



PRESSE - INFORMATION

ALFRED-WEGENER-INSTITUT FÜR POLAR- UND MEERESFORSCHUNG
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Workshop on the Biological Effects of contaminants in the North Sea

An International Workshop on the Biological Effects Monitoring Techniques sponsored by the International Council for the Exploration of the Sea (ICES Copenhagen) and the Intergovernmental Oceanographic Commission (IOC of Unesco, Paris) has been held at the Alfred Wegener Institute for Polar and Marine Research (AWI) in Bremerhaven (FRG) from 12 to 30 March 1990.

Seventy scientists from countries bordering the North Sea, as well as from the United States and Canada, have been carrying out joint investigations in the German Bight and off the Dutch coast. The work has included physiological, biochemical, embryological, gross and cell pathological, chemical and other methods. Eight vessels, six from Germany and two from the Netherlands, have taken part in the exercise.

The preliminary results of the workshop will be summarised by the scientists at the Closing Session of the workshop at 10.00 am on 30th March at the Alfred Wegener Institute. There will be a press conference afterwards providing an opportunity to interview the coordinating scientists about their part of the workshop.

The preliminary findings indicate that:

1. A wide variety of biological techniques can be used to detect and measure pollution gradients offshore in the North Sea.
2. Using these techniques our preliminary results can discriminate pollution gradients on a transect running northwest from the area off the mouth of the River Elbe and in relation to a disused oil platform off the Dutch coast.
3. The preliminary conclusions from work in the German Bight are that water quality improves progressively offshore, but there are unexpected indications that environmental quality deteriorates at the most offshore station over the Dogger Bank.



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4. Our primary objective to make a comparison of techniques under the kind of conditions under which they might be used in a monitoring programme have been fulfilled. A number of the techniques are clearly sensitive enough, and can be used at sea.

A wider variety of techniques have been tested simultaneously on the same contamination gradients in this workshop than ever before. The techniques include:

1. Fish Disease - An investigation of fish disease (in flatfish) in relation to contamination of the sediments on which they live. Our results confirm the discovery that there are examples of liver tumours, not only on nearshore fish, but also in offshore areas over the Dogger Bank.
2. Fish larval abnormalities - Similarly the frequency of abnormalities and malformations in fish larvae in the plankton is high in near shore waters off the Elbe and the Weser declining offshore, but increasing again over the Dogger Bank.
3. Biochemistry - These data are supported by some of the biochemical indices used on adult fish in the same gradient. The production of certain enzymes that have evolved to degrade toxic materials is enhanced in fish from contaminated waters and this helps to identify the groups of toxic contaminants to which they have been exposed.
4. Molecular and Cell Pathology - Indicators of molecular and cell pathology have been tested on Dab liver cells and initial findings indicate a gradient of abnormality declining offshore.
5. Deep frozen embryos - Experimental assays that measure water quality in biological terms (bioassays) have been tested on research vessels at sea. They include the use of cryopreserved (deep frozen) embryos and larvae of bivalves for growth and development tests for the first time.
6. Bioassays - these and other bioassays (with microalgae and planktonic animals) have been used to test sea surface in relation to sub surface water



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samples. The sea surface (microlayer) is an especially sensitive level in the water column because many planktonic larval forms (fish and invertebrates) live there, and it is becoming clear that some toxic contaminants accumulate there to much higher concentrations than below the surface.

7. Bioassays have also been used to test the relative toxicity of extracts of organic contaminants from large volume water samples (several hundred litres) along the German Bight transect - a new method for assessing water quality.

8. Bottom living communities - Work in the communities of benthos (bottom living animals) indicate changes close to the oil platform, but the more sensitive indices of community change depend on the time-consuming analysis of the smaller organisms.

9. Benthic Triad - Analysis of benthic community data, sediment bioassay data (performed with samples from the oil platform gradient in the US and Canada) and sediment chemistry will together allow the Triad approach to be tested in European waters for the first time.

10. Contaminant Chemistry - water samples, tissues and sediments will be analysed for the contaminants most likely to have toxic effects, so that the biological effects data can be linked to those most likely to be responsible.