready and that we should first establish what MARS can do within this observing system. Fred or Steve could attend a future meeting. Meanwhile, through an action by Pierre Lasserre, MARS was invited to a discussion with UNESCO-IOC on this topic.

As regards connections with other organizations:

- a blueprint has been prepared by Carlo on the activities of MarBEF for DIVERSITAS
- at least three research areas in the Census of Marine Life (mid-Atlantic ridge, hydrothermal vents and abyssal plains) could have interactions with MarBEF
- there is a need to find funds to re-do the fauna and flora assessments of the past
- MARS should contact the steering committee organizing the Marine Biology Symposium in Austria in 2005 to offer a sponsorship for a keynote lecture or a prize for the best student poster, or both.

Summer schools and student awards were also discussed in Bruges. It was suggested that MARS could co-sponsor courses such as those of MarBEF so as to increase its visibility. The EC discussed, for example, the possibility of co-sponsoring the course on Hydrozoa being organized by Nando Boero this summer in 2004. MARS would contribute funds for two participants (750 euros/person) to attend this course so as to cover T&S costs for ascending states that are MARS members. Two travel awards of 2000 Euro were offered in the past (last year two of 2000 and two of 1000 Euro), whereas in Amsterdam it was decided to offer three full awards in 2004, one of which should be assigned to member states from Southern and/or Eastern Europe.

The EC decided that there should no longer be associated members of the MARS network but only full members, as already established in Amsterdam. UNESCO has paid membership fees for 2 countries (Turkey and Croatia) in 2003/2004. The EC accepted the new membership of the Station Marine de l'Ile d'Yea of the University of Angers and suggested that Malta and Cyprus should be approached for new membership. The possibility of involving marine stations situated in Cork and Belfast was also discussed.

The EC suggested that the next meeting of the Conference of Directors of MARS could be held in Ischia in 2006 (i.e. every 3 y) and Adrianna will speak with the President of the Stazione Zoologica of Naples, Giorgio Bernardi, about this possibility. It was also decided that the next MARS meeting of the EC should coincide with the next General Assembly meeting of MarBEF early next year. Pierre Lasserre suggested that MARS or MarBEF organize a meeting linking science, protection and the political dimension of biodiversity, and its conservation and role. The EC in Bruges recommended that such issues should be addressed to the MarBEF Steering Committee.

The EC established that the MARS Newsletter should consistently be blue and not mauve as the latest issue of the Newsletter. It also confirmed that the BIOMARE website should be transferred to MARS. The VLIZ Institute should be able to take care of this. The same institution should also provide the MARBEF website with an e-mail listing of MARS activities.

Other minor points:

- The possibility of covering T&S costs using MARBEF funds was discussed for possible invitations to UNESCO initiatives
- The EC will ask MARS members to suggest a new Honorary Fellow (re-elected every three years) to succeed to Otto Kinne.
- The template of the MARS Honorary Fellow Plaque will be used to design a similar one as a membership plaque to be made available for all MARS members

Last but not least, the EC in Bruges acknowledged the support of its former President, Treasurer and General Past Members Bernardi, Bonsdorf, Costello, Eleftheriou, Feral, Skora and Warwick.

MINUTES OF THE MARS STEERING COMMITTEE IN AMSTERDAM, 06 JUNE 2005

Participants were Fred Buchholz (FB; President, chair), Ricardo Santos (RS), Pierre Lasserre (PL), Mireille Harmelin (MH), Steve Hawkins (SH), Herman Hummel (HH; minutes), Adrianna Ianora (AI), Carlo Heip (CH), and Mike Thorndyke (MT) **Absent with notification:** Anna Szaniawska, Evangelos Papathanassiou

Opening by the chair Fred Buchholz

Welcome to new co-opted members: Pierre Lasserre, Ricardo Santos (for Deep Sea research), and Mike Thorndyke (for Marine Genomics). Reference was also made to Evangelos Papathanassiou being representative for East Mediterranean.

