

MARS

The European Marine Research Stations Network



www.marsnetwork.org



Introduction by the MARS president

The most outstanding event concerning the MARS community was its triennial Conference of Directors of Marine Stations, last year in Naples, following the successful meetings in Venice (2000) and Amsterdam (2003). The dates were 2 and 3 November, 2006 and the venue was the Stazione Zoologica in Napoli. Perfect hosts were Giorgio Bernardi and Adrianna Ianora who took care of us very generously at this beautiful location – for MARS, the first time at a true Marine Station – and one of the oldest and most prominent at the same time!

The central topic was: “Marine Stations in FP7: Towards a virtual European Institute of Marine Science?” About 15 presentations were given under the subtopics: (1) “Marine Science in the next decade: Policy and Cooperation” and (2) “Marine Science in the next decade: Research Priorities.”

Members of the most relevant bodies of organisation gave presentations: EU DG Research (Miguel Nuevo-Alarcon); the ESF Marine Board; UNESCO/MAB; ISE; and LifeWatch.

A Round Table with presentations of the three current marine Networks of Excellence (NoE) was convened by Graham Shimmiel, and given by their coordinators:- MarBEF: Carlo Heip; EurOceans: Paul Treguer; and Marine Genomics, Bernard Kloareg. It was the first time that the three NoEs were represented at the same time and in such close proximity.

Cutting-edge science was additionally presented to highlight current trends in Marine Biology, including fascinating reports on the large Integrated Projects HERMES and SESAME.

The talks gave an excellent background for ample discussion of the central topic. MARS, representing the Observatories of the Seas, may be a firm basis on which to build such a

virtual institute, well related to the current Networks of Excellence and carrying a consolidated foundation into the Framework Programme of the European Union. MARS's function will again be to identify and promote new ideas and topics to help set the trends, strategies and structures in marine biological research, on a Europe-wide scale.

The following events were part of the conference:

- The MARS Award for Life-Time Achievement was given to Pierre Lasserre
- The next President (for 2008–2010) was elected: Mike Thorndyke
- A plaque for MARS Stations was given to all members.

A Gala dinner party was sponsored by Stazione Zoologica, and took place at beautiful Villa d'Angri, and a concerto was enjoyed in the Fresco Saal, according to Anton Dohrn's tradition. Many thanks again to Giorgio and Adrianna, our very generous hosts!

In the meantime the discussion has continued, first of all in relation to the three marine NoEs – which have been identified to contribute to the task towards the establishment of a Virtual Institute, now on the way, and to construct a more durable basis for such an institution, in which LifeWatch may play an important role.

Infrastructures for Marine Research will also be a topic at the forthcoming World Conference of Marine Biodiversity at Valencia, convened by MarBEF in November 2008, where MARS is placed in the Executive Board.

Most importantly, at the coming SSC meeting at NIOO Yerseke in February 2008, Mike Thorndyke will take over the presidency; he introduces some of his ideas with an article on EU Infrastructures in this newsletter.

Fred Buchholz
President of MARS

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Pierre Lasserre speaking at the Naples Conference Dinner. (Photograph: Ferdinando Boero)

Laudatio for Pierre Lasserre

By Friedrich Buchholz, Helgoland

MARS honours colleagues of outstanding reputation in marine science with a MARS honorary fellowship. The first MARS medal of honour was awarded to Professor Otto Kinne for his longstanding contribution to the marine science community; it was presented at the 2nd MARS Conference of Directors in November 2003 in Amsterdam. The second fellowship was awarded to Pierre Lasserre, the far-sighted founding father of the MARS network. We are very glad to have Pierre in the SSC of MARS as a co-opted member, relating MARS to UNESCO and the 'Man and the Biosphere' programme. The award honours in particular his life-time achievements in marine biodiversity and, within this theme, to MARS, which are highlighted in the following (with a little help from UNESCO and MAB texts):

Pierre Lasserre is a marine biologist and a professor at the University Pierre and Marie Curie – Paris VI. He received his PhD (Docteur des Sciences Naturelles) from the University of Bordeaux I. As assistant professor at the Institute of Marine Biology, Arcachon, he was awarded several fellowships, in Denmark, Sweden and Bermuda. He was research associate at the Marine Biological Laboratory, Woods Hole, and at Duke University Marine Laboratory, Beaufort, NC, USA. From 1982 to 1993, he was Director of the CNRS Station Biologique de Roscoff, one of the leading marine research centres in Europe. Subsequently, Pierre Lasserre worked for UNESCO, from 1993 to 2003, and served,

consecutively, as the Director of Ecological Sciences Division and Secretary of the intergovernmental Man and the Biosphere (MAB) Programme, and as the Director of UNESCO's Regional Office for Science and Technology in Europe (ROSTE) in Venice.

His past research has included pioneering studies on marine biodiversity and the ecophysiology of marine meiofauna, and studies on the role of micro-organisms on fluxes of materials and energy in marine sediments. Furthermore, he has contributed research on osmotic and ionic regulation in fish and aquaculture.

With his many PhD students and colleagues, Pierre Lasserre has conducted comprehensive research projects in coastal environments along the Atlantic coast and the Mediterranean, North and West Africa, Mexico, the Kerguelen Islands and the East China Sea. In the early 1990s, he coordinated an international project on the Venice Lagoon Ecosystem.

Pierre Lasserre is author of more than 100 articles and several books, including *The Coastal Lagoons* (Gauthier-Villars); *Biogeochemical Processes at the Land-Sea Boundary* (Elsevier); *The Venice Lagoon Ecosystem* (Parthenon Press); *Reconstruction of Scientific*

Cooperation in South East Europe (UNESCO-ROSTE). He was Editor-in-Chief of *Cahiers de Biologie Marine* (CNRS) and of *Nature and Resources* (UNESCO). He acted as science advisor to several TV movies in the field and edited successful series of educational wall-charts and a CD-ROM on biodiversity research and conservation.

Professor Lasserre has been a member of international organisations such as IUBS (Executive Committee member), IABO (President 1983-93) and SCOR (ex-officio member of Executive Committee and several SCOR Working Groups). He represented ICSU in the preparatory Working Parties on Oceans for UNCED (1991-92) and attended the ASCEND 21 meeting in Vienna (1991) and the Rio de Janeiro World Summit (1992) as invited speaker. In 1989 he was elected Member of the Academia Europaea.

During his 10 years at UNESCO, Pierre Lasserre has actively participated in the launching of the DIVERSITAS Programme, and the organisation of the Seville Conference (1995) on the World Network of Biosphere

Reserves, a landmark in the MAB Programme. He has been instrumental in science policy and capacity-building projects in developing countries, and in 2001 he organised the important UNESCO initiative on scientific cooperation in south-east Europe (Balkans) in cooperation with the Academia Europaea, the European Science Foundation, and the Istituto Veneto di Scienze, Lettere ed Arti.

Pierre Lasserre's initiative was essential in the founding of the European network of Marine Research Stations (MARS). Originally, it was based on 11 founding institutes having been identified as "seaside labs" in 1990. At that time he was one of their directors, and he knows it all: life and work at a marine research station and the potential such an observatory of the seas has. This became particularly clear in view of the Rio de Janeiro World Summit (1992) which he attended as invited speaker. The extinction crisis, which was addressed there for the first time in a global context, resulted in an important impetus for an European network of the Observatories of the Seas joining forces with museums and universities with collections, data and

scientific approaches on marine biodiversity.

From UNESCO, Pierre Lasserre has always been the good shepherd of MARS, and the inauguration of MARS as a European network with more than 300 attendees, and Carlo Heip as the first president, followed at the UNESCO in Paris in 1996. MARS's First Conference of Directors took place in Venice in 2000, being an appropriate good start to the series.

Pierre Lasserre has been promoting marine biodiversity research and the international structures of research organisation with great consequence and efficiency. The award of Honorary Fellow of MARS has been given to him in full recognition of his life-time achievement in studies of Marine Biodiversity and promotion of its causes and, within the larger context, MARS causes.

The MARS community is happy that he will be able to continue to introduce and maintain his lively and easygoing French attitude, combined with his experience as a serious scientist and influential science politician within MARS affairs.

Infrastructures

By Mike Thorndyke

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The past few years have witnessed increasing attention being focused on Infrastructures, particularly by the European Commission (http://cordis.europa.eu/fp7/capacities/home_en.html).

Moreover, there is a specific European strategy group that has the mission to identify and produce a "Roadmap" for European Infrastructures in the coming decade and more (<http://cordis.europa.eu/esfri/roadmap.htm>).

In the main, these "Infrastructures" have traditionally been considered single sites or entities, for example Cyclotrons, an Arctic ice-breaking research vessel, Telescope, etc. That is sites, laboratories and resources that serve a wide community. This is perhaps best exemplified by the activities at CERN where a whole community of physicists meets to collaborate (<http://public.web.cern.ch/Public/Welcome.html>).

