

INNOVATIVE MULTI-PURPOSE OFFSHORE PLATFORMS: PLANNING, DESIGN AND OPERATION

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In the near future, the European seas will be subjected to a massive development of marine infrastructures. The most obvious structures include offshore wind farms, constructions for marine aquaculture and the exploitation of wave energy. The development of these facilities will increase the need for marine infrastructures to support their installation and operation and will unavoidably exert environmental pressures on the marine ecosystems. It is therefore crucial that the economic costs, the use of marine space and the environmental impacts of these activities remain within acceptable limits. Hence, offshore platforms that combine multiple functions within the same infrastructure offer significant economical and environmental benefits.

In order to tackle these challenges, the European Commission launched in 2012 the research project MERMAID: Innovative multi-purpose offshore platforms: planning, design and operation. MERMAID is one of three EU-FP7 funded projects in response to the multi disciplinary call Oceans of Tomorrow on multi-use offshore platforms. The project will develop concepts for the next generation of offshore platforms which can be used for multiple purposes, including energy extraction, aquaculture and platform-related transport. MERMAID does not envisage building new platforms, but will theoretically examine new concepts, such as combining structures and building new structures on representative sites under different conditions (Fig. 1).



Fig.1: Scheme of the project concept: the innovative design has to preserve the ecosystem and enhance species biodiversity; to assure device operation and survivability; to produce 'green' energy and local storage allowing operation of existing platforms and facilitating transportation; to face social perception and needs.

Four offshore study sites which represent different environmental, social and economic conditions have carefully been selected. The sites, are located in four different seas: (i) the Baltic Sea - a typical estuarine area with fresh water from rivers and salt water, (ii) the trans-boundary area of the North Sea-Wadden Sea - a typical active morphology site, (iii) the Atlantic Ocean - a typical deep water site and (iv) the Mediterranean Sea - a typical sheltered deep water site (see fig 2). Based on the results of these studies, a verified procedure will be created to select the most appropriate design options for a given offshore area. This procedure should be generic so stakeholders and end users can use it for marine planning strategies.

The objective of these cross-cutting pilot studies is to:

- focus research on solving problems in a manner suitable for immediate use,
- to provide real sites with real and specific problems against which tools, techniques and decision support systems may be tried, tested and validated,
- to provide feedback into the research and development process from industrial partners,
- to ensure that MERMAID deliverables are of real value, practicable and usable..

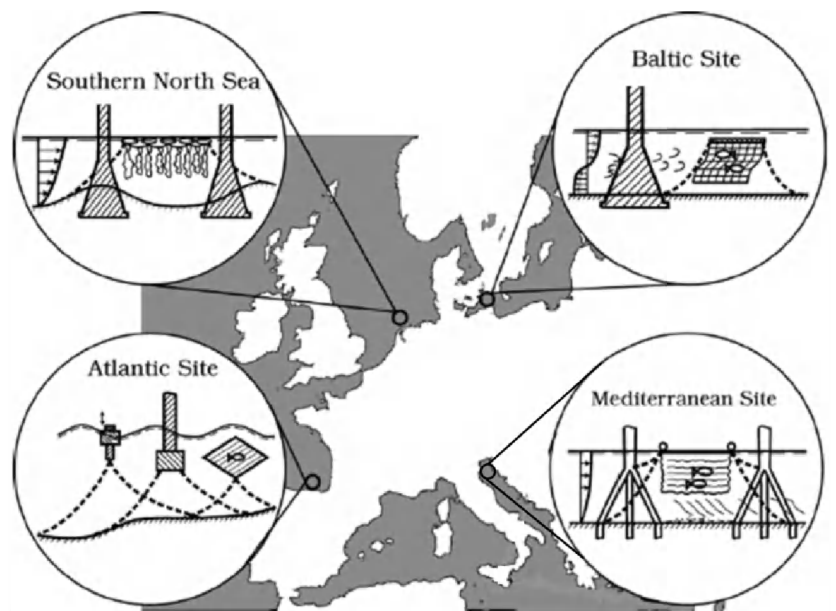


Fig. 2 Location of the four sites and scheme of design options.

A series of possible design options and industrial interaction will be scoped and implemented on a site by site basis. The extent and focus of this interaction will vary from site to site and will depend upon the existence and / or flexibility of policies and social, economic and environmental management schemes or constraints. For more information, go to <http://www.mermaidproject.eu>