Water Quality Assessments - A Guide to Use of Biota, Sediments and Water in Environmental Monitoring - Second Edition

Edited by
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Foreword to the first edition

Hydrological problems related to artificial and natural changes in the quality of inland water bodies were discussed by the Co-ordinating Council of the International Hydrological Decade (IHD) in the late 1960s. As a result, the Secretariats of UNESCO (United Nations Educational, Scientific and Cultural Organization) and WHO (World Health Organization), with the assistance of FAO (Food and Agriculture Organization of the United Nations) and IAHS (International Association for Hydrological Sciences), established an international working group, primarily to:

- identify and define the hydrological processes and phenomena directly concerned with the means of entry, distribution and self-purification of pollutants in surface and groundwater;

- review the known effects of such pollutants on any aspect of these processes and phenomena.

The outcome of the IHD working group and their collaborators was not meant to constitute a treatise on water chemistry or water pollution problems, but was a document attempting to link water quality considerations to aspects of the quantitative hydrology of surface and groundwater bodies. Advice was also included on the organisation of hydrological services, methods of conducting water quality surveys, and interpretation and evaluation of water quality data for hydrological purposes. An attempt was also made to meet the needs of developing regions by describing methods likely to be applied in these regions, both from the point of view of practicability and economy. On the other hand the report also aimed to be attractive to industrialised countries by including references to sophisticated methods.

It appeared that many hydrologists found difficulty in coping with water quality problems, and that hydrological surveys and water quality studies were not often adequately linked. The joint UNESCO/WHO publication *Water Quality Surveys* (1978) was, therefore, intended to harmonise these aspects and to synthesise the assessment of the hydrological regime and quality changes brought about by nature and man. The publication became a success world-wide and soon ran out of stock. The two Secretariats of UNESCO and WHO considered a re-print of the 1978 version, but decided to compile a completely new edition in view of the following:

(a) The progress in water quality research had been enormous over the past years and this needed to be taken into account.

(b) Water quality had become a regional, if not a global, concern encompassing more pollutants than in the past; an ecological approach could combine the physical, chemical, biological and microbiological aspects; x Water Quality Assessments heavy metals and synthetic organic compounds have called for a change in the strategies for water quality surveys and monitoring.

(c) There is no need to describe the operational aspects of water quality monitoring and the laboratory procedures since they are mostly contained in the *GEMS/WATER Operational Guide,* a revised third edition of which appeared in 1991.

(d) Basic guidance on methodology is given in the *GEMS/WATER Handbook for Water Quality Monitoring in Developing Countries* which will be available by the end of 1991.

In October 1987, the two Secretariats compiled an annotated outline for the revised *Water Quality Surveys* on the understanding that the new book would describe, in a much broader way, the application and interpretation of water quality information in water resource management. The methodological and technical aspects could be largely omitted since the reader could be referred to the above-mentioned GEMS/WATER literature.

Authors were designated in 1988 and a first meeting of authors and contributors, supported by the United Nations Environment Programme (UNEP) and the USSR Centre for International Projects, took place in Sochi (former USSR) from 14 to 20 November 1988, followed by a second editorial meeting at Baikalsk (former USSR) from 3 to 10 August 1990. A final editorial panel meeting was then convened in Geneva, 22-23 November 1990. The result of these meetings is this guidebook, now renamed *Water Quality Assessments.*

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Foreword to the second edition

Much has happened in the water sector at national and international level since the preparation of the first edition of this guidebook. One major event was the International Conference on Water and the Environment which was held in January 1992 in Dublin, Ireland. In dealing with the protection of water resources, water quality and aquatic ecosystems, the conference made rather specific requests regarding the need for more and better water quality assessments, including:

- Purpose-orientated water assessments and predictions, taking into account the specificity of both surface and groundwaters, water quality and water quantity, and addressing all pollution types.

- Assessments harmonised for natural basins or catchments (including station networks, field and laboratory techniques, methodologies and procedures, and data handling) and leading to basin-wide data systems.

- New appropriate assessment and prediction techniques and methodologies, such as low-cost field measurements, continuous and automatic monitoring, use of biota and sediment for micro-pollution monitoring, remote sensing, and geographic information systems.

In June 1992 in Rio de Janeiro, Brazil, the United Nations Conference on Environment and Development resulted in an agreement on the action plan known as Agenda 21 which, in its chapter on freshwater, largely endorsed the recommendations from the Dublin conference. The stated objectives of Agenda 21 include issues which this