However, thanks to the insistent lobbying by several of our MARS members, it is now accepted that Infrastructures can also be "Distributed Infrastructures." It is recognised that "an infrastructure" can be an assemblage of sites and/or a "virtual infrastructure" that too serves a whole community of scientists. This is

clearly a very important development for biologists everywhere in Europe (and the world) and perhaps specifically for us marine folk! Thus, here an "Infrastructure" might be a set of marine sites, stations, etc, much as is the ambition of the MARS network!

Advances are being made and a number of us are involved in a "Preparatory Phase" project known as "Lifewatch" (<http://www.lifewatch.eu/>). This originated as an idea from Carlo Heip and has turned into an ambitious project to bring together all data, including historical, museum collections, climate, marine monitoring data, etc, and establish key "sites" for future monitoring as a "virtual infrastructure" to benefit all researchers in the area of biodiversity research. This project was identified on the ESFRI roadmap and has recently been approved for funding.

It is important to realise that this is a "Preparatory Phase Project." This means that it is designed to create the agreements needed, and to put the construction phase of such an infrastructure in place. Thus, much of its work will be directed to policy, business and legal matters so that each member state can sign an agreement to contribute to the construction phase. This is very important, since the

Commission considers it the responsibility of each member state to support its own infrastructure(s) as part of their mission with the EU.

One of the most important activities that MARS members should engage in is to lobby their own governments, agencies, etc, to ensure they appreciate the value and need for a distributed biological infrastructure of this type. In a way, our future depends upon this and we must do all we can to protect the rich European heritage of marine sites with their long-term datasets and the exceptional and diverse ecosystems they represent.



Marine Biological Station at Santander, Spain. (Photograph: © John Dolan)

Minutes – Annual MARS Steering Committee Meeting

Stazione Zoologica Anton Dohrn, Naples, Italy, 1 November 2006

By Herman Hummel

Present: Participants were Fred Buchholz (FB; President, chair); Steve Hawkins (SH); Carlo Heip (CH); Herman Hummel (HH; minutes); Adrianna Ianora (AI); Pierre Lasserre (PL); Ricardo Serrao Santos (RS); Mike Thorndyke (MT)

Absent with notification: Mireille Harmelin-Vivien, Anna Szaniawska

Opening by the chair: Fred Buchholz

1) Minutes of MARS Steering Committee Meeting, Amsterdam, 6 June 2005

Jan de Leeuw is still the chair of POGO. A meeting will be held in the beginning of 2007 in China. Nick Owen is the observer for MARS.

In trying to raise a higher membership, with an emphasis on Spain, SH will contact Daniel Martin, Blanes; CH will contact Pep Gasol, Barcelona; PL will contact colleagues in Canaries and Bilbao; and FB might try to contact institutes in Romania and Bulgaria. [action: SH, CH, PL, FB]

In relation to the European Research Council (ERC), what can MARS do? This will be discussed at the Directors' Meeting. The ERC should not be mixed up with the Initiative for Science (ISE) in Europe, of which MARS is a signatory. At the Directors' Meeting, the role of this initiative should also be discussed.

The 'Man and Biosphere' (MAB) initiative is running well (PL). He is keeping in contact with CH and FB for the planning of coordinative actions.

At the last European Marine Biology Symposium (EMBS) in Cork, Ireland, a further cooperation of EMBS and MARS was proposed. The steering committee of EMBS decided that their chairs (Erik Bonsdorff and Artemis Nicolaidou) would discuss with HH on this issue and report at the coming EMBS in Kiel.

The MBA (SH) wishes to have also a vehicle for symposia and other activities. To this end, option for a profile and for a platform of activities (for more visibility) should be examined. Maybe a new society for marine biology and oceanography could be created. Another example is Danovaro's federation of

marine biologists. MARS could maybe also be affiliated with UNESCO as an NGO.

First we should focus on how we want to go forward with MARS. For this we have to be anticipatory, to adopt a broad definition regarding disciplines (not only including biology) and a statutory organisation (association or foundation for stations and institutes). The Steering Committee is in favour of further cooperation and HH was assigned to explore the possibilities. [action: HH]

Mutual cooperation with American activities and organisations, such as NAML, became more difficult, partly because they were finished (CORONA). We need concrete issues to have fruitful contact, and with that we can contact NAML. [action: FB, SH]

Within EuroNagisa, there are budgetary issues that lower the speed of action.

The 116-year-old Station Marine d'Endoume at Marseille will be definitively lost, since it is sold.

The system of (MARS) awards has to be kept as it stands. An announcement on the awards should soon be launched. [action: HH]

2) Preparations for Conference of Directors, Napoli

Composition of discussion panels and agenda details were discussed.

The MARS Lifetime Achievement Award goes to Pierre Lasserre, to be handed over at the Naples Conference Dinner.

3) MARS Newsletter

For the coming Newsletter, several authors could be asked by FB to contribute [action: FB]. A tentative short-list for authors and topics is:

- Abstracts of the lectures at the Conference of Directors
- Mike Thorndyke on Infrastructures
- Phill Weaver on Hermes
- Graham Shimmiel on CoML
- Ed Hills on Oceans 2000

4) Finances and Membership

The financial balance for MARS at October 31, 2006, was again positive, being €19,000.

The membership is slowly increasing, being for 2006 more than fifty. An additional mailing should be sent to late payers. [action: HH]

A simple booklet with the list of member stations, plus short descriptions, could be sent together with the annual invoices. A lay-out for a form/questionnaire will be composed by SH. [action: SH]

The membership of the Executive Board and the steering committee is due to change at the end of 2007. The committee members are asked to think about replacements.

Proposed changes are: Mike Thorndyke to become President-elect; Maciej Wolowicz to replace Anna Szaniawska; to offer Carlo Heip co-opted membership; and to leave the executive secretariat permanently at Yerseke (since MARS Network foundation has its legal seat in the community of Reimerswaal, i.e. Yerseke).

5) Miscellaneous

The next MARS Directors' Meeting might be connected with the MarBEF General Assembly (November 2008 in Valencia, Spain).



The Oceanographic Museum in Monaco, 1909 (pre-inauguration). (Photograph: © John Dolan)

Minutes – Third MARS Conference of Directors

Stazione Zoologica Anton Dohrn, Naples, Italy, 2-3 November 2006
By Herman Hummel

On 2 to 3 November 2006, the directors of MARS stations and institutes assembled in Naples, Italy, for their bi-annual meeting. The major issues at stake and future challenges in marine sciences were discussed.

Thursday 2 November (morning)

Miguel Nuevo-Alarcon: EU DG Research, 7th Framework Programme

The EC council has adopted the 7th Framework Programme. In this programme, the competitiveness of the EC in the global arena is important. The EU is attaining the lead of the most competitive knowledge-based economy in the world.

In FP6 (2002-2006) for the maritime and marine sector €557 million funding is available, and for Environment the share is €54 million. The attention for marine sciences remains high in FP7. For FP7, the Galway Declaration and Green Paper on Maritime Strategy are leading documents.

There are four activity types in FP7: (1) transnational cooperation, (2) ideas, (3) individual actions of people, and (4) support capacities. Content is structured into 10 Themes, a.o. Environment. Within Environment, the relevant topics are, a.o.:

- (1) sustainable production
- (2) communication technologies
- (3) climate change, pollution risks
- (4) sustainable management of resources
- (5) management of marine environment
- (6) earth observation.

The EC is still open for input – knowledgeable persons and organisations, such as MARS, are requested to give input to the FP7 programme and on the green paper. This input can help to adjust (influence) future calls in FP7.

Jan Mees: ESF Marine Board and MarinERA

The focal points of the ESF Marine Board are to be (1) a voice and (2) a forum, and to develop (3) strategies and (4) synergy.

MarinERA is a strategic and operational platform for funding agencies. MARS is invited to be an observer in that programme. In MarinERA the calls will be on (1) Regional drivers of ecosystem changes, and (2) Rapid changes (e.g. thermocline circulation in the North Atlantic).

We should be aware that funding organisations have a different philosophy to that of researchers. MarinERA is a top-down system, whereas NoEs and researchers follow a bottom-up approach. The connection between the different approaches needs attention.

Salvatore Arico: UNESCO/MAB

Linkage of the network of marine biosphere reserves with networks of marine research stations such as MARS is necessary as part of an effort towards a federation of marine stations (MAB ICC 19) – not only for Europe but also at the global scale.

Thursday 2 November (afternoon)

Wouter Los: LifeWatch

Lifewatch aims at:

- Supporting a coherent approach and strategy on research infrastructures
- Facilitating multilateral initiatives to better use research infrastructures.

The plan is to link the collected ecological monitoring data with physical data. It may help to promote new research. Yet, to integrate the different methods, facilities, etc. is cost-intensive. Moreover, a link to GMES and GEOSS may be needed. This all needs structuring of the scientific community. Networks need to work together.

The ESFRI (European Strategic Forum for Research Infrastructures) initiative may be instrumental in this. It needs national and EC community support. Feasibility has to be tested now (2007-2009), after which committed institutes can start. Within ESFRI there are now 35 proposals, one of which is LifeWatch.

