

## **SUPPLEMENTARY INFORMATION for the call for proposals with the deadline 2 June 2010**

Funding is available for the following application types: Researcher Project, Knowledge-building Project with User Involvement, Personal Overseas Research Grant, Personal Visiting Researcher Grant and Support for Events.

To ensure the highest possible quality of the research activities, project funding will be awarded on a competitive basis. Scientific merit is a requirement for all programme activities, and will be given priority as a criterion in the allocation of research grants. Grant applications will be submitted to external referee panels for scientific assessment. Grant applications will also be assessed in relation to the assessment criteria stipulated for the relevant application type ([www.forskningsradet.no/english](http://www.forskningsradet.no/english) >Apply for funding > Application information > Application types).

The Research Council administration and the HAVKYST programme board will assess the relevance of the grant proposal relative to the primary and secondary objectives of the programme and this call for proposals when ranking applications for funding. Assuming all other conditions and quality-related factors are equal, priority will be given to projects led by women project managers.

A total of NOK 17.5 million is available for allocation in 2011 under this call for proposals.

### **Language:**

The Norwegian-language call for proposals is the legally binding version. All grant applications are to be submitted in English.

### **General:**

- The programme board has defined priority research areas for the individual sub-programmes and cross-cutting activities encompassed by this call for proposals. Please refer to the descriptions of the priority research areas listed below and the HAVKYST work programme for further details relating to the sub-programmes. Grant applications for projects that do not lie within these areas will be rejected.
- Grant applications that do not fulfil the general requirements for the relevant application type and/or the requirements stipulated for this call for proposals will be rejected.
- The project description may not exceed the number of pages stipulated for the relevant application type. Please refer to the description of the application type for further details. Please note that the eSøknad electronic application submission system does not allow uploading of files that exceed the page total stipulated. The project description may be maximum 10 pages for Researcher Projects and Knowledge-building Projects with User Involvement and maximum five pages for Personal Overseas Research Grants, Personal Visiting Researcher Grants and Support for Events. The standard page format is A4, single spaced, with 2 cm margins and a 12 point font.
- The amount of funding sought must not exceed the amount available for the specific sub-programme. Applicants may not propose a low budget for the first year of the project with substantial budget increases in the subsequent years of the project period, unless this is a natural component of the project implementation.
- All grant applications must target a specific sub-programme. In cases where the proposed project is inter-disciplinary and of relevance to several sub-programmes, this

must be noted in the application form (under the item Additional information from applicant). Applicants are asked to select the sub-programme that best fits the project.

In response to increasing pressure relating to exploitation of the Arctic resources, focus will be placed on research on and within the Arctic region under the programme.

The programme will employ research projects and other activities to facilitate the optimal use of international funding instruments. International cooperation should be viewed in the context of the need for greater expertise in areas of national and international interest.

International exchange for both fellowship-holders and researchers alike is encouraged. The programme will provide support to cooperative projects within the EU framework provided these are successful in the competition for research funding under the programme.

## **Sub-programme I – Marine ecosystems (MAROKO)**

**Budget:** NOK 5 million is available for start-up of two to four new projects in 2011.

### ***Priority research areas:***

- **Operational ecosystem models**

This area focuses on the development of operational modelling systems for Norway's oceans and coastal areas.

In order to utilise new knowledge about ecosystems quantitatively – to predict how resources will develop under the influence of various climatic (bottom-up) or catch (top-down) scenarios – it will be necessary to develop data-driven, operational modelling systems for Norway's ocean areas. Similarly, in order to effectively manage resources it must be possible to predict the status over time of threatened, vulnerable or rare species and habitats, as well as the effects of any changes in species distribution. Modelling the likely occurrences of habitats, natural conditions and natural variations in these factors will require the development of habitat and ecosystem models for coastal areas.

These modelling systems will have to be equipped to combine information from the lower reaches of the systems (physical pressures) with data on the systems' top predators (catches by humans and predation by marine mammals and marine birds). The application of physical oceanographic and biological process understanding to the development of ecological models will provide new insight into the structure of important, large-scale marine ecosystems. Basic knowledge about light conditions in Norwegian waters, particularly in coastal areas, will help to maximise the usefulness of satellite data from the Arctic and will reveal more about the behaviour of marine organisms and alterations in light conditions resulting from climate change. This especially applies to species lower in the pelagic food web; too little is known about how microorganisms function together in a complex network and how they respond to change, as well as about the inherent genetic potential within this system. Such approaches will build upon well-established traditions in marine research that integrate multidisciplinary field research with modelling.

