

The panel for evaluation of NERI's research on marine eutrophication and oxygen depletion

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Press Release:

Evaluation of NERI's research on marine eutrophication and oxygen depletion

In May 2003 a review by an international Evaluation Panel was undertaken of the research on marine eutrophication and oxygen deficiency conducted by The National Environmental Research Institute (NERI) of Denmark. The Evaluation Panel was nominated by the Natural Science Research Council and included Professor John Stuart Gray, Department of Marine Biology and Limnology, University of Oslo, Norway (Chairman); Professor Patricia M. Glibert, University of Maryland Center for Environmental Science, USA; Professor Robert J. Diaz, Virginia Institute of Marine Science, USA; and Professor Nancy Rabalais, Louisiana Universities Marine Consortium, USA. The evaluation involved advance review of articles and submitted documents and an on-site review, which involved presentations from NERI scientists and interviews with critics, from May 19-21, 2003.

NERI has responsibility for strategic research and the management of the marine monitoring programme for the state of Danish marine waters. The Danish monitoring programme represents one of the more comprehensive, long-term records of continuous monitoring in coastal waters in the world. The wealth of accumulated data has provided a rich data base for long term trend analysis and interpretation. NERI provides sound quantitative advice for the Ministry of the Environment, which forms part of the scientific background for political decisions on the marine environment. NERI has a wide range of expertise among its scientists, and their research is of high international caliber.

There have been several issues that have been the source of considerable debate within the public domain and which have been the source of criticism of NERI; these issues were directly addressed by the Evaluation Panel. The Panel recognized that such debates occur when political and/or economic decisions hinge on the outcomes of such debates. The open nature of science allows for and encourages debate of different opinions, but because of the complexity of the issue of eutrophication, the most appropriate forum for exchange of scientific ideas and opinion is the scientific literature. Policy issues require consensus building between scientists and all parties concerned.

The Panel shares the view of NERI (and many other Danish scientists) that inputs of nitrogen from land sources are the largest contributors to eutrophication and oxygen depletion in Danish coastal waters. Much of the criticism of NERI's research and advice relates to the Institute's analysis of eutrophication in the open Kattegat and Belt Seas.

Nevertheless, the Panel recognizes that in the open waters of the Kattegat and Belt Seas, the estimates of Danish contribution of nutrients to oxygen depletion are less certain. Understanding the impacts of nutrient discharge from land in the open waters has been one of confusion because of the transport of water and nutrients from other sources – the Baltic Sea and Skaggeak, and the fact that composition of the nutrient pool in the open waters may differ from land derived sources. These sources also vary as the inputs of nutrients vary with local wind and weather. In estimating the contribution of terrestrial sources, NERI differentiated between forms of nitrogen that are readily used by the microbes and algae in the water, and those sources of nitrogen that are less readily used (the bioavailable fraction). Whereas mineral nitrogen is known to be easily assimilated into algae, there are many other forms that are more complex, only some of which can be assimilated into algae and other microbes. The Panel accepts that the estimate of this fraction provided by NERI is a reasonable first approximation, but should serve as a hypothesis to be tested and not as a final conclusion.

The Evaluation Panel strongly recommends that NERI continue the comprehensive and efficient monitoring program, coupled with sound basic research on relevant topics. Some recommendations were provided to ensure timely analysis and communication of results, accurate estimates of the terrestrial nutrient loads to coastal and open waters, and increased predictive capability. Through implementation of these recommendations, NERI will set a global standard for environmental monitoring and analysis.