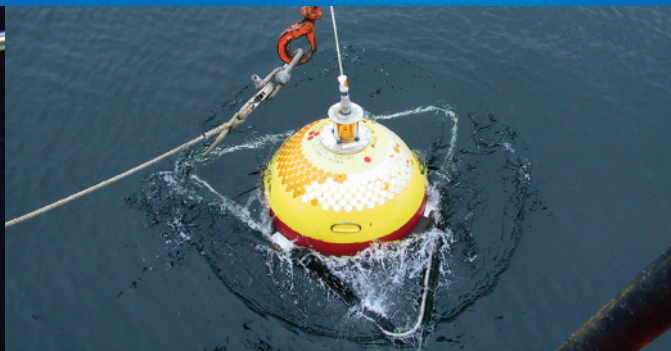


Publications of the Academy of Finland 5/07

BALTIC SEA RESEARCH PROGRAMME (BIREME) 2003–2006



Evaluation Report



ACADEMY OF FINLAND
RESEARCH FUNDING AND EXPERTISE

BALTIC SEA
RESEARCH PROGRAMME
(BIREME) 2003–2006

Evaluation Report

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KUVAILULEHTI

Julkaisija	Suomen Akatemia		Päivämäärä 20.4.2007
Tekijä(t)	Arviointipaneeli		
Julkaisun nimi	Baltic Sea Research Programme (BIREME) Evaluation Report 2003–2006		
Tiivistelmä	<p>Suomen Akatemian hallitus päätti kokouksessaan 6.11.2001 käynnistää Itämeri-tutkimusohjelman (BIREME). BIREME:n tavoitteena oli syventää ymmärrystä valuma-alueen, rannikkoalueen ja avomeren välisistä yhteiskunnallisista, taloudellisista ja ekologisista vuorovaikutussuhteista. Erityisesti ohjelma kannusti suunnittelemaan tutkimuksia, joissa yhdistetään kahden tai useamman tieteenalan aineistoja, lähestymistapoja, tutkimusmenetelmiä ja kysymyksenasetteluja. Suomen Akatemian lisäksi vuosina 2003–2006 toteutettua BIREME ohjelmaa rahoittivat ympäristöministeriö, maa- ja metsätalousministeriö, liikenne- ja viestintäministeriö, Maj ja Tor Nesslingin säätiö sekä Venäjän perustutkimusrahasto.</p> <p>Ohjelman lopussa, syksyllä 2006, Suomen Akatemia nimitti kansainvälisen asiantuntijapaneelin arvioimaan ohjelmaa. Paneelia pyydettiin arvioimaan ohjelmaa pääasiassa kokonaisuutena erityisesti keskittyen seuraaviin asioihin: tutkimusohjelman valmistelu ja suunnittelu, ohjelman tieteellinen laatu, ohjelman tavoitteiden saavuttaminen, panostus tutkijakoulutukseen, yhteistyö ja verkottuminen, tutkimustulosten merkittävyys ja sovellettavuus sekä suositukset Suomen Akatemialle tulevaisuutta varten. Tämä raportti sisältää arviointipaneelin työn tulokset.</p> <p>Paneelin mukaan ohjelma saavutti hyvin osan tavoitteistaan. Tutkimus oli tieteellisesti korkealaatuista ja tieteellisten tuotosten määrää pidettiin vaikuttavana. Saavutetut tutkimustulokset ovat lisänneet ymmärrystämme Itämerestä. Paneeli kiinnitti huomiota siihen, että BIREME oli lähinnä aiheuuntautunut, eikä niinkään ongelmasuuntautunut. Selkeä ongelmanasettelu olisi edesauttanut todellisen tieteidenvälisen yhteistyön syntymistä hankkeissa. Aittoa tieteidenvälistä tutkimusta oli vain muutamassa hankkeessa, joten tältä osin myöskään tieteidenvälinen tutkijankoulutus ei saavuttanut tavoitettaan.</p> <p>Paneelin mielestä menestyksellinen ohjelma-arviointi edellyttää selkeämmin määritellyt, mitattavissa olevat tavoitteet. Kun ohjelman tavoitteena on tulosten sovellettavuus, rahoitettavia hankkeita valittaessa yhtenä keskeisenä arviointikriteerinä tulisi olla hankkeen merkityksellisyys ohjelmakokonaisuudessa. Paneelin mielestä ohjelmaryhmän tulee jatkossa nykyistä aktiivisemmin johtaa, opastaa ja koordinoida ohjelmaa koko ohjelman keston ajan. Paneeli suosittelee Akatemiaa myös varmistamaan, että BIREME:n osana rahoitetaan työpaketti (vuoden rahoitus), jossa ohjelman tulokset kootaan ja analysoidaan.</p>		
Asiasanat	tutkimusohjelma, arviointi, tutkimusrahoitus, Itämeri, rehevöityminen, kalabiologia, talvi-ekologia, ympäristöhistoria, ympäristön hallinta, biodiversiteetti, ympäristömyrkyt		
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DESCRIPTION

Publisher	Academy of Finland	Date	20.4.2007
Author(s)	Evaluation Panel		
Title	Baltic Sea Research Programme (BIREME) Evaluation Report 2003–2006		
Abstract	<p>The Board of the Academy of Finland decided on 11 November 2001 to launch a research programme for Baltic Sea research. The aim of the Baltic Sea Research Programme (BIREME) was to gain a deeper understanding of the social, economic and ecological interactions between the drainage basin, the coastal regions and the open sea. The programme especially encouraged submission of multi- and interdisciplinary proposals. The BIREME Programme ran from 2003 through to 2006 and was jointly funded by the Academy of Finland, the Ministry of the Environment, the Ministry of Forestry and Agriculture, the Ministry of Transport and Communications, the Maj and Tor Nessling Foundation and the Russian Foundation for Basic Research.</p> <p>As the BIREME Programme drew to a close in 2006, the Academy of Finland appointed an international expert panel to evaluate the programme. The panel was asked to assess the programme as a whole with a special focus on the following issues: planning of the programme, scientific quality of the programme, success of the implementation of the programme goals and objectives, contribution to researcher training, collaboration and networking, applicability of research and importance to the users and recommendations to the Academy for the future. This publication includes the report of the evaluation panel.</p> <p>According to the panel, the programme has achieved part of its goals well. The scientific quality of the research is high and the productivity is considered impressive. The objective to deepen understanding and knowledge on environmental issues has been met. The panel points out that the programme was designed as subject-oriented rather than problem-oriented. The panel views that a clear problem-oriented approach would have enhanced a true interdisciplinary collaboration in the projects. True interdisciplinary research took place only in few projects, hence the transfer of interdisciplinary skills to young researchers has not been achieved.</p> <p>According to the panel, successful evaluation of the programme would require more well-defined, and measurable objectives. When applicability is one of the aims of the programme the evaluation criteria should include a measure of relevance for the programme besides the scientific quality in the initial project evaluation. The opinion of the panel is that the Steering Group should in the future have more active role in steering, advising and coordinating the programme during the whole course of the programme. The panel also recommends that the Academy ensures funding for an additional year for a separate task to analyse the data and to produce a synthesis of the programme.</p>		
Key words	research programme, evaluation, research funding, Baltic Sea, eutrophication, fish biology and fisheries, winter ecology, environmental history, environmental governance, biodiversity, environmental toxins		
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PREFACE

Following extensive discussions between many interested parties representing research and funding interests in Finland, in 2001 the Academy of Finland established the Finnish Baltic Sea Research Programme (BIREME) and allocated 4.4 million euros for the implementation of the programme during 2003–2005. Following further discussions, other bodies joined the programme: the Ministry of the Environment, the Ministry of Agriculture and Forestry and the Ministry of Transport and Communications (2002), the Maj and Tor Nessling Foundation (2003) and the Russian Foundation for Basic Research (RFBR) (2003). This ensured the creation of a larger and more comprehensive Baltic Sea Research initiative with a total budget of 5.88 million euros.

The BIREME Programme aimed to deepen the understanding of science-based management of environmental issues in the Baltic Sea. In particular, it focused on research aiming to prevent problems caused by eutrophication and harmful substances as well as on the maintenance of biodiversity and the sustainable use of marine resources. It ambitiously aimed for a greater knowledge relating to the changes in the Baltic Sea and its drainage basin, and on interactions between the land, coast, air and open sea and between social and environmental aspects in the Baltic Sea region.

More widely, the programme was designed to enhance interdisciplinary research and the further use of existing information and resources; to research historical changes in institutions, issues and actors; to develop conceptual and numerical models and other analytical tools, and to increase research competence within the Finnish scientific community.

The programme eventually included twenty-one BIREME research projects chosen to receive funding during 2003–2005. In addition, in a Maj and Tor Nessling Foundation call, a project was funded which was included into the BIREME Programme. A further two Finnish–Russian collaborative projects were funded for 2004–2006 and included into the BIREME Programme.

In May 2006, the Academy of Finland appointed an international evaluation panel to review the programme. Professor Michael Elliott (UK) chaired the panel and the other members were Professors Christiane Lancelot (Belgium), Peder Agger (Denmark) and Marta Estrada (Spain) (see Annex 2). Ms. Susan Travers (UK) acted as a panel secretary.

The panel have pleasure in presenting here the results of the evaluation of BIREME but also thank the Academy, their staff and the researchers involved in BIREME for their kindness and courtesy during the evaluation process.

Michael Elliott
Chair of the Evaluation Panel

March 2007

1 BALTIC SEA RESEARCH PROGRAMME (BIREME)

1.1 Background

The initiative to set up a Baltic Sea research programme originated from the scientific community. In 2000, the Academy of Finland Research Council for Environment and Natural Resources (Research Council for Biosciences and Environment since January 2001) appointed a working group composed of researchers and representatives of funding bodies, three ministries and the Maj and Tor Nessling Foundation, to make preparations for an exploratory workshop on the current state of Baltic Sea research. The workshop was organised in February 2001, with a total of 110 researchers and potential end-users of research results taking part.

The Research Councils for Biosciences and Environment and Culture and Society proposed the establishing of a Baltic Sea research programme to the Board of the Academy of Finland. The Baltic Sea received an increased attention at the national and international levels. Based on the programme of the Government of Finland, the Finnish Programme for the Protection of the Baltic Sea was finalized in summer 2001. In November 2001, the Board decided to launch the Finnish Baltic Sea Research Programme (BIREME) and allocated 4.4 million euros for the implementation of the programme during 2003–2005. The BIREME Steering Group (Annex 3) was appointed to plan the research programme (www.aka.fi/bireme). Funding cooperation with various national and international organisations was sought.

As a result of discussions between the Academy of Finland and several ministries, in spring 2002, the Ministry of the Environment, the Ministry of Agriculture and Forestry and the Ministry of Transport and Communications indicated their willingness to co-fund the programme. The Maj and Tor Nessling Foundation participated with a funding scheme that could be included into the BIREME programme.

In 2003, the Russian Foundation for Basic Research (RFBR) and the Academy of Finland agreed on launching a special call for Finnish-Russian collaborative projects (2004–2006) concerning environmental problems in the Baltic Sea. The projects to be funded would be part of the BIREME Programme.

1.2 Organisation

The BIREME Programme was steered and directed by the Programme Steering Group with the help of the Programme Manager. The Steering Group was composed of representatives of the Academy's Research Councils, other funding bodies and an expert (see Annex 3). The Steering Group worked with the Programme Manager and had a role in the management of the programme by monitoring implementation, planning evaluations and promoting the use of results. A sub-group was appointed in 2001 to make the funding decisions by the Academy of Finland (Annex 4).