- **Characterisation of nature types**

This area focuses on generating knowledge about relationships between benthic geotopes and biotopes and identifying how fluxes of fluids and gases from the seabed affect the oceanic biosphere.

In recent years, the Norwegian Biodiversity Information Centre has been developing a new classification system for nature types in Norway. There is a need for more knowledge about how to define and describe marine nature types, and how they change over time and in response to the pressures exerted by pollution and climate change. Methods for cost-effective, representative mapping and monitoring of species and nature types with special needs for management (threatened species, stewardship species, conservation areas, areas under development) need to be developed. Methods and criteria are also needed for identifying and characterising the ecological conditions, critical thresholds and value of species and nature types, as well as conservation goals.

The seabed is the interface between the water column, sediments, sedimentary rocks and bedrock. Research on seabed habitats and the relationship between geotopes and biotopes in Norway's ocean areas is lacking. Geological processes lead to a continuous flux of fluids and gases to the water column, creating a potential basis for life for chemosynthetic organisms.

Other fluids and gases are natural sources of hydrocarbons, which are brought into the marine environment and contribute to “natural pollution”. These types of processes may comprise an important component of the ecosystems on and near the seabed.

### **Sub-programme II – Effects on ecosystems (OKOSYS)**

**Budget:** NOK 1.6 million is available for start-up of one to two new projects in 2011.

#### ***Priority research areas:***

- **Environmentally hazardous substances from contaminated landfills and sediments; clean-up operations and measures**

This area focuses on dispersal, accumulation and effects in Norway’s harbour and coastal areas.

Diffuse leaching of environmentally hazardous substances from landfills and contaminated sediments has prompted dietary cautions relating to the consumption of seafood from a number of Norwegian fjords and harbour areas. In order to provide reliable, research-based knowledge for decision-making on dietary cautions and other measures, more efforts are needed in this research field.

There is limited empirical knowledge about the progression of restitution processes in polluted marine areas where the discharge of hazardous substances is markedly reduced or has ceased altogether (after oil or chemical spills, clean-up of contaminated sediments and depots).

There is still a need to improve our understanding of the role of sediments as a secondary source of pollution and how this affects ecosystems. Too little is known about sediment transport and its significance as a source in dispersal, accumulation, and bioavailability of environmentally hazardous substances. There is a further need for more knowledge about how the bioavailability of substances such as TBT and PAHs varies with sediment characteristics.

- **Introduced species and diseases**

This area focuses on mapping the distribution of introduced species and diseases, and how these affect the flora and fauna of Norway’s oceans and coastal areas.

The introduction of alien organisms is considered the second-largest cause (after habitat destruction) of the dramatic reduction in diversity of earth’s species. Disease is another potential force in diminishing biological diversity.

The introduction of species from one ocean to another occurs primarily from ships taking on ballast water in a harbour and then releasing it elsewhere; species growing on ships’ hulls are also carried to new sites and spread. Alien species are in addition introduced for consumption (as with the American lobster) or production and other species may follow in their wake. A number of major algal blooms, which among other effects have caused serious losses in the aquaculture industry, are believed to be due to introduced algae transported in ballast water. There are suspicions that certain species have been deliberately released (moving the red king crab from Finnmark to more southerly locations, for instance).

It is important to prevent the introduction of alien species, map the distribution of species already introduced, and increase knowledge about how these species affect fauna and flora

along the coast. Timely discovery of an introduced species will facilitate the initiation of countermeasures to hinder its spread and limit its damaging effects.

There is a need for knowledge about diseases that attack and weaken both commercial and non-commercial species.

### **Sub-programme III – Long-term effects of discharges to the sea from petroleum-related activities (PROOFNY)**

**Budget:** NOK 6 million is available for start-up of three to five new projects in 2011.

This sub-programme focuses on increasing knowledge about the long-term effects of discharges to the sea from petroleum-related activities.

Knowledge in this field is crucial for enabling the authorities to manage the development of petroleum activities and to coordinate utilisation of petroleum resources with other usage and protection of the marine environment. It is essential that the overall impact on the marine environment does not lead to substantially negative effects on marine organisms.

Research projects that focus on results, knowledge and documentation of importance for society in general, and for the authorities and the petroleum industry in particular, are encouraged.

#### ***Priority research areas:***

- Effects of discharges from drilling on sponges and coral communities
- Development of an integrated ecosystem-based modelling system for assessing the effects/risk of discharges, with focus on upscaling from the individual (egg/larva/adult) to the population and ecosystem levels. The modelling system should encompass both plankton and fish.

