

**EuroDEEP**

Ecosystem Functioning and Biodiversity  
in the Deep Sea



## The EuroDEEP Programme

The scientific goal of the EuroDEEP Programme is to further explore the deep-sea environment, to further describe the biological species and communities that inhabit it, and to better understand the physical and geochemical processes that shape the environment in which these communities live. The final goal is to describe, explain and predict variations of biodiversity within and between deep-sea habitats, their consequences for deep-sea ecosystem functioning and the interactions of the deep sea with the global biosphere. The resulting scientific data are a prerequisite for the sustainable use and the development of management and conservation options aiming at the sustainable use of marine resources that will benefit society as a whole.

EuroDEEP aims at the exploration and identification of the different deep-sea habitats, assessing both the abiotic and biotic processes that sustain and maintain deep-sea communities in order to interpret variations of biodiversity within and between deep-sea habitats and the interactions of the biota with the ecosystems in which they live.

EuroDEEP is a European Collaborative Research Programme (EUROCORES) in deep sea biodiversity science that brings together more than 25 research groups from 10 countries. After the Call for Proposals, the EuroDEEP programme has been launched in June 2007 and includes four international, multidisciplinary Collaborative Research Projects (CRPs) which were selected for funding, with a total budget of about 4 million Euros.

The EuroDEEP Programme fosters pan-European collaborative research, networking and training as well as dissemination of scientific results and activities developed in the framework of the Programme.

# List of funded Collaborative Research Projects (CRPs)

## **Biodiversity and ecosystem functioning in contrasting southern European deep-sea environments: from viruses to megafauna (BIOFUN)**

(MEC, CNR, NWO, FWO, IRCSET, CNRS)

The overall aim of BIOFUN is to characterise, through an ecosystemic approach, two deep-sea habitats – the mid-slope and abyssal plain – to understand the linkages between biodiversity patterns and ecosystem functioning in relation to environmental conditions along a trophic gradient, from Eastern Atlantic to the Western, Central and Eastern Mediterranean, enabling the simulation of their potential response to changing trophic conditions. This is the first project aiming at a complete investigation of the entire food web, from viruses and microbes to megafauna, including commercial species. Results gathered in this project will provide new and essential information for a correct management of the biodiversity and natural resources of the deep sea and for understanding the importance of these biological components on global biogeochemical cycles.

### **Project Leader:**

#### **Prof. Francisco Sardà Amills**

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### **Principal Investigators:**

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#### **Michael Türkay**

Senckenberg, Department of Marine Zoology, Germany

## Monitoring colonisation processes in chemosynthetic ecosystems (CHEMECO)

(CNRS, IFREMER, IRD, FCT)

The main objective of this project is to realise a multidisciplinary study of colonisation processes at several sites distributed in the European waters, from the Mediterranean sea to the Atlantic ocean and Nordic sea. The specific interest, first, relies on the establishment of pioneer microbial communities, the recruitment of metazoan larvae, the development of symbioses and their importance in the biodiversity and tropic structure of newly-established communities. A second aspect of this project is to assess the impact of metazoan colonisation on chemical exchanges and biogeochemical processes. These aims will be addressed through a unique combination of site surveys, replicate colonization experiments, comparison of natural and experimental organisms assemblages and in situ chemical monitoring with microsensors.

### Project Leader:

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### Principal Investigators:

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## Unravelling population connectivity for sustainable fisheries in the Deep Sea (DEECON)

(NRC, FCT, IRCSET)

In this project, the most modern methodologies for a multidisciplinary approach will be applied to unravel population structure and population connectivity in economically important deep-sea fishes. Specifically, microsatellite DNA, mtDNA and nuclear DNA sequence polymorphisms, and otolith microchemistry will be applied to detect population structure. Information on genetic differentiation and otolith microchemical parameters will be integrated with bathymetric data, life-history traits, and oceanographic models of ocean currents within a common statistical framework. Both GAM models and landscape genetic tools will be applied to unravel mechanisms for population connectivity, such as passive larval drift and active migration. On the basis of this mix of proven technologies and new approaches, new fundamental biological knowledge will be acquired that will be put forward for developing scientifically sound management plans for one of the world's most valuable ecosystems.

