*** Biography Pierre Lasserre ***

Table of Contents

Introduction
1. University degrees and fellowships.
2. Positions.
3. Publications.
4. Research activities.
5. Science committees, international responsibilities.
6. UNCED drafting group of Agenda 21, chapter 17 – Oceans.
7. Contributions to biodiversity.
8. Marine Station Networks: ressource base for biodiversity assessments.
9. The European and Russian Fed. MARS Network.
10. The World Association of Marine Stations WAMS.
11. Secretary General of the UNESCO international Conference on Biosphere Reserves, Seville, Spain (March 1995).
12. UNESCO-Venice and Academia Europaea, organizerz of the Conference of Experts on Reconstruction of Scientific Cooperation in South East Europe, Venice, Italy, 24-27 March 2001.
13. Round Table of Ministers of Science on Rebuilding of Scientific Cooperation in South East Europe. UNESCO, Paris, 24 October 2001.
14. Jacques-Yves Cousteau Petition on the Rights of Future Generations, and UNESCO Declaration on the Responsibilities of Present Generations.

Introduction.

Professor Pierre Lasserre is a marine biologist, oceanographer with proven knowledge, and field experience of coastal seas, coastal lagoons and estuaries, wetlands and mangroves, and small islands. He is interested in nature and society interactions associated with ecosystem services, emphasizing the application of research for achieving sustainable resource management.

Dr Pierre Lasserre has been active in international science planning and coordination, taking a particular interest in capacity building for scientists from developing countries, and in the transformation of the research stuctures in economy in transition countries. His specific research themes included the following aspects:

- Flows of energy and materials in marine ecosystems enriched by oceanic and continental inputs, bioturbation and benthic-pelagic coupling;
- Ecophysiological adaptation of meiofauna and fish and their competitive interactions;
- Connections between ecosystem structure and function, ecosystem services, policies, and values;
- Coastal lagoons, estuaries, wetlands and mangroves in the global change context;
- Reinforcing focus on novel marine model organisms, to inform our understanding of topics such as evolutionary and developmental biology, genomics-enabled analysis of microscopic oceanic life, the availability of new technologies and tools to study organismal adaptation and resilience in the face of climate change;
- Marine Station networks as infrastructure platforms of excellence in research, education, training, and capacity building resources;
- Biosphere reserves at the land-sea transition, designed to reconcile biodiversity

conservation, and the quest for economic and social development, under the UNESCO's Man and the Biosphere (MAB) Programme, remarkable models of ecological transition;
- Encouraging partnerships between scientific comunities, and funding new centres of excellence in countries in transition and developing countries.

1. University degrees and fellowships.

Graduate from the University of Bordeaux I, France (1960-1967), based on the French ''LMD'' – Licence, Master's and Doctorate, with a ''third-cycle'' Thesis in Animal biology (title: *Contribution à l'étude des Oligochètes marins du Bassin d'Arcachon*), received with highest distinction (1967), and followed by a PhD degree in Natural Sciences (''Docteur ès-Sciences Naturelles'', 1967-1977), received from the University of Bordeaux (title: *Competitive interactions in lagoon ecosystems, ecophysiological research on metiofauna and mugilid fish*), received with very honorable distinction, highly commended from his jury, and ''Habilitation'' to supervise research and thesis.

Holder of a scholarship at the Biochemistry and Physiology Laboratory, University of Liège, Belgium, he was awarded several fellowships at: the Biological Institute of Carlsberg Foundation (Copenhagen, Denmark), the Kristineberg Marine Research Station (Fiskebäcksil, Sweden), the Bermuda Biological Station for Research (St George, Bermuda). He was invited in the US, as Associate researcher at Marine Biological Laboratory, Woods Hole, Massachusetts, and as Research fellow at Duke University Marine Laboratory, Beaufort, North Carolina.

2. Positions

Successively *Assistant, Maître-Assistant, Maître de Conférences* (1965-1981), Dr Pierre Lasserre was appointed *Professor of Biological oceanography* at Bordeaux University (1980-1982). He was appointed, from 1982 to 1992, full *Professor of Marine Biology* at the Pierre and Marie Curie University (UPMC) Paris, and Director of the *Station Biologique de Roscoff*, prestigious historical marine laboratory of the Sorbonne–UPMC and of the *Centre National de la Recherche Scientifique CNRS*.

From 1992 to 2002, Professor Pierre Lasserre has served on secondment at *UNESCO Headquarters, Paris, France*, consecutively as: Director of the *UNESCO Division of Ecological Sciences*, and Secretary of the intergovernmental *Man and the Biosphere (MAB) Programme*, and from 1999 to 2002, as Director of the UNESCO *Bureau for Science and Culture in Europe*, Venice, Italy.

At the end of his 10 years secondment (in 2002), Professor Pierre Lasserre was re-integrated at UPMC, Paris (2003-2009), until retirement age.

3. Publications (see list enclosed)

Professor Pierre Lasserre is author of more than 120 peer-reviewed papers, 12 co-edited books, and numerous technical reports and, notably :
- *Aspects of Meiofauna Research: International workshop on ecophysiology of meiofauna (*Cahiers de Biologie Marine, Roscoff, vol.5-supplément, 1974)
- *Coastal Lagoons* (Oceanologica Acta - Gauthier-Villars, 1982)
- *Biogeochemical Processes at the Land-Sea Boundary* (Elsevier, 1986)
- *The Venice Lagoon Ecosystem*, *Inputs and Interactions Between Land and the Sea* (Parthenon Press and UNESCO, 2000)
- *CoastWetChange, Proceedings, of the International Conference (Venice, 26-28 April 2004).* (ICAM N°3, IOC-UNESCO, Paris (2005)
- Lagoons and Coastal Wetlands in the Global Change Context: Impacts and managent issues

(Springer, 2007)
- *Reconstruction of Scientific Cooperation in South East Europe. International Conference of Experts, convened by UNESCO-ROSTE, Academia Europaea, European Science Foundation, and IVSLA.* UNESCO, Venice (2001)

Dr Pierre Lasserre was the Director and Editor of ''Cahiers de Biologie Marine'' (CNRS) and ''Travaux de la Station Biologique de Roscoff'' (1982-1993); Director of ''Nature and Resources'' (UNESCO Quarterly Journal; (1995-1999); he was member of many Editorial boards, e.g. ''Estuarine, Coastal and Shelf Sciences'', ''Biochemical Systematics,'' ''Journal of Coastal Research''. He is a member of the Science Committee of ''National Geographic'' (France edition), and he contributed to many Radio and TV scientific and cultural magazines (France 3, TV 5, Channel: Thalassa, Save Venice, etc.), in France, Italy, Spain, Australia, Brazil, Venezuela, etc.). He edited for UNESCO successful series of educational wall charts and CD-ROM on biodiversity research and conservation.