With BIREME an in-house coordination scheme was introduced by the Academy of Finland. A Programme Manager position based at the Academy of Finland was announced in 2001. Dr Kaisa Kononen started as Programme Manager on 1 March

2002. The tasks of the programme manager included building up the coherence of the programme and helping to attain its objectives, looking for and negotiating national and international funding collaboration, fostering national and international networking and information exchange among scientists.

In June 2002, the project leaders who were asked to submit full proposals were invited to the partnering seminar to learn more about international funding cooperation possibilities. Among the presenting organisations were Formas (Sweden), the International Council for the Exploration of the Seas (ICES), Deutsche Bundestiftung Umwelt (Germany) and Forschungszentrum Jülich GmbH (Germany). In collaboration with other research funding organisations in the Baltic Sea region Dr. Kaisa Kononen (Academy of Finland/BIREME) submitted a proposal *Baltic Sea Research ERANET (BONUS)* to the EU Sixth Framework Programme ERANET scheme. The proposal was successful and Dr Kaisa Kononen assumed the responsibilities of BONUS coordination at the end of 2003. The Programme Manager position was re-announced and Dr Tuula Aarnio was appointed to the position in January 2004.

1.3 Objectives of BIREME

The objective of the BIREME Programme was to deepen the understanding of conditions for science-based management of environmental issues in the Baltic Sea (see Programme Memorandum www.aka.fi/bireme). The programme focused on research aiming to prevent problems caused by eutrophication and harmful substances as well as on maintenance of biodiversity and the sustainable use of marine resources. Specific themes of the programme were:

- Analysis of change in the Baltic Sea and its drainage basin
- Interactions between the land, coast, air and open sea
- Social and environmental interactions in the Baltic Sea region

Other aims of the BIREME Programme included:

- Enhancing interdisciplinary research
- Use and reconsideration of existing information
- Research in historical changes in institutions, issues and actors
- Developing conceptual and numerical models and other analytical tools
- Synergistic use of existing resources and infrastructures
- Researcher training
- Fostering international research collaboration

Specific themes in the Academy of Finland and the Russian Foundation for Basic Research call for Finnish-Russian collaborative projects concerning environmental problems in the Baltic Sea were:

- Ecological processes in littoral habitats: influence in coastal ecosystems, management and protection
- Comparative ecology of the White Sea and the Baltic Sea coastal ecosystems
- Sources, pathways and effects of anthropogenic hazardous substances in coastal ecosystems of the Baltic Sea

1.4 Research Projects in the Programme

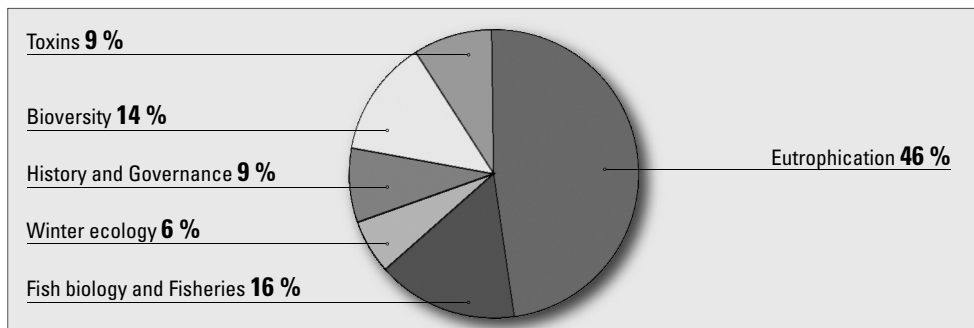
The BIREME Call, followed by a two-phase procedure, was carried out in 2002. The deadline for outline proposals was 15 May and for full proposals 9 September. Eighty-two letters of intent were submitted. The Steering Group invited 41 applicants to submit their full proposal. An international review panel evaluated the scientific quality of the applications at its meeting in October 2002.

Based on scientific evaluation by the evaluation panel the Steering Group ranked the applications and made recommendations for funding for the participating funding bodies. The Academy of Finland (sub-group) made funding decisions in December 2002 and so twenty-one BIREME research projects were chosen to receive funding during 2003–2005.

In a Maj and Tor Nessling Foundation call (2003) a project was funded which was included into the BIREME Programme.

The Finnish-Russian collaborative call in 2003 was followed by a one-phase procedure with a deadline of 30 September. Fifteen eligible applications were received and each organization evaluated its own applications. At the Academy, individual, international external evaluators were consulted whereas at the Russian Foundation for Basic Research the evaluation was done by Russian scientists. The Steering Group (including RFBR representative) ranked the applications and recommended the funding at a joint meeting in December. Each party funded its own researchers. The Research Council for Biosciences and Environment made the funding decisions in December. Two projects were funded for 2004–2006 and included into the BIREME Programme.

Figure 1: Breakdown of funding by theme.



1.5 Programme funding

The total funding of BIREME has been 5.88 million euros. The programme has been financed by the Academy of Finland (4.7M€), the Ministry of the Environment (0.5M€), the Ministry of Agriculture and Forestry (0.3M€), the Ministry of Transport and Communications (0.07M€), the Maj and Tor Nessling Foundation (0.25M€) and the Russian Foundation for Basic Research (0.06M€). The three-year funding term for twenty-one of the projects started in January 2003, and for three projects a year later (Nessling, Finnish-Russian collaboration).

The list of the BIREME projects and information on funding is given in Annex 5.

2 EVALUATION PROCEDURE

The objective of the evaluation was to estimate to what degree the BIREME Programme has succeeded in fulfilling the objectives originally set for it in the Programme Memorandum. The evaluation is designed against the starting-points of the programme, its objectives and funding volume. The main focus shall be on the performance of the programme as a whole as well as on the added value it has generated. However, evaluations shall also be carried out at the level of individual thematic areas and projects. Of specific interest are interdisciplinarity, applicability of research, networking and dissemination of results. The following issues are asked in the evaluation (Annex 1a):

- Planning of the research programme
- Scientific quality of BIREME
- Success of the implementation of the programme goals and objectives
- Contribution to researcher and expert training
- Collaboration and networking
- Applicability of research and importance to the users
- Recommendations for the future

The Academy of Finland appointed an international evaluation panel in May 2006. Professor Mike Elliott (UK) chaired the panel and the members were Professors Christiane Lancelot (Belgium), Peder Agger (Denmark) and Marta Estrada (Spain) (Annex 2). Ms. Susan Travers (UK) acted as a panel secretary. Since the evaluation also comprises programme coordination, the Programme Manager had an assisting role in the evaluation process.

The Programme Manager compiled and prepared the material needed for the evaluation and organised the programme's self-evaluation. An information package was sent to the panel members in May describing the research policy environment in Finland and the role of the Academy of Finland in it. The material also included some examples of previous research programme evaluation reports.

The self-evaluation forms were requested for each BIREME research project, FORM 1 (project leaders), FORM 2 (partly or fully BIREME funded researchers) and the Programme Managers filled FORM 3 (Annex 6a-c). The Programme Manager prepared compilations and summary tables of the received information. These, together with filled forms, and other material were sent to the panel members in June. The material, which included original research plans, was sent to the panel members and was organised into the following folders:

- Assignment letter and content of material
- Compilations and summaries
- Events in English
- Events in Finnish
- Implementation
- Planning and launching
- Self-evaluation FORMS
- Working groups
- BONUS
- Other

The complete list of the material sent to the panel members can be seen in Annex 1b.

The evaluation panel had its meeting in Helsinki on September 18-20, 2006 (Annex 7). The panel members were also invited to attend the BIREME Final Symposium, which was organised back-to-back with the panel meeting on 21–22 September. The Chair, Professor Elliott and Susan Travers attended the symposium.

In addition to examining the reports, self-evaluation assessments, publications and other products of the programme the panel also interviewed members of the Programme Steering Group, key stakeholders, researchers and the Programme Managers during the panel meeting. The project leaders were interviewed in five groups of similar scientific fields, and from each project a young researcher (PhD student/post doc) was chosen by the project to be interviewed in one of the three student groups.

Between interviews time was reserved for summing up, preparing and drafting the evaluation report. Programme Manager Mikko Ylikangas and Project Officer Elina Sarro from the Academy of Finland assisted the panel during the meeting. The BIREME Programme Manager was available for answering questions and for discussions during breaks and when invited, but did not take part in the panel work.

The panel finalised the evaluation report by email communication. The Programme Manager drafted the technical part of this report (1–2).

3 OVERALL EVALUATION OF BIREME AND THE PROJECTS

3.1 Introduction

This is to estimate to which degree the BIREME research programme has succeeded in fulfilling the objectives originally set for it in the Programme Memorandum. Of specific interest were the programme's approach, added value and programme impacts, interdisciplinarity, applicability of research, networking and dissemination of results. The panel also assessed the scientific contribution of the work carried out, but kept in mind the available funding for the programme and its coordination.

In creating the evaluation report, the panel assessed the programme as a whole and especially considered the issues presented in the assignment letter (Annex 1a)

The evaluation report treats each of these topics as a separate section.

3.2 Scientific evaluation of the programme

Objectives and methods of the evaluation

The primary role of the evaluation panel was to estimate the degree to which the BIREME Research Programme has succeeded in fulfilling the objectives originally set for it in the Programme Memorandum. The programme approach, added value and programme impacts, interdisciplinarity, applicability of research, networking and dissemination of results are discussed in later sections.

The panel points out that it is not reviewing the Finnish higher education sector, postgraduate training and employment, the PhD/MSc system, government-university links or the role of the Nottbeck and Nessling Foundations. However, all of these provide much of the context for the programme and are mentioned where necessary. In particular, it is of note that the foundations also fund research, but that training and coordination linked to these schemes can come within the remit of BIREME. The panel has taken as its starting point that a definition of a research programme, as opposed to merely a research theme, should be ‘*a set of research projects on a well-defined and concerted theme, with links, added value and synergies between them for mutual benefit and findings that can be brought together in a synthesis*’. The evaluation has been carried out with this definition in mind.

The panel interviewed 56 of the key players (projectleaders, members of the Steering Group, Programme Managers) and young researchers (PhD students and post-docs, at least one per project) as well as had informal discussions with several others during the BIREME Final Symposium that followed the evaluation panel interviews.

At this stage, it is possible to initially and scientifically evaluate the programme in terms of conventional scientific outputs such as published outputs and deliverables, number of papers, reports, conferences etc. (see Table 1). However, it is emphasised that this is only a preliminary assessment because of the early stage in the publishing cycle. In addition, given the high value placed on the outcomes of the project being of value to the user community, such value will become apparent only at a later stage.

Table 1: Conventional scientific outputs from BIREME (2003–April 2006)

Peer-reviewed publications	Other scientific publications	Popular publications	International meetings attended
86	18	52	222

3.3 Contribution to the implementation of BIREME’s goals and objectives

As written in the Programme Memorandum, the primary objective of BIREME was to conduct research that will deepen the understanding of conditions for science-based management of environmental issues in the Baltic. Four main issues were identified: eutrophication, harmful substances, maintenance of biodiversity and sustainable use of marine resources. To achieve this objective, interdisciplinarity was highly recommended as well as the analysis of historical data, model development, synergetic use of existing resources and infrastructure, researcher training and international collaboration. The extent to which this has been achieved is discussed in the following sections.