What is the role of MARS – a data provider organisation, or a scientific network partner organisation? MARS members at this moment can at least help to establish LifeWatch by informing science ministers (make publicity, lobby, etc).

We should consider two aspects. Firstly, marine research was formerly often privately funded – how about taking up this early thread, and how now to finance LifeWatch? Will industry participate from the start? Secondly, many data collectors are amateurs. They have their own networks. They are not partners in LifeWatch. Should they not be included?

Jan Mees: Marine data management

There are many reasons for better (central archiving) data management:

- Data series are short-term and tend to get lost with their creator
- Paper records get lost
- Each datapoint has a high cost
- Historically unique (cannot be repeated)
- Nobody has a complete overview
- Sharing and integration of data is still poor (standardisation needed)
- Data should be advertised – data-centres should not bury the data.

We should aim for an IMIS – Integrated Marine Information System. Metadata should be compliant with ISO norms. ERMS is a good example, now hosted by MarBEF. In the MarBEF data centre there are more than 85,000 species (in ERMS 31 546), which means that it already includes many species outside Europe.

In the present datasets there is a lack of heterogeneity, essential information is missing, e.g. geo-references. Therefore we need training in data management of scientists.

Luc van Dyck: Initiative for Science in Europe (ISE)

This organisation is for and by scientists. Founders are originally from the field of molecular sciences. ISE is now focusing on ERC, and has become a lobbying organisation.

For MARS, the take-home message is:

- Make long-term strategy (15-20 years)
- Promote research
- Install proper infrastructure, and take care about updates.

Round Table Discussion

Introduction of NoEs:

- MarBEF: Carlo Heip
 - EurOceans: Paul Treguer
 - MarineGenomics: Bernard Kloareg
- Discussion followed 10 questions posed by the chair, Graham Shimmield.

(1) What has been the most innovative aspect of your NoE?

(2) What has been the most challenging aspect of your NoE?

NoEs have been excellent (innovative) in structuring the marine science arena. How can it then be that no structure after the existence of the NoEs is foreseen, so far? Indeed, the challenge was enormous; but the future is

unclear because we need financing for such a follow-up structure. The EC is currently working on a mechanism for the follow-up of NoEs – it is not going to have an end.

The innovation could have been stronger if there had been a focus on some issues. For some issues the focus is even less than in FP3 and FP4. Yet we cannot be exhaustive and that may have its drawbacks for some issues.

(3) Are there advantages of combining NoEs?

Yes, a combination, maybe as a Virtual Institute, is very much needed.

(4) Is this the right development area for young scientists?

Exchange and training projects are incorporated in the NoEs. But it may be questioned if this is sufficient? What happens after their training, and what when their PhD ends? If there is so little money for research in NoEs, what can we offer young scientists then? As a follow-up we need a system of tenure-track – the current situation now is dramatic.

Still, the general feeling is that there have been many mechanisms in the NoEs to open up possibilities for PhDs and post-docs. The EC will now install a helpful system for young scientists within the Mobility programme.

(5) How to manage institutes that should be included or excluded?

NoEs cannot do anything about that at this moment since there are no additional funds.

(6) What is the challenge for FP7?

Quality needs time. Once shown to work properly, a follow-up within FP7 should be automatic for the NoEs. Maybe the different NoEs still need a common goal. This should encompass a holistic approach (e.g. the water-column cannot be done without sediment) and free access to all results of the research. Moreover, care should then be taken about a good public outreach, although several networks are already aware of public outreach and have developed strong initiatives for this.

(7) How do NoEs link to other organisations like the ESF/MarinERA networks?

(8) What has been the experience with the Commission?

(9) Has bureaucratic management overtaken the science?

(10) Does the rest of the world take NoEs seriously?

Additional questions were raised:

What went wrong in the NoEs? What do you think about how continuation can be achieved?

Not much went wrong. Yet, the EC does not sufficiently discuss the priorities in science at

the national level. We are changing from a cottage science to an industrially organised science. Needs and wishes can be different at the research and political level. EC should therefore interact more with what is done at the national level.

Also, the EC should take care that there can be a loss of interest in participating in a NoE because of working for such little money. However, lack of money may also be helpful to be critical in setting the highest priorities and investing restricted funds in the most intelligent way.

Were the NoEs a success story? why? And what mechanism is preferred?

Although NoEs have proven to be successful in reaching their aims (integration of European science arena), the EC should take into account that they contribute only 5% of the total European science budget, and thus they cannot set the complete science agenda. There is now a strong need to find money for research “at the bench.”

Also, IPs should be kept as a mechanism since they are a good (sometimes better) chance for the combination of science and integration.

Paul Treguer: Towards a Virtual Institute

The aim is to create a long-lasting multi-site institute.

It is not fully clear what a Virtual Institute is. The concept has been introduced by the EC without definition. The concept seems to have developed from industry, where it is used for making centralised tasks that different companies share with each other in order to optimise efficiency for each partner.

It makes sense that a Virtual Institute is a continuation of the NoEs. A Virtual Institute should be used only if there is added value.

The role of the NoEs now is that we can build a taskforce, in a good position to go also outside Europe. The EC needs to help with that.

Moreover, we are creating the NoEs also for the future. We are now no longer only looking at our national borders, but have responsibilities to go even further than that, e.g., conservation and protection of the oceans.

Four working groups have been created among the three NoEs:

- WG1: Scientific challenges. 8 Key areas for scholarships, 3 Multidisciplinary studies
- WG2: PhD programme (Doctoral School in marine sciences)
- WG3: Sharing of facilities (in close link with ESFR)
- WG4: Mobility of personnel (started already with mobility of students).

Paul Treguer states that a Virtual Institute based on a large number of participants is not realistic.

The idea is rebutted since it would lead to consortia from UK, France and Germany, whereas Eastern European countries also have sufficient excellence and expertise to bring in. Moreover, many smaller institutes could contribute a highly valuable diversity.

Concern is also expressed that centralised initiatives may create “marine ghettos,” e.g. oceanography versus ecology. Different disciplines, groups and networks therefore need to do more about confidence-building. That needs time.

Be also aware of the fact that universities do not wish to let a PhD be granted/delivered by a Virtual Institute, since it is their own prerogative.

Still, a strongly positive feature of a Virtual Institute is that, as for NoEs, advanced high-level courses can be organised.

Friday 3 November 2006

Jan Hiddink: Foodwebs and fisheries

MPAs may not be suitable for all fish species. In an MPA, the total amount of food increases. Yet, the food amount of small polychaetes (opportunistic species) may be higher due to trawling, thus lower in the MPA, whereas plaice have better conditions outside the MPA.

One should not forget that taking adult fish out of the system may change predator-prey relationships. An example is that jellyfish may take over the predator role, thus taking out juvenile and larval stages of fish – thus there is no recovery if fishing is abandoned.

Adrianna Ianora: Marine chemical ecology

Marine natural products are considered at the basis of ecological specialisation by affecting species' distribution patterns and community organisation, as well as maintenance of biodiversity through resource and habitat partitioning. Many of these products may also find important biotechnological applications as new drugs and in the aquaculture, agriculture and chemical industries.

Vangelis Papathanassiou: SESAME

The aim is to study changes in the Mediterranean and Black Seas simultaneously. What kind of changes have there been in essential mechanisms and goods and services, and what will occur in the future?

Phil Weaver: HERMES – a project on deep sea research

Coral areas coincide strongly with trawling areas. Most areas belong to territorial waters, and could be indicated as Natura 2000 sites. Yet, proper legislation is still needed. In Norway, some protected areas are indicated.

Ricardo Santos: Deep-sea vents and the Mid-Atlantic Ridge

Fisheries often followed the chain of underwater sea-mounts around which fish appear to concentrate. A fascinating picture of unique deep-sea communities has been drawn. A conservation concept is being developed based on the Azores islands.

Lisandro Benedetti-Cecchi: Euro-NaGisa

The NaGisa system goes back to a Japanese activity but has now been extended worldwide, closely associated with the Census of Marine Life. It is focused on the nearshore and intertidal regions in documenting species and species assemblages. A Euro-NaGisa has been established comprising four major European areas (including the Arctic, and linked to BIOMARE sites). An initiative is reported to assess processes involved with structures recorded (EMBED). A support by MARS may enhance the global approach in turn.

Fred Buchholz: Large-scale long-term changes in marine biodiversity

Examples for implementation of biodiversity research are given, from the beginning in Darwin's time to the early days of MARS via BIOMARE and into current MarBEF activities. The commitment of [MARS] institutes through contribution of BIOMARE sites further lies in supplying existing data for large-scale comparisons of patterns of biodiversity. The assessment of global change effects along gradients, e.g. latitudinal and salinity related, is followed with MarBEF support through its responsive mode project LargeNET with a focus on long-term observation series.

Steve Hawkins: Climate change impacts on marine ecosystems

Lots of range shifts/extensions can be found around the UK. Local observation series match SAHFOS series. Shifts may occur also indirectly when competition between species (for food, space) is involved (shown for barnacles).