No additions to the agenda
Most actions are on the present agenda

Open actions:
- Links with POGO should still be established. MARS can be seen as a Marine Observatories network. Formally an exchange of agendas should be requested, and maybe a mutual exchange of members in the Executive Committees could be established [Action: FB, CH (CH connect to Jan de Leeuw]. This could maybe also be achieved through cross-over of people being member in both networks, as PML (Nick Owen) and Southampton [Action: SH].
- Trying to raise a higher membership, with an emphasis on Spain and maybe Albania. In Spain Pep Gasol could be contacted. Contacts should be made on personal basis. [Action all: send contact addresses to FB; Action FB: send personal letters]. Make clear that there are 3 levels of membership, and/or make an official letter to be sent together with the coming MARS Newsletter to potential members [Action: FB]

New initiatives
The European Research Council
PL was in first meeting, RS in second meeting held in Lisboa.
Report on first initiatives/meeting mainly from Max Planck institutes.
Report on second meeting by RS, representing MARS. There were representatives from 36 nations and many organizations. The ERC wants to be a bottom-up organization, and wants to be independent. Proposals from 1 institution are possible. There is common agreement, although there is still some doubt about budgets and resistance from some EC members (Italy, UK). There was no other marine representative than MARS. We should try to be an established member in the (steercom for) further initiatives.

How does this interact with EuroScience? It is a consortium as the AAAS that could become a central foundation for research in Europe. There is a call for proposals at this moment. MARS could consider membership of this organization.

MAB: Man and Biosphere initiative
Meeting at UNESCO-ROSTE in Venice was well attended, including representatives from GOOS. Links between MaB, MARS and MarBEF and earlier initiatives on observatories and indicators, as BIOMARE, were discussed. A taskforce will be founded, and funded by UNESCO. The draft report was circulated. Already 200 stations/sites are included in the programme. The issue of nature protection and conservation becomes more important, and the initiative thus is just in time.

EMBS and MARS
There could be a loose link between both organizations; otherwise EMBS may loose impact. Erik Bonsdorff and Nando Boero wanted to organize a special MARS/MarBEF workshop at the EMBS. There have long been efforts to join EMBS and MARS, but has not really been successful so far. The ideas given by Erik and Nando are still not crisp and clear – it should be according to them an open discussion – the MARS EC is not in favor of such a loosely defined agenda. We will ask a more concrete programme [Action FB: ask Erik on behalf of MARS for a concrete programme; CH: ask Erik on behalf of MarBEF]

SH proposes to start with a MARS sponsored poster session (best poster award) or a MARS invited lecture at the EMBS. MARS will support it with e.g. €500. To start with the Cork EMBS meeting [Action SH: send John Davenport a letter]

Mediterranean Research Stations
Relations with Mediterranean stations should be intensified. This has been promoted by MARBENA with a meeting in Piran, Slovenia. There is a lot of monitoring, even more than BIOMARE had documented. As in the Baltic the eastern European colleagues may be more interested in receiving money for local activities, and therefore it could be difficult to attract them to international initiatives such as MARS. Make an evaluation on what to do to get them involved in European activities (PL). UNESCO ROSTE might sponsor this. This can be stimulated by visits. A taskforce might work this out [Action: PL]

Non European organisations
No strong mutual activities. There is some room for activities with America (CORONA, NAML). We should start with re-establishing the contacts before thinking about a Federation of Marine Stations. First action would be to invite, and subsidise, an American colleague, e.g. the president of NAML [Action FB; SH could make links in Boston].

CoML is active, and started European activities as EuroNAGISA. MARS should stress that they want (to cooperate in) a EuroNAGISA network [Action: FB].

An article on NAGISA could be published in the MARS Newsletter (Action: FB ask Lisandro Benedetti-Cecchi)

GEOS (Global Earth Observation System) is a GO system trying to coordinate all observatory systems. MARS could introduce, connect with, the European sites [Action: CH].

Membership of MARS in the main NoEs
An overview of MARS members involved in Marine Genomics, EurOcean and MarBEF would be helpful [Action: CH ask Pim van Avesaath].