4. Research activities

Originally specializing on marine meiofauna (microscopic motile metazoans of benthic sediments), particularly on Oligochaeta systematics and reproduction and ecology (1-6, 9, 10, 20, 23, 28, 29, 30, 32, 37), and meiofauna ecophysiology of Oligochaeta and Mystacocarida crustaceans (7, 8, 11, 13, 14, 16, 17, 19, 21, 24, 28, 29, 30, 32, 37, 47), Pierre Lasserre developed pioneering micro-respirometry techniques, derived from the cartesian diver technique of Holter and Zeuthen (7, 8, 11, 13, 14, 16, 17, 25, 26), and flow microcalorimetry to characterize metabolic trends at the seawater-sediment interface, in small-scale controlled ecosystems (53, 57-63, 66).

With his many PhD students and colleagues, Dr Pierre Lasserre has conducted research projects on *in situ* mesocosms and laboratory microcosms used to characterize bacterial and meiofaunal metabolic activity at the water-sediment interface, and to compare the interactions and species composition of functional groups of benthic metazoans displaying fast turnover rates, such as bacteria, and meiobenthos. Experiments were designed using assemblages varying in species diversity to determine particular aspects of ecosystem function, including the rate of recovery after a perturbation, or seasonal metabolic trends in a fluctuating environment, in an attempt to describe ecosystem behavior in a holistic sense. Microcosms enable experimentally controlled studies of functioning ecosystems with cybernetic or negative feedback loops in place. This knowledge is not only valuable in its own right but may be more useful in an indirect, rather than a direct, way in understanding the robustness of these systems and so in evaluating some general effect of stess. In carefully situations, a microcosm may respond to stress very much like the natural marine ecosystem (54, 58, 59, 66).

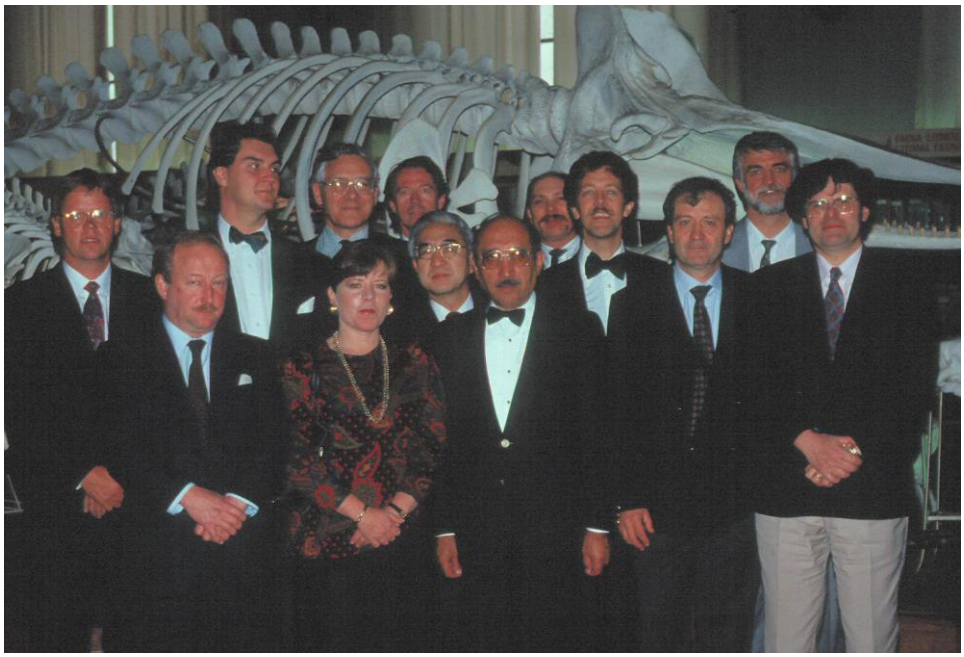
The presence of benthic meiofaunal communities with extremely high numbers of individuals in estuarine habitats is well documented (24). In view of their high specific oxygen consumption (25, 32, 40, 41), the euryhaline meiofauna (mainly composed of nematodes, copepods, annelids) contribute significantly to total community respiration (57). In this context, a significant part of the benthic primary production which is converted to meiofunal tissue might not be passed upwards to higher trophic levels. Growth retardation of grey mullets and other benthophageous macrofauna could therefore be explained in terms of trophic competition with such highly adapted meiofaunal benthic metazoans (27, 31, 41, 54, 57). Parallel ecophysiological research was developed on euryhaline fish species (grey mullets, seabass, flounders and salmons), showing complex patterns of osmotic regulation linked to differential seasonal penetration of freshwater or sea water habitats. The role of gill Na-K ATPase pools was demonstrated as the major adaptive response that control osmotic and ionic stress in fish populations colonizing estuaries and lagoons, and are of high economic interest in aquaculture. (12, 18, 22, 24, 27, 32, 35, 36, 38, 39, 41, 44, 45, 46, 48, 49, 50, 51, 52). Dr Pierre Lasserre conducted many field research projects: on the Atlantic coast of France, the Eastern

coast of North America, the Antarctic Kerguelen Islands, the Bermuda Island, the Changjiang estuary and adjacent East China Sea. In the early 1990-2000, he coordinated an international project on the Venice Lagoon Ecosystem (92) and co-edited ''*Lagoons and Coastal wetlands in the global change context*" (100).

5. Science Committees, international responsibilities

- Founding member of the International Association of Meiobenthologists (1969 -)
- Secretary general of the international Symposium on Coastal Lagoons, 8-14 September 1981, Bordeaux, France, sponsored by UNESCO, SCOR, IABO (1981)
- President of IABO, the International Association for Biological Oceanography (1982-1993)
- IUBS Executive Committee member (1983-1994)
- SCOR/ICSU Executive Committee member (1983-1993)
- Organizer of the 17th General Meeeting of SCOR, held at the Station Biologique de Roscoff, France (22-24 0ctober 1984)
- Council member of the UK MBA, Plymouth (1985-1990)
- Convener of first ''Jacques Monod Conferences'', organized at the Station Biologique de Roscoff, sponsored by CNRS (1987-)
- Elected Member of Academia Europaea, section Earth and Cosmic Science (1989)
- Président du Comité national français de la recherche océanique CNFRO/COFUSI (1989-1993)
- Founding member of the European Marine Research Stations (MARS) network (1989-)
- IABO-IUBS/UNESCO Task Force on Marine Biodiversity and Ecosystem Function. A Proposal for an International Programme of Research (1990-1994)
- From Genes to Ecosystems: A Research Agenda for Biodiversity. Report of a IUBS-SCOPE-UNESCO Workshop, Havard Forest, Petersham, MA, USA (June27-July 1, 1991)
- UNESCO Advisor and Project leader on the international Project on the Venice Lagoon Ecosystem (1991-1999)
- UNCED Drafting group member of Agenda 21, chapter 17 on Oceans (1991-1992), adopted at Earth Summit, Rio-de-Janeiro, Brazil (June 1992)
- Executive Secretary of the UNESCO intergovernmental Man and the Biosphere (MAB) Programme (1992-1999)
- Executive Board member of the International DIVERSITAS Programme (1992-2000)
- Co-Organizer of IABO international Symposium on Marine biodiversity in Estuaries, Lagoons and Near-shore Coastal Ecosystems, Pointe-à-Pitre, Guadeloupe (February 1993)
- UNESCO/COMAR Conference. Paris, 21-25 mai 1991. Consultative Panel on the Coastal marine Programme COMAR. P.Lasserre Chair of session
- Biodiversity Focal Point for UNESCO and Representative to Conferences of the Parties of the Convention
- Biodiversity Focal point of UNESCO and Representative to the first five Conferences of the Parties (COP1 to COP5) of the Convention on Biological Diversity (CBD): COP1 Bahamas, 1994; COP2 Jakarta, 1995; COP3 Buenos Aires 1996; COP4 Bratislava 1998; COP5 Nairobi 2000
- Convener of the First Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity (CBD), held in Paris at Headquarters of UNESCO (4-8 September 1995)
- Secretary general of the UNESCO international Conference on Biosphere Reserves, Seville, Spain (20-25 March 1995). Formal adoption by the UNESCO Assembly of the ''Seville Strategy'' & the ''Statutory Framework of the World Network'' (November 1995).
- Reviewer for the European Commission of Networks of excellence: « Marine Biodiversity and Ecosystem function (Marbef) », « Marine Genomics Europe », « Eur-Oceans » (6th, 7th, 8th EU Framework Programme, 2003-2005).
- Founding member of the World Association of Marine Stations WAMS (2011-)

