

THEMATIC STRUCTURE

The thematic structure for Cycle II's research program differs from that used in Cycle I and is now represented as a matrix defined by a) pressures (which create impacts or effects) and b) areas of vulnerability (which feel the impacts or effects) (see Fig.1, below).

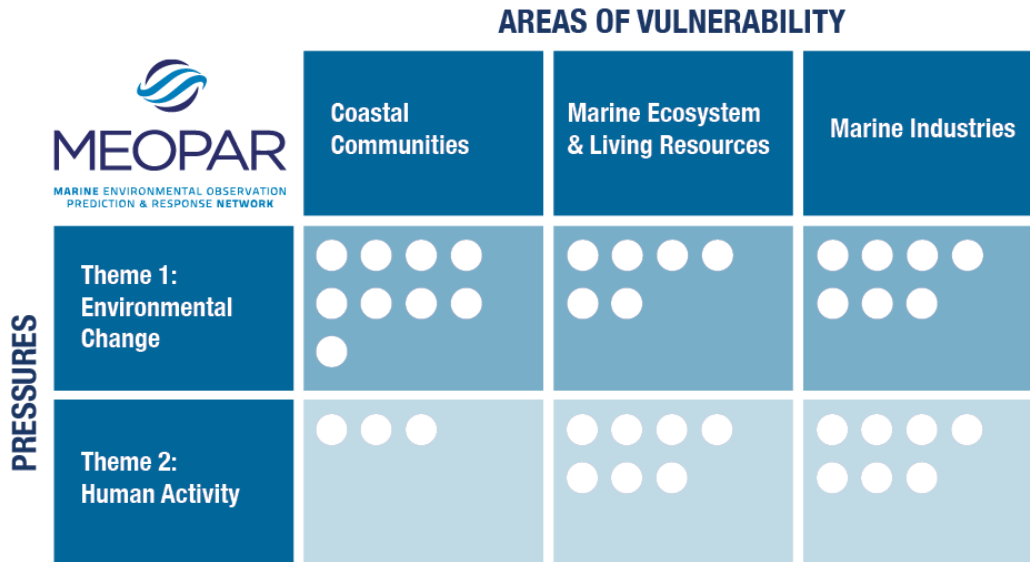


Figure 1: MEOPAR's Cycle II Research Themes. The circles represent Cycle II projects that have been reviewed and approved by MEOPAR's Board.

Within this structure, specific examples of phenomena and hazards that the research program will address can be assigned to one or several of the matrix elements. The thematic structure defines an overall problem space for MEOPAR research and assists the Network with connecting a wide range of projects to each other and to users. The research themes correspond to two main categories of 'pressures':

- **Theme 1 (environmental change)** - addresses risks and opportunities that arise as a result of marine environmental change. This includes risk associated with natural hazards such as wind, fog, earthquakes, icebergs, toxic algae outbreaks, etc. The impacts of these naturally hazardous phenomena are, in several cases, altered by anthropogenic perturbations (e.g. by pollution or human-induced climate change). Hence research projects investigating the impacts of human-induced, large-scale environmental changes (e.g. ocean acidification, climate change) are also incorporated under this theme.

- **Theme 2 (human activity)** - addresses risks and opportunities arising from pressures that are a direct consequence of human activity within the marine and coastal environments and from technological change. This includes risk of ship groundings and collisions, oil spills and offshore accidents as well as impacts of coastal development and siting of coastal industries.

The change from Cycle I's structure, where themes were based on timescale that distinguished weather- from climate-timescale phenomena, is due to the evolution of MEOPAR's research profile. The Cycle I structure reflected MEOPAR's origins in the natural science community that worked primarily on geophysical hazards (e.g. extreme weather and/or climate change). The Cycle II structure accommodates the range of direct, human-induced drivers of change and risk that MEOPAR now addresses, as well as the increased number of activities and projects developed by social scientists.

AREAS OF VULNERABILITY

The addition of a vertical axis with three "areas of vulnerability" (as shown in Fig. 1) allows MEOPAR projects to be readily linked to where (and by whom) impacts are felt and, therefore, can also be connected readily to end-user needs. The three main areas of vulnerability are:

- **Coastal Communities** - These range from large cities to small, northern communities.
- **Marine Ecosystem and Living Resources** - This includes the marine ecosystem itself, which provides valuable services and has its own inherent value. This category also includes industries that depend directly on living marine resources (e.g. the fishing and aquaculture industries).
- **Marine Industry** - This category includes marine industries such as shipping, offshore oil and gas, tourism, ocean technology, the consulting sector, etc.

During Cycle II, we envision that some projects will focus on particular hazards and will be aligned with either Theme 1 or 2. However, we may also receive proposals focussed on preparedness and response of particular sectors, or the overall sustainability of a particular regional ecosystem, regardless of hazard (or addressing

a range of hazards). This type of proposal could address, for example, all-hazard preparedness of municipalities, provinces, or specific industries. The Cycle II structure allows for flexibility in organization and assignment of projects to themes, and allows results to be aggregated in multiple ways. The inclusion of a thematic axis for addressing communities and sectors that are vulnerable to change allows MEOPAR to strengthen knowledge transfer from collections of projects to particular end users.

RESEARCH CORES

As in Cycle I, the research projects will be supported by activities of three Cores: the Observation, Prediction and Response Cores. The Cores are the main mechanism through which MEOPAR takes advantage of the NCE program's long-term perspective regarding research support. This, almost uniquely for academic research, allows for maintenance and sharing of key expertise, data, instrumentation and knowledge transfer activities that are of general relevance to MEOPAR projects as well as to closely-related activities outside the Network. Hence Cores provide technical support and central functions – in the form of equipment, technical expertise, technicians, training, and quality assurance. They also play an important role for knowledge transfer, exploitation and exchange, especially through hosting Communities of Practice. In Cycle II, Cores will be staffed exclusively by experienced researchers (primarily RAs and technicians).

MEOPAR's three cores are:

- **Observation Core** – maintains and deploys technical expertise for ocean observation in strategic locations, supports shared access to observing infrastructure, and encourages technological developments, knowledge sharing and training related to ocean observing. Promotes national and international sharing of data, expertise and coordination of observation programs. The Observation Core supports four Communities of Practice (CoP).
- **Prediction Core** – houses expertise to support, develop and apply models of, and approaches to, prediction in order to make them more precise, region-specific, and interpretative of socio-economic impacts. The Prediction Core has four main activities: development of models; training on selected topics pertaining to numerical modeling and prediction; maintenance of a code

repository with documentation; and, provision of project support and advice. The Prediction Core is creating and will support two CoPs.

- **Response Core** – serves as a focal point for technical expertise, information and engagement on the impacts of marine hazards and opportunities for response and risk mitigation. The Core has two principal activities: development of shared information resources, (e.g. web-based platforms; databases) to support response components of MEOPAR projects and external stakeholders; and hosting CoPs in four topical areas to support research on response strategies.