3.3.1 Planning and coordination of the research programme

Programme approach

The programme was informed of earlier work on the Baltic Sea area and on the research and environmental management priorities for the area, especially those

related to the HELCOM (Helsinki Convention, www.helcom.fi) area. Research projects by the Academy of Finland and especially the Nessling Foundation formed the precursor to the programme, especially through the enthusiasm of pivotal individuals in these organisations. Similarly, some funds were available from these organisations as well as from other participating ministries, such as the Ministry of Agriculture and Forestry, the Ministry of the Environment and the Ministry of Transport and Communications. In addition, research priorities from the funding bodies and other stakeholders coincided in a desire for multidisciplinary/interdisciplinary research. It became apparent that some ministries wanted to fund specific projects and BIREME provided a suitable vehicle for this.

The programme had a high and broad ambition, i.e. *to deepen the understanding of conditions for the science-based management of environmental issues of the Baltic Sea*. The programme was planned to last three years, although collaboration with Russia gave a one year later start to two projects. There were two calls for projects, and in the first of these the final projects were selected by a two-step initial selection procedure. Out of eighty-two letters of intent 41 proposals were invited to submit a full proposal. An international panel was invited to rate the scientific quality and relevance of the selected 41 proposals. The proposals ratings were based on their research plan (compatibility with BIREME, scientific level and originality, research plan, methods and feasibility) and research environment (scientific merits and expertise, organisation, national and international cooperation, training for graduate students and postgraduates) criteria. On this basis, the BIREME Steering Group ranked the proposals and made recommendations for funding decisions, which led to 21 proposals being selected. A bilateral Russia-Finland call then resulted in a further two projects (lasting 2004–2006) being selected. A final project (led by Korpimäki) was selected by the Nessling Foundation and then accepted by the Steering Group for inclusion in BIREME.

Although interdisciplinary research was clearly recommended in the BIREME Programme Memorandum, it did not appear as a criterion in the evaluation form of the evaluators. As this aspect features highly in the panel's evaluation, it is useful to indicate understanding of the terms used. Interdisciplinary research involves a team effort of specialists from two or more related fields working closely together on a topic. Multidisciplinary research includes individual inputs from specialists in separate disciplines. These research links are often combined as cross-disciplinary or pluri-disciplinary (Env. Sci. Technol. 1988 22(9) p 987). In the evaluation here, the term cross-disciplinary is used to include all collaborations across disciplines. However, it is emphasised that the success of this relies on workers being willing to think across disciplines and outside of their main field.

The programme consisted of 24 projects that, in some cases, e.g. SEGUE, NUTRIBA and CYBER, were clustered within a consortium in order to encompass the various aspects of the environmental questions being addressed. The projects cover many areas of Baltic science, from genetics to alien species and the causes and consequences of eutrophication. In this, BIREME has produced a great deal of excellent and high-quality science, covering many areas of the ecosystem structure and functioning of the Baltic Sea and its response to human pressure. However, as noted, this is a somewhat open-ended objective and as such it is not easy to determine, quantitatively, whether the objective has been reached. For example, the

objective ‘*to deepen...*’ is not easy to measure, thus it is not easy to indicate that this objective has been met to the satisfaction of the funders. A problem-solving approach expressed under the form of key questions would have been clearer for both applicants and the evaluators.

The approach, as laid down in the Programme Memorandum, is somewhat confusing as it leads from the objective, given above, to four main environmental issues (eutrophication, harmful substances, maintenance of biodiversity, and sustainable use of marine resources). In turn, these lead to encouraging seven activities that are here regarded as deliverables: interdisciplinary research, use of existing information, research on historical changes, development of models and other analytical tools, synergistic and efficient use of resources, training of researchers and promoting international collaboration. The Programme Memorandum proposed that these deliverable areas and main issues should then lead to three research themes: analysis of change in the Baltic Sea and its drainage basin, interactions between land, coast, air and open sea, and socio-economic and environmental interactions in the Baltic Sea region.

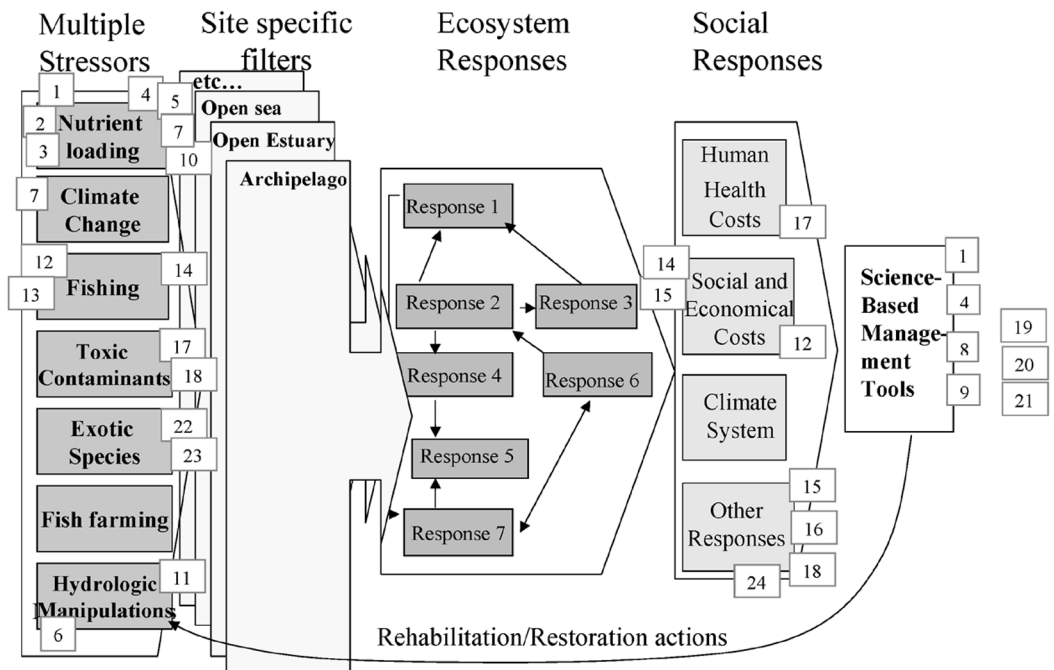
The programme combines a good and wide-ranging set of projects even though the selected projects are quite disparate. The topics identified in the Programme Memorandum reflect a subject-orientated approach, even though, as emphasised by the panel, in order to address the problems faced by the Baltic, a problem-based approach would have been more desirable. As indicated below, as the problems are caused by the nature of the Baltic societies, a high input of economic and societal aspects is required to determine solutions. Because of this, although the selected projects focused on the natural sciences, the programme also needed to link the natural and social sciences and it is recommended that research into the societal links and environmental economics should have been embedded at all stages and in all themes. It was observed that this was not the case, with very few exceptions, for example the project on salmonid populations and fisheries.

Many, but not all of the projects selected by the initial evaluators come within the four issues (Table 2). As shown by superimposing the projects funded within the programme on the conceptual model in the Programme Memorandum (Figure 2), there are elements not covered and the programme is lacking in true multidisciplinary and interdisciplinary. As indicated above, some of the projects were linked as clusters and there were even groups of clusters (e.g. SEGUE-CoastGas-NUTRIBA, DETECT-IMAGINE, Alien Species), but others are very individual and not inter-linked. The panel identified that some of the latter could have benefited from mutual interactions.

Table 2: Assessment of the projects under BIREME, projects' place within the major themes (parentheses indicate implicit rather than explicit links).

Project number	Project title	Environmental issue			
		Eutrophication	Harmful substances	Maintenance of biodiversity	Sustainable use of marine resources
1	Searching Efficient Protection Strategies for the Eutrophied GOF: The Integrated Use of Experimental and Modelling Tools. MMT Catchment Nutrient Flows and Coastal Retention	✓			(✓)
2	Factors Influencing Phosphorus and Silicon Binding in the Sediment	(✓)			
3	Nitrogen Fluxes at the Sediment-Water Interface	✓			
4	Nutrients from River Basins - Experimental and Modelling Approach	✓			
5	Pool Sizes, Turn-Over Rates, Transformation and Retention of Nutrients in Selected Water Bodies	✓			
6	Assessing Coastal Water Characteristics Using River Basin and Estuary Modelling	(✓)			(✓)
7	Nitrogen and Greenhouse Gas Cycling in Rivers and Estuaries of the Bothnian Bay, The Baltic Sea (CoastGas)	(✓)			
8	Interpreting Baltic Coastal Marine Ecological Data for Environmental Decision Making (IMAGINE)	(✓)		(✓)	✓
9	Developing a Tool for Assessing Ecological Reference Conditions in the Coastal Zone of the Baltic Sea (DETECT)	(✓)			✓
10	Eutrophication and Biotic Regulation of Littoral Macroalgal Communities	✓			
11	Cyanobacterial and Microbial Communities in the Baltic Sea: Responses to Environmental Impacts	(✓)			
12	Baltic Salmon Action Plan in the Bothnian Bay Rivers: Interdisciplinary Modelling of the Evolving Salmon Stock and Socio-Economic Aspects			✓	(✓)
13	Molecular Mechanisms of Early Mortality Syndrome (M74) in Baltic Salmon (<i>Salmo salar</i>)			✓	
14	Trophic Interactions in the Baltic Sea: Zooplankton Communities and Commercially Important Fish	(✓)			✓
15	The Sea and the Societies: Approaches to the Environmental History of the Baltic Sea				(✓)
16	Governing a Common Sea (GOVCOM) Changing Modes of Governance in the Baltic Sea Region				(✓)
17	Bioaccumulation of Dioxin-Like Organochlorines in Baltic Fish - Experimental and Modelling Approach (DIOXMODE)		✓		
18	Bioremediation of Oil Spills in the Coastal Region of the Baltic Sea		✓		
19	The role of Baltic Sea Ice and Biota in Wintertime Nutrient Cycles and Organic Matter Transformations and Transfer (ICEMAT)	✓			
20	The Baltic Sea Ice Bacteria: The Community Structure and Role in Wintertime Biogeochemical Transformations	(✓)			
21	The Role of Baltic Sea Ice Biota in Carbon Cycling During Winter	(✓)			
22	Human Impacts on Biodiversity in the Baltic Sea – Invasion of an Alien Predator and Return of a Native Top-predator			✓	(✓)
23	Is the Biological Integrity of the Baltic Sea Threatened by Invasive Non-native Species?			✓	(✓)
24	Dominant Littoral Invertebrates of North European Marginal Seas: Dynamic Genetic Changes and Their Ecological Consequences			(✓)	

Figure 2: Conceptual model in Programme Memorandum



The Programme Memorandum set the requirements for applications and then the general topics for study and expressions of interests were sought under the general themes proposed. This constitutes what elsewhere is termed a speculative-mode for research, i.e. topics are proposed by the investigators rather than the funders. It is suggested here that the method of project selection was not conducive to producing a coherent structure. The initial review of submitted project outlines was followed by detailed applications from a select group of projects, which were graded separately by the international evaluation panel. It appears that at this stage, the whole programme was not evaluated for coherence, but rather that each project was evaluated individually although the international panel did meet the scientific coordinator and produce a consensus. Thus, the BIREME Programme was based on individual projects selected for their scientific quality, and the panel takes the view that it was the Steering Group's role to create a coherent programme. This may explain the weakness in the interdisciplinarity component of the programme. The panel recognises that scientific excellence is a primary criterion, but although combining natural sciences and environmental socio-economics is a rather new concept, it is essential for achieving sustainable development. Because of this, other criteria and relevant mechanisms in the programme approach should have been applied to create interdisciplinarity.