6. UNCED drafting group of Agenda 21, chapter 17, Oceans (1991-1992)



Historical photo (1991) of drafting group, Agenda 21, chapter 17 on Oceans. Front row, right to left: Pierre Lasserre (MAB-UNESCO), Serge Garcia (Fisheries, FAO), Laurence Mee (IAEA, Monaco), Alicia Barcena (UNCED), Gunnar Kullenberg (IOC-UNESCO), Carl-Gustaf Lundin (IUCN)… Agenda 21, chapter 17 on Oceans was adopted at UNCED Rio-de-Janeiro, 3-14 June 1992.

The Earth Summit in Rio de Janeiro (3-14 June 1992) was unprecedented for a UN conference, in terms of both its size and the scope of its concerns. Hundreds of thousands of people were drawn into the Rio process. The Summit's message — that nothing less than a transformation of our attitudes and behaviour would bring about the necessary changes — was widely transmitted by the media and heard by millions around the world. The message reflected the complexity of the problems facing us: that poverty as well as excessive consumption by affluent populations place damaging stress on the environment.

The two-week Earth Summit was the climax of a process, begun in December 1989, of planning, education and negotiations among all Member States of the United Nations, leading to the adoption of Agenda 21, a wide-ranging blueprint for action to achieve sustainable development worldwide. At its close, Maurice Strong, the Conference Secretary-General, called the Summit a "historic moment for humanity". Although Agenda 21 had been weakened by compromise and negotiation, he said, it was still the most comprehensive and, if implemented, effective programme of action ever sanctioned by the international community.

Assessments of climate change by the IPCC drawing on the work of hundreds of scientists from all over the world, and assessment by the Science – policy Platform IPBES, on biodiversity and ecosystem services it provides to nature and society, in response to requests from decision makers are key chalenges. A robust follow-up and review mechanisms for the implementation of the United Nations 2030 Agenda for Sustainable Development requires a solid framework of indicators and statistical data to monitor progress. It seeks not only to eradicate extreme poverty, but also to integrate and balance the three dimensions of sustainable development – economic, social and environmental – in a comprehensive global vision. SDG 13, on climate action and SDG 14 on life below water and oceans address urgent global challenges for the next decenny. UNESCO-IOC proclaimed recently the International Decade of Ocean Science for Sustainable Development (2021-2030) that should motivate the World Association of Marine Stations (WAMS)

United Nations Conference on Environment & Development
Conférence des Nations Unies sur l'Environnement et le Développement

160 Route de Florissant
P.O. Box: 80
CH-1231 Conches
Switzerland

Tel: (41-22)789-1676
Fax: (41-22)46 68 15
InterNet/EcoNet: unced@igc.org,
D41: tcn4091, GeoNet: mcr1:unced

AB/ls

July 30, 1992

Dear Prof. Lasserre,

Now that the Earth Summit is behind us, I want you to know how deeply grateful I am for your immensely valuable help and support you have given us. You made an extremely important contribution to the success of the Oceans Chapter of Agenda 21 and I am particularly grateful for the many ways in which you lent support to our work at key points along the way.

I was especially pleased to be able to work so closely with you on these issues in which we have long shared a common interest and commitment. I can not tell you how much I value your friendship and I look forward in the period ahead to continuing the association with you, both personal and professional, which has come to mean so much to me.

I will leave my post as Principal Officer on Oceans of UNCED by the end of July, and will continue my work in Costa Rica where I have been invited to be the Executive Director of the Earth Council a project which will deal with the follow-up of Rio agreements and results. As soon as I have my new address I will let you know immediately.

In the meantime, all my colleagues at UNCED join me in extending our deep gratitude to you for the indispensable role you played as part of the UNCED team.

Warmest personal regards.

Yours sincerely,

Alicia Barcena
Principal Officer on Oceans
Oceans, Enclosed and Semi-Enclosed Seas,
Coastal Areas and Living Resources

Prof. Pierre Lasserre
Chairman of the International Association of Biological Oceanography of the International Union of Biological Sciences
Université Paris VI/CNRS
Station Biologique de Roscoff
29211, Roscoff, France

IN OUR HANDS

Reference:
http://www.un.org/detofs/los/consultative_process/docum (seeents/A21-Ch17.htm

Report of the United Nations Conference on Environment and Development. Rio de Janeiro, 3-14 June 1992. Chapter 17. Protection of the oceans, all kind of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources.

7. Contributions to biodiversity

Challenges posed by the marine biodiversity.

Investigations of marine biodiversity pose a considerable scientific and conservation challenge because of the great size and relatively inaccessibility of marine ecosystems. The processes maintaining biological diversity in marine ecosystems are, at first sight, similar to those found in terrestrial ecosystems. There are major differences, however, largely due to the dispersive nature of marin larvae and the wide distribution of organisms life and habitats. Life presumably appeared first in the ocean, and the oceans remain the greatest repository of the diversity of life at the level of phyla. At least 43 of the more than 70 phyla of all life forms are found in the oceans, while only 28 are found on land. Our understanding of marine biodiversity continues to increase.