We need broad-scale studies, integration with/between national monitoring programmes, networks such as MarBEF, MARS, mechanisms of response and consequences of changes, incl. adaptation strategies.

Concluding Discussion

Marine stations are endangered. The present tendency to change marine stations more and more into molecular laboratories has to be counteracted. Marine and molecular sciences have to work together.

Marine stations should continue to carry out local observations, which in the long-term will have a high scientific significance.

Therefore, the role of marine observatories should be strengthened. For such, a common

protocol is needed, old data need to be better recovered and exchangeable, and a common policy has to be agreed upon. Moreover, marine stations and MARS could become stronger by providing training, long-lifetime learning (although fundamental teaching belongs to the universities, yet also universities have often (connections with) marine stations).

This process of strengthening marine stations and MARS can be extended even outside Europe through the MAB (Man and Biosphere) programme. For going outside Europe, and to reach a global level, a proposal is also that each MARS member will adopt and support a marine station from developing countries.

Networking, on the other hand, bears the imminent risk of further fractionation of research issues and structures rather than the intended integrative effect. We need to network the existing networks now, at least establishing a better flow of information between them and a coordination in the pursuit of common goals. A great integrative potential is seen in the coming LifeWatch system with an appropriate input from the MARS network.

Accordingly, a mandate is requested to continue with the LifeWatch Programme and to give full support from MARS. This is supported unanimously by the members of MARS present at the meeting.

For this strengthening of marine sciences, which is high on the agenda of the EC, the NoEs are only the starting point, and preferably the NoEs should interlink as well. It became quite clear that the three NoEs had their origins in those Marine Institutions which to a large extent were MARS members at the same time. It is to be expected that such mutual support in the Marine Research area will continue. However, it is important that the smaller institutes and projects should not be forgotten and should always be able to join.

At the same time, the MARS network could be strengthened. MARS could obtain NGO recognition by UNESCO, to give it global visibility and maybe funding for a secretariat.

The host of the meeting, Professor Bernardi, thanks the audience for a productive meeting and suggests the prompt circulation of the abstracts and results of the meeting as soon as possible.

Participants (from Norway to Naples, Athens to the Azores: F, I, De, Dk, UK, NL, Croatia, B, Gr, Lit, Est, N, P, Pl = 14 nations).

Arico Salvatore	United Nations Educational, Scientific and Cultural Organization, France
Benedetti-Cecchi, Lisandro	University of Pisa, Italy
Bernardi, Giorgio	Stazione Zoologica Anton Dohrn, Naples, Italy
von Bodungen, Bodo	Institut fuer Ostseeforschung Warnemuende, Germany
Boero, Ferdinando	University of Lecce – DISTEBA, Italy
Bonhomme, Francois	Univ. de Montpellier, Stat. Méditerranéenne de l'Environnement Littoral, France
Buchholz, Friedrich	AWI, Biologische Anstalt Helgoland, Germany
Doumenc, Dominique	National Museum for Natural History, Paris, France
van Dyck, Luc	Initiative for Science in Europe – ISE, Heidelberg, Germany
Hawkins, Stephen	Marine Biological Association of the UK, Plymouth, UK
Heip, Carlo	NIOO – Netherlands Institute of Ecology, The Netherlands
Hiddink, Jan	School of Ocean Science, Univ. of Wales, Bangor, Menai Bridge, UK
Hummel, Herman	NIOO – Netherlands Institute of Ecology, The Netherlands
Ianora, Adrianna	Stazione Zoologica Anton Dohrn, Naples, Italy
Kloareg, Bernard	Station Biologique Roscoff, France
Lasserre, Pierre	UFR Life Sciences, Univ. Pierre et Marie Curie, Paris, France
Lebaron, Philippe	Observatoire Océanographique de Banyuls-sur-Mer, France
Los, Wouter	Inst. Biodiversity & Ecosystem Dynamics, Univ. of Amsterdam, The Netherlands
Marasovic, Yvona	Institute of Oceanography and Fisheries, Split, Croatia
Mees, Jan	Flanders Marine Institute (VLIZ), Oostende, Belgium
Nuevo-Alarcon, Miguel	European Commission, DG-RTD, Brussels, Belgium
Olsen, Jeanine	Dept. of Marine Benthic Ecology & Evolution, Centre for Ecological and Evol. Studies, Univ. of Groningen, The Netherlands
Owens, Nick	Plymouth Marine Laboratory, UK
Papathanassiou, Vangelis	Hellenic Centre for Marine Research, Inst. of Oceanography, Anavissos, Greece
Razinkovas, Arturas	Coastal Research & Planning Institute, Klaipeda Univ., Lithuania
Saat, Toomas	Estonian Marine Institute, Univ. of Tartu, Estonia
Schander, Christoffer	Univ. of Bergen, Dept. of Biology, Norway
Sellos, Daniel	National Museum for Natural History, Marine Biology Station, Concarneau, France
Serrao Santos, Ricardo	Univ. of Azores, Dept. of Oceanography and Fisheries, Horta, Portugal
Shimmield, Graham	The Scottish Association for Marine Science (SAMS), Scotland
Thorndyke, Mike	Royal Swedish Academy of Sciences, Kristineberg Marine Research Lab., Sweden
Tinti, Fausto	Interdept. Centre Research Environmental Sciences, University of Bologna, Ravenna
Tommeras, Bjorn Age	Dept. of Biology, Univ. of Bergen, Norway
Treguer, Paul	IUEM, France
Weaver, Philip	National Oceanography Centre Southampton, UK
Weslawski, Jan Marcin	Inst. of Oceanology, Polish Academy of Sciences, Poland

Minutes – Ad hoc MARS Steering Committee Meeting

Kiel, Germany, 30 August 2007
By Herman Hummel

Present: Participants were Fred Buchholz (FB; President, chair); Steve Hawkins (SH; Vice-President); and Herman Hummel (HH; Executive Secretary, minutes).

In view of the nearby end of the term, at the end of year, for the Executive Board and Steering Committee of MARS, the President of MARS, Fred Buchholz, called for an ad-hoc meeting at the venue of the 42nd EMBS at Kiel.

An overview of the MARS committee members from the beginning of MARS (1995) was presented by HH (see Table).

The positions of the Executive Board due to be replaced at the end of 2007 were manifold. A strategy for new Board members has to be developed.

Moreover, the membership of the co-opted members will end, and a proposal for the invitation of co-opted members has to be composed (and to be decided by the new Executive Board).

The changes can encompass the following:

- To propose for the Executive Board:
 - Mike Thorndyke to be confirmed as

- President elect
 - Fred Buchholz to become full member as Past-President
 - Adrianna Ianora as Vice-President for the Mediterranean
 - Maciej Wolowicz to be confirmed to replace Anna Szaniawska and to represent the Baltic
 - Ricardo Serrao Santos to represent the Atlantic.

- To propose as co-opted members to the Steering Committee:
 - Carlo Heip (as the General Coordinator of MarBEF)
 - Steve Hawkins (as expert on long-term series)
 - Herman Hummel (as Executive Secretary)
 - Piere Lasserre as representative for UNESCO, MAB and Diversitas
 - Nando Boero as representative for CIESM
 - Bernard Kloareg as representative of the Virtual Marine Institute

It was further discussed to leave the Executive Secretariat permanently at Yerseke, since the MARS Network foundation has its legal seat in the community of Reimerswaal, i.e. Yerseke.

The next SSC meeting is proposed to take place at NIOO, Yerseke, as well, with a date suggested of February 2008. At a pre-meeting with Mike Thorndyke the official hand-over of presidency to take place at the Yerseke meeting will be discussed with Carlo Heip, Herman Hummel and Fred Buchholz.

The MARS Directors' Meetings have been held until now every three years, whereas it was the intention to organise them every second year (as laid down in the by-laws). To increase the commitment of the station directors it was decided to aim from now on for Directors' Meetings every two years. Moreover, it was suggested to choose an alternating location in north and south Europe. The next meeting would then be in 2008, and Paris, Stockholm and Bangor were suggested as proper locations (an earlier suggestion was to combine it with the MarBEF General Assembly in Valencia, Spain). For 2010, proper locations could then be Lisbon, Nice-Villefranche, or Monaco.

To these Directors' Meetings, representatives of EC and NGO institutions, such as ICES, CIESM, EEA, will also be invited.

