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# Environment Canada

Water Science and  
Technology Directorate

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Direction générale des sciences  
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# Environnement Canada

Workshop on the Role of Groundwater in Watershed  
Management Studies

By:

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## Management Perspective

Recently, *The Watershed Management Symposium* was held in Burlington, Ontario, at the Canada Centre for Inland Waters (December 6-8, 1995). As part of this symposium a workshop was convened to bring together people who have an interest in the hydrogeological aspects of watershed management and to discuss the role of groundwater in watershed management studies. It was evident, from both the number of attendees at the workshop and their diverse backgrounds and interests that there is considerable interest in hydrogeological aspects of watershed management studies and studying groundwater on a regional scale. The workshop discussion focused on first, the types, availability and accessibility of data/information required for groundwater quality and quantity studies in watersheds, and secondly the management of groundwater resources on a watershed basis. Several recommendations were conceived by the attendees of this workshop including: (1) the recognition that boundaries for watershed studies (surface water boundaries) do not typically follow the groundwatershed boundaries, (2) although considerable groundwater and geoscience data exists, it is not widely available and hence there is a need for better inventorying and distribution of data, (3) because of the cost of undertaking comprehensive groundwatershed management studies, future studies need be undertaken on a cost-shared basis, (4) there is a need for a large scale groundwatershed management study to demonstrate both the value of such management practices, and to develop tools and legislation for groundwater management, and (5) a working group should be established to discuss issues and plan strategies related to the role of groundwater in watershed management. As a first step towards achieving the goals of the last recommendation, the Groundwater Remediation Project of NWRI has established an electronic mailing group on the Internet to both facilitate communication among individuals interested in groundwater issues related to watershed management studies, and act as a forum for discussion.

### **Abstract**

At *The Watershed Management Symposium*, held in Burlington, Ontario, during December 6-8, 1995, a workshop entitled *The Role of Groundwater in Watershed Management Studies* was convened to bring together people who have an interest in the hydrogeological aspects of watershed management and to discuss the role of groundwater in watershed management studies. The workshop discussion focused on first, the types, availability and accessibility of data/information required for groundwater quality and quantity studies in watersheds, and secondly the management of groundwater resources on a watershed basis. Several recommendations were conceived by the attendees of this workshop including: (1) the recognition that boundaries for watershed studies (surface water boundaries) do not typically follow the groundwater boundaries, (2) although considerable groundwater and geoscience data exists, it is not widely available and hence there is a need for better inventorying and distribution of data, (3) because of the cost of undertaking comprehensive groundwater management studies, future studies need be undertaken on a cost-shared basis, (4) there is a need for a large scale groundwater management study to demonstrate both the value of such management practices, and to develop tools and legislation for groundwater management, and (5) a working group should be established to discuss issues and plan strategies related to the role of groundwater in watershed management.

## **Workshop on the Role of Groundwater in Watershed Management Studies**

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The purpose of this workshop was to bring together people who have an interest in the hydrogeological aspects of watershed management, and specifically defining tools and techniques for assessing the quantity and quality of groundwater at a watershed scale. The workshop was attended by over 30 people who comprised of a good representation of innovators and practitioners involved with both theoretical and practical aspects of groundwater management within watersheds. Their backgrounds and interests included researchers, consultants, watershed managers and one mayor, and they represented academia, consulting companies, conservation authorities, federal government agencies, provincial government agencies, and municipal governments. Following three short presentations, the workshop consisted of a lengthy discussion that focused on (1) types, availability and accessibility of data/information required for groundwater quality and quantity studies in watersheds, and (2) the management of groundwater resources on a watershed basis.

The attendees of the workshop proposed the following recommendations relating to the role of groundwater in watershed management studies.

The boundary for a watershed study are almost always defined on the basis of the boundary of a surface water drainage basin. However, because groundwater flow systems typically occur within aquifers, which do not follow the surface water boundaries, the groundwater watershed may be considerably different from the surface water watershed. Because of this, it should be recognized that the groundwater component of watershed studies may extend beyond the surface watershed boundaries. Although, it was recognized that groundwater studies can be undertaken independently of surface water studies, the strong hydrologic interaction between these two components has a direct bearing on the quantity and quality of both groundwater and the surface water systems, and hence the two should be linked following the completion of characterization of the groundwater flow regime.

A considerable amount of groundwater information in the form of reports (water resources evaluations, waste management master plans, contamination investigations, research studies, etc.), monitoring records (water levels and chemistry), and water well drillers' logs currently exists. Further numerous government and private organizations have extensive collections of data and are responsible for various monitoring programs. However much of this information is not widely available or advertised. Therefore, it was recommended that an inventory (which may be comprised of sub-inventories) of geoscience/groundwater information be established and made available to those undertaking groundwater studies. Although the actual vehicle for collecting and distributing the information was not recommended, it was suggested that the Internet could be used to list sources of information and groundwater resources (both original data bases and processed data bases) and to distribute these actual data and information. Further, it was

recognized that an important component of this information base would include the OMOEE water well records. Although it was recognized that a considerable amount of the water well data has been processed and interpreted for various studies, it was generally agreed that both the interpreted or corrected water well records and the original documents are valuable and desired by those undertaking groundwater studies.

It was also recognized that no one government agency (federal, provincial, municipal, conservation authority), has the resources nor commitment to successfully fulfill these tasks due to the required costs, time and needed resources. Therefore, it was recommended that these tasks be undertaken on a shared basis between all levels of government, private companies and interested parties. Further, it was suggested that in order to meet the costs of undertaking these tasks, as well as undertaking groundwater management studies, that finances could possibly be raised through both a minimal tax or license (for example on groundwater usage or well installation), and data information could be distributed on a cost recovery basis or through an annual subscription fee.

Although a few comprehensive groundwater management studies on a large scale have been completed or are in progress in Ontario (Credit River Conservation Authority, Grand River Conservation Authority, EC GL2000 initiative in the Regional Municipality of Halton), these are currently not widely undertaken throughout Ontario or undertaken on a consistent basis, in part due to costs, and in part due to lack of education on the benefits of such management strategies. It was recommended that one or two pilot demonstration projects be established. The objectives of such studies would be to (1) demonstrate the benefits of regional scale groundwater management strategies, (2) develop the scientific and management techniques required to successfully evaluate and manage groundwater resources, and (3) establish the legislation required for implementation of groundwater resource management on a watershed basis.

It was evident, from both the number of attendees and the participation at the groundwater workshop that there is considerable interest in the role of groundwater in watershed management studies. It was recommended that a working group be established to discuss related issues and plan strategies. As a first step, the National Water Research Institute of Environment Canada (through the Groundwater Remediation Project) has established an electronic mailing group on the Internet to both facilitate communication among individuals interested in groundwater issues related to watershed management studies, and act as a forum for discussion. It is hoped that in the near future Internet access will be available for all Conservation Authorities, municipal and regional governments, and others who have an interest in the role of groundwater in watershed management studies. The address of the Regional Groundwater Management mailing list **GWMAN-L**. Interested individuals are invited to subscribe to this list, and all submissions to the list would be automatically distributed to all current subscribers. This service is operated entirely through e-mail and there is no cost for subscription to, or use of, the list. To subscribe to the **GWMAN-L** mailing list, simply send an e-mail message to **majordomo@gwrp.cciw.ca** containing the message "**subscribe GWMAN-L**". Further information will be supplied to the subscriber at this time. Comments regarding **GWMAN-L** should be sent to Dr. A.S. Crowe at the e-mail address "**Allan.Crowe@cciw.ca**".

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