The panel concluded that with respect to the aims of BIREME, there seems to be a dilemma concerning the mandate of the Academy of Finland. It had an expressed wish to fund the most scientifically excellent research (which often includes basic research topics), while it at the same time attended to the needs of other funding agencies. The latter were often directed towards solving particular applied problems.

3.3.2 Scientific quality of BIREME

Scientific quality and degree of innovativeness

The panel recognised a high degree of scientific quality and innovativeness of the research undertaken as well as an excellence in scientific competence of the consortia brought together for the programme. The scientific achievements have certainly contributed to the deepening of understanding of the Baltic Sea (cf. main objective) as well as to helping to create the conditions for science-based management of environmental issues in the Baltic Sea. There are many excellent examples of new data, and much information and knowledge created by BIREME funded projects; for example the new ecological quality indicators based on palaeontological studies, coupled biogeochemical models linking the watershed and the sea, development of a probabilistic interdisciplinary model linking natural science and economics (Bayesian model for Baltic Salmon Action Plan), and increased collaboration with Russia.

The programme included a large amount of biological research in that information was produced for all levels of biological functioning from the cell to the ecosystem; in very few cases this then progressed to societal aspects. However, the projects also identified key gaps in Baltic science; for example, the need to link the diverse biological components (zooplankton, fish, benthos etc.) and also to assess the consequences of changes detected (e.g. genetic differences).

The projects demonstrate some excellent hypothesis testing and rigorous research, but there is a need to determine the significance of the findings, in statistical, environmental and societal terms. Similarly, most projects were rather more multidisciplinary than interdisciplinary, although there are some excellent examples of true interdisciplinarity, such as links across food chains, natural resource exploitation and society, and integration of natural and societal science. As such, these show the essence of BIREME's core aims. Finally, although there was much focus on the biological aspects, there was less on the physical and chemical sciences as supporting information, even though some of the models encompassed physical and chemical ideas.

Contribution to science-based management of environmental issues in the Baltic Sea

In many countries, research is judged by its contribution to the advancement of knowledge, wealth creation and the quality of life. The BIREME projects directly or indirectly make such a contribution. In addition, research can have two types of applicability – for the advancement of science and to the development and implementation of policies. All the research fulfils the former, in that all projects have answered some scientific questions and provided a background and suggestions for further study. However, whereas much of the research could have a high applicability to Baltic management policies, this has as of yet been realised only in a few cases. For example, some of the work is relevant to implementing present European Directives (for Habitats, Nitrates control, Water Framework policy, etc.) and much will be needed for the development of Finnish policies for the European Marine Strategy and the proposed Marine Strategy Directive.

In any programme such as this which purports to provide information, tools and data for managers and policy-makers, there are a few main questions in science (both natural and social) that should be asked, such as '*so what*' and '*what if*' there is a need to relate the findings to problem-orientated research. While some of the projects did tackle these questions, many did not. Despite this, there have been many interesting findings, as described by the principal investigators, but this is not the same as relevant science, hence the need to constantly be aware of producing scientific findings as '*nice to know*' as opposed to '*need to know*' and to constantly review whether the science is '*fit for purpose*'.

The outcome of the projects highlights that natural and social scientists are working at different spatial and temporal scales and that installing a constructive dialogue between the two disciplines might take time, beyond the programme's duration. The projects show the importance of deriving conceptual and numerical models as a means to understand and tackle environmental problems and some of them have produced tools for end-users, such as indices of change, ecological-quality indicators for implementing EU Directives and models for use in decision-support systems. The modelling will allow scenario testing relating to policies, for example on the nutrient controls in catchments. It is pleasing that, even at this early stage, some of the research has already informed nature conservation and water management policies. In addition, BIREME has given a platform on which the ERA-NET project BONUS can be developed. However, the lack of breadth in many projects and in the linking between projects shows that environmental economics, environmental law and governance, environmental technology and environmental history and sociology need to be actively encouraged in Finland as in most countries. In particular, the evaluation showed the need for scientists and science managers to understand that multidisciplinary studies are not the same as interdisciplinary studies.

While the projects studied some of the problems of immediate interest within the Baltic, there was very little inclusion of studies on external forcing factors that may be regarded as '*unmanaged exogenic pressures*', such as climate change and large-scale events; for example, the North Atlantic oscillation that will influence the changes observed and for which the consequences rather than the causes have to be managed at the spatial and temporal scales covered. The programme also showed the need for philosophical discussions, such as on what is required of the Baltic; for example, does society want a pristine system or merely a system '*fit for purpose*' (after defining this/these purpose(s))? It also showed the need to put environmental aspects in context and constantly indicate the international nature of the environmental problem, hence the importance of dialogue with Russian scientists and managers. Despite this, the research has to show what directions are required for the advancement of Finnish Baltic science.

Programme impacts

The evaluation took place while some projects were continuing, because of delays and personnel difficulties, so it is difficult to determine to what extent the programme had an impact within, for and on the user community. Similarly, the application of the research findings will take a while to filter through to the user community, hence

there will be a need to evaluate its impact several years after the end of the programme.

3.3.3 Success of the implementation of the programme goals and objectives

Agreement with the objectives of the research programme

The programme had the very broad and challenging objective (given above) of deepening the science and so, of course, while it is easy to observe that this objective has been met, it is not clear to what extent. Similarly, the Programme Memorandum stated certain goals for the programme, here termed programme deliverables, but it is also difficult to indicate conclusively that these have been met. Hence, the Academy of Finland should ensure that in the future its programmes have rigorous and measurable objectives.

The programme implies that the science has to be of benefit for the user community, although, again, this is not explicit. In this, there is always the dichotomy that academic scientists are more concerned with bottom-up processes, such as the biogeochemical cycles influencing nutrient uptake and retention, whereas managers and policy-makers are concerned with top-down responses and impacts on the human system. The latter include environmental responses to policies, large-scale ecosystem effects (such as toxic blooms) and effects on top predators and charismatic megafauna such as cetaceans and seals.

Functioning of the programme

The programme functioned as a collection of projects, but it is still too early to evaluate whether these will be regarded as being combined to form a coherent programme. Annual meetings between partners were organised and attended by all participants, thus giving the participants and the coordinators the chance to understand interlinks between the various projects and increase networking and collaboration. The programme coordination was subject to personnel changes, both as regards Programme Manager and in the composition of the Steering Group. It is noted that the present and previous Programme Managers have a different style and approach to management and it is commendable that the Programme Manager managed to attend meetings to gain an insight into all ongoing projects. However, it is considered that there was not an opportunity or a mechanism to reformulate or redirect the projects or the programme once started.

Added value

The evaluation has firmly indicated that the programme has generated a large amount of added value, which would not have occurred had BIREME not been created. It provided funding for Baltic science and produced a large amount of research that would not otherwise have been accomplished. Much of the research, as is expected, was a continuation of themes developed by the principal investigators prior to the programme. The programme gave a boost for new collaboration and improved the knowledge of natural and societal scientists. Also, it gave the impetus for the EU-

funded ERA-NET BONUS and enables the BIREME community to take the lead in this new programme.

It is notable that BIREME complemented funding from other sources, increased local, national and international contacts and acted as the catalyst for new research collaboration that is likely to continue after the end of the programme. Other tangible benefits include the production of databases and the coupling of models and, more specifically, the transfer of techniques, approaches and knowledge from the watershed to the coastal areas of the Baltic Sea. These connections are vital to implement an integrated management of the marine area.

The provision of funds to allow young researchers to attend national and international meetings has been especially worthwhile. The programme has led to the training of young researchers by arranging several one-day training workshops (on ethics, interdisciplinary approach and science communication). However, many young researchers considered that these were not sufficient and that workshops should be mandatory, made longer and repeated. For example, intensive one-week courses twice a year and covering skills-based training for young researchers would be better than one-day meetings. However, it is acknowledged that the short duration of the programme could limit this degree of contact.

The programme allowed contact between young and experienced researchers, and between these and administrators and policy-makers. This occurred within the individual projects and via the workshops devoted to particular themes and the annual symposia. The evaluation showed the importance of wider links to key funders, public and private, even giving the chance to build on new initiatives, for example the Carlson Foundation in Sweden, therefore reaching beyond the initial programme borders. However, all the researchers would have benefited from greater contacts with policy-makers and funding bodies.

The marine science and management community in Finland is relatively small, which makes it easier for scientists to have a formal and informal influence on policy. It is apparent that many of the key researchers and science administrators have a wide set of contacts, which gives an opportunity for BIREME benefits to be disseminated informally as well as other initiatives to be brought into BIREME. However, despite the programme, it appears that there are few scientists either interested in or willing to engage with environmental policy-makers.

Interdisciplinarity, multidisciplinary and cross-disciplinarity

Several of the projects gave an opportunity to carry out research additional to that which had been supported either by the Academy of Finland or by other bodies. Although the funding in BIREME was limited, it allowed synergisms and contacts to other sources and to stakeholders with an interest in understanding the Baltic. It also gave a chance for links between catchment and coast, social and natural sciences, etc.

Both the Academy of Finland and the Programme Memorandum as initially defined had admirable pluridisciplinary research intentions, but it is considered that in many cases these were not followed through. For example, there were few selected projects outside the natural sciences and it appears that it was not the Academy's policy to be more proactive in stimulating such projects. For example, projects evaluated as poor, based on scientific excellence, could have been rewritten or

benefited from outside collaboration to bring social sciences into the field, even if the required expertise was not available in Finland. Of course, the BIREME projects were selected according to the Academy's prime criterion of excellence in science but, with hindsight and to achieve a greater range of projects reflecting research into social, economic, policy and governance issues, perhaps additional and/or different criteria should have been used. For example, relevance to problem solving could have been given a higher weighting in projects meeting a certain threshold of scientific excellence. Despite this, the panel recognises that interest in interdisciplinarity in environmental fields is relatively new and was less well-developed at the start of the programme than it is now.

As mentioned above, much of the research within the programme has been a continuation of ongoing projects, as often occurs when large programmes are inviting new projects. Well-established research institutions have the advantage of being able to extend existing programmes or start new ones more easily than scattered, less established research communities. This is to be expected and is not necessarily a drawback, but new, independent and maybe even fundamental transdisciplinary research will not easily be incorporated. This, therefore, should be given special attention and support if such an aim should be achieved.

The interviews showed that the perception of interdisciplinarity differs with discipline – e.g. molecular biologists regard this as links with ecologists whereas in the programme context it should be taken as links between social and economic aspects with natural sciences. The programme has in some areas provided a catalyst for interdisciplinarity, but this trend was limited.

Programme management and coordination

Programme management and coordination was carried out by the Programme Manager and the Steering Group. It is recognised that the coordination has been effective, but it is emphasised that the coordinator of any programme as large as this has to be given the time to concentrate on it rather than expending too much time on other tasks. As examples, perhaps more attention could have been given to the needs of PhD students, who would have benefited from more activities and training, and it would be valuable if the coordinator's term could be extended in order to support e.g. the dissemination of the programme results to a wider audience.

The Steering Group represented a large body of expertise and influence as it consisted of the Research Council for Biosciences and Environment (Academy of Finland), the Research Council for Culture and Society (Academy of Finland), the Ministry of Transport and Communications, the Ministry of Agriculture and Forestry, the Ministry of the Environment, the Maj and Tor Nessling Foundation and the Russian Foundation for Basic Research. The evaluation panel considered that the Steering Group played a key role during the evaluation procedure and at the end of the programme, but too small a role during the middle period where most activities took place. It did not appear to have a clear or sufficient steering, advisory, management or coordination role and as such the panel sees that the Steering Group needed to further define its mission and input. The essence of the Steering Group was to facilitate a two-way exchange between member organisations and the programme, but this was not achieved – while members may have disseminated BIREME

information to their own organisation, the converse did not occur. Furthermore, the functioning of the Steering Group was hampered by many personnel changes during the programme; this may have contributed to the panel's detection of a poor ownership of the programme. Because of this, the panel recommends that there should be an effort by the Academy of Finland to keep some permanent members of their Steering Group throughout programmes.

