

Preface

Few environmental issues are of greater importance than the contamination of the world's freshwater resources. Supplies of water from surface and groundwater sources have been, and continue to be, subject to increasing pollution by a very wide range of chemical, physical and biological contaminants. Some contamination occurs as a result of natural processes, but human activities are more often than not responsible for deterioration in water quality, not only in urban and rural environments but also in remote regions of the globe. Freshwater contamination has been accelerated as a consequence of exponential growth in population with attendant processes of urbanization, industrialization and intensification of agriculture that have led to huge increases in the volume of wastes discharged directly or indirectly to freshwaters. Pollution can be further exacerbated by changes in the hydrological cycle brought about through local and regional human intervention in attempts to meet an ever-growing demand for water, or through wider processes such as climate change associated with global warming. However caused, water quality problems have important implications for the management of water resources because contamination can adversely affect the availability of freshwater for use in public potable supply, in irrigation systems for agriculture and in consumption for industrial processes.

The International Commission on Water Quality (ICWQ) of IAHS, which was formed in 1971, is concerned with all water quality aspects of hydrological systems, including assessment and management, and over recent years ICWQ has organized a number of symposia, often in conjunction with other Commissions and Committees of IAHS, dealing with different issues related to water quality. These have included: the Symposium on Sediment and Stream Water Quality in a Changing Environment: Trends and Explanation held in Vienna, Austria, in 1991; the Symposium on Hydrological, Chemical and Biological Processes of Transformation and Transport of Contaminants in Aquatic Environments (HYDROCHEMISTRY 1993) staged at Rostov-on-Don, Russia, in 1993; the Symposium on Tracers in Hydrology which took place in Yokohama, Japan, in 1993; and Symposia on Effects of Scale on Interpretation and Management of Sediment and Water Quality, on Models for Assessing and Monitoring Groundwater Quality, on Man's Influence on Freshwater Ecosystems and Water Use, and on Modelling and Management of Sustainable Basin-Scale Water Resources Systems which all were held in Boulder, USA, in 1995 during the XXI Assembly of the International Union of Geodesy and Geophysics.

The symposium on *Freshwater Contamination*, for which these proceedings have been compiled, has been convened jointly by ICWQ and the International Commission on Groundwater of IAHS. It aims to draw together

recent studies of the quality of surface waters and groundwaters with the objective of understanding contamination in terms of basic natural and anthropogenic processes, of investigating pollution from point and non-point sources, and of exploring the options available for the prevention and remediation of contaminated waters. The 41 papers published in this volume are grouped into eight sections. The first highlights freshwater contamination at world, regional and catchment scales and includes a keynote paper on the recent GEMS-GLORI compendium of global fluxes. Papers which consider contaminants transported in sediment-associated form are grouped in a second section, while pollution and water quality degradation is the theme of the third section and includes studies of contamination by heavy metals, radionuclides and organisms, and as a result of urban and agricultural activities. The fourth section focuses on nutrients in surface waters, while the fifth addresses subsurface contamination and includes studies of problems arising from pollution arising from fertilizers, salinization and saltwater intrusion as well as more general investigations of groundwater quality at countrywide, regional and local scales. Papers concerned with contamination of lakes and reservoirs, modelling of water pollution and managing water quality are grouped together in the sixth, seventh and eighth sections of this proceedings, respectively.

While the symposium is concerned with freshwater contamination in all regions of the world, a special emphasis was placed in soliciting contributions from developing countries and from arid and semiarid zones, and *c.* 40% of the papers in the proceedings fall into this category.

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