The diversity of marine plankton is enormous, and immenses reservoirs of algae, bacteria, fungi, protozoa, viruses, as well as benthic microbes and meiofauna in marine sediments have yet to be isolated, identified and studied. An assessment is required of how diverse and ubiquitous microscopic life is in the oceans. More efficient samplers and genomics-enabled analysis of the rich diversity of microscopic life in the oceans are now available, they provide sources of information by which to decode previous life histories and the driving forces of evolution. The marine « picoplankton » has been recognized as the largest numerical component of the phytoplankkton and may play a major role as a sink for atmospheric carbon dioxide. In addition to that of coral reefs, the unexpected magnitude of the benthic diversity of hard bottoms and soft sediments ranging over a variety of uni- and multicellular organisms, has emerged as a key area in the understanding of the functioning of marine ecosystems, e.g. intertidal rocky shores, mangroves and wetlands, estuaries, lagoons and deep sea. Coastal zones are increasingly subjected to the discharge of human wastes, ranging from domestic to industrial effluents. The result is massive loss of seagrasses and related estuarine and marine vegetation and the build-up of bacteria and viruses with pathogenic potential. Recreational areas along the coasts become both publiv health hazards and an aesthetic loss for communities. The extent of plastic debris in coastal and open-ocean worldwide in now a major threat to ocean life.

While species erosion is not so apparent as it is on land, the loss of genes, species and ecosystems may become a rapidly worsening problem in oceans. Human impacts have been most keenly felt in the regional seas of developed, industrial regions. More recently, less developed countries in tropical regions have been affected. Here, for example, it is estimated that most than 5% of the world's mangrove have already been lost and coral eefs are now threatened. The global depletion of regional seas is now apparent through studies of large marine ecosystems that have been conducted during the past decades. Physical destruction and pollutions are profoundly altering most ecosystems, exploitation is leading tothe striking decline of commercially important organisms, and biological invations of exotic species may cause significant community changes. The evaluation of the scale and consequences of these changes is seriously compromised by a critically inadequate knowledge of the patterns, and the processes that control marine biodiversity.

DIVERSITAS Scientific Steering Committee member

The first phase (1991-2001) of the international DIVERSITAS programme of biodiversity science initiated, by IUBS, IABO, SCOPE and UNESCO. The general objectives of this programme were: - to identify scientific issues that require international cooperation on the role of biodiversity in ecosystem function, - to address general questions about how knowledge of species and ecosystem diversity can contribute to global ecology. A workshop held at Harvard Forest, Petersham, Mass., USA was called (27 June-1 July 1991) to set research piorities and to develop the outlines of a *Research Agenda for Biodiversity From Genes to Ecosystems* (report edited by Otto Solbrig and published by IUBS, 1991). Dr Pierre Lasserre contributed to this workshop, attended by a group of distinguished researchers.

Biodiversity and Ecosystem Function.

As President of the international Association for Biological Oceanography (IABO), Dr Pierre Lasserre took a prominent part in a series of meetings arranged by IABO, IUBS, SCOR in conjunction with UNESCO.

The initial stimulus originated some years ago from the SCOR Working Group N°67 on ''Oceanography, Marine Ecology and Living Resources'' which generated the IOC/FAO International Recruitment Experimental Programme (IREP), dealing with fisheries. In order to further develop the question of marine diversity, IABO brought together an *ad hoc* Task Force which met at the marine station of Roscoff in September 1983, to examine the special problem of recruitment in high diversity systems. The Roscoff meeting concluded that the single problem of recruitment was not appropriate at that time, but recommended a programme emphasizing an experimental approach to the biological oceanography of high diversity systems to provide an in depth understanding of of their functioning. The meeting further addressed the question of biological interactions and environmental variability in determining the abundance of individual species in the community structure. As a follow up, IABO formed, in conjunction with the UNESCO-IOC and IUBS a Working Group to deal with the concept of high diversity marine ecosystems. This WG met in Syracuse in 1987 and in Woods Hole in 1988, when is expanded its interests to biodiversity in general. Discussion of biodiversity in general were continued at an IUBS/SCOPE meeting held at the National Academy of Sciences, Washington, DC, in June 1989.

Marine ecosystems, in particular, were considered at an UNESCO and IABO/IUBS sponsored Discussion Group organized as part of the 4th International Congress of Systematics and Evolutionary Biology (ICSEB IV) held at the University of Maryland, College Park, in July 1990. The two day meeting of ''Round Table Discussion Group on Marine Biodiversity'' was attended 50 participants from 12 countries (Canada, Chile, France, Germany, Japan, Netherlands, New Zealand, Norway, Panama, UK, USA, Venezuela). Discussions included the definition of biodiverity (genetic and species levels, as well as habitat levels); differences between terrestrial and marine systems; biogeographic generalizations; bacterial diversity; and the experimental ecosystem approach (mesocosms). The role of high diversity marine ecosystems in the global carbon cycle was also considered. The temporal perspectives provided by the fossil record can contribute to an understanding of the consequences of impending global diversity modifications. It was also expected that ''studies of current biodiversity will illuminate a number of issues in palaeobiology and palaeoclimatology.''

At ICSEB IV Round Table Discussion Group on Marine Biodiversity (July 1990), and at earlier meetings, ideas for an International Marine Biodiversity Programme were crystallized and further developed by the IABO/IUBS/UNESCO Task Force that met at the ICSU/IUBS Secretariat, Paris, in 9-12 November 1990, the results of which was the Report by J.F. Grassle, P. Lasserre, A.D. McIntyre and G.Carleton Ray, *Biology International*, IUBS, Special issue N°23, 1991.

IABO/IUBS/UNESCO Task Force on Marine Biodiversity and Ecosystem Function, meeting at ICSU/IUBS headquarters, Paris, France, 9-12 November 1990. From left to right: J. Frederick Grassle (Rutgers University, NJ, USA), Pierre Lasserre (Roscoff Biological Station, France), G. Carlton Ray (University of Virginia, VA, USA), and Alasdair D. McIntyre (University of Aberdeen, UK).

IABO/IUBS/UNESCO Marine Biodiversity and Ecosystem Function, a research proposal linking marine biodiversity and ecosystem function.

In June 1993, the need for a comprehensive review of current knowledge in the broad field of biodiversity was approved by UNEP, who formally approved the Global Biodiversity Asessment (GBA). Around 1500 biological and social scientists from around the world have contributed their knowledge and expertise to the GBA, providing an independent, critical, peer-reviewed ascientific analysis of the current issues, theories and views regarding the main global aspects of biodiversity (Heywood and Watson, Editors, 1995, UNEP, Cambridge University Press. Dr Pierre Lasserre contributed in GEF notably in chapters concerning Inventorying and Monitoring Biodiversity, and the Resource Base for Biodiversity Assessments (Marine stations and the marine realm, Marine stations as biodiversity observatories, Existing networks).

In 1996, the DIVERSITAS Scientific Steering Committee adopted, in its operational plan, ten core program elements, program element 7 proposed a -still topical- question on marine bodiversity: *How is the biodiversity of the oceans and coastal zones affected by and contributing to human activities?* The European (MARS) network played a major role in three of DIVERSITAS themes: (1) the role of marine biodiversity in ecosystem functions and sustainability, (2) the origin, maintenance and loss of biodiversity, and (3) inventorying and monitoring biodiversity. After a second (2002-2011) and third phase (2012-2020), DIVERSITAS was transferred in December 2014 to the ICSU Programme called *Future Earth*.