It is of note that the overall programme coordination was supplemented by the projects and consortia organising their own meetings, and that some had created their own steering committees. The communication between those participating in the programme has been thorough and has included the production of monthly newsletters, annual newsletters, and annual coordination reports, and the arrangement of numerous workshops, seminars and consortium meetings.

3.3.4 Contribution to researcher and expert training

As indicated above, the projects had some excellent examples of training in techniques and approaches for young researchers, including exchanges to broaden their technical skills in the research fields. However, this experience was not uniform across the projects. The Academy of Finland contributed to researcher training by providing several workshops for young researchers, but the workshops were not attended by all, were not necessarily arranged in a form and language suitable to all and were not of sufficient frequency or duration. Despite this, it was particularly pleasing that the final symposium showed the skills of young researchers in presenting their work.

However, the evaluation questions whether the Academy of Finland in particular and the Finnish PhD system in general is providing young researchers wide training in Personal Transferable Skills (PTS). These are required to increase their employability and their competence as researchers and to stop students from relying only on skills passed on from their supervisors. Furthermore, the evaluation panel has an impression that, in comparison to other countries, Finnish PhD students have a rather insufficient and unstable financial situation.

The programme has facilitated a large number of PhD theses, although many of these had been started before the programme and several will be finished after the programme (as of early 2006, 16 PhDs were completed, with a further 22 expected to be finished by the end of 2008). In general, students had a positive view of being part of the BIREME Programme and considered that their participation in BIREME events has very much broadened their views on different aspects of environmental science. However, there appeared to be insufficient international contacts to allow students to prepare for postdoctoral opportunities abroad. There have been a larger number of MSc theses linked to the programme, although it is noted that these were not funded by the programme, but have only arisen where the principal investigators have recruited them as technicians who then register for a Master's degree.

3.3.5 Collaboration and networking

While there were good examples of collaboration within the project clusters, and in some cases between the clusters, the degree of collaboration across the whole programme was limited. Despite this, it is pleasing that the programme has given the

impetus for groups to work together, within geographical locations, and sometimes even within the same institution, and across Finland. Researchers suggested that it was not possible to answer all the questions proposed (a reflection of the over-ambitious nature of the programme) and that cooperation was not as expansive as hoped for (a reflection of the time constraints), but that the programme represented an improvement on the previous situation.

There were some notable examples of synergisms, including the use of equipment and infrastructure. The added value from collaborations included sharing cruises and fieldwork, with the latter relying on support from the Finnish Institute for Marine Research. Some of the projects have involved international contributions such as incorporating overseas workers into project steering committees and having wider discussions. Collaboration with end-users has been minimal in most projects, although there are some good examples of this, especially regarding project leaders. Notable here is the meeting with politicians and environmental managers, including the input from HELCOM. Young researchers, however, have had minimal contact with end-users.

As shown in Table 1, there has been a large amount of attendance at internally and externally organised workshops, conferences and symposia, and much of this has resulted from the funding provided. It is pleasing to note that graduate researchers have been given better opportunity to travel and network thanks to BIREME. This is an example of a scientific achievement as well as of increasing collaboration.

There has been good international cooperation, such as that initiated with Russia, the implementation of BONUS and collaboration with MARE (Marine Research on Eutrophication, Swedish Programme) for the AMBIO special issue.

3.3.6 Applicability of research and importance to the users

Dissemination of results

While it may be too early in the publishing cycle to fully indicate the number and influence of any publications and the influence of the results on policy-makers, the results have been disseminated at local, regional, national and international levels and via formal and informal channels. The most notable attempt to disseminate results as a means of informing policy was the parliamentary and policy workshop, “*What is going to happen to the Baltic Sea – scientist’s diagnosis*”, on 14 February 2006. It is particularly impressive that the meeting attracted a large audience, including the project leaders, but especially notable is that the Minister of the Environment, Mr Jan-Erik Enestam, chaired the meeting and that civil servants were also present.

There has been good media coverage as is expected of a high profile topic such as research into the state of the Baltic Sea, although it is noted that not all researchers are equally comfortable, enthusiastic or prepared to present their work to a non-scientific audience. It is pleasing to note that there was good media coverage, even of field sampling, and other examples of engaging with the public. It is also pleasing that some of the information has been sent out to policy-makers and that the data and databases produced by the programme are incorporated into those maintained and used by HELCOM.

There are plans, and high hopes, for a special issue of the journal *Ambio* that, in common with the aims of the programme, has an international dimension in linking with the Swedish Programme MARE. The draft list of content indicates that this issue will have a wide selection of formal research papers resulting from the programme. Its main value, however – and thus an indication that the programme has met its aims – will follow from the editors and contributors including chapters synthesising the main findings of the work for decision-makers. Given that the latter do not always read scientific journals, it is suggested that the Steering Group should consider producing a short, illustrated summary of the programme results, relevant in content and style to a wider community and the public. It is hoped that the publication will form a synthesis and basis for the forthcoming BONUS programme.

The programme has led to formal scientific dissemination such as national and international peer-reviewed publications. An impressive number of publications have already appeared or are in press or in preparation (see Table 1). Some of the earlier publications will have been based on work prior to the programme launch, but it is possible that they received a final impetus from the programme. Similarly, a wide range of presentations has been given to national and international audiences both by senior scientists and young researchers (see Table 1).

The programme has shown that there is a need for the translation of data into information and it has also provided a reminder that environmental managers have to take decisions in the light of poor information or even no data. The programme indicated the nature of the challenge as it needed to coordinate science and scientists and provide information and data to manage the natural and social environment. However, in attempting to discern the extent to which the programme has fulfilled its main aim, the panel questions whether the Baltic science community has sufficiently summarised the present state of knowledge, i.e. what is known must be assessed in order to determine what is not known. This is an important prerequisite to defining what science is required. Despite this, thanks to BIREME, an increasing number of workers, and especially young scientists, now realise the complexity of the natural and human system. This emphasises the need to create a framework where scientists reach beyond their borders in geography, discipline and thought, and learn from different areas. It is of note that the extremely valuable final symposium presented the results of several projects, although it still demonstrated the need to engage more fully with the end-user community.

4 CONCLUSIONS AND RECOMMENDATIONS FOR THE FUTURE

Conclusions

- Scientific quality of the research and researchers – the prime criterion of excellence in research has been met, although it is too early in the publishing cycle to gauge the quality of the papers that will result from the programme.
- Structure – the evaluation questions whether BIREME has created a programme or

merely a theme, in that a programme should not only include a collection of projects on a single topic, but they should be managed to be linked together and summarised or synthesised for wider value. The panel considers that the programme was designed as subject-orientated rather than problem-orientated – the subject being to increase the knowledge of the Baltic Sea ecosystem. The problem to be addressed might have been for example ‘What are the possibilities and barriers to the improvement of the state and function of the Baltic Sea?’

- Objectives – the objective as defined by the programme, ‘*to deepen the understanding...*’ has been met. However, the Academy of Finland should realise that it is difficult to determine whether an objective has been achieved if that objective is not fully defined in quantitative terms. For example, objectives have to be SMART (Specific, Measurable, Appropriate/Achievable/Attainable, Relevant/Realistic/Results-focused, Timely/Time-bound) against which the deliverables can then be measured.
- Outputs, Networking and Dissemination – there is an impressive list of published papers, seminars and workshops attended.
- Future research – BIREME has contributed to the preparation of the BONUS ERA-NET project, which will be both geographically and conceptually broad. BIREME scientists are now in a good position to take the lead in this project.
- Training – formal training on Personal Transferable Skills for young researchers was lacking, but was good for technical skills; even senior scientists indicated the value in broadening their competences and outlook. However, the programme was too short for PhD achievement. There was no real network of young researchers, which should be a prerequisite for implementing the interdisciplinarity needed for tackling environmental problems. Hence, the transfer of interdisciplinary skills to young researchers has not been achieved.
- Interdisciplinary research – this was lacking in many projects and even where it occurred, the projects were multidisciplinary rather than interdisciplinary. However, there were a number of promising projects linking natural and societal science as well as good examples of synergies between adjacent disciplines. These projects also demonstrated that true integration and interdisciplinarity is a slow process and will take additional time to be achieved.
- Use of existing information – there were good examples where projects have collated and synthesised information and data from different sources. There were problems, however, in the timing of obtaining the data among the different projects and also in the availability of the data, for example, in that some projects cannot use it until it has been published by other PhD students.

Examples of new, innovative research:

- Research on historical changes includes palaeontological reconstruction of signals and aspects of the history of the Baltic Sea, of how nature has affected humans and how humans have used, affected and perceived nature. The study of links between anthropogenic changes and natural environmental changes still has to be encouraged, despite this being somewhat overestimated in the self-evaluation report.

- Development of models and other analytical tools – there has been good development of both conceptual models and numerical models, and some of the latter have already been used in scenario testing. However, the development and use of numerical models has been hampered, because the time span of the projects was so short that the treatment of data for model development or calibration could not always be achieved. In essence, data collection was required in sufficient time to allow the models to be used later. Within a programme such as this, there is a need for opportunities to link natural science models with socio-economic models.
- Synergistic and efficient use of resources – the programme allowed the joint use of large equipment (such as ships). This is the only example the panel has seen from the information package it received, but there may be further examples such as the transfer and intercalibration of models.
- Promoting international collaboration – there were a few examples of young researchers going to laboratories abroad in order to learn techniques, and there were also examples of international collaboration on BIREME projects (e.g. Russia, Sweden, Norway, Denmark). There are many examples of work being presented at international fora. BIREME has also allowed the preparation of applications to international programmes both at a Baltic scale, e.g. BONUS, and as EU-integrated projects.

Recommendations

Science

- Given the aims and background, social and economical aspects should be considered at the onset of the programme and embedded throughout all areas.
- For interdisciplinary/multidisciplinary projects to be successful, they have to be problem-orientated.
- The programme encountered difficulties and delays in making data available between projects. Protocols for sharing data (i.e. data policy) are required but these face the difficulty of getting data from PhDs due to timing. It is important to demonstrate that data from one project is useful for others.
- The time scale for the programme was too short, firstly, to achieve the required interdisciplinarity needed to address environmental questions and, secondly, to allow Finnish PhDs to be completed within the set time. A longer time is needed, because interdisciplinarity requires time to find a common language.
- There is a need to find a way of further synchronising projects and allowing a synthesis that has to follow the publishing of the primary information.
- The Academy of Finland should find a mechanism to fund an additional year for data analysis and to produce a synthesis that will identify and use all the instruments (ecological indicators, numerical models, etc.) that have been developed for addressing questions related to the four BIREME environmental issues. This synthesis should identify the possibilities of and barriers to improvement of the state of the Baltic Sea, for example to build on the interdisciplinary modelling and scenario testing in BIREME.