Table: The members of the MARS Executive Board, and the co-opted members for the Steering Committee, since MARS was founded in 1995.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Carlo Heip	Chair		Chair		President		President			Past President			
John Matthews	Treasurer		Treasurer		member								
Anastassios Eleftheriou	member		member		Vice-president		member						
Brendan Keegan	member		member										
Brian Bayne	member		member										
Jarl-Ove Stromberg	member		member										
Alain Guille	member		member										
Salvatore Geatano	member		member										
Christof Skora					member		member						
Giorgi Bernardi					member		Vice-president						
Mark Costello					member		member						
Carlos M. Duarte					member								
Jean Pierre Féral					Treasurer		Treasurer						
Björn Ganning					member								
Michael D. Guiry					member								
Herman Hummel					Exec. Secretary		Executive Secretary			Executive Secretary			
Richard Warwick					member		member						
M. Whitfield					Vice-president								
Steve Hawkins							Vice-president			Vice-president			
Erik Bonsdorff							member						
Friedrich Buchholz							member			President			
Adrianna Ianora										member			
Mireille Harmelin-Vivien										member			
Evangelos Papanthassiou										member			
Anna Szaniawska										member			
Pierre Lasserre										member			
Mike Thorndyke										member			
Ricardo Santos										member			

 full members max 2 periods of 2 yrs

 max 9 members for max 2 periods of max 4 yrs
co-opted members at invitation

The 42nd EMBS – A Report

The 42nd European Marine Biology Symposium, Kiel, 27-31 August 2007
By Herman Hummel

The 42nd EMBS was organised by IfM-GEOMAR (Institut fuer Meereskunde) at the University of Kiel from 27-31 August 2007.

The symposium was organised along three parallel sessions on the themes of (1) Global Change, (2) Complex Interactions and (3) Invasions & Biodiversity. It was attended by 400 researchers who had a choice of 10 keynote lectures, 195 regular oral contributions and 135 poster presentations.

The themes during the meeting were introduced with keynote lectures by, a.o., Mojib Latif on climate change and Ulf Riebesell on ocean acidification.

Latif indicated the fact that the climate change of the last decades is especially visible from the occurrence of more and higher maximum temperatures and fewer minimum temperature extremes. Even if the excessive carbon dioxide input into the air is drastically reduced, the increase in temperature will last another 300 to 500 years due to inertia effects.

Riebesell indicated that the oceans will be a sink for 90% of the anthropogenic carbon dioxide output. This will lead to a further decrease of the acidity in the ocean, which now already amounts to 0.1 pH units. Besides the negative impacts of lower pH, such as reduced rates of calcification, positive effects were also noted, such as increased photosynthetic rates in some micro- and macro-algal groups.

In the studies on the relation between (the level of) marine biodiversity and ecosystem functions, such as nutrient regeneration, productivity or stability, often no significant relations could be shown.

Mathieu Cusson, one of the several MarBEF-related speakers, Herman Hummel and Birte Matthiessen all indicated no or an even negative relation between species richness and ecosystem functions as stability, variability, density or biovolume in benthic systems. These results are thus in contrast to the general expectation that a higher diversity promotes or positively contributes to the production or stability in marine systems.

Also contrasting results were remarkably often presented for the long-term series. Previously the variability in the results was often related to the NAOI (the North Atlantic Oscillation Index, based on temperature anomalies in the north Atlantic), as still indicated in the

contributions by Jürgen Alheit and Karen Wiltshire, including the often-seen change in patterns around the mid-eighties due to regime shifts in the NAOI. However, several contributions, as the one presented by Ingrid Kröncke, showed that since 1995 the link with the NAOI is weakening. Dynamics in biotic time-series become more extreme than the NAOI. Causes are sought in the occurrence of more and more extreme temperatures, especially in the summer, and stronger local events, interfering with the regular patterns.

In the contributions by Heike Büttger and Alexandra Markert on the effects of the invading, reef-building oysters, it was noted that on introduction of the oysters the diversity may strongly increase due to (accompanying) epifauna, 75% of which can consist of barnacle species, or due to polychaetes. The increase in oysters is not always accompanied by a decrease in mussels. In the case of a decrease in mussels, as observed in the Netherlands and Germany, it is primarily attributed to (direct and indirect) anthropogenic impacts such as those induced by mussel fisheries. Yet higher mussel densities could be found in the oyster reefs than outside oyster reefs or in nearby mussel beds.

Strong deviations from the postulated degree of 1% enrichment in $\delta^{13}\text{C}$ and 3.4% enrichment in $\delta^{15}\text{N}$ were shown by Nicole Aberle-Malzahn in an experimental food-chain (from planktonic algae to *Acartia tonsa* to herring larvae). In cases where algae were grown under N-rich conditions, their $\delta^{15}\text{N}$ could be 5% lower than those grown under N-deficient conditions. Surprisingly, in the food chain based on the N-rich algae (with a low $\delta^{15}\text{N}$), the consumers showed a high differentiation (large $\lambda\delta^{15}\text{N}$) and in the food chain based on N-deficient algae the trophic enrichment could be even negative ($\lambda\delta^{15}\text{N}$ below 0).

The next EMBS symposia are being organised in:

• 2008, 8-12 September, Azores

(www.43embs.com)

Topics (to be published in *Marine Ecology*):

- Marine ecological health
- Biodiversity and ecosystem function
- Past, present and future of marine research
- The contribution of marine biology for a sustainable future.

• 2009, 7-11 September, Liverpool

EMBS and MARS

MARS was, besides being mentioned in all booklets and advertisements as a sponsor of the EMBS, presented at the symposium through awarding prizes for the best poster and oral presentations. MARS representatives were Fred Buchholz, Steve Hawkins and Herman Hummel.

Two awards were given for the best posters presented by young students or young researchers at the start of their career.

The second prize, an award of €100, was given to Bettina Riedel and her colleagues for a poster presentation on “Dead zone: a future coastal scenario for climate change.”

The first prize, an award of €250, was given to Pia Norling for a poster entitled “*Mytilus* and red algae interactions with implications for diversity of associated macrofauna in the Baltic Sea.”

The MARS Otto Kinne Lecture Award for young scientists, amounting to €1,500 for the best oral presentation, was given to Rachel Hermand for her lecture on “Differences in response of a Mediterranean benthic community submitted to natural and anthropic high sedimentation.” The participation of Heye Rumohr from the convener's board in the selection process is highly appreciated.

After several deliberations, which overspanned many years, it was decided by the EMBS committee to cooperate with the MARS network in order to promote the mutual visibility in the scientific arena and to guarantee for the EMBS a permanent approachability, where relevant through the internet, of the history of the EMBS and a databank on (potential) participants.

The services that the MARS network can deliver to the EMBS (for free) are:

- Permanent webpage development and maintenance
- Hosting of website for each individual EMBS symposium (with the freedom for each organiser to develop it themselves and to position it on their own home-page)
- Archive of earlier symposia webpages
- Development and maintenance of databases on (potential/earlier) EMBS participating institutes and participants (based on lists of previous symposia, and extension with available Registers of

Resources from MARS members), including:

- online changes of addresses in existing database of (potential) participants
- electronic registration
- Support for the organisation of EMBS meetings, including facilitation of electronic registration
- Increasing visibility through announcements at/in MARS websites, MARS Newsletter, and through its entrances in related networks (MarBEF, Marine Genomics, EurOceans)
- Promoting participation and increasing interest, through:
 - MARS Otto-Kinne Lecture Award of

€1,500 for each EMBS meeting

- Two MARS poster awards (of €250 and €100) at each EMBS meeting
- Help in fundraising through its network at international (EC, Unesco) level.

The benefits that MARS expects to get from the EMBS are:

- a platform and timetable for activities, including a vehicle for world-known symposia
- increase of visibility, by co-announcing MARS and EMBS on webpages, relevant activities and through awards
- stronger profile as being the major

European network for marine biology and oceanography.

Representatives of related organisations such as the MBA and the Italian marine research stations expressed their wish to connect to the MARS-EMBS cooperation. Further details will be worked out in the near future.

The MarBEF NoE, being the major Network of Excellence initialised by MARS members, was frequently mentioned as (one of) the sponsors of the presented research issues.

A brilliant overview of the LargeNet project in MarBEF was presented by Matt Frost.

MARS awards

By Herman Hummel

The MARS network offers the following awards:

- **MARS Travel Award for young scientists**
- **MARS Poster Award at EMBS**
- **MARS Otto Kinne Lecture Award for young scientists**
- **MARS medal of honour.**

To date, 26 colleagues have received awards from MARS. An overview of the awards and their winners shows the wide coverage of countries and topics (see table). More information can be found on our website www.marsnetwork.org.

Table: MARS awards winners (2001-2007).