During the first session of Conference of the Parties to the Convention on Biological Diversity (Nassau, Bahamas, 28 November – 9 December 1994), a distinct consensus stressed the importance of coastal and marine biodiversity. As well, it was established that a first meeting of the newly created *Subsidiary Body on Scientific, Technical and Technological Advice* (SBSTTA) to the Conference would be hosted by UNESCO, Paris (4-8 September 1995). Its

Agenda included provision of advice on scientific and technical aspects of the conservation and sustainable use of coastal and marine biological diversity. Moreover, a previous forum 400 scientits, policy-makers, and managers, organized at UNESCO, Paris (5-9 September 1994), had the merit to underline the need for consolidated international action to bridge the knowledge gap in aspects crucial to ecosystem maintainance and the sustainable use of Earth's resources.

8. Marine Station Networks: resource base for biodiversity assessments

8.1 Marine Stations and the marine realm.

Marine stations are seaside laboratories with a long history of biological and ecological research. In contrats to other major biodiversity resources, marine stations are relatively evenly distributed among tropical, temperate and cold latitudes and between the major coastal ecosystems. Their common culture and traditions, which have predisposed them to co-operative programmes (Lasserre et al. 1994) combined with the ease of accessibility of their biological materias, have encouraged a tradition of high quality descriptive and experimental research. The marine stations of the world have great potential as an infrastructure for programmes in research, training and education, and conservation of marine biodiversity, from genes to ecosystems.

Marine stations are usually closely tied to academic institutions or museums with long-standing traditions in the study of marine organisms, in the training of scientis, students and managers, in comunication and exchange with other marine stations and land institues, and environmental impact assessments. Many are government supported with strong mandates in resource management. For more than one century, marine laboratories/stations have proven, historically, to have been very important in the emergence and the development of concepts and new techniques, on model marine organisms made available for research to visiting and permanent scientists. Research themes concern: systematics, evolutionary biology, developmental biology, neuroscience, biotechnology, biomedecine, physiological ecology, systematics, evolutionary biology, marine genomics, biogeochemistry, etc.

There are five areas of research in which marine stations have made a unique contribution: (1) the use of marine organisms as models in developmental biology, marine genomics, biotechnology, neurobiology and phamacology; (2) the long history of inventorying and monitoring all types of marine organsisms, forming a firm basis on which a comprehensive study of biogeography gradients in biological diversity; (3) the special facilities that have been developed to study aspects of biodiversity experimentally, ranging from the molecular level to experiments on natural communities in the environment; (4) evaluating fish stocks and assisting in developing strategic policies to strengthen the fishihg economy in developing countries; and (5) providing the infrastructure both to repond rapidly to unexpected events and to study the biological effects of longer-term environmental change.

8.2 Marine stations as biodiversity observatories and resources.

The marine stations are ideally placed for inventorying and monitoring marine and coastal biodiversity in terms of their facilities, expertises, long-term data sets and geographical locations (Grassle et al. 1991). Outside the deep sea sediments, which support an immensely rich biota, the coastal zone has been the major source of novel discoveries in marine biodiversity since the end of the nineteenth century. Historically, marine research stations have played a very important role in such discoveries and many marine stations have published comprehensive inventories which describe the distribution patterns of marine species to some degree. Most of them have reference collections of local marine flora and fauna, and many of them are well equipped to study delicate forms of pelagic organisms (including gelatinous plankton, picoplankton, ciliates, bacteria and viruses) and benthic taxa (including bacteria, ciliates and fungi, macrofauna and meiofauna and the larval stages of all kinds of marine species).

The continuity of research in the vicinity of marine stations has led to the assembly of

long-term data sets which form a critical baseline against which human impact may be assessed. These data sets are a critical resource for monitoring marine biodiversity, and cataloguing, standardizing them being undertaken by marine stations networks.

8.3 Existing networks of marine stations.

A number of regional networks have been formed to co-ordinate biodiversity research in marine stations. These networks aim to cover coastal and offshore ecosystems by a chain of marine observatories which would exchange their long-term time-series data and develop initiatives to encourage a better use of existing data sets. The objectives are to:

- identify the long-term data sets available in marine stations in order to establish which processes, communities, and variables are best represented, and to highlight where there is a paucity of data that would recommend the initiation of collections of other long-term data sets;
- design comparative studies that combine the information contained in these data sets to answer relevant questions that transcend the local scenario of the data sets;
- identify constraints to the comparability of theses data sets to: (a) modify and standardize sampling procedures; and (b) recognize the methods best suited to compare different data sets;
- develop initiatives to encourage use of existing data sets (e.g. foster an adequate forum for comparative analyses of the data sets, promote intercalibration exercices, improve the availability of the data sets).

Although the collecting effort and taxonomic extent of existing studies have ben uneven, many marine stations havec published inventories describing the distribution patterns of marine species and biota. A major challenge is to build up co-ordination, taking account of the multiple habitat requirements, taking account of the multiple habitat requirements, and the possible very wide distributions, of marine organisms:planktonic larval life and many invertebrates and fishes, as well as the ocean-wide migrations of tuna, turtles, seabirds, seals and whales.

Ongoing networks include:

- The European Marine Stations Network (MARS)
  http://www.marinestations.org
- The US National Association of Marine Laboratories (NAML)
  http://www.naml.org
- The Australain Tropical Marine Network (TMN)
  http://www.tmnonline.net
- The Association of Marine Laboratories of the Caribean (AMLC)
  http://www.amlc-carib.org
- The Shimoda Marine Research Center, Japan (SMRC)
  http://www.shimoda.tsukuba.ac.jp
- Partnership for Observations of the Global Oceans (POGO)
  http://www.ocean-partners.org

Liaison with many other marine stations and their networks around the world is foreseen, in cooperation with UNESCO-IOC (see paragraph 10 the **World Association of marine stations WAMS.).**

One of the most challenging problem of this century will be to understand how climate change – past, present and future – influences life in the oceans. Ocean acidification from increased atmmospheric carbon dioxide entering the oceans is likely to affect calcifying organisms, such as coccolithophores and corals, and also other groups of organisms. A major investment has been made over many decades to collect ecological data at long-term observatories. Many ocean time-series sites exist worldwide, including locations in the open ocean (Hawaï, Bermuda).

Close and fully complementary cooperation is envisaged between UNESCO-IOC/OBIS

and the existing networks of marine stations. **OBIS database**, emanating from the Census of Marine Life (the successful 10 years programme funded by the Sloan Foundation 2000-2010), was adopted as a project under IOC-UNESCO international Oceanographic Data and Information (IODE) programme.