### Project Leader:

**Prof. Christian Stenseth**

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### Principal Investigators:

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University College Dublin, Dublin, Ireland

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University of the Azores, Horta, Portugal

### Associated Partner:

**Francis Neat**

Fisheries Research Services, Aberdeen, United Kingdom

## **Microbial diversity in the deepest hypersaline anoxic lakes (MIDDLE)**

(CNR, CNRS, NWO)

The deep-sea hypersaline anoxic lakes represent a special type of environments different from any known ecosystems and one of the last frontiers of the undiscovered biosphere that challenges the life science today. A number of very initial attempts to characterise the indigenous microbial consortia, gained valuable and promising background information on the presence of novel and unique pro- and eukaryotic organisms in these extreme environments. Up to date, none of them have ever been isolated and obtained in pure culture, thus, their metabolic features and their role within their natural ecosystems are still unknown. MIDDLE Project will concentrate for the first time on the comprehensive molecular biodiversity study of two DHAL environments, namely Discovery (pure bischofite) and L'Atalante - Urania (pure halite) as typical sites for different extreme environments (athalassic and thalassic, respectively). Further development of molecular techniques like metagenome and functional genomic is foreseen in the frame of MIDDLE to get inside of astonishing DHAL genomic pool and to mine for novel biologically active products of industrial and technological importance.

### **Project Leader:**

#### **Dr. Michail Yakimov**

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The aim of the European Collaborative Research (EUROCORES) Scheme is to enable researchers in different European countries to develop collaboration and scientific synergy in areas where European scale and scope are required to reach the critical mass necessary for top class science in a global context.

The scheme provides a flexible framework which allows national basic research funding and performing organisations to join forces to support excellent European research in and across all scientific areas.

The European Science Foundation (ESF) provides scientific coordination and support for networking activities of funded scientists currently through the EC FP6 Programme, under contract no. ERAS-CT-2003-980409. Research funding is provided by participating national organisations.

**[www.esf.org/eurocores](http://www.esf.org/eurocores)**

## THE FOLLOWING NATIONAL FUNDING ORGANISATIONS SUPPORT THE EuroDEEP PROGRAMME:

**Fonds voor Wetenschappelijk Onderzoek-  
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*National Centre for Scientific Research, France*

**Institut Français de Recherche pour  
l'Exploitation de la Mer (IFREMER)**

*French Research Institute for Exploitation  
of the Sea, France*

**Institut de Recherche pour  
le Développement (IRD)**

*National Institute for Development, France*

**Irish Research Council for Sciences,  
Engineering and Technology (IRCSET)**

*Ireland*

**Consiglio Nazionale delle Ricerche (CNR)**

*National Research Council, Italy*

**Nederlandse Organisatie voor  
Wetenschappelijk Onderzoek (NWO)**

*Netherlands Organisation for Scientific  
Research, Netherlands*

**Norges Forskningsråd (NFR)**

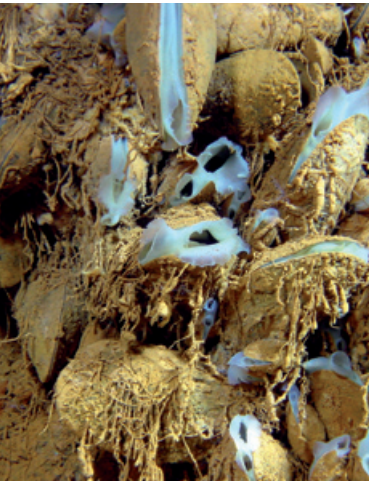
*Research Council of Norway, Norway*

**Fundação para a Ciência e a Tecnologia  
(FCT)**

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**Ministerio de Educación y Ciencia (MEC)**

*Ministry of Education and Science, Spain*



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Bathymodiolus from MAR.  
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