

Coastal pollution

Current problems and baseline data for future solutions

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The Land-Ocean Contaminant Study (LOCS) was initiated under the coordination of the BGS to help protect coastal and marine systems and to improve socio-economic and human health status along urban coastal margins.

The East African ports of Mombasa and Dar es Salaam were identified as appropriate for the study of contaminant fluxes to estuarine environments discharging onto reef fringed coastlines, while the more heavily industrialised setting of Jakarta Bay, Indonesia, was selected as representative of an open embayment with an outlying coral island chain. Research undertaken in East Africa was led by the BGS and supported by overseas counterpart institutes. In Indonesia, the BGS's geochemical and physical oceanographic inputs were supplemented by the provision of ecotoxicological expertise from two UK institutes: the University of Newcastle Centre for Tropical Coastal Management Studies (CTCMS) and the Institute of Terrestrial Ecology (ITE).

The recent LOCS Sepetiba Bay (Brazil) case-study was formulated to review the

storage and dynamics of contaminants in a semi-enclosed coastal lagoon with a high sedimentation rate and containing long-residence waters. It was supported by personnel from the Universidad Federale Fluminense (UFF) and the Rio de Janeiro State Pollution Control Agency (FEEMA). Sepetiba Bay is ideal for such a study as it suffers from industrial contamination and is conveniently near to the laboratories and services of Rio de Janeiro. A conflict of interests exists in its use, as it is also the focus for small-scale fisheries, and fast-developing tourism. The bay is only one of over 20 lagoons confined on the landward side by mountains, and by seaward barriers, on the southern coast of Brazil, thus the findings of the LOCS survey will have a wide applicability.

A sampling programme produced data for surface waters, suspended particulate matter and seabed sediments (by hydraulic coring to a depth of one metre) for 43 stations within the bay. The emphasis was on the presence of elevated levels of potentially toxic heavy metals such as copper, lead and cadmium within the system and their relationship to dredging and industrial

The Procedures Manual (Volume 1: Guidelines and Volume 2: Technical Appendices), which include contributions from CTCMS, ITE and the NERC Plymouth Marine Laboratory, are published as BGS Technical Reports WC/98/41 and WC/98/58 and are available from BGS Keyworth.

effluent inputs. Hydrocarbons (n-alkanes) were also determined to monitor the effects of possible oil spills.

A major report detailing the work carried out at Sepetiba Bay is now available. The material given in this report was also presented by BGS staff at a workshop in Rio de Janeiro in June 1998. This was attended by representatives of the collaborating institutes and several other organisations with research and economic interests in Sepetiba Bay.

The current LOCS project was completed in late October 1998 with the publication of a two-volume Procedures Manual, and a major workshop meeting to draw together the conclusions of the project.

The cost-effective surveying methods used in the LOCS programme serve a twofold purpose. They enable a 'snapshot' of the existing state of marine contamination to be taken to identify current or potential pollution problems and thus ways of ameliorating the ensuing health, environmental and economic effects. They may also be used to establish a baseline from which changes due to, for example, industrial development, can be measured and the cause of the pollution identified and treated. LOCS-type surveys are therefore valuable to marine scientists, coastal-zone managers and regulatory authorities charged with ensuring that development does not come at an unacceptable social, environmental and economic price.

Fisherman collecting clams next to a sewer outfall, Jakarta. Clearly an unacceptable health risk, but a common problem where traditional industries are affected by urbanisation and lack of investment in waste treatment infrastructure.