9. The European and Russian Fed. MARS Network.

The European MARS core group of marine station directors, at UNESCO headquarters, Paris in 1991. From left to right: G. Bernardi (Naples, Italy), P. Lasserre (Roscoff, France), E. Bonsdorff, (Abo, Finland), F. Buchholz (Helgoland, Germany), J.P. Feral (Marseille, France), C. Heip (Yerseke, Netherlands), S. Hawkins (Plymouth, UK), and A. Eleftheriou (Crete, Greece).

Most marine stations, in Europe, maintain long-term programmes on research and education, with their main institutional academic, or research institutions, and liaisons of their and who have active primary appointments at other academic or research institutions. These seaside laboratories are distibuted among rich and varied coastal systems comprising the North, Baltic an Irish Seas, the English Channel, the North-East Atlantic and the Mediterranean. While marine stations have been in existence for a century and more, their growth in number and in the range of their research expertise and services has been greatly improved.

Their tradition of excellence is, in no small measure, a result of the ready availability of marine organisms and ecological sites for study, as well as a result of the resourcefulness for young scientists who have been coming to these marine laboratories for more than a century to learn from their distinguished founders and scolar Fellows. Singular feature of some historical marine stations has their convening power, attracting many accomplished scientists to perform research, at time throughout the year, and yet others leading or lecturing and carrying out some of their most creative and far-reaching works (e.g. was the very successful « table » system to the benefit of their numerous visiting investigators and fellows). Many Universities developed, with marine stations, research and teaching activities in ''total immersion'' programmes for graduate students and advanced undergraduates. These courses have been the tradition since the origin of marine stations, the first courses being offered in the 1880s in Roscoff, Banyuls, Plymouth, Naples etc.

Today, marine stations serve as centres for many European courses in marine biology

and oceanography all over Europe. A primary aim of these courses is to introduce students or train young researchers in the lastest concepts, theories and techniques that need laboratory work and in situ (fields) applications with emphasis on basic understanding of marine organisms and marine ecosystems as well as in multidsciplinary approaches to marine ecosystem processes.

Moreover, the European marine-science community has expanded rapidly in marine stations, with the emergence of new scientific developments and research areas: Marine Biology and Biodiversity, Genomics, Biotechnology, Evolution, Microbiomes, Cell biology & Imaging, Regeneration & Development, Neuroscience, Models of Human Diseases, Computation & Modeling, Ecology, Ecosystem Function & Global Change.

The original idea of the European MARS Network came from the initiative (5 June 1989) of Professor Pierre Lasserre, then Director of the marine station of Roscoff, to launch a European Network of Marine Research Stations, MARS. The project evolved with enthusiastic feedback from both Directors and permanent staff members in the stations, and from a growing number of visiting investigators from universities and other inland institutions.

The project was elaborated by a group of scientists in charge of 11 marine laboratories: B. Battaglia (Venice); B ; Bayne (Plymouth); A. Cruzado (Blanes); E. Duursma (Texel), T. Fenchel (Helsingor); A. Guille (Banyuls); C. Heip (Yerseke); P. Lasserre (Roscoff, Scientific coordinator); L. Saldanha (Cascais); J. Soyer (Villefranche-sur-Mer); G. Uhlig (Helgoland). It was considered that, initially, it would be preferable to maintain the original group of 11 marine stations, representatives from which would constitute an ***ad hoc*** **MARS Network Steering Group**. Representatives from Ireland (B. Keegan), and Greece (A. Eleftheriou), and the Director of Stazione Zoologica, Napoli were subsequently invited to join. Observers from other major marine stations were also invited to attend meetings of the MARS Network Steering Group.

A proposal entitled: *''Biological processes and Long-term variability in European ecosystems: A Marine Research Stations Joint Study (MARS) for a future European Network''* was submitted, on 27 June 1989, to the Commission of European Communities (CEC), Professor Pierre Lasserre acting as scientific coordinator. It was considered timely to enlarge collaboration, embracing a wider network of marine stations throughout Europe, to identify joint projects and activities which have high priority all over Europe, and to put the MARS Network on a more established footing. Two meetings of the ad hoc MARS Steering Committe have been held, in Brussels (5-6 March 1990), and Paris (28-29 January 1991). Three workshops were sponsored by the EU-CEC: *''Long-term Time-series Data Sets in Europe Marine Stations*'' in Blanes, Spain (27-29 May 1991), ''*Biogeographic Patterns in Biodiversity*'' in Plymouth (7-8 October 1991), and ''*Molecular Approaches to Marine Microbial Ecology*'' in Roscoff (16-26 September 1992).

At the 1st MARS Director's meeting, held at UNESCO, Paris, in 1991, Professor Carlo Heip was elected President of the European MARS Network. (Professor Pierre Lasserre, was just seconded at UNESCO to serve as Director of the UNESCO Division of Ecological Sciences and Secretary of the Intergovernmental Man and the Biosphere MAB Programme.)

In his excellent history on marine stations and the MARS Nework, Professor Anastasios Eleftheriou noted the difficulties to find financial support for MARS Secretariat: « *The European Commission ... proved hard to convince about the feasibility of a marine scienve network ... as a result many MARS objectives planned for subsequent yars never materialised or were seriously delayed ... over the years of its existence, the aims of the MARS network have indeed been met, many with outstanding results although the seminally important presence of MARS has often remained as an unacknowledged background influence. Suprisingly, these successes have not always been directly attributed to the MARS entity itself, partly at least because the netword has been remarkably generous in the financial and professional support of its members. Over the years, MARS has inspired and been involved in many EU-funded projects which have generated several million euros in external fundings.»*

MARS medals of honour.
Three MARS medals of honour have been awarded to the following scholars, in reccognition of their outstanding reputation and contributions : Professor Otto Kinne (2002), Professor Pierre Lasserre (2006), and Professor Anastasios Eleftheriou (2017). The MARS medal of honour carries a MARS Fellowship.

References. *Laudatio* for Pierre Lasserre (by Fredrich Buchholz, Helgoland).
http://www.marinestations.org/wp-content/uploads/2016/04/mars-newsletter-2007-winter.pdf

10. The World Association of Marine Stations, WAMS.

Background

It is is estimated that nearly a thousand marine stations can be identified around the world's oceans, in both Northern and Southern latitudes, including sensitive polar regions. Many have a long-standing international reputation for scientific excellence, education and dissemination to the public of the knowledge gained. Databases accumulated for decades by these laboratories and a growing number of new stations are considerable, and they are incubators for creative and innovative science. Joint potential has been, however, far too little used or exploited. Because of their location around most of the world's seas, the networking of marine stations should be encouraged to play an important role as distributed observatories and infratructures, for pursuing their pioneering work in fundamental marine biology and for assessing the impact of climate change on biodiversity and marine ecosystem functioning. In addition they can be central to the collection of data, crucial to the exploratory efforts and in depth advanced studies of coastal and deep water environments including: genomics, systematics, basic biology, ecology and evolutionary biology from genes to ecosystems, stressed and extreme environments, biotechnology, biogeochemistry, etc. Many marine stations are a rich resource of experienced scientists and scholars, and offer unique coverage of many on the World's most important and often vulnerable marine ecosystems and resources.

