

Environmental Interactions of Marine Renewables (EIMR - II)

Theme: Interactions with devices.

Title: Offshore renewables and impacts: who cares, how much and why?

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ABSTRACT

Background: The number of man-made structures to be placed in the marine environment is set to increase massively in the near future as a consequence of the wide-scale adoption and commercialisation of offshore electricity generation. Marine renewable energy devices (MREDs) interact with their receiving environment at a number of levels. Environmental monitoring in relation to these interactions has focussed on the top-predators (cetaceans, pinnipids and birds), commercially relevant groups such as fish and seabed organisms.

Aim: 1. To review the basis of current monitoring programmes from a European planning perspective. 2. Comment on the likely scale of MRED-environment interactions and consider how these differ between different receptors (from mammals to benthic infauna). 3. Suggest ways of developing proportionate monitoring programmes that are relevant, in space and time, and cost-effective. 4. Show how regulators will need to make 'value-judgements' in relation to receptor-type and receptor-risk and prioritise limited monitoring funds appropriately.

Review contents: Monitoring programmes should start with a clear understanding /statement of the questions being addressed and these should be considered within the likely cumulative and ecosystem consequences of the proposed development. In order to assist this process the following aspects will be addressed:

1. the difference between 'impact monitoring' and 'environmental research'.
2. the need to clearly specify what it is that we actually care about – what is our metric/ response variable?
3. that tests of null hypotheses of 'no impact' are of limited value
4. the need for effect sizes, not null hypotheses.
5. the need for spatially and temporally defined effect sizes

6. the need for affordability – how to we maximise overall monitoring efficacy?

Conclusions: Monitoring and research usually have quite different objectives (e.g. in the spatial domain) and, consequently, monitoring programmes are not necessarily helpful in understanding processes relevant to their proper design. Through environmental research we need to predict/identify and understand processes and interactions, occurring around offshore structures, which are of a relevant scale and involve societally-relevant processes. Ecosystem models, with relevantly-scaled domains (e.g. the North Sea), supported by hydrographic models, would be useful in identifying potential factors and processes that are relevant to a wide-range of receptors and ecosystem services. Considerable thought should be given to how limited resources be allocated, to maximise cost-benefit, and monitor only those aspects of environment that are considered at most risk. Decisions should be made in relation to the efficacy of monitoring ecosystem components that are considered at low-risk.