

## THE NCC REPORTS BACK

**T**he National Co-ordinating Committee of the National Aquatic Ecosystem Biomonitoring Programme (NAEBP) was officially constituted at its first meeting on 28 January 1997.

The Committee comprises representatives from:

- the three custodian organisations, the Department of Water Affairs and Forestry (DWAF), the Water Research Commission (WRC) and the Department of Environmental Affairs and Tourism (DEAT);
- provincial champions from all nine provinces, and
- three scientific advisors, Professor Jay O'Keeffe (Rhodes University), Dr Jackie King (Southern Waters) and Dr Neels Kleynhans (Institute for Water Quality Studies).

### Responsibilities of the NCC

The responsibilities of the NCC include:

- seeking funding for the programme;
- the implementation of the NAEBP;
- communication and marketing;
- research and development, and
- the identification of training requirements and opportunities.

The responsibility of these portfolios was allocated to various parties at the meeting. Funding and the implementation of the NAEBP falls under the Executive Committee until such time as a national Co-ordinator is appointed. Ms Tisha Greyling (Greyling Liaison cc) will be responsible for communi-

cation and marketing; Prof O'Keeffe for research and development and Dr Johan Engelbrecht (Mpumalanga Parks Board) for the identification of training needs and opportunities.

A National Co-ordinator for the programme will not be appointed until later when the NAEBP is up and running.

### Goals for the NAEBP

Short-, medium- and long-term goals for the NAEBP were agreed upon by the NCC.

#### Short-term (1-3 years)

- Test and finalise the programme design for riverine ecosystems.
- Identify key South African rivers where implementation of the NAEBP can take place.
- Implement and demonstrate the NAEBP for rivers in at least three to four provinces.
- Launch projects for designing programme components for different types of freshwater ecosystems.
- Liaise with other southern African countries regarding their collaboration with and adoption of the NAEBP.
- Integrate all the relevant research, development and implementation activities into the framework of national co-ordination and provincial implementation.

#### Medium-term (3-6 years)

- Implement and maintain, in a sustainable way, the NAEBP for all key riverine ecosystems within South Africa.
- Expand the implementation of the NAEBP for riverine ecosystems across southern-Africa, starting with Lesotho and Swaziland.
- Finalise conceptual designs and test the NAEBP for impoundments, wetlands and lakes.

#### Long-term (>6 years)

- Maintain and improve, in a sustainable way, the NAEBP for all inland aquatic ecosystems in South Africa and throughout the southern African region.

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### HOW YOU CAN CONTRIBUTE

The success of the National Biomonitoring Programme depends upon the involvement of as many stakeholders in water resource management as possible. If you or your organisation would like to know more about the programme and how you can become involved, please contact:

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## TECHNICAL WORKSHOP

One of the initial tasks of the NCC is to convene a practically-orientated, technical workshop. Although many people are very enthusiastic about the NAEBP, all the technical developments required for implementing a national-scale biomonitoring programme have not been finalised. The workshop will, in general, serve as a forum to deliberate technical direction for the future. It will include a theoretical component on biomonitoring, as well as practical demonstrations in the field.

The workshop will be held in KwaZulu/Natal in August 1997. People already actively involved in biomonitoring will be invited to attend.

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## PROVINCIAL PROGRESS

**The next issue of River Health will report on progress in the other provinces.**

# Provincial involvement in the NAEBP - progress all round

## The success of the NAEBP depends on the provinces becoming involved in the national effort.

Each of the provinces has been encouraged to set up a Provincial Implementation Team (PIT) consisting of various stakeholders. PITs are responsible for:

- encouraging the participation of various bodies;
- resource development and policy planning;
- implementing and maintaining the NAEBP within the province;
- managing operational resources and infrastructure, and
- finding funding for each region.

*River Health* reports here on the progress already made in some provinces.

## Pilot biomonitoring project planned for Eastern Cape

The driving force behind the Eastern Cape biomonitoring programme is a core group consisting of members of regional offices of the Department of Water Affairs and Forestry and the Environmental Protection Unit (EPU - a directorate of the Department of Economic Affairs, Environment and Tourism), the Institute for Water Research (IWR - Rhodes University), the Albany Museum (Grahamstown), and various specialists. Representation on the core group by additional interested and affected parties is currently being planned. The chairperson is Nicholas Scarr of EPU, Port Elizabeth.

A proposal for a pilot biomonitoring project for the rivers of the Eastern Cape was drawn up by the Institute for Water Research and accepted by the core

group (December 1996). The proposed budget is currently being finalised. The biomonitoring programme in the Eastern Cape is envisaged to be long-term and ongoing, and has been endorsed in principle by the regional offices of both DWAF and EPU. The duration of the initial pilot study will be five years, consisting of one year of site selection, site rating, training and monitoring, one year of ongoing training and monitoring, and three years of monitoring.

The Buffalo and Zwartkops river catchments have been selected for the first biomonitoring exercise in the region as a) they represent rivers in different DWAF management areas, b) they represent different sub-regions according to the biogeographic characterisation of the country, c) a range of conditions, from undisturbed to highly polluted, exist in both rivers, and d) a range of users are present on both rivers.

A wide range of research has also been carried out on both these catchments, and extensive databases exist. The Zwartkops Catchment Management Programme has been running for about one year, and an Amatole Systems Analysis (includes the Buffalo River) is currently being carried out. Catchment management and biomonitoring on these two catchments can therefore be linked, and the results of biomonitoring programmes can be used for water resource management in the region. It is proposed that additional rivers, such as the Umtata River, may be incorporated during this five-year period.

Preliminary site selection has been carried out for both these rivers based on geomorphological zonation of the river, major tributaries, management reaches between impoundments, major catchment developments, point sources of effluents, DWAF monitoring points (where possible) and land use. The sub-regional classification approach (see NBP Report Series Nos 2 and 3) was not followed as only two



rivers (and not the entire region) were selected. The classification of all the Eastern Cape rivers is under consideration.

The programme plans to initially use the following seven indices, as proposed by NBP Report Series No 4:

- SASS4 (South African Scoring System, Version 4) using benthic macroinvertebrates to assess water quality;
- HAM (Habitat Assessment Matrix) to characterise habitat diversity;
- FCII (Fish Community Integrity Index) to assess ecosystem integrity or health based on fish community parameters: this method needs to be optimized for Eastern Cape conditions;
- RVI (Riparian Vegetation Index) to assess the modification of riparian vegetation from natural conditions;
- Hydrological Index to characterise flow conditions prior to and at the time of sampling;
- Water Quality Assessment to compare sampled water quality to typical conditions at that site, and
- Geomorphological Index to determine changes in channel condition from natural conditions.

The involvement of stakeholders and interested and affected parties will be carried out on a regional (river-by-river) basis. A public meeting on the Buffalo River catchment biomonitoring programme will be held during 1997 to inform the public and to attract wider representation for a Buffalo River core group. The existing Zwartkops Advisory Committee will be used as the forum for a public meeting for the Zwartkops River biomonitoring programme.

At present, planning for the commencement of the Eastern Cape pilot biomonitoring programme is well underway. Once funding has been finalised, site visits will be undertaken, training workshops planned and monitoring initiated.

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## **Mpumalanga: Crocodile and Elands Rivers surveyed**

Dr Neels Kleynhans of the Institute for Water Quality Studies reports that biomonitoring field surveys of two rivers in Mpumalanga were undertaken as part of the implementation phase of the NAEBP in September and October 1996. The Crocodile River (from its source near Dullstroom to Komatipoort) and the Elands River (from Machadodorp to its confluence with the Crocodile at Montrose) were both surveyed.

Fish and invertebrates were surveyed in both rivers. Fish were studied from a fish-community perspective. Historical fish distribution information was analysed and both rivers subdivided into fish reaches. For each of these reaches a reference (or expected) condition was constructed. This took into account the species expected to be present, their relative tolerance to environmental conditions, abundance, frequency of occurrence and general health. The reference condition was then compared to the observed data. This gave an indication of the current health of the fish communities of the river, based on the Fish Community Integrity Index (FCII).

A preliminary analysis of fish community data indicated that the integrity of both rivers declined from the source downstream. In some cases this decline can be related to the impact of development. In the Lowveld the effects of droughts during the early 1990s and the 1996 floods are still evident.

Invertebrate communities were investigated using the well established SASS4 methodology. A reach identification procedure was followed for the invertebrates. Although reaches differed from those identified for fish, the same sampling sites were used. SASS4 results also indicated perturbation in reaches that have traditionally been associated with water quality problems.