Existing and planned coastal and deep observatories should be connected directly to the marine stations. These coastal, sea-side laboratories are also of interest as specialised land-based infrastrutures for climatologists, physicists, geochemists, and specialists in fisheries, aquaculture, biotechnoloy and biomedecine. Many marine stations are a rich resource of experienced scientists and scholars, and offer unique coverage of many on the World's most important and often vulnerable marine ecosystems and resources.

The WAMS initiative.

The World Association of Marine Stations, WAMS is built upon existing regional networks in Europe (MARS), North America (NAML), the Caribbean (AMLC), Australia (TMN), Japan (SMRC), in cooperation with Global Oceans (POGO). Other new regional regional networks are planned in South America, Africa, the Mediterranean, the Gulf, South-East Asia, China, to develop excellence in marine biodiversity and ecosystem services, long-term observation of living systems, in relation to climate change.

WAMS is a broad enterprise and new developments are envisaged in close cooperation with UNESCO-IOC. Following the presentation of WAMS at the 26th session of the UNESCO-IOC Assembly (22 June – 5 July 2011) by Dr Herman Hummel, Dr Pierre Lasserre and Dr Mike Thorndyke, the IOC Assembly adopted the work plan for implementing joint IOC activities with WAMS.

Marine ecosystems are centrally important to the biology of the planet, yet a comprehensive understanding of how anthropogenic climate change is affecting them has been poorly developed. WAMS through its UNESCO-IOC cooperation has the capacity to offer and provide the broad ocean capacity logistics for quality platforms to meet, communicate and

exchange informations and knowledge.

One particular cooperation has been envisaged between WAMS and the IOC–Ocean Biogeographic Information System OBIS database, that emanates from the Census of Marine Life (the successful 10 years programme funded by the Sloan Foundation 2000-2010).

Reference. Report on progress and implementation of the World Association of Marine Stations (WAMS). UNESCO-IOC-XXVI/2 Annex 12, Paris, 20 May 2011.

11. Secretary general of the UNESCO international Conference on Biosphere Reserves, Seville, Spain (March 1995). The World Network of Biosphere Reserves.

A landmark in the UNESCO Man and Biosphere (MAB) Programme, the Seville Conference brought together 102 countries and 15 international and regional organiztions; Dr Pierre Lasserre acted as Secretary General. The Conference had two complementary parts : the elaboration of a common platform for action known as the *''Seville Strategy for Biosphere Reserves'',* and an examination and refinement of a ''*Statutory Framework of the World Network of Biosphere Reserves''*. The same year, the Seville Strategy and the Statutory Framework of the World Network were unanimously adopted by the General Assembly of UNESCO, Paris (November 1995). The Seville Conference has caused a renaissance of the MAB Programme and the Seville "vision" is now pursued in promoting sustainable development taking into account social, economic, scientific and cultural perceptions on human-environment inter-relationships. Today composed of more than 669 sites in 120 countries, including 16 transboundary sites, the World Network of Biosphere Reserves is a dynamic and interactive network of excellence. It works to foster the integration of people and nature for sustainable development, respect for cutural values, contributing through participatory dialogue, practical experience for viable mitigation and adaptative strategies to cope with climate change.

Reference: The Seville Strategy and the Statutory Framework of the World Network. UNESCO, Paris, 1996. Biosphere reserves: special places for people and nature. UNESCO, Paris 2002. MAB Biosphere reserves

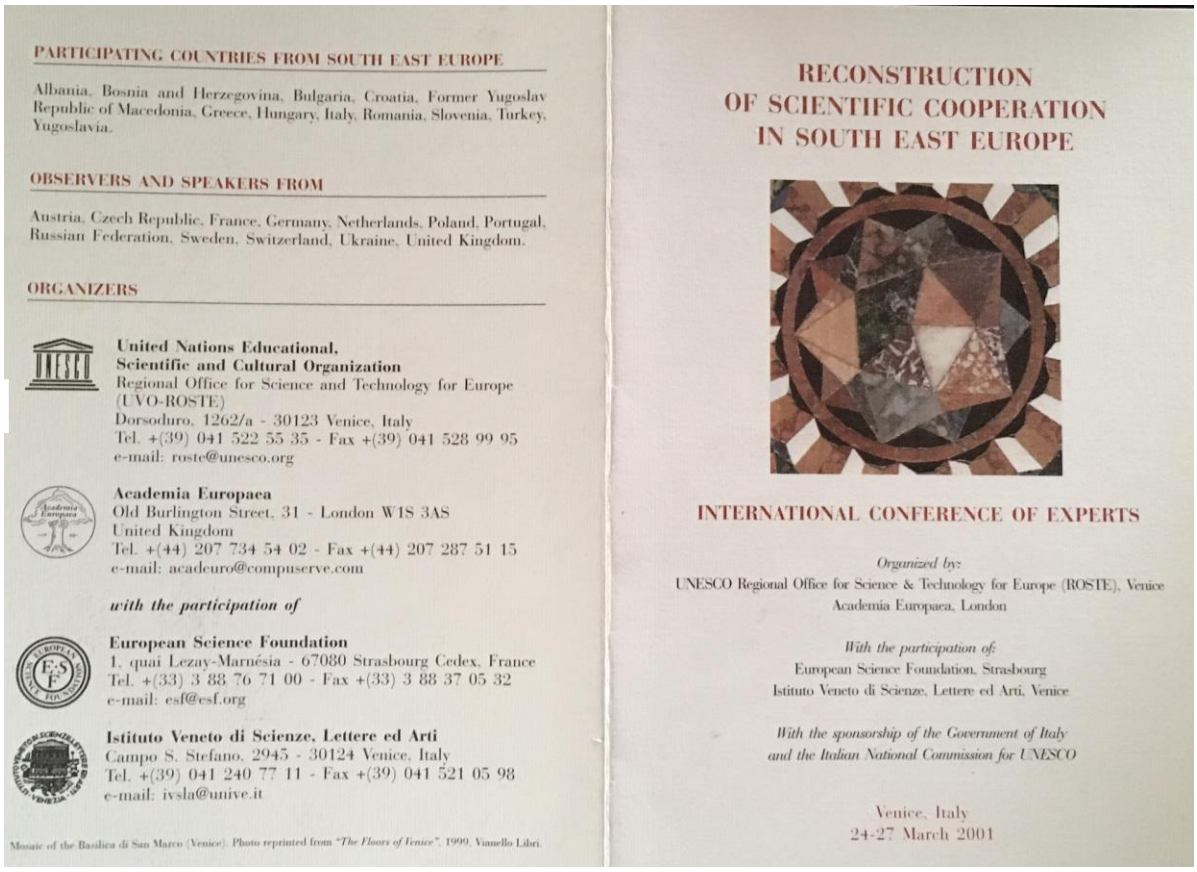
12. UNESCO-Venice and Academia Europaea organizers, of the Conference of Experts on Reconstruction of Scientific Cooperation in South East Europe Venice, Italy,24-27 March 2001

The UNESCO Regional Bureau of Venise and Academia Europaea co-organized, from 24 to 27 March 2001, an International Conference of Experts, with the participation of Professor Stig Strömholm, President of Academia Europaea and Dr Peter Colyer, Executive Secretary, the contributions of Dr Enric Banda, and Dr Tony Mayer of European Science Foundation, and the generous help of Istituto Veneto di Scienze, Lettere ed Arti. The meeting brought together 80 experts from 20 European countries, including ten countries in southeastern Europe. To revitalize science in Southeastern Europe, the lack of computer networks was identified as the largest impediment to strengthening cooperation in the area. The situation was particularly acute in the war-torn Balkans. Speakers reported a severe brain drain from the region. The meeting agreed that the region's best prospects lay in better access to research facilities in western Europe, particularly for the training of young scientists. The main priorities identified were the following:

1. Improvement of the communication and data handling infrastructures in Southeastern Europe. To overcome difficulties, UNESCO together with Academia Europaea and ESF, and the

expertise of other possible parners such as CERN, TERENA, DANTE Networks etc. were envisaging to join forces to help to up-grade the computer networks for research and education across the region. This initiative was considered as an essential step in the recognition of equal scientific status and to create effective means to communicate and participate on equal basis in broad scientific issues of world relevance, such as: the new life sciences revolution in genomics, biotechnology, medecine; environmental issues such as biodiversity, ecosystem management and conservation of ocean and terrestrial ressouces, pollution and regional effects of global climate change; computer science and information technologies; material science; sustainable development and ecology transition.

2. Improvement of the research infrastructures available and of the relations to the large infrastructures existine elsewhere. Research infrastuctures are the backbone for scientific activities. They include large equipments, medium size facilities, data banks, archives, libraries and service laboratories. Upgrading those facilities in the region is necessary as well as training of scientists and technicians.



PARTICIPATING COUNTRIES FROM SOUTH EAST EUROPE

Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia, Greece, Hungary, Italy, Romania, Slovenia, Turkey, Yugoslavia.

OBSERVERS AND SPEAKERS FROM

Austria, Czech Republic, France, Germany, Netherlands, Poland, Portugal, Russian Federation, Sweden, Switzerland, Ukraine, United Kingdom.

ORGANIZERS

United Nations Educational, Scientific and Cultural Organization
Regional Office for Science and Technology for Europe (UVO-ROSTE)
Dorsoduro, 1262/a - 30123 Venice, Italy
Tel. +(39) 041 522 55 35 - Fax +(39) 041 528 99 95
e-mail: roste@unesco.org

Academia Europaea
Old Burlington Street, 31 - London W1S 3AS
United Kingdom
Tel. +(44) 207 734 54 02 - Fax +(44) 207 287 51 15
e-mail: acadeuro@compuserve.com

with the participation of

European Science Foundation
1, quai Lezay-Marnésia - 67080 Strasbourg Cedex, France
Tel. +(33) 3 88 76 71 00 - Fax +(33) 3 88 37 05 32
e-mail: esf@esf.org

Istituto Veneto di Scienze, Lettere ed Arti
Campo S. Stefano, 2945 - 30124 Venice, Italy
Tel. +(39) 041 240 77 11 - Fax +(39) 041 521 05 98
e-mail: ivsla@unive.it

Mosaic of the Basilica di San Marco (Venice). Photo reprinted from "*The Floors of Venice*", 1999, Vianello Libri.

RECONSTRUCTION OF SCIENTIFIC COOPERATION IN SOUTH EAST EUROPE

INTERNATIONAL CONFERENCE OF EXPERTS

Organized by:
UNESCO Regional Office for Science & Technology for Europe (ROSTE), Venice
Academia Europaea, London

With the participation of:
European Science Foundation, Strasbourg
Istituto Veneto di Scienze, Lettere ed Arti, Venice

With the sponsorship of the Government of Italy and the Italian National Commission for UNESCO

Venice, Italy
24-27 March 2001

3. Joint work in multi-disciplinary problem-oriented projects. It should help to revitalize scientific communities in their respective countries as well as to address problems of societal relevance.

4. Training and fellowships. Training a new generation of scientists and retraining of existing competent scientists to the use of new techniques is an urgent necessity. This should be done with an appropriate fund to promote the exchange of scientists beween SEE countries and between them and EU and non EU countries. Specific programs should also be established to promote regional summer schools.

5. Training of science managers. The building up of scientific capacities will require enhanced competence and expertise in science management in many domains.

References: Lasserre P. (editor) Reconstruction of Scientific Cooperation in South East Europe. International Conference of Experts. Proceedings. Venice, Italy 24-27 March 2001.

UNESCO-Venice, 2001, 281 pages.

Anguelov, S., Kroo, N., Lasserre P., Papon P. 2001. EU will gain from funding eastern European centres of excellence. *Nature*, 2001, 410, 627.

http://www.nature.com/nat/journal/v410/n6829/full/410627a0.html?foxtrotcallback=true

13. Round Table of Ministers of Science on Rebuilding of Scientific Cooperation in South East Europe. UNESCO, 24 October 2001.

Organized at UNESCO Headquarters, Paris, this ministerial round table was a logic and successful follow up of the Venice Conference of experts held in Venice, in March 2001. Participation of Ministers of Science and Education of ten southeast Europe countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Greece, Romania, Slovenia, Turkey, Yugoslavia, were followed by contributions of UNESCO, Academia Europaea (Professor Ian Butterworth), the ESF, CERN, Austria, France, Germany, Italy, Russian Federation, Poland, and representatives of the European Commission, COST, NATO and Euroscience. A final Communiqué was unanimously adopted by the Round Table of Ministers.

Reference: Rebuilding the Scientific Cooperation in South East Europe. Round Table of Ministers of Science Interventions, Final Communiqué, List of Participants. UNESCO 24 October 2001.

14. Jacques-Yves Cousteau Petition on the Rights of Future Generations, and UNESCO Declaration on the Responsibilities of Present Generations, (adopted 12 November 1997)

Launched by the famous Captain Jacques-Yves Cousteau, a petition on the Rights of Future Generations, which is at the same time a Declaration on the Responsibilities of Present Generations was proposed to the General Conference of UNESCO and adopted on 12 November 1997. Professor Pierre Lasserre contributed to J.Y. Cousteau petition which gathered millions of signature from people around the world, notably in Europe, Brazil, India, China.

UNESCO-Cousteau chairs in Ecotechnology.

A joint initiative of UNESCO and the Cousteau Society, with the aim of supporting institutional development, education, research, policy formulation, field projects and networking in the area of ecological economics, human ecology and ecotechnology. A key element in this programme is the creation of a network of UNESCO-Cousteau Chairs in Ecotechnology in some 20 universities in different parts of the world.

A Pierre Lasserre , notre complice pour
que nos descendants vivent mieux …
J.Y. Cousteau

- END -