Winners of the MARS Travel Award for young scientists:

Year	Name	Sending institute	Receiving institute	Title of research topic
2001	Maria Salomidi	University of the Aegean, Greece	SME/COM-CNRS, Marseille, France	Methods and techniques of hard bottom benthos study for ecological quality evaluation.
	Lara Arroyo Hailuoto	Universidad Complutense de Madrid, Spain	AAU, Aland, Finland	Effect of drifting algal mats on meiobenthic communities in the Northern Baltic Sea. Implications on Harpacticoid copepod diversity and dispersal.
2002	Piotr Kuklinski	Institute of Oceanology, Sopot, Poland	Centre d'Océanologie de Marseille, France	Bryozoan taxonomy and ecology.
2003	Rogério Ribeiro Ferraz	University of the Azores, Portugal	Marine Biological Association, Plymouth, UK	Management of limpets in the Azores.
	Oksana Anikyeyeva	Institute of Biology of the Southern Seas, Sevastopol, Ukraine	SOC, Southampton, UK	Soft-shelled foraminifera in the Black Sea, with an emphasis on <i>Allogromiina</i> .
	Katharina Reichert	Biological Institute at Helgoland, AWI, Germany	University of Amsterdam, Netherlands	Intertidal hard-substrate communities in the Oosterschelde estuary after the expansion of the invasive Japanese oyster <i>C. gigas</i> .
	Katerina Sevastou	Institute of Marine Biology of Crete, Greece	Senckenberg, Wilhelmshaven, Germany	Meiofaunal biodiversity in the oligotrophic environment of the Mediterranean Sea.
2004	Ylenia Carotenuto	Stazione Zoologica, Naples, Italy	University of Bergen, Norway	Novel molecular methods to quantify selective <i>in-situ</i> feeding by common marine copepods.
	Agata Weydmann	Institute of Oceanology, Sopot, Poland	Centre d'Océanologie de Marseille, France	Does genetic diversity of Arctic fauna depend on the life strategy?
2005	Jasmin Annica Godbold	Oceanlab, University of Aberdeen, UK	Göteborg University, Kristineberg Marine Research Station, Sweden	Species diversity effects on ecosystem function: Niche differentiation through resource partitioning.
	Katya Ivanova	Institute of Biology of the Southern Seas, Sevastopol, Ukraine	School of Ocean Sciences, University of Wales, UK	Diversity of meiofauna of cold seeps in shallow waters of the Black and Irish Seas.
	Thanos Dailianis	Hellenic Centre for Marine Research,	Centre d'Océanologie de Marseille, France	Implementation of the study on

Crete, Greece

Mikhail O. Son	Institute of Biology of the Southern Seas, Sevastopol, Ukraine	Estonian Marine Institute
2006/07 Mateja Grego	Marine Biology Station, Piran, Slovenia	Ghent University, Belgium
Nika Stagicic	Institute of Oceanography and Fisheries, Split, Croatia	University of Lecce, Italy
Nova Mieszkowska	Marine Biological Association, Plymouth, UK	Station Biologique de Roscoff, France

Mediterranean commercial sponges at a pan-European level: Stress markers expression, reproduction and population studies.
 Corridor of molluscs invasion "Black Sea – Baltic Sea."
 Impact of fish culture on meiofauna in the Bay of Piran: A structural and functional approach.
 The use of non-destructive techniques for assessing the effectiveness of marine protected areas.
 Archival, resurvey and analysis of long-term data sets to detect climate-driven biogeographic shifts.

Winners of the MARS Otto Kinne Lecture Award:

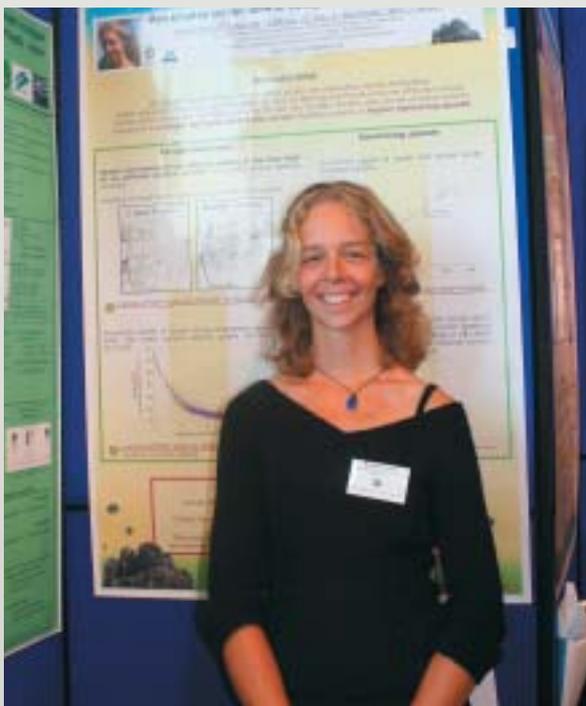
Year	At the occasion of	Name	Institute of winner	Title of research topic
2006	EMBS 41, Cork, Ireland	Monika Kedra	Institute of Oceanology, Sopot, Poland	Global warming-driven biodiversity change: pelagic versus benthic domain in the Arctic (79°N) – taxonomic distinctness approach.
2007	EMBS 42, Kiel, Germany	Rachel Hermand	COM-CNRS, Marseille, France	Differences in response of a Mediterranean benthic community submitted to natural and anthropic high sedimentation.

Winners of the MARS Poster Award at the EMBS:

Year	At the occasion of	Name	Institute of winner	Title of research topic
2005	EMBS 40, Vienna, Austria	Judith Fuchs	University of Vienna, Austria	Neuronal and muscular systems in two <i>Loxosomatidae</i> (<i>Entoprocta</i>).
		Anke Oertel	University of Salzburg, Austria	The fauna of Grotta del Bel Torrente, Golfo di Orosei, Sardegna, Italy.
2006	EMBS 41, Cork, Ireland	Karin Troost	IMARES, Yerseke, Netherlands	Are bivalve larvae able to escape bivalve feeding currents?
		Lucy Woodall	University of London, UK	Seahorse population subdivision across Europe.
2007	EMBS 42, Kiel, Germany	Pia Norling	Stockholm University, Sweden	<i>Mytilus</i> and red-algae interactions with implications for diversity of associated macrofauna in the Baltic Sea.
		Bettina Riedel	University of Vienna, Austria	Dead zone: a future coastal scenario for climate change.

Winners of the MARS medal of honour:

2003	Conference of Directors	Otto-Kinne	Inter-Research Science Center, Oldendorf/Luhe, Germany
2006	Conference of Directors	Pierre Lasserre	Pierre & Marie Curie University, Paris, France



Left: Karin Troost, First MARS Poster Award winner, EMBS 41, Cork, Ireland, 2006. Right: Lucy Woodall, Second Mars Poster Award winner, EMBS 41, Cork Ireland, 2006.

MARS Travel Award Winner 2003

Intertidal hard-substrate communities in the Oosterschelde estuary after the expansion of the invasive Japanese oyster *Crassostrea gigas*

By Katharina Reichert

During the preparations for the development and application of a new approach in monitoring intertidal hard-substrate communities at Helgoland, the Japanese oyster *Crassostrea gigas* was observed in 2003 for the first time. A pilot sampling in 2004 showed an abundance of about seven oysters per square metre in the harbours of Helgoland, whereas the natural rocky substrates were free from oysters. Since we are likely at the onset of an invasion of the Helgoland marine habitats by the Japanese oyster, this presents a unique opportunity for a study of the invasive process. In view of its rapid expansion in the Netherlands, and the concurrent decrease in the diversity of community types, a programme for monitoring new developments around Helgoland and, if possible, trying out methods to control these, appears urgent.

Apart from an investigation of the settlement and recruitment of the oyster around Helgoland since 2005, a sampling of the oyster in the Oosterschelde was considered in order to give a possible prediction on how the indigenous communities around Helgoland might change under the influence of the invasive oyster.

In the recently protected Oosterschelde estuary in the SW Netherlands, *Crassostrea gigas* expanded after 1989. Originally, the estuary harboured different sessile communities with its own associated mobile species (de Kluijver

1989), but at present the entire estuary is populated with low-diversity oyster reefs (de Kluijver, 1997). Along with this imported Pacific species, many other exotic species were introduced into the area, leading to new dominant floral and faunal species in the benthic communities. The loss of the original sessile biota has a large impact on mobile species feeding on it, and thus on the functioning of the ecosystem as a whole.

The MARS Travel Award enabled me to carry out the considered sampling of the intertidal hard-substrate communities in the Oosterschelde estuary in September 2005 in cooperation with Mario de Kluijver from the University of Amsterdam, Institute for Systematics and Population Biology.

During my stay in the Netherlands we sampled 10 stations following an investigation in the period 1982-1992 (Meijer and Waardenburg, 1994). Transect surveys were made by using quadrats of 0.25m² laid down contiguously along the slope of the sea-wall between the upper side of the stony slope and the low-water line during low tide. The percentage cover of all sessile and semi-mobile organisms was determined.

Preliminary results showed a total of 84 species (43 algae, 41 invertebrates) in seven different communities. *Crassostrea gigas* appeared in five

communities and was recorded as a dominant species in three of them. Furthermore, it could be shown that oyster-dominated communities only appeared at sheltered and moderately exposed locations, but not at exposed ones. At the moment, detailed analysis of the Oosterschelde and Helgoland data are under way, firstly to give evidence on the extent of the oyster expansion since the investigation by Meijer and Waardenburg, and secondly to predict the influence of *Crassostrea gigas* on different communities around Helgoland.

The stay in the Netherlands was highly satisfactory, in terms of the facilities and material available for the field survey and in terms of the cooperation with Mario de Kluijver who was always willing as well as competent to share his fundamental knowledge. Furthermore, to become acquainted with the biodiversity of the hard-bottom communities in the Oosterschelde estuary and to see the low diversity oyster reefs was an extreme fruitful experience.