Both fish community integrity and SASS4 indicate that there has been good recovery of the Elands River downstream from the Ngodwana paper mill after an accidental spill in 1989 caused serious pollution.

Dr Kleynhans says that generally, and despite some areas of concern, the biological integrity and health of the Crocodile and Elands rivers still appear to be high.

The next phase of the Crocodile River investigation will include a survey of the riparian zone and an aerial survey of the habitat integrity of the river.

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### **PROVINCIAL CHAMPIONS FOR THE NAEBP**

**We invite you to be  
in touch with the  
provincial champion  
in your area if you  
are interested in  
becoming involved:**

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# South Africa and Australia strengthen ties

## DR JACKIE KING REPORTS

The Monitoring River Health Initiative (MRHI) of the Australian National River Health Programme recently held its Third National River Bioassessment Workshop in Canberra, Australia.

The aims of the workshop were to synthesise outputs of the developmental phase of the MRHI and to assess how to integrate the MRHI with the National River Health Programme and other national programmes in Australia.

The South African scientists who attended were favourably impressed by the outcome of the workshop.

Dr Jackie King of the Freshwater Research Unit, University of Cape Town, reports that a large number of specialists with a wide range of skills had been brought together to contribute to a common effort and achieve a joint product. "The magnitude of the main sampling programme is impressive," she says, "as are the variety of supporting projects to assess quality control, to explore the potential for using biota other than invertebrates for riverhealth assessment, and to enhance fundamental understanding of the functioning of river ecosystems."

Dr King says that the positive response of the lead agencies in each State or Territory had been encouraging. In many cases, two or more agencies had collaborated in the effort and, as a result, built closer working relationships.

One of the major concerns of the Australian initiative is the selection of reference sites for each region. South Africa's more structured approach to select reference sites was met with interest.

According to Dr King, the thinking behind the NAEBP and the Australian National River Health Programme is remarkably similar. Links between the two initiatives should be continued and strengthened where possible, she adds.

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# ALBANY MUSEUM OFFERS ITS SERVICES TO THE NAEBP

## DRS FERDY DE MOOR AND JIM CAMBRAY REPORT

The Albany Museum in Grahamstown houses the National Collection of Freshwater Invertebrates.

This collection comprises over 1,5 million specimens stored in glass vials in alcohol, on microscope slides or as pinned material in insect cabinets. The collection covers the whole of southern Africa and incorporates long-term surveys and one-off or "snap" samples collected at a range of riverine, lake and temporary water bodies. There are presently about 75,000 computerised records and the collection is growing at a rate of several 100,000 specimens per year. The computerised information allows easy access to past and present records of important indicator species. Selected information can be retrieved for environmental health assessment over time and can be used for the preparation of reports.

The Albany Museum also houses comprehensive collections of freshwater fish. All the collections are fully computerised. In addition, there is a growing collection of the early life history stages, which are the most vulnerable stages in the life history of a fish species. These are useful in assessing environmental degradation and water pollution.

So far no plan has been made for keeping a record of actual specimens collected at the biomonitoring sites of the NAEBP. This is especially important for reference sites, where accurate identification of specimens is required. An inventory of species backed up by "voucher samples" of actual specimens for each reference site should be compiled over time. Such information is important to resolve possible future conflicts over what species occurred in various rivers before major changes took place. It is also important to determine exactly what species are found at sites so that rare or endemic species can be noted for conservation purposes.

The Freshwater Invertebrates and Freshwater Ichthyology Departments at the Albany Museum have the infrastructure and capacity to handle such collections. The museum is prepared to hold voucher collections and can also prepare an accessible database for rapid dissemination of information.

In short, the Albany Museum is willing to serve as a repository for aquatic invertebrates and freshwater fish collected during the NAEBP. The Museum also offers identification services and can audit routine monitoring collections, verifying identifications to ensure that a high standard of identification competency is maintained.

## Water Quality Managers attend biomonitoring course

Twenty-five water quality managers of the DWAF met at the Roodeplaat Training Centre for a week-long course in February on the role and uses of aquatic biomonitoring. The development of the course was sponsored jointly by the DWAF and the CSIR.

According to Dr Henk van Vliet of the IWQS, the course was very well received. The balance between theory and the practical application of biomonitoring allowed everyone to benefit significantly. Apparently, due to its success, the course is likely to be repeated in the second half of 1997.