

PUBLICATION OF THE YEAR AT IMR 2010

A total of 13 publications have been selected by colleagues at IMR as candidates for the Publication of the Year. In the following we will nominate and evaluate what we believe are the three best publications, and out of these three, finally select the Publication of the Year. We have based our decisions on how central people from IMR have been in the work, the relevance of the research for the activity of the institute, and the scientific originality and quality of the publications.

All nominated publications were of good quality and nicely illustrated the diversity of research conducted at IMR. Selecting the best among these was a challenging task, and several publications that did not make it to our shortlist had qualities that would have justified selecting them.

Before presenting our shortlist, we would like to raise a general point. Both primary papers reporting new data/models and review papers are important for the advancement of science. However, these two categories differ in many respects, and it is not straightforward to rank contributions belonging to different categories. Here we have selected to focus on primary publications. One possibility for the future would be to select both the Publication of the Year and the Review of the Year. In addition, to encourage communication about scientific findings to a wider public we suggest that a Popular Science Article of the Year should be selected in the future.

The three selected publications are (listed alphabetically):

Abrahamsen, M.B., Browman, H.I., Fields, D.M. and Skiftesvik, A.B. The three-dimensional prey field of the northern krill, *Meganyctiphanes norvegica*, and the escape responses of their copepod prey. *Marine Biology* 157: 1251-1258.

Korneliussen, R.J. The acoustic identification of Atlantic mackerel. *ICES Journal of Marine Science* 67: 1749-1758.

Meier, S., Morton, C.H., Nyhammer, G., Grøsvik, B.E., Makhotin, V., Geffen, A., Boitsov, S., Kvestad, K.A., Bohne-Kjersem, A., Goksøyr, A., Folkvord, A., Klungsøyr, J. and Svardal, A. Development of Atlantic cod (*Gadus morhua*) exposed to produced water during early life stages: Effects on embryos, larvae, and juvenile fish. *Marine Environmental Research* 70: 383-394.

Abrahamsen et al. 2010. This is a laboratory study on the three-dimensional prey field of the northern krill. By using an elegant observation technique (silhouette video imaging) allowing accurate quantification of the behaviour in 3-D, the authors have studied the reaction distance of tethered krill to free-swimming copepods (*Calanus* spp.) in the light and in the dark. The work provides new knowledge about sensory modalities that are involved when krill capture their prey. Mechanoreception triggered by hydrodynamic disturbance of swimming prey seems to be crucial as krill also detected and attacked prey in complete darkness and as most of the prey detections were located below the midline of the krill's body outside its visual field of view. Under the low, realistic light intensities used in the experiment there was only a relatively small increase in the detection of prey in the light compared to in the dark, but even this small increase in detection distance doubled the sampling volume, making also vision an important aspect of the feeding ecology of krill. The distance at which the copepods initiated their escape response was in addition shown to increase significantly in the light compared to in the dark. Overall, this well-written publication elegantly demonstrates how the dynamics between predators and prey in the marine environment can be quantified under different environmental conditions in a laboratory. The results of this study have the potential to be used to parameterize models that assess the role of krill as predators in marine ecosystems.

Korneliussen 2010. We rated this submission for the title of 'Publication of the Year' highly for a number of reasons. The subject of study is important. Assessment and biomass estimation of pelagic fishes is difficult, as quantitative capture methods are hard to apply, and less direct methods, including acoustic surveys or labour-intensive egg surveys, are necessary. Mackerel is an abundant and economically important species, but lacking a swim-bladder is inapt for acoustic survey, especially at the usual standard frequency of 38 kHz. This submission has addressed this problem.

The submission describes multi-beam (i.e. operating at several frequencies simultaneously) active acoustic experiments for quantitative surveying of mackerel. It concludes that echoes at other frequencies than 38 kHz, especially 200 kHz, are of critical importance for identifying mackerel, and describes in detail an algorithm for consistently processing returned echograms and identifying mackerel on them. Echograms were verified by mid-water trawling (although mackerel swim so fast that they are hard to catch) and by results obtained from penned fish in separate experiments. The algorithm was also checked by comparing its results with those of expert echogram analysts, and appears to be reliable; the submission recommends recalculating, using the methods developed, earlier 38 kHz acoustic estimates of mackerel abundance from surveys which also used 200 kHz.

This submission is, furthermore, clearly written in plain language, and is a pleasure to read, even if one is not a specialist in active marine acoustics.

Meier et al. 2010. The offshore oil production technology currently used in the North Sea creates a large amount of so-called produced water (PW), which is discharged into the sea. PW consists of seawater containing an extremely complex mixture of dispersed oil, polycyclic aromatic hydrocarbons (PAHs), alkylphenols (APs), organic acids, metals, and traces of production chemicals. An important question has therefore been if, and to what extent, PW might affect marine organisms. In this study, Meier et al. exposed embryos, larvae and juvenile Atlantic cod for different dilutions of produced water collected from a platform in the North Sea. Subsequently, samples were taken from various tissues and analyzed for the presence of different pollution components and relevant biomarkers that should uncover biological effects. The sampled individuals were also examined for macroscopic developmental changes. In the introduction of the article, the authors give a clear description of the background and aim of the study. The experiments are well-designed, and the interpretations of the results are logical. The article is well-written and the tables and pictures are illustrative. This article, together with other studies from the same group of researchers, shows how basic research can be combined with applied science, and value of collaboration in bringing a wide variety of expertise together. The use of PW obtained from a platform in the North Sea gives a realistic picture, and the results will therefore be very useful for risk evaluation of the

biological effects of the oil extraction, to support the decision makers in charge of overseeing future developments in oil industry.

Conclusion:

All three nominated publications are of very high quality and present relevant and scientifically interesting results. We finally selected the work that in a systematic and thorough way elucidated the biological consequences of a potentially serious environmental problem.

The Publication of the Year in 2010 is:

Meier, S., Morton, C.H., Nyhammer, G., Grøsvik, B.E., Makhotin, V., Geffen, A., Boitsov, S., Kvestad, K.A., Bohne-Kjersem, A., Goksøyr, A., Folkvord, A., Klungsøyr, J. and Svardal, A. Development of Atlantic cod (*Gadus morhua*) exposed to produced water during early life stages: Effects on embryos, larvae, and juvenile fish. *Marine Environmental Research* 70: 383-394.

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