Structure and coordination

- There is a need to have the objectives much more well-defined as a programme, so that an evaluation can determine if these have been met and if the funding has given value for money.
- The Academy of Finland needs to determine how programmes can overcome the lack of stability encountered in BIREME, where there were numerous changes in the composition of the Steering Group.
- The Steering Group had the main role in the beginning in defining the programme and in the end in disseminating information, but apparently only a small role in between. In the future, there should be a true Steering Group that could direct the programme throughout its life span; project leaders principal investigators on the Steering Committee would be valuable.
- It is of note that the science community has high hopes for BONUS, which will give a large benefit in being spatially (geographically) as well as conceptually broad. This will require greater management and coordination across disciplines and countries, although BIREME has enabled Finland to take the lead in BONUS.
- Future programmes should include a measure of relevance (in addition to scientific excellence) in the initial project evaluation, when the Academy of Finland has specific aims for applied results.

Training and researcher development

- There is a need for a more proactive approach to the training of students towards interdisciplinarity and aspects of policy-making. While the workshops organised by the Academy of Finland during BIREME for young researchers have been worthwhile, these need to be expanded in content, duration and frequency.
- As project leaders are generally running more than one project, there should be a clear indication of PI contribution in person-months at the beginning of the projects. Further support could come via granting of sabbaticals or postdoctoral support to the project leader to assist him/her in running the project and in training PhD students.
- The programme could encourage the employment of MSc students as technical assistants.

Application of outputs

- If BIREME is to be a true, integrated programme, it needs a facility for providing a synthesis; hence, there is a need for one project (or work package) in the programme to produce the synthesis of the findings.
- Exchange of data – there is a need for data sharing agreement within the programme and also within Finland and internationally; this can be achieved via more links with HELCOM.
- While the coordination reports are very worthwhile, they are descriptive, in that they indicate the tangible outputs and decisions. They need to be evaluative as well.

- It would be beneficial for the Steering Group to produce an annual report. The Group should also consider producing a short, illustrated summary of the programme relevant in content and style to a wider user community.
- The panel strongly emphasises that there is a need for a small group of key players to produce a synthesis of the programme's results and, in doing so, to rigorously assess whether all projects carried out under BIREME are required for that synthesis.

ANNEX 1a: The assignment

Evaluation of the Baltic Sea Research Programme (BIREME)

The Academy of Finland has launched the evaluation process of the Baltic Sea Research Programme. The scientific evaluation of the programme will be carried out by an international evaluation panel. The members of the evaluation panel are Professor Mike Elliott from the University of Hull, UK, (Chairman), Professor Christiane Lancelot from Université Libre de Bruxelles, Belgium, (Vice Chairman), Professor Peder Agger from the University of Roskilde, Denmark and Professor Marta Estrada from the Institute of Marine Science, ICM, Spain. With this assignment we, on behalf of the Academy of Finland, confirm your membership in the evaluation panel of the Baltic Sea Research Programme.

The objective of the evaluation is to estimate to which degree the BIREME research programme has succeeded in fulfilling the objectives originally set for it in the Programme Memorandum. Of specific interest are the programmatic approach, added value and programme impacts, interdisciplinarity, applicability of research, networking and dissemination of results.

In the evaluation report, the panel is expected to assess the programme as a whole and reflect especially on the following issues:

1. Planning of the research programme
 - Preparation of the programme and planning of the contents of the programme
 - Research projects funded and funding decisions in creating the necessary preconditions for the programme
2. Scientific quality of BIREME
 - Scientific quality and innovativeness of the research
 - Scientific competence of the consortia
 - Contribution to the deepening of understanding of conditions for science-based management of environmental issues in the Baltic Sea.
3. Success of the implementation of the programme goals and objectives
 - Concordance with the objectives of the research programme
 - Functioning of the programme
 - Added value of the programme
 - Contribution to enhancing inter- and multidisciplinary in research
 - Scientific and administrative co-ordination
4. Contribution to researcher and expert training
5. Collaboration and networking
 - Collaboration within the programme
 - Collaboration with other Finnish groups
 - International co-operation
 - Collaboration with the end users

6. Applicability of research and importance to the users
 - Contribution to promoting the applicability of research results
 - Relevance and importance to the users
 - National and international impact of the programme
7. Recommendations for the future (including the justification for the recommendations)

The time and place for the panel work have been decided to be 18-20 September in Helsinki at the Academy of Finland, Vilhonvuorenkatu 6. The preliminary schedule for the panel is as follows:

- | | |
|-------------------|---|
| * 17 September | Arrival in Helsinki |
| * 17 September | Get-together dinner at 7.30 pm |
| * 18–20 September | Panel meeting at the Academy of Finland |
| * 20 September | Departure from Helsinki - late flights, after 6 pm or |
| * 21–22 September | BIREME Final Symposium |

The work will include examination of the reports, self-evaluation assessments, publications and other products of the programme and discussions with the Programme Steering Committee, key stakeholders, researchers, and programme coordination during the panel's meeting. There will also be periods reserved for the intensive work of the panel including the preparation and drafting of the evaluation report. Technical assistance will be provided during the visit.

Further details of the meeting will be sent to you later.

Tuula Aarnio
Programme Manager
Academy of Finland

ANNEX 1b: Material for the Evaluation

Additional material only in the disc indicated in Italics

Background and introduction

Research Funding and Expertise
Scientific Research in Finland (summary)
Annual Reports (2004 and 2005)
Research in Finland (2005)
Academy of Finland International Strategy
Academy of Finland Research Programme Strategy
Evaluation Reports (Fibre, Figure, Sunare, Terve)
ProAcademia (2/2005, 1/2006 –in both issues also a Baltic Sea Research article)

An assignment letter

Assignment letter

Planning and Launching

Lists of all applicants	1 st phase/2 nd phase/Finnish-Russian
Call for proposals of collaborative Russian-Finnish projects	
List of funded projects	In the BIREME website annual updates of the progress of the projects
Programme memorandum (BIREME)	The Call text

(Research proposals Application form/Research plan)
(Cover letter for applications sent to the evaluators)
(Proposal evaluation form 2002)

Compilations and summaries

BIREME step by step summary
Description of project progress, a summary
Publications in BIREME groups, a summary
Self-evaluation summary report (project leaders)
Summary BIREME Networking (table)
Summary BIREME Products (table)
Summary BIREME Resources (table)
Co-ordinator reports
Co-ordination self-evaluations
Self-evaluation summary report (students)

Events in English

Programmes (*Participants/Abstracts*)

Events in Finnish

Summary list and short descriptions

Communication & dissemination

AMBIO Special Issue 2007	Planned draft content
BIREME Publication	The importance of personal research networks in the production and dissemination of environmental research knowledge (M. Otronen)
NewsLetters	2003/2004/2005
Posters	Poster exhibition on the road (5 posters)
Vesitalous 2/2006	Description
Special Issue	

(Articles in ProAcademia)

(BIREME News – June 2004 – ca monthly e-mail communication)

(Press Releases in English)

Self-evaluation Form

(BIREME selected publications) Electronic articles by author

PhD hardcopies by request

(Self-evaluation FORMS 1 *Original filled forms)*

Project Leaders

(Self-evaluation FORMS *Original filled forms)*

2 Students

Working Groups

(Steering group memos in English 2004 –)

(Steering group appointment *Definition of responsibilities)*
letter

(Ad-hoc working groups *Project Leaders/Parliament seminar/
AMBIO editorial board)*

BONUS

Brochure

Publication 1 BONUS ERA-NET 2004-2007

Publication 2 The joint Baltic Sea Research Programme – Best Practice, possibilities and barriers

Publication 3 BONUS Publication Baltic Sea Research and R&D Funding in 2004

BONUS 169 in a nutshell

BONUS Newsletter 1/2006

ANNEX 2: BIREME Evaluation Panel

Short biographies

Chair

Professor Mike Elliot

Institute of Estuarine & Coastal Studies
& Department of Biological Sciences
University of Hull
UK

Mike Elliott, Professor of Estuarine & Coastal Sciences and Director of the Institute of Estuarine & Coastal Studies (IECS) at the University of Hull. He has co-authored and/or edited 6 books on estuarine and coastal aspects including *The Estuarine Ecosystem: ecology, threats & management* (with DS McLusky 2004, OUP) as well as more than 100 international peer-reviewed scientific articles and numerous unpublished reports. A marine biologist by background, he was formerly the Senior Marine Biologist of the Forth River Purification Board (Scotland). His main fields of research are on the structure and functioning of estuarine and coastal biological communities in relation to human activities and on the responses by society to the effects of those activities. He has been a member of many national and international working groups and review panels connected with higher education, research and policy in the estuarine and marine fields. He has been an advisor to government, statutory, industrial and other bodies and he is a visiting professor at Heriot-Watt and Napier Universities (Scotland) and the Universities of Aveiro and the Algarve (Portugal), Gent (Belgium) and Venice (Italy).

Vice chair

Professor Christiane Lancelot

ESA (Ecologie des Systemes Aquatiques)
Université Libre de Bruxelles
Belgium

Christiane Lancelot was born and raised in Brussels. She studied biochemistry at the 'Université Libre de Bruxelles (ULB)' where she completed in 1981 her PhD on North Sea Phytoplankton Ecology under the supervision of Prof. Roland Wollast. She now holds the position of Professor and Director of the Laboratory 'Ecologie des Systèmes Aquatiques' at ULB. Her research activity addresses the study and modelling of the response of marine ecosystems to climate and anthropogenic changes throughout the understanding of the interactions between plankton organisms and marine biogeochemical cycles (C, N, P, Si, Fe). Her research questions include the contribution of biological processes to air-ice-sea exchanges of CO₂ and DMS in the Southern Ocean as well as the response of coastal eutrophication and harmful algal blooms (e.g. *Phaeocystis*) to changing nutrient loads and climate in the North Sea. In this scope she has been involved in several national and international projects and

chaired and co-chaired international conferences such as the Gordon Research Conference on Polar Marine Science.

Members

Professor Peder Agger

Department of Environmental, Social and Spatial Change
Roskilde University
Denmark

Peder Agger, Professor of Environmental Planning: Biological Resources at Roskilde University Centre (RUC), Denmark. Originally he used to be a marine fishery biologist at Danish Fishery Research Institute, but since RUC was founded (in 1972) he has been teaching and researching at the Department of Environment, Society and Spatial Change, first within pollution-oriented planning, later in landscape ecological studies of the dynamics of agricultural landscapes in Denmark, and later again in nature conservation and nature policy. Over the years he has worked two years as consultant in third-world countries, and for seven years he was Head of Department, Monitoring Section at the National Forest and Nature Agency in Denmark. He has been an advisor to the government in the Danish Nature Conservancy Board and the Danish Nature Council and is now a member of the Ethical Council. Working at a very multidisciplinary department and cooperating with sociologists and geographers in research and teaching he has found special interests in inter-, cross- and transdisciplinary projects such as the ongoing process of establishing national parks in Denmark.

Professor Marta Estrada

Institut de Ciències del Mar, CMIMA (CSIC)
Barcelona, Catalunya
Spain

Marta Estrada, Research Professor (Profesora de Investigación) of the Consejo Superior de Investigaciones Científicas, (CSIC); Institut de Ciències del Mar, CMIMA, Barcelona, Spain. She has written numerous articles related to various aspects of biological oceanography; her main research field is phytoplankton ecology, including physical-biological interactions and the distribution of phytoplankton assemblages. She has directed research cruises in the Mediterranean and the Southern Ocean. Between 1995 and 1997, she was Director of the Institut de Ciències del Mar (CSIC), Barcelona and between 1997 and 2005 she was Head of the Department of Marine Biology of the Institute. She has been Principal Investigator of a number of Spanish projects and partnerships in EU research contracts and has served in numerous national and international committees and panels.