De Kluijver, M J (1989). Sublittoral hard substrate communities of the southern Delta area, SW Netherlands. *Bijdr Dierk* **59**: 141-158.

De Kluijver, MJ (1997). Sublittoral communities of North Sea hard-substrata. PrintPartners Ipskamp, Enschede.

Meijer, AJM, Waardenburg, HW (1994). Tidal reduction and its effects on intertidal hard-substrate communities in the Oosterschelde Estuary. *Hydrobiologia* **282/283**: 281-298.

MARS Travel Award Winner 2004

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

By Ylenia Carotenuto

The MARS Travel Award 2004 for Young Scientists gave me the opportunity to be hosted from 7th May to 18th June 2005 by the University of Bergen (UoB) and to take part in the Pelagic Ecosystem CO₂ Enrichment (PeECE) mesocosm experiment, under the EEC CARBOOCEAN-UoB collaboration. The experiment was coordinated by Dr Ulf Riebesell from IFM-GEOMAR (Germany) and involved more than 40 researchers from eight different countries. Its general goal was to estimate the strength of feedback processes between increasing CO₂ and air/sea fluxes induced by biogeochemical processes (marine biota, ecosystem structure, particle flux). Several disciplines of the marine system were investigated: marine chemistry, marine biology,

molecular and cell biology, biogeochemistry, atmospheric chemistry and earth system modelling.

During my stay, I was hosted by Jens Nejstgaard, who was the scientist responsible for the mesocosm experiment at the UoB. In the frame of this project, my work consisted of: (1) measuring copepod reproduction, as part of the marine food web, under different CO₂ concentrations (as it will presumably generate different food regimes), in order to assess the impact of specific algal consumption on secondary production of zooplankton, and (2) assessing copepod ingestion rates on *Emiliana huxleyi* (*Haptophyceae*) (which normally develops in the mesocosms), by a quantitative

PCR method recently developed by Jens Nejstgaard and co-workers. In relation to this latter point, in particular, my goal was to learn the molecular biology technique, and then, time-allowing, analyse the samples obtained during the experiment.

In the first week of my stay I worked closely with Jens Nejstgaard and his students to design the copepod reproduction experiment and arrange the mesocosms at the Marine Biological Field Station of the University of Bergen. After the mesocosms were set up and the experiment started, I monitored egg production rates, hatching success and egestion rates of the most abundant copepod species in the area (*Calanus finmarchicus*) fed water samples from different

CO₂ mesocosm treatments. Successively, I learnt from Jens Nejstgaard and his colleague Marc Frisher how to perform the qPCR method to assess copepod grazing in laboratory conditions. Using frozen *C. helgolandicus* females previously fed on *E. huxleyi* or *Rhodomonas baltica* (*Chryptomonadacea*), I extracted algal and copepod DNA using a standard DNA extraction kit and then performed a quantitative PCR on it. This powerful technique enables direct quantification of amplified prey DNA without labelled probes, thus allowing determination of copepod ingestion rates.

I was extremely satisfied with my stay at the University of Bergen. Working with Jens Nejstgaard and his group was very helpful for learning a new, powerful molecular biology technique, as well as having the opportunity to take part in a mesocosm experiment. In the future, I would like to apply the qPCR method

by developing new specific DNA markers for more prey species, e.g. diatoms, whose interaction with marine copepods is the main subject of my post-doc at the Stazione Zoologica A. Dohrn in Naples. We also discussed further cooperation on the subject during my stay.

I also found taking part in the multidisciplinary mesocosm experiment very useful. It was a new and brainstorming experience, especially due to the fact that I had the opportunity to meet and discuss with several researchers from many different study areas. I will meet most of them soon at an upcoming workshop where we will discuss our data and possibly plan several co-authored publications. The data on copepod production and recruitment I obtained during the mesocosm experiment are now the subject of a manuscript in preparation with Jens Nejstgaard and co-workers.

I would like to thank Jens Nejstgaard and his group for the wonderful days spent there and for the warm and friendly working atmosphere. I also want to thank Marc Frisher from the Skidaway Institute of Oceanography, Savannah, Georgia (USA), for his kindness in teaching me the 'secrets' of qPCR.

Sending MARS Institution:

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E-mail: ylenia@szn.it

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.

MARS Travel Award Winner 2004

Does genetic diversity of Antarctic fauna depend on the life strategy?

By Agata Weydmann

Thanks to the MARS Travel Award I had a great opportunity to visit the UMR 6540 DIMAR (Marine Diversity Evolution and Functional Ecology), Station Marine d'Endoume. I stayed in Marseille between 6th of October and 16th of November 2005.

The first days were spent on getting to know the Marine Station (laboratories, library, computers, etc) as well as the staff. I was hosted by Jean-Pierre Feral and his PhD student Jean-Baptiste Ledoux. We discussed the plan and my expectations of the visit. I was also informed about the health and safety-at-work rules: how to behave in the lab, and to work safely with some toxic substances.

In the following days I learned how to work with samples used for population genetic research. Although at my home institute I work with Arctic organisms, our model organism was a sea urchin, *Abatus cordatus*, from the sub-Antarctic Kerguelen archipelago. This organism is useful for studies about dispersal capacities in the marine environment because of its breeding strategy.

Firstly, I learned how to extract DNA from the alcohol-preserved samples, using a kit. Then I prepared samples for PCR reaction to amplified microsatellite loci and checked the amplification results by electrophoresis. Then I started to work by myself extracting DNA and amplifying two microsatellite loci from nearly 100 samples of *Abatus cordatus*. Then the samples were sent for genotyping, but unfortunately there was not enough time to wait for the results as my visit came to its end. However, I was taught how to

analyse the genotyping results using different software (firstly STRAND and Genetix or Genpop).

As every molecular lab works in a slightly different way, it was one of the most interesting things to observe these differences between UMR DIMAR Station Marine d'Endoume and the lab that I work in at the Institute of Oceanology PAS. The biggest differences I noticed, apart from the finances available for research in France, were the safety standards, especially in working with toxic chemicals, which in Poland unfortunately aren't at as high a level as in Marseille.

But most of all, during my stay, I got to know a lot of friendly people who helped me in many ways and proved that small language misunderstandings (I don't speak French) are not a problem as long as both people want to cooperate. My visit to UMR DIMAR Station Marine d'Endoume was fruitful also because of the opportunity to discuss my PhD project with the other scientists and use the library.

I would like to thank all the UMR DIMAR Station Marine d'Endoume staff, especially Jean-Pierre Feral and Jean-Baptiste Ledoux, for their help and friendly attitude.

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Below: Rachel Hermand receives the MARS Otto Kinne Lecture Award (for best oral presentation by a young researcher) at EMBS 42 from MARS President Fred Buchholz, in Kiel, Germany in 2007.



MARS Travel Award Winner 2004

Does genetic diversity of Antarctic fauna depend on the life strategy?

By Ivanova Kateryna

Thanks to the MARS Travel Award for Young Scientists I visited the School of Oceans Science (University of Wales, Bangor) for a three-week-long period where, under the supervision of Professor P Dando, I performed microcosm experiments. We studied re-structuring of meiobenthic communities under hypoxic treatment in terms of its abundance and diversity, and to characterise time and space scales of the process.

For the microcosm experiments, meiobenthic samples were collected in a shallow littoral seepage area (Bangor, north Wales). The samples were carefully mixed to homogenise the meiofauna distribution and incubated for 12 days in the dark at 10°C in tanks with flowing seawater (untreated control). Highly reduced environments of a hypoxic 'patch' and a methane seep were simulated in replicate tanks with a layer of Na₂S on their bottom sediments (sulphide treatment, ST) and, in addition, methane bubbling through part of the microcosm (methane treatment, MT). Sub-samples were collected from the upper 4.8cm of the microcosms and divided into three vertical sections for further microscopical examinations and measuring methane and sulphide concentrations, and redox potential.

Chemical conditions in the experimental

microcosms differed significantly: in ST, persistent vertical gradient of redox potential and sulphide formed, while in MT the distribution patterns of the latter and methane were complicated owing to ejection of reduced materials from the tank bottom to the sediment surface by methane bubbles. As a probable result of this, the peak of meiobenthic abundance in the MT microcosm was in the middle section (1.6 to 4.8cm) of the core as compared to the control. Another factor complicating the picture in both the treatment microcosms was bioturbation by large polychaetes that transferred materials upwards and downwards (recorded on video). *Nematoda* and *Foraminifera* initially dominated the community. However, the contribution of the first dropped on homogenising the sediment to fill the microcosms.

In all the microcosms, including the control one, a decrease in the total meiobenthos abundance was observed over the incubation period, about 10-fold in ST and 2-fold in MT and the control. In the two latter, *Foraminifera* maintained their high numbers, contributing most of the total meiobenthos (corr. coeff. $r = 0.85$, $p < 0.05$, $n = 8$). Statistically significant ($p < 0.05$) negative correlations between methane concentrations and *Foraminifera* ($r = -0.53$, $n = 14$), and between methane and the total

meiobenthos ($r = -0.75$, $n = 8$) were found.