Transnational Access Marine Stations (by MT)

Background is in Marine Genomics (Biological Resource Centres) based on the major marine stations developing model organisms, keep culture collections, and supplying these organisms. It is now a SSA (Research Infrastructures) proposal within the 6th FP. Proposal is focusing on coastal and shelf zone, and will be carried out by 8 major institutes with a tradition on model organism supply and having ships. A budget is foreseen for visiting researchers from other marine institutes. In the 7th FP there might be an opportunity for other MARS institutes to be included.

For sale: the 116 year old Station Marine d'Endoume at Marseille
The marine station in Marseille is planned to be sold. A petition to save this historical station is offered to MARS to be published at its website [Action: HH]. Advice was given to emphasize the cultural heritage, international position, large size, and importance of the institute more strongly in the petition. Send petitions also directly to local administrators, such as the lord Mayor. Also MARS can send a letter of support [Action: FB], and the Marine Biological Association of the UK will do the same [Action: SH].

Conference of Directors
Ischia (AI) confirmed to be willing to organize the Directors meeting on 2+3 November 2006. Different hotels are available. Yet, for practical reasons the conference could be better organized at the Stazione Zoologica in Naples. It is decided to organize the Directors meeting in Naples. Immediately before this a Marine Genomics meeting is organized in Sorrento. A fund could be requested by MARS from UNESCO-ROSTE to invite Eastern European colleagues [Action: FB].

MARS Newsletter
Will be kept separate from the MarBEF Newsletter.

Contents include:
- FB makes an editorial [Action: FB].
- Position papers will be made on new research themes [Action: CH, SH, FB]. Some authors should still be contacted [Action: CH, FB].
- Links with the major NoE's can be explained: MarBEF [Action: CH], EurOceans [Action: CH contact Caroline Gernez], Marine Genomics [Action: CH contact Catherine Boyen].
- Articles by Allen Cembella & Jane Robertson [Action: FB]
- list of summer schools [Action: FB, HH]
- reports of travel grantees [Action: HH]
- Minutes of meetings [Action: HH]
- Financial report [Action: HH]
- Presentation of marine stations – Station Marine d'Endoume [Action: MH]

Prizes, Awards
- MARS Honorary Fellow prize. Nominations will be requested from the members [Action: PL, CH]
- Student Award: this year 2 students awarded. Remarkable was the dominance of Italian and Polish applications.
- A MARS plaque will be sent to the MARS members [Action: HH]

Finances and membership
There is a positive balance (€40 k). Costs of the secretariat still have to be booked. A reserve can be put at a higher interest account [Action: HH]

This year the contribution has been paid already by 37 members, 6 are awaited. A letter should be sent to the UNESCO awardees of 2003 (that got 2 years membership for free) [Action: HH].

New research themes
Trends and processes and modeling are new themes to be discussed within FP7.
We should try to push integrative biology.
CH will make a first set-up for an overview of new research themes and a research strategy for MARS [Action: CH].

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MARS Listserver

To facilitate communication of the MARS project, its aims and results to as wide an audience as possible, the Marine-B (Marine Biodiversity) electronic mailing list is being used by the project.

To join the list

This process will generate a piece of mail inviting you, as the owner, to add yourself to the list.

Send an email to listserv@listserv.heanet.ie, leaving the subject line blank. In the main part of the mail, type in the command:-
Subscribe MARINE-B <firstname surname>

Make sure not to add a signature at the end of the email. You will then receive a message saying you are subscribed to the list.

To send mail to the list

When you want to send mail to the list, you just enter MARINE-B@listserv.heanet.ie in the 'To:' field and your mail message is distributed to the people who have signed onto the list.

If you wish to check the list archives, go to: http://listserv.heanet.ie/marine-b.html

The website http://www.lsoft.com/ may also be useful if you wish to get further information about listservers and the running of the list. If you have any problems, please e-mail Chris Emblow cemblow@ecoserve.ie

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