ANNEX 3: BIREME Steering Group

Steering Group 2002-2003

Chair

Professor Terttu Vartiainen, Research Council for Biosciences and Environment

Vice-chair

Professor Marja Järvelä, Research Council for Culture and Society

Members

Director General Lea Kauppi, Research Council for Biosciences and Environment

Professor Paavo Okko, Research Council for Culture and Society

Professor Juha Tuomi, Research Council for Biosciences and Environment

Senior Advisor Saara Jääskeläinen, Ministry of Transport and Communication

(with Senior Advisor Jaana Heikkinen as her deputy)

Senior Advisor Heikki Granholm (until mid-2002) and Elina Nikkola

(from mid-2003), Ministry of Agriculture and Forestry (with Researcher Marjaana Vainio-Mattila as his deputy)

Counsellor of International Affairs Tapani Kohonen from the Ministry of Environment (with Senior Advisor Eeva-Liisa Poutanen as his deputy)

Head of Research Laura Höijer, Maj and Tor Nessling Foundation

(with Attorney at law Jarmo Hirvonen as her deputy)

As a permanent expert member, chairman Heikki Simola, Finnish Association for Nature Conservation

Steering Group 2004 - 2006

Chair

Professor Juha Kämäri, Research Council for Biosciences and Environment

Vice-chair

Professori Liselotte Sundström, Research Council for Biosciences and Environment

Members

Head of Research Laura Höijer, Maj and Tor Nessling Foundation (on leave of absence March 2004 – March 2005) deputized by Dr. Sari Repka (with Attorney at law Jarmo Hirvonen as her deputy)

Counselor for International Affairs Tapani Kohonen, Ministry of the Environment (with senior advisor Eeva-Liisa Poutanen as his deputy)

Professor Anne Kovalainen, Research Council for Culture and Society

Senior Researcher Jyrki Luukkanen, Research Council for Biosciences and Environment

Senior advisor Raija Merivirta, Ministry of Transport and Communication (until February 2005), Raisa Valli (from February 2005) (with senior advisor Risto Saari as her deputy)

Senior advisor Elina Nikkola, Ministry of Agriculture and Forestry
(Senior advisor Jussi Laanikari as her deputy)
Directorate Head Valeryi D. Smirnov, Russian Foundation for Basic Research, Russia

As a permanent expert member, docent Heikki Simola, Finnish Association for
Nature Conservation

ANNEX 4: BIREME Subgroup

Members of the Research Programme Subgroup:

Professor Terttu Vartiainen (Chair)
Professor Marja Järvelä (Vice Chair)
Director General Lea Kauppi
Professor Paavo Okko
Professor Juha Tuomi

ANNEX 5: BIREME Research Projects and their funding

Eutrophication

Searching efficient protection strategies for the eutrophied GOF: the integrated use of experimental and modelling tools (SEGUE). Consortium led by Heikki Pitkänen.

1. Heikki Pitkänen, Finnish Environment Institute (84.000 €)
Searching Efficient Protection Strategies for the Eutrophied GOF: The Integrated Use of Experimental and Modelling Tools
2. Petri Ekholm, Finnish Environment Institute (206.840 €)
Catchment Nutrient Flows and Coastal Retention
3. Mirja Leivuori, Finnish Institute of Marine Research (228.309 €)
Factors Influencing Phosphorus and Silicon Binding in the Sediment
4. Jorma Kuparinen, University of Helsinki (203.520 €)
Nitrogen Fluxes at the Sediment-Water Interface

Nutrients from river basins - experimental and modelling approach (NUTRIBA). Consortium led by Martti Rask.

5. Martti Rask, Finnish Game and Fisheries Research Institute (88.450 €)
Nutrients from River Basins - Experimental and Modelling Approach
6. Lauri Arvola, University of Helsinki (274.670 €)
Pool Sizes, Turn-Over Rates, Transformation and Retention of Nutrients in Selected Water Bodies
7. Ilona Bärlund, Finnish Environment Institute (221.220 €)
Assessing Coastal Water Characteristics Using River Basin and Estuary Modelling
8. Pertti Martikainen, University of Kuopio (193.150 €)
Nitrogen and Greenhouse Gas Cycling in Rivers and Estuaries of the Bothnian Bay, The Baltic Sea (CoastGas)
9. Erik Bonsdorff, Åbo Akademi University (303.330 €)
Interpreting Baltic Coastal Marine Ecological Data for Environmental Decision Making (IMAGINE)
10. Atte Korhola, University of Helsinki (323.700 €)
Developing a Tool for Assessing Ecological Reference Conditions in the Coastal Zone of the Baltic Sea (DETECT)

11. Veijo Jormalainen, University of Turku (327.090 €)
Eutrophication and Biotic Regulation of Littoral Macroalgal Communities

Cyanobacteria research in the Baltic Sea: from Genetics to Open Sea Ecosystem Response (CYBER). Consortium led by Prof. Markku Viitasalo

12. Kaarina Sivonen, University of Helsinki (324.080 €)
Cyanobacterial and Microbial Communities in the Baltic Sea: Responses to Environmental Impacts

Fish Biology and Fisheries

13. Jaakko Erkinaro, Finnish Game and Fisheries Research Institute (300.000 €)
Baltic Salmon Action Plan in the Bothnian Bay Rivers: Interdisciplinary Modelling of the Evolving Salmon Stock and Socio-Economic Aspects

14. Mikko Nikinmaa, University of Turku (285.980 €)
Molecular Mechanisms of Early Mortality Syndrome (M74) in Baltic Salmon (*Salmo salar*)

Cyanobacteria research in the Baltic Sea: from Genetics to Open Sea Ecosystem Response (CYBER). Consortium led by Prof. Markku Viitasalo

15. Markku Viitasalo, Finnish Institute of Marine Research (334.720 €)
Trophic Interactions in the Baltic Sea: How are Zooplankton Communities and Commercially Important Fish

History and Governance

16. Simo Laakkonen, University of Helsinki (185.860 €)
The Sea and the Societies: Approaches to the Environmental History of the Baltic Sea

17. Marko Joas, Åbo Akademi University (310.550 €)
Governing a Common Sea (GOVCOM) Changing Modes of Governance in the Baltic Sea Region

Toxins

18. Juha Karjalainen, University of Jyväskylä (357.290 €)
Bioaccumulation of Dioxin-Like Organochlorines in Baltic Fish - Experimental and Modelling Approach (DIOXMODE)

19. Martin Romantschuk, University of Helsinki (154.000 €) & Boronin Alexander, Institute of Biochemistry and Physiology of Microorganisms, Russian Academy of Sciences (30.000 €)
Bioremediation of Oil Spills in the Coastal Region of the Baltic Sea

Winter

The role of Baltic Sea ice and biota in wintertime nutrient cycles and organic matter transformations and transfer (ICEMAT). Consortium led by Jorma Kuparinen

20. Jorma Kuparinen, University of Helsinki (163.010 €)
The Baltic Sea Ice Bacteria: The Community Structure and Role in Wintertime Biogeochemical Transformations
21. Harri Kuosa, University of Helsinki (183.550 €)
The Role of Baltic Sea Ice Biota in Carbon Cycling During Winter

Biodiversity

22. Erkki Korpimäki, University of Turku (250.000 €)
Human impacts on biodiversity in the Baltic Sea - invasion of an alien predator and return of a native top-predator
23. Erkki Leppäkoski, Åbo Akademi University (393.360 €)
Is the Biological Integrity of the Baltic Sea Threatened by Invasive Non-Native Species?
24. Risto Väinölä, University of Helsinki (145.670 €) & Petr Strelkov, St. Petersburg State University (30.000 €)
Dominant littoral invertebrates of North European marginal seas: dynamic genetic changes and their ecological consequences

ANNEX 6a: BIREME Research Programme evaluation Form 1

(To be filled by BIREME Project Leaders)

You are kindly asked to answer all the questions, even if negative, in order for us to be sure there are no omissions.

A summary technical report will be compiled based on the questionnaire.
NOTE well that all forms will be sent also to the evaluation panel members.

A. Description of the project

1) The organisation and structure of the project

Project title (and home page in the Internet, if applicable):

Consortium Yes No
Name

Person(s) in charge:

Name, position, organisation, gender, degree, year of birth

(COPY NEXT SECTION WHEN NEEDED)

Research personnel financed (fully/partly) by BIREME funding

Name, department and position, person months, gender, degree, year of degree, year of birth

In the section 'Position' the following titles should be used: professor, senior researcher, Post Doc, PhD student/MSc student, other (specify).

(COPY NEXT SECTION WHEN NEEDED)

Research personnel closely related to the BIREME project (but on other funding)

Name, department and position, gender, degree, year of degree, year of birth

2) The degrees completed in the project

Including all degrees

(COPY THIS SECTION WHEN NEEDED)

Name:

Basic degree:

Year of earning the above degree:

University and department (of basic degree):

Degree completed within **this project**:

Sex: Male Female

Major subject:

University:	Major subject:
Department:	
Year:	
Graduate school (if appropriate):	

3) The funding

Total BIREME funding (Euro) and who financed the project:

A) Funding from the Academy of Finland, Ministry of Environment, Ministry of Agriculture and Forestry, Ministry of Transport and Communication, Maj and Tor Nessing Foundation, Russian Foundation for Basic Research (by calendar year)

B) Other funding (and the name of the financier) (by calendar year)

Other funding for the project:

- a) Funding of the home institution (an estimate, including in-kind contribution¹) (Euro)
- b) Other external funding (such as university, other national funding, international funding, other)

¹ 'In-kind contribution' means an estimate of the monetary value of resources given in other form than money, for example, working time of the personnel.

	year	2003	2004	2005	2006
A) in Bireme					
B) other/specify	a)				
	b)				

4) The progress of the project and main results

Please describe the aims, the main scientific results and achievements, including the innovativeness (novelty) in comparison to other research in your field. (Max 3 pages)

5) Multi- and interdisciplinarity of the project

How did multi- and interdisciplinarity become concrete?

(Multidisciplinarity means that a given set of problems is analysed simultaneously from the vantage point of several different disciplines. Interdisciplinarity implies deeper integration: research will also borrow concepts, methods and perspectives from other disciplines.)

6) What, if any, changes were made to the original research plan?

How did the project follow the research plan and why the plan had to be changed?

7) Drawbacks

What factors, if any, hindered the planned progress of the project? Were the risks identified in the beginning of the project?

8) The national and international collaboration and networking of the project

Free text describing your networking. Please, specify the nature of collaboration and type of collaboration partners. Specify if the networking have resulted in co-publication or other documented output.

Did the BIREME programme bring about co-operation, which you would not have had without this funding?

Do you have collaboration with other BIREME projects, and what is the level of collaboration? Is this collaboration old, or brought about by BIREME?

The following forms should be used in describing the activities, which have been relevant in the networking of the researchers. 'Other activities' can include things like a working group or an evaluation task, etc.