Besides, the other goal of this project was to process the sediment samples collected in seeps area of the Irish Sea during the SEA6 cruise (SOS's *RV Prince Madog*) in 2004 to carry out taxonomic identification of meiobenthos, its diversity and abundance/biomass estimates and to compare the data obtained for seepage areas in the Irish Sea and the NW Black Sea (using published data) and perform their comparative analysis. During my stay at SOS, nine of 34 samples were processed.

Unfortunately, the short time of my stay at Bangor did not allow me to analyse all of the collected samples. Further analyses of the rest of the samples will now be performed at my home institute.

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MARS Travel Award Winner 2006/2007

The use of non-destructive techniques for assessing the effectiveness of Marine Protected Areas

By Nika Stagicic

Thanks to the 2007 MARS Travel Award I spent a month at the Laboratory of Zoology and Marine Biology, University of Lecce, Italy, where I was trained in underwater visual census techniques, data collection and analysis methods used for assessing the marine protected area (MPA) effectiveness, under the supervision of Dr Paolo Guidetti.

Immediately upon my arrival I was included in the current activities of the Laboratory. Dr Paolo Guidetti and I agreed this would be the best approach to provide me with a practical and comprehensive introduction for developing the aforementioned skills. I participated in the regular monitoring of two Italian MPAs – Porto Cesareo, located in the Ionian Sea along the SW coast of Apulia, and Torre Guaceto, in the Adriatic Sea just north of Brindisi.

First of all, Dr Guidetti stressed the importance of the appropriate sampling strategy considering the hypothesis being tested (in our case the

hypothesis was that protection produces a significant increase in littoral fish abundance and/or size) and only after a thorough, methodological discussion and a detailed sampling plan we proceeded to fieldwork.

Field activities included underwater visual identification of fish species and estimation of their number and size, since these are the variables affected by fishing activities. The field experience was also indispensable in terms of most practical things – learning how to organise the plastic slate in the most elegant way as well as simultaneously unrolling the reel while recording the information as quickly as possible, since the slightest hesitation will result in loss of data. Namely, one has to rapidly identify and estimate the size and number of fish, in the area laid out, with a reasonable level of accuracy. That also made me well aware of the importance of regular observer training so as to maintain an acceptable level of performance.

Once field activities were completed, I was trained in specific methods of data processing and analysis, but also special attention was paid to sound, ecologically correct interpretation of the analysis output.

Furthermore, I prepared and held an oral presentation on the recent status of marine protection in Croatia for the staff and students in the laboratory. Since all the people present were directly involved in issues of marine protection, after the presentation we discussed extensively the legal and effective framework of marine protection of both countries. Sadly, we came to the conclusion that still, especially in Croatia, what is set by law is not effectively enforced. Such unclear, vague implementation of protection makes it even more difficult to assess the MPA performance.

Last and perhaps most importantly, a longer-term collaboration was established. Namely, Dr Guidetti agreed to co-mentor my PhD research.

Wishing to contribute to the improvement of present marine conservation status in the Adriatic Sea, we devised a layout for the research aimed at assessing the effectiveness of protection measures applied in Croatian MPAs. Now back home, the plan is to elaborate the sampling strategy in more detail, taking into account the time, financial and other conceivable constraints and subsequently also to undertake preliminary samplings. Once the objectives and constraints are clear, I hope to be able to return to the University of Lecce to present and discuss the details of the intended PhD thesis with Dr Guidetti and other scientists working in the lab. I know their opinions and suggestions will be invaluable for refining the research and bringing

it to a further level, the same as they have already been in this preliminary phase.

Finally, I wish to express my gratitude to MARS for the wonderful opportunity of the Travel Award. Many thanks to all the people I met at the University for making me feel at home from the first day, as well as for the most stimulating discussions of a scientific and more down to earth nature. My warmest thanks go to my host, Dr Paolo Guidetti. I'm greatly indebted to him for a lot of things, but what I appreciate most about him is that by his own example he is showing that keeping that sense of wonder about the world around us will help you remain a balanced, happy person in the face of all the

uncertainty and difficulties that the work environment inevitably brings about.

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MARS Otto Kinne Lecture Award Winner 2006

Global warming-driven biodiversity change: Pelagic versus benthic domain – taxonomic distinctness approach. An Arctic (79°N) case study.

By Monika Kędra and Wojciech Walkusz

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Increased interest in consequences of climate change motivated research in the high Arctic. Even though Kongsfjorden (Svalbard) is a fjord in the high Arctic (79°N) it is still influenced by sub-arctic conditions due to Atlantic water carried in by the West Spitsbergen Current (Svendsen *et al.*, 2002). Kongsfjorden represents a border area between Atlantic and Arctic biogeographic zones and its fauna is composed of both boreal and arctic species (Hop *et al.*, 2002).

An increased input of Atlantic water into Kongsfjorden would change its environment toward a more boreal one, while the increased glacier input would make the inner part of the fjord more arctic. The balance between Arctic and Atlantic conditions in the fjord is probably sensitive to climate changes, with the most rapid changes occurring in the pelagic systems.

Kongsfjorden hosts the most active tidal glacier – Kongsbreen • of Svalbard Archipelago, which is retreating at a rate of up to 0.5km per year (Lefauconnier *et al.*, 1994). Glaciers' retreat is accompanied by an increase in meltwater outflow and a flux of inorganic particles (Svendsen *et al.*, 1996). This has a direct influence on the benthic communities' diversity and its variability. The scale and magnitude of the impact depend on the activity of the glacier (Gorlich *et al.*, 1987; Syvitski *et al.*, 1989; Kendall, 1994).

Most biodiversity studies dealing with species richness and different diversity indices combine the species richness and the evenness of individuals' distribution among the species (Magurran, 2004). Warwick & Clark (1995) introduced two new measures of biodiversity: taxonomic diversity and taxonomic distinctness for quantitative data and, later (Clark &

Warwick, 1998), average taxonomic distinctness index based on qualitative data. Clark & Warwick (2001) also proposed another index: variation in taxonomic distinctness. All these indices are based on the taxonomic relatedness of species. They capture not only the distribution of abundance among species but also the taxonomic relatedness of the species in each sample (Clark & Warwick, 1998). Assemblages with the same number of species may comprise species that are taxonomically close or more distantly related to each other.

The measures of diversity based on taxonomic distinctness are currently widely explored (e.g. Izsak & Price, 2001; Ellingsen *et al.*, 2005), dealing mostly with benthic assemblages' diversity. While there is some research made on planktonic diversity (e.g. Sherman *et al.*, 1998; Irigolen *et al.*, 2004) in fact very few compare these two domains.

The main aim is to answer the question whether climatic differences in following years influence the variability in planktonic and benthic biodiversity and whether the taxonomic distinctness index is an appropriate tool for describing biodiversity and its variance in both domains.

Material for this study – benthos and zooplankton – was collected at two stations in the Kongsfjorden. Station K0 was set at the fjord mouth, the site characterised by unconstrained contact with the surrounding waters of Greenland Sea weak sedimentation rate and bioturbated mud on the bottom. Station K5, on the contrary, was set in the glacial basin located at the end of the fjord. The sedimentation rate in that part of the fjord is high and the sediment is mostly sandy silt (Svendsen *et al.*, 2006).

Samples were collected in the last week of July in four consecutive years, 2001-2004. Benthos samples were taken by means of Van Veen grab (0.1m² sample area) in three replicates, sieved on the 0.5mm screen. Zooplankton was sampled with Multinet sampler (0.25m² net opening; 180µm mesh size) from the bottom to the surface. All organisms found either in benthos or zooplankton samples were identified to the lowest taxonomic level.

The planktonic response to the changing environmental conditions is immediate – warm (2002) and cold year (2004) are significantly different both in terms of biodiversity and species composition – while the benthic response is not clear. Rapid changes of plankton domain are connected with short (annual) life-cycle of planktonic organisms while most of the arctic benthos has a relatively long life-cycle (perennial) and their response is postponed in time. Also, the variability in the zooplankton biodiversity is strongly dependent on the balance between the input of Arctic and Atlantic water masses and therefore it is much higher than in the benthic domain. The species diversity measured by means of traditional indices is lower than the benthic one, but in terms of taxonomic distinctness the difference is not so evident anymore. In the case of the outer part of the fjord the taxonomic diversity of the zooplankton is even higher.

Biodiversity measures that utilise higher taxa richness and evenness are of great importance. We almost completely lack comparisons of Arctic year-to-year biodiversity changes in both zooplankton and benthos. The application of taxonomic-based indices for comparisons of two different domains is useful and allows detection of signals not shown by traditional indices.

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MARS listserver

To facilitate communication of the MARS project aims to as broad an audience as possible, and to disseminate the results of the project, the **Marine-B (Marine Biodiversity) electronic mailing list** is being utilised 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:-

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subscribe MARINE-B <firstname surname>
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Make sure that you do not add a signature at the end of the mail. 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).