This applies to:

- Operational discharges
- The Arctic region
- Acute discharges

### **Sub-programme IV – Management and resolution of conflicts (FORKON)**

**Budget:** NOK 3.2 million is available for start-up of two to three new projects in 2011.

#### ***Priority research areas:***

- **Effects of harvesting on marine resources and the environment**

This area focuses on generating knowledge about how the harvesting of marine resources can affect the development of these resources and ecosystems.

In Norway, the EU and other forums, ambitious goals have been set for the sustainable development of the oceans and coastal areas, integrated ecosystem-based management, conservation of biodiversity, and value creation. Still, too little is known about how to achieve these goals within current management systems, which are designed to deal with sector-specific areas.

It is necessary to employ models and provide national and international management advice based on quantitative process understanding of the factors regulating changes in recruitment, growth, migration and mortality of plankton, fish, marine birds and marine mammals (predator-prey interactions).

In addition to this, it is important to learn more about the effects of resource harvesting on biodiversity. Four main areas are of obvious interest in this respect: the effects of fisheries activity on 1) benthic habitats, 2) species that are taken as by-catch, 3) other species affected in the food chain, and 4) the genetic make-up of fish stocks.

Better understanding of the processes and dynamics of commercial and sports fishing is important to be able to define their effects on the ecosystem. Fisheries are in constant flux, and catch capacity exceeds the level needed to maintain sustainable harvesting of marine resources. New knowledge about the distribution of fish in time and space is vital for determining actual catch levels and other environmental impacts.

- **Management processes**

This area focuses on the need to expand the knowledge base for the development of good models and processes for integrated planning and management of marine resources, and management of area-based, nature-based and cultural resources in the coastal areas.

Norwegian fishermen possess a wealth of experience-based knowledge which is insufficiently drawn upon in the context of research activities. As an example, more extensive mapping and monitoring of coastal cod stocks is needed, which could be implemented in cooperation with fishermen and researchers.

Management processes and conflicts of interest must be viewed as part of the same whole. There is a need to analyse the relationship between expert and experience-based knowledge; the different types of knowledge should be shifted toward more wide-ranging marine management, including issues related to international policy, negotiating strategies and legal questions.

### **Sub-programme V – The basis for value creation (VERDI)**

**Budget:** NOK 1.6 million is available for start-up of one to two new projects in 2011.

#### ***Priority research areas:***

- **Less-exploited species and harvesting of species lower in the food chain**

This area focuses on generating better knowledge about harvesting species lower in the food chain.

There is significant potential associated with catching/harvesting organisms lower in the food chain. However, utilisation of species of lower trophic levels poses major management challenges and necessitates the development and refinement of models that can incorporate multiple trophic levels. Better models and methods for calculating a sustainable basis for harvest are needed, and criteria must be established for how to prioritise such harvesting at different trophic levels. Rational harvesting must be based on temporally and spatially specified models, refinement of harvesting technology, and greater understanding of critical input factors as well as existing and emerging markets. More detailed studies are needed to determine the ecological effects of harvesting at lower trophic levels and to generate a knowledge base for use in determining critical threshold limits for catch levels.

The aquaculture industry is expected to grow significantly in the near future, which means that the pressure on marine feedstuff resources will also grow. Unexploited marine resources of the magnitude needed to meet the aquaculture industry's feed requirements are found only at lower trophic levels. Harvesting further down the food chain has a number of ecological advantages, for instance that marine resources are harvested where production is greatest. It is also presumed that the content of organic pollutants that accumulate in the food chain will be lower. Yet there is still a lack of basic knowledge about production and the ecological ramifications of commercial fisheries for zooplankton and micronekton for species higher in the food chain. Commercial harvesting in Norwegian waters is dependent on knowledge of this type.

Bio-economic multistock modelling will be an important tool for clarifying whether harvesting will be profitable on the basis of the resource base, density, availability, catch costs and market conditions. Additionally, in keeping with the precautionary principle, the risks – allowing the plankton to become food for species at higher trophic levels – must be weighed against the alternative in a multistock context.

**Cross-cutting activity: Methods, models and technology (MEMOTEK)**  
**No funding is available under this call for proposals.**

**Cross-cutting activity: Research cooperation (FORSKSAM)**  
**Budget:** NOK 0.5 million is available for 2011.

Applications for **Personal Overseas Research Grants, Personal Visiting Researcher Grants** and **Support for Events** will be accepted under this cross-cutting activity. Applications for Personal Overseas Research Grants and Personal Visiting Researcher Grants may only be submitted in connection with projects that are already receiving funding under the HAVKYST programme. Projects that are already receiving funding under the HAVKYST programme will be given priority when awarding support for events.