

UK National Marine Monitoring Programme

Introduction

The UK National Monitoring Plan (NMP) was established to co-ordinate marine monitoring to meet UK obligations to international programmes. It provided an overview of the distribution of contaminants, including persistent organic pollutants and trace metals, in a range of matrices (water, sediment, shellfish and fish). NMP was initiated in response to a review of marine monitoring by the Marine Pollution Monitoring Management Group (MPMMG) in 1987/1998. The aim of the MPMMG (re-named the Marine Environment Monitoring Group – MEMG – in 2003) was to ensure that Government organisations with statutory marine environmental protection and monitoring obligations undertook this work in a co-ordinated and cost effective manner. The first phase of NMP, carried out between 1993 and 1995, provided a spatial overview of contaminant concentrations in the UK¹.

NMMP2

Phase two of the programme, now known as the National Marine Monitoring Programme (NMMP), began in 1999 and addressed the continuing need to meet the UK's marine monitoring commitments co-ordinated through the Oslo and Paris Commission (OSPAR). OSPAR's Joint Assessment and Monitoring Programme (JAMP) and the Nutrients Monitoring Programme require contracting parties to monitor the marine environment. In addition, NMMP2 was designed to meet the temporal trend monitoring requirements of OSPAR.

FRS Monitoring Programme

Approximately 40 estuarine sites, 45 intermediate sites and 30 offshore sites have been monitored as part of NMMP2. Fisheries Research Services (FRS) is responsible for sampling at six of these sites (Figure 1). Ten sediments and 25 plaice (five pools of five samples), where possible, are collected annually during January at each site from FRV *Scotia*. In addition, water samples are collected at each station for determination of salinity, temperature and nutrient concentrations.



Figure 1. NMMP sites sampled annually by FRS during January from FRV *Scotia*. The NMMP site number is shown in brackets.

Chemical Analysis

Five of the sediment samples from each site are analysed for chlorobiphenyls (CBs), trace metals (aluminium, cadmium, mercury, copper, lead, nickel, zinc, arsenic, chromium, lithium, iron and manganese) and polycyclic aromatic hydrocarbons (PAHs). As an example of the type of data produced, a box plot of the CB concentrations in sediment is shown in Figure 2, PAHs in sediment in Figure 3 and mercury in plaice muscle in Figure 4. Generally, the lowest contaminant concentrations are found at the offshore Moray Firth (NMMP105) and Montrose Bank (NMMP165) sites and highest in the Clyde (NMMP35).

Plaice liver samples are analysed for CBs and trace metals, the latter also being determined in plaice flesh.

Biological effects measurements

Integrated chemical and biological effects monitoring is becoming increasingly important. EROD activity, used to assess the activity of the detoxifying enzymes, is determined in plaice liver.

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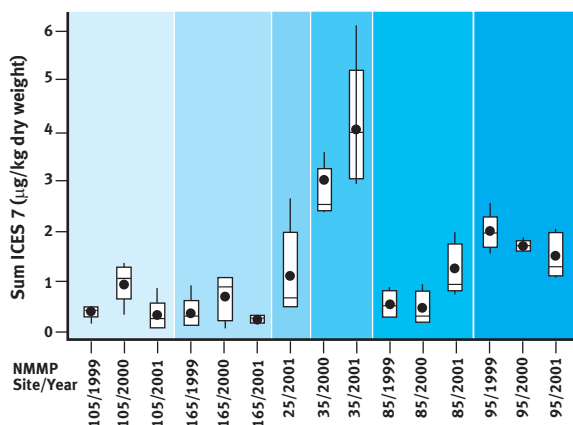


Figure 2. Boxplot of CB concentrations (sum of the ICES7)* in sediment samples collected at the FRS NMMP sites between 1999 and 2001.

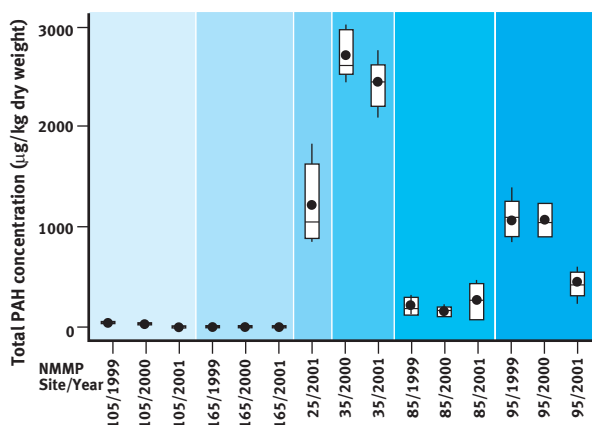


Figure 3. Boxplot of total PAH concentrations (2- to 6-ring parent and alkylated) in sediment samples collected at the FRS NMMP sites between 1999 and 2001.

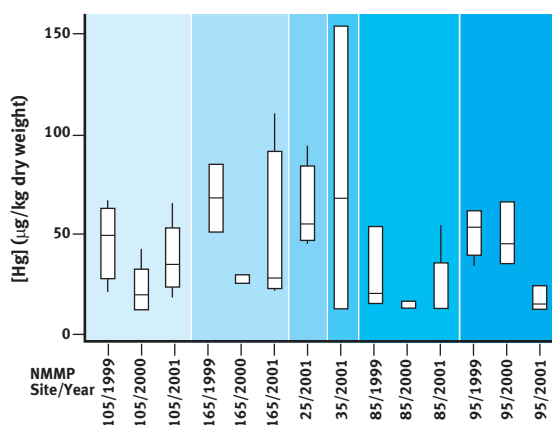


Figure 4. Boxplot of mercury in plaice muscle samples collected at the FRS NMMP sites between 1999 and 2001.

Benthos

Benthic community (flora and fauna occurring at the bottom of the sea) analysis of the remaining five sediment samples is undertaken by a contract laboratory.

Submission of Data

All data are submitted to the central NMMP database by April following the year of collection. After submission, all chemical data are screened by a datafilter to ensure it is of good quality before acceptance for use in national reports, or submission to international agencies.

Assessments

The NMMP co-ordinating group prepares periodic reports summarising the findings from this monitoring programme^{1,2}. The data will contribute to the assessments that are a part of the UK Government's commitments presented in 'A Strategy for the Conservation and Sustainable Development of our Marine Environment'³. In addition, the data are submitted to the International Council for the Exploration of the Sea (ICES) database in Copenhagen where they are available for use in international assessments of the quality of the marine environment, as are undertaken by OSPAR⁴.

References

1. Marine Pollution Monitoring Management Group, National Monitoring Programme Report. Survey of the Quality of UK coastal water, 1998.
2. UK National Monitoring Programme, Scottish Regional Report, available online from http://www.frs-scotland.gov.uk/FRS.Web/Delivery/Information_resources
3. Safeguarding Our Seas, A Strategy for the Conservation and Sustainable Development of our Marine Environment, DEFRA, 2002.
4. OSPAR Quality Status Report 2000.

*ICES 7 CBs 28,52,101,118,153,138,180 were recommended by the European Union Community Bureau of Reference; these CBs were selected as indicators due to their relatively high concentrations in technical mixtures, their wide chlorination range and their persistence.