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Water Quality Assessments

A guide to the use of biota, sediments and
water in environmental monitoring

Edited by

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WHO World Health Organization



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Chapter 6*

RIVERS

6.1 Introduction

Rivers are the most important freshwater resource for man. Social, economic and political development has, in the past, been largely related to the availability and distribution of fresh waters contained in riverine systems. Major river water uses can be summarised as follows:

- potable water supply,
- irrigation of agricultural lands,
- industrial and municipal water supplies,
- industrial and municipal waste disposal,
- navigation,
- fishing and body-contact recreation,
- aesthetic value.

A simple evaluation of surface waters available for regional, national or trans-boundary use can be based on the total river water discharge. The Colorado river, USA is an example where extraction of water has virtually depleted the final discharge to the ocean. The flow has been used almost completely by negotiated extraction and distribution to nearby states. Any increase in extraction and use would require diversion of a similar water quantity to guarantee the minimum flow required to meet all the water demands of the region.

Upstream use of water must only be undertaken in such a way that it does not affect water quantity, or water quality, for downstream users. Use of river water is, therefore, the subject of major political negotiations at all levels. Consequently, river water managers require high quality scientific information on the quantity and quality of the waters under their control. Provision of this information requires a network of river monitoring stations in order to:

- establish short and long term fluctuations in water quantity in relation to basin characteristics and climate,
- determine the water quality criteria required to optimise and maintain water uses,
- determine seasonal, short and long term trends in water quantity and quality in relation to demographic changes, water use changes and management interventions for the purpose of water quality protection.

As with all freshwater systems, river quality data must be interpreted

**This chapter was prepared by M. Meybeck, G. Friedrich, R. Thomas and D. Chapman.*