



International Association of Hydrogeologists

Groundwater & Ecosystems Network

A Call to Action

Dear Chairman, IAH National Chapter

The Groundwater & Ecosystems Network, as a subgroup of the International Association of Hydrogeologists (IAH), provides a forum for scientists to network and exchange ideas and is dedicated to improving our understanding of the relationship between groundwater and ecological resources. One of our main goals is to communicate our message to other organizations, associations, scientific societies, and research centers dealing with groundwater, ecology, and environmental sciences. IAH, as a community of concerned scientists and citizens, can encourage organizations to take a proactive role in sustaining the long-term health of protected and unprotected groundwater dependent systems.

A core mission of IAH and the Groundwater & Ecosystems Network is to foster awareness of groundwater's important role in sustaining ecosystems while at the same time fulfilling societal needs for water. We are at a juncture where unwise use of groundwater may not only deplete aquifers but may also destroy dependent ecological systems as well. It is thus essential that wetland and water managers understand how groundwater systems function in relation to specific groundwater-dependent ecosystems (GDEs). New knowledge and techniques are now becoming available to support improved quantification of the hydrological and ecological links between aquifers and their associated dependent ecosystems. Without this understanding, managers risk making incorrect decisions on water and GDE management.

The Ramsar Convention, an important IAH partner, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources and is responsible for designating and protecting Ramsar sites. The Groundwater & Ecosystems Network is working toward meaningful engagement with Ramsar on groundwater issues.

Therefore, the Groundwater & Ecosystems Network requests that this letter be distributed to your IAH members, in particular to those working on the issue of GDEs and those members that have any interactions with Ramsar sites. We encourage these members to: 1) interact with Ramsar site management to offer help in review or provide hydrogeological input on issues related to groundwater, and 2) share their hydrogeological characterizations of Ramsar sites with the Groundwater & Ecosystems Network.

What are groundwater-dependent ecosystems and why are they important?

Groundwater provides a vital source of water and creates critical habitat for a broad range of species¹. Groundwater-dependent ecosystems (GDEs) comprise a complex and often biodiverse subset of the world's ecosystems, including many Ramsar sites, and can be found in marine, coastal, lotic, lentic, terrestrial, cave, and aquifer environments. These are habitats that must have access to groundwater to maintain their

¹ Foster, Stephen; Koundouri, Phoebe; Tuinhof, Albert; Kemper, Karin; Nanni, Marcella; Garduno, Hector. 2006. Groundwater dependent ecosystems: the challenge of balanced assessment and adequate conservation. GW Mate briefing note series; no. 15. Washington, DC: World Bank. <http://documents.worldbank.org>, accessed August 11th, 2014

ecological structure and function and are critical components in the conservation of the earth's aquatic biodiversity. GDEs go beyond the narrowly defined "wetland". They include springs, caves and karst, shallow water table areas that support unique flora and fauna, and baseflow that supports river flow during dry seasons. Large surface water or rain fed wetlands frequently provide recharge to underlying aquifers and play a vital role in regulating the quantity and quality of groundwater.

GDEs also offer multiple ecosystem services to humans, such as clean water for domestic use, irrigation, fish and wildlife habitat, stormwater control, ethnobotanical uses, and sequestration of carbon². Increasingly, the water needs of communities are in direct conflict with the water needs of natural systems. Human activities have the potential to alter the fluxes, levels and quality of groundwater, which, in turn, can diminish groundwater supported biodiversity that has evolved over millennia. Many communities depend for their livelihoods on groundwater abstraction for drinking water and irrigation, however the Millennium Ecosystem Assessment concluded that freshwater, both surface water and groundwater, is one of the ecosystem services under greatest pressure from over-exploitation in many parts of the world.

Why are Ramsar sites important?

Presently, the Ramsar Convention is involved in the conservation of 2187 sites in 168 countries³, constituting a critical mass of aquatic biodiversity across the globe. The Convention uses a broad definition of the types of wetlands it covers and many sites are groundwater supported or directly recharge aquