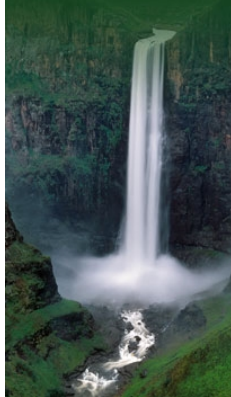


# Orange-Senqu River Awareness Kit


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## Resource Management

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## Resource Monitoring: Aquatic Ecosystem Health Monitoring

**Aquatic Ecosystem Health (AEH)** monitoring has been proposed by ORASECOM and expert consultants to support understanding of the overall status of the Orange-Senqu river system. Chemical and physical monitoring occur in a specific moment in time and may miss pollution events or variations in flow over time. AEH monitors the organisms found in the aquatic environment (**response indicators**) as well as **drivers** and **stressors** that impact the environment and organisms, to develop a comprehensive assessment of the overall health of the ecosystem.

Fish, invertebrates, algae and plants respond to stress and can be considered as **response indicators**. Their abundance and diversity can indicate the extent of **stress** (ORASECOM 2009). Water quality, flow and habitat integrity are examples of **drivers or stressors** and are normally the factors that cause changes in the response indicators.

An AEH monitoring programme can be implemented at various degrees of complexity depending on the objectives of the programme, the mandate of the implementing agency and the resources available to implement the monitoring (see box below).



Monitoring response indicators is a good way of determining the overall health of an ecosystem.

Source: DWAF South Africa 2001  
(click to enlarge)

### Box: Options for an Aquatic Ecosystem Health (AEH) Monitoring Programme in Order of Increasing Output and Costs

1. Simple biological response monitoring (initially based only on invertebrates, but possibly including fish, riparian vegetation, diatoms and/or a simple habitat assessment that describes the overall condition of the river);
2. As above, with investigative monitoring of drivers/stressors initiated only by the response indicators suggesting that there is a problem at a site;
3. Biological response and driver/stressor monitoring (habitat integrity, basic chemical monitoring as it effects aquatic biota, flow monitoring);
4. As above, with set targets to be achieved;
5. As above, including investigative monitoring and determination of the cause of degradation of any site;
6. As above, with recommendations for management responses; and
7. As above including management interventions to achieve targets.

ORASECOM 2009

Recommendations have been assembled based on international best practices and put into the context of ORASECOM's circumstances.

The recommendations are:

1. ORASECOM should develop an AEH programme to assess the current status of the Orange-Senqu River basin and to assess any trends that would indicate risk of collapse and potential loss of ecosystem services.
2. The AEH should focus on monitoring invertebrates and habitat (only) at a greater number of sites than those that exist at present.
3. Hot spots should be identified for more detailed survey and investigational sampling through ORASECOM.
4. Sampling should be done twice a year in Autumn and Spring.
5. Reporting for each site should be specific to the spot sampled and all sites should be compared against a reference area for that region.
6. Annual reporting should be standardised.
7. The annual AEH monitoring should be operated and maintained through the Secretariat who would appoint consultants to undertake the sampling and analysis of the programme (ORASECOM 2009).

[Next: Information Systems](#) ▶

## Interactive

**Basin Map**

Explore the sub-basins of the Orange-Senqu River

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**Water Management**

Explore the water management systems around the basin - including intra-basin transfers and sectoral water requirements

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**Dams**

Investigate the dams and water infrastructure in the Orange-Senqu basin

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**Video Tour**

Tour video scenes along the Orange-Senqu River related to Meeting the Water Challenge

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**Panel Discussion**

Listen to a panel discussion about the history and challenges in the Orange-Senqu basin

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