(COPY THIS SECTION WHEN NEEDED)

Seminar/congress ATTENDED

Title:

Organiser(s):

Time:

Participant(s) from the project:

Activity, authors and title (paper, poster, chairmanship, other):

Place:

(COPY THIS SECTION WHEN NEEDED)

Seminar/congress ORGANIZED BY THE PROJECT

Title:

Organiser(s):

Time:

Participant(s) from the project:

Activity, authors and title (paper, poster, chairmanship, other):

Place:

(COPY THIS SECTION WHEN NEEDED)

National or international visits, duration of one week or longer

Type of visit (visiting researcher, teacher, etc):

Aim of the visit:

Host:

Time:

Participant(s) from the project:

(COPY THIS SECTION WHEN NEEDED)

National or international visits HOSTED BY THE PROJECT, duration of one week or longer

Type of visit (visiting researcher, teacher, etc):

Aim of the visit:

Visitor:

Time:

(COPY THIS SECTION WHEN NEEDED)

Other activity

Type of activity:

Aim of the activity:

Activity:

Place:

Participant(s) from the project:

9) The post graduate training of the personnel

How the post graduate training in the project was organized in general? What training did the researchers receive and who organised it? Were the researchers enrolled in a graduate school? If yes, which?

Researcher, name of the graduate school, postal address of the school

10) How did the project promote equality?

B. Self-evaluation of the project

Objectives of BIREME

- To deepen the understanding of conditions for science-based management of environmental issues in the Baltic Sea
- To enhance
 - inter – and multidisciplinary research
 - use of existing information
 - synergistic use of resources
 - researcher training
 - national and international cooperation

To what extent did you achieve your goals and objectives?

Excellently

Well

Satisfactorily

Poorly

To what extent did your project/activities contribute to the objectives of the Programme?

Added value of the consortium (when appropriate) – has working as a consortium advanced the research of your project? How?

How much of the research work has been carried out as team-work between the research groups (sub projects)?

The applicability of the research results – contribution to practice and decision making

How could your results be utilized and by whom? Identify possible end users. Have your research results been used? When, by whom?

Communication of the results

How did/does the project communicate with the end users? Specify these end users.

How does/did the project disseminate the results? Has your results of the BIREME-project been presented or published in any media outside the science community? If yes, what media and when? Who initiated the publicity?

How did the BIREME programme work as a whole compared to the objectives set for the programme?

Excellently

Well

Satisfactorily

Poorly

Were the goals relevant and achievable? Other comments.

Coordination and programme management

How did the co-ordination manage its task in trying to achieve the objectives?

Excellently

Well

Satisfactorily

Poorly

How did your project benefit from the coordination?

Which of the events organized by the coordinator you found useful and why?

How has your project and its researchers participated in the joint programme actions?

How has the participation been reflected in the work of your research group?

What kind of support would your project have required more from the coordination? What did the coordination fail to achieve? Other comments.

Funding

How essential was the BIREME funding for your research?

Very essential

Essential

Not very essential

Not at all important

Did the project receive the funding that was applied for?

Yes

No

Was the funding sufficient compared to the research plan?

Other effects of funding (positive/negative)

Did the research field gain any added value for having a programme compared to normal research grants? What about your project?

How, if at all the programme enhanced the development of the research area?

Which do you think were the most important gaps in the research area not covered by the BIREME Programme?

How beneficial the participation in the BIREME programme has been to your research if NOT considering the direct funding?

Very beneficial

Beneficial

Not very beneficial

What did you achieve that could not have been done without the BIREME funding?

Strengths and weaknesses

What are the inner strengths of the BIREME programme?

What were the weaknesses of the BIREME programme?

How could the BIREME programme have been improved?

Future

What are the future possibilities and plans of the research team after BIREME?

On terms of funding, completion of studies, employment of the personnel, etc.

In what form you anticipate the present national/international collaboration of your project to continue?

What new important research topics, if any, came up?

Recommendations for the future

How would you raise the level of research in your field in Finland

How would you compare the level of research in your field in Finland to other countries?

What are the greatest shortcomings, problem areas, and needs in your field of research?

Suggestions for improving future research programmes

Other comments

Appendices:

1. A full list of publications and other outcomes of the project (2003 –) presented as shown below.

Underline publications and other outcomes arising from funding granted by BIREME programme for this project.

Articles:

1. Scientific articles (reviewed)
2. Other scientific articles

3. Popular articles
 4. Submitted manuscripts (indicate status: submitted/accepted).
(Abstracts and manuscripts in preparation are not reported)
- Scientific reports
Books or book chapters
Academic theses
Patents
Television and radio programmes
Scientific awards
Other professional documented activities

2. An electronic version (preferably, if available) of key published scientific papers (Max of 10 papers/project).

3. One copy of PhD theses, or supervisor's assessment and schedule of the completion of each of the BIREME funded PhD student (in English)

**The form should be sent as an e-mail attachment by 28 April 2006 to
Tuula.Aarnio@aka.fi**

ANNEX 6b: BIREME Research Programme evaluation Form 2

To be filled by those who were/are employed by the BIREME projects - funded fully/partly

A summary technical report will be compiled based on the questionnaire.
NOTE well that all forms will be sent also to the evaluation panel members.

Self-evaluation of the research project and programme

Name of researcher:

Name of project:

Research field:

Period of work in the project:

EVALUATION CRITERIA

1. Goals and focus

1.1. What were the goals and focus of your work in the project?

1.2. To what extent did you achieve them?

Excellent

Well

Satisfactorily

Poorly

Explain:

2. Scientific standard

2.1. What are the new scientific results achieved by your part of the project?

2.2. Publications (published and to be published, year) connected to this project

Publications in scientific journals, as well as dissemination in any other media

a) National

b) International publications

2.3. Education

a) Did you or will you receive a university degree as a result of the project?

Yes

No

Which degree? MSc Licentiate PhD other, specify

b) How were you employed/will be employed after the project ended?

Academic research and teaching (same field)

Academic research and teaching (different field)

Other publicly financed research and development work

- Teaching outside university
- Administration work
- Other, specify
- No employment

c) How are you/have been engaged in non-academic work during or after the project?

- Have you employment outside Academia (specified above)?
- If not, have you been involved in consultancy work?
- Have you provided paid or unpaid advice to non-academic organizations?

If yes, to any above question

Specify the activity.

Have you applied in such work any of the knowledge or skills gained during the BIREME programme? Specify.

3. Co-operation

3.1. How has the project leader functioned?

- Excellentlly Well Satisfactorily Poorly

Comments:

3.2. How has the co-ordination of the programme functioned?

- Excellentlly Well Satisfactorily Poorly

Comments:

3.3. How have you participated in the joint programme activities?

3.4. How has the participation been reflected in your work?

3.5. Did the programme bring about co-operation with researchers from Finland/other countries (which) that you would not have had without this funding?

- Yes No

Specify:

3.6. What are the lessons learnt from the co-operation between teams from Finnish and other countries' research environments?

4. *Project funding*

4.1. Describe the project funding you received by calendar year from the following sources:

Funding source: year	2003	2004	2005	2006
BIREME programme				
University				
Other national funding				
(specify)				
Other international funding				
(specify)				

4.2. Was the funding made available to your part of the project appropriate in view of your research plan?

Yes

No

Comments:

5. *Strengths and weaknesses*

a) What were the inner strengths of the BIREME programme?

b) What were the weaknesses of the BIREME programme?

c) How could the BIREME programme have been improved?

6. *Recommendations for the future*

a) How would you raise the level of research in your field in Finland

b) How would you compare the level of research in your field in Finland to other countries?

c) What are the greatest shortcomings, problem areas, and needs in your field of research?

d) Suggestions for improving future research programmes

ANNEX 6c: BIREME Research Programme evaluation Form 3

Self-Evaluation of the coordination

The tasks of the Programme co-ordinator include:

- *To direct and to co-ordinate the Programme in collaboration with the Steering Group*
- *To monitor the progress of the Programme, to maintain contact with researchers, funders and end-users of research results*
- *To seek new initiatives and to plan future research programmes together with Research Councils*
- *To organize the call and application process of the programme*
- *To look for and negotiate about national and international funding collaboration*
- *To foster national and international networking of scientists*
- *To enhance information exchange and dissemination of the results*

Name of the co-ordinator:

Period appointed as a co-ordinator:

Programme

How did the BIREME programme work as a whole compared to the objectives set for the programme?

How did the co-ordination contribute to the Programme? Did you find the role of the co-ordination useful and why?

How did the coordinator managed the task of organizing the call and application process?

How did the coordinator monitor the progress of the programme and maintained contacts with researchers, funding organizations and end-users of research results?

How has the national and international funding collaboration taken place?

How has the co-ordinator enhanced national and international researcher collaboration?

How has the co-ordinator participated other programme development and planning work?

What did the co-ordination fail to achieve? Other comments.

Funding

Was the co-ordination funding sufficient compared to the tasks? Other comments.

Communication

How did the co-ordination enhance information exchange and dissemination of the results?

Collaboration

Was the participation of Steering Group in the management, in monitoring implementation, planning evaluations and promoting the utilisation of results sufficient. Other comments.

How beneficial has it been for the coordinator to work in the Academy instead working as a contractor outside the Academy?

Strengths and weaknesses

What were the inner strengths of the programme?

What were the weaknesses of the programme?

Suggestions for improving future research programmes

Other comments

ANNEX 7: Agenda for the BIREME Evaluation Panel meeting

Date: 18-20 September 2006

Place: Academy of Finland, Helsinki, Vilhonvuorenkatu 6

Sunday 17 September 2006

19:30 Get together Dinner

Monday 18 September 2006

08:20 Meeting in the lobby of the Hotel Vaakuna, going together to the Academy

08:45 Kick off of the panel meeting

- An introductions of panel members and the staff of the Academy

- An introduction of the Academy (coordinator)

- An introduction of the research programme evaluation (coordinator)

- Organization of the Panel work (Chair)

10:00–11:10 Interview Project Leaders Group 1

11:30–12:30 Interview Project Leaders Group 2

12:50–13:30 Lunch

13:40–14:40 Interview End-user 1

14:40–15:30 Interview Project Leaders Group 3

15:50–16:50 Interview End-user 2

16:50– Summary of day one

Drafting

Tuesday 19 September 2006

08:30 Meeting in the lobby of the Hotel Vaakuna, going together to the Academy

09:00-10:00 Interview BIREME Steering group
(Funders: Academy & Nessling Foundation)

10:20-11:20 Interview Project Leaders Group 4

11:40-12:40 Interview Students Group 1

12:50-13:30 Lunch

13:40-14:50 Interview Project Leaders Group 5

15:10-16:00 Interview Coordinators

16:20-17:20 Interview Students Group 2

17:20- Summary of day two

Drafting

19:30 Dinner hosted by the Nessling Foundation

Wednesday 20 September 2006

- 08:30 Meeting in the lobby of the Hotel Vaakuna, going together to the Academy
- 09:00–10:00 Interview End-users/Steering group (ministries, HELCOM)
- 10:20–11:30 Interview Project Leaders Group 6
- 11:50–13:00 Interview Project Leaders Group 7
- 13:00–14:00 Lunch
- 14:00–15:00 Interview Students Group 3
- 15:00– Summary of day three
Drafting of the evaluation report
Departure
or

21 – 22 September 2006 BIREME Final Symposium

There is coffee and snacks available during morning and afternoon.

The Baltic Sea Research Programme (BIREME) ran from 2003 to 2006 and was jointly funded by the Academy of Finland, the Ministry of the Environment, the Ministry of Agriculture and Forestry, the Ministry of Transport and Communications, the Maj and Tor Nessling Foundation and the Russian Foundation for Basic Research. The aim of the programme was to deepen understanding of the social, economic and ecological interactions between the drainage basin, the coastal regions and the open sea. The programme especially encouraged submission of multi- and interdisciplinary proposals.

After the closing of the programme, it was evaluated by an international expert panel. According to the panel, the programme achieved part of its goals well. The scientific quality of the research was high, the productivity was impressive and the objective to deepen understanding and knowledge of environmental issues was met.



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