Isotopic Techniques in Water Resources Development 1991. Edited by G. V. Ramesh. Proceedings of a Symposium, Vienna, 11–15 March 1991. Vienna, Austria, International Atomic Energy Agency, 1992, 789 pages. (757 text pages) Paperbound, $240.

This volume consists of 84 papers presented (37 oral, 47 poster) at the symposium of the same name. The topics for the oral presentation are: Interface Processes between the Atmosphere and the Hydrosphere (2 papers); Surface Water and Sediments (6 papers); Groundwater Dating: Problems and New Approaches (9 papers); Groundwater Dating: Problems and New Approaches – Methodological Aspects and Models (3 papers); Groundwater (6 papers); Environmental Problems and Water Pollution (5 papers); and Paleohydrology and Paleoclimatology (6 papers). The poster presentations are listed in their separate categories, and are more concise than the papers from the oral presentations. Seven papers are in French, 2 in Spanish and 2 in Russian. Only the three non-English papers from the oral presentations have English-language abstracts.

This volume will be valuable reading for those who utilize environmental isotopes, and need to learn about the latest isotopic tools and new applications of the traditionally applied isotopes. Topics range from applications of the well-studied ^{14}C, ^{3}H, $^{2}H/^{1}H$, and $^{18}O/^{16}O$, to ^{36}Cl, U-series isotopes and noble gases. The papers contain a few examples of the use of artificial tracers in water-tracer experiments; one illustrates the propitious use of Chernobyl-generated isotopes as large-scale "artificial" tracers. At least three papers deal with *in-situ* production of environmental isotopes.

Recent years have seen the evolution of the hydrological applications of environmental isotopes from strict isotopic considerations to more integrated studies that include not only all available geochemical parameters, but also the geological and hydrological context. Environmental isotopes have assumed their proper role in testing hypotheses based on all available data. This volume continues this trend.

A particularly vexing aspect of groundwater isotope data is the interpretation of the results in terms of real uncertainties. Several previous groundwater investigations have pointed out possible sources of errors, but until recently, few efforts have dealt with uncertainties quantitatively. The article by Brian Payne shows how statistical methods can be applied to stable oxygen and hydrogen isotope data. The techniques are transferrable to other isotopes. This chapter should be required reading for users of environmental isotopes.

The section on environmental problems includes studies of saline mine discharge, artificial radionuclide migration, and public water supply degradation. The Paleoclimatology section has particular relevance to global change research, as papers in this section illustrate that aquifers and groundwater-deposited travertine and permafrost can be archives of paleoclimatic information.

This volume will be a valuable addition to libraries of universities and research institutions in two senses of the word. First, it illustrates the current state of acceptance of the use of environmental isotopes in practical situations involving questions of water quality and quantity. Second, the price all but precludes this volume's occupancy on personal library shelves. At $240 (US), even university libraries, many of which are currently trimming budgets, will be circumspect about its purchase. Current and potential users of environmental isotopes in water resources, including hydrology students and environmental consultants, should take note of the variety of ground and surface water studies illustrated in this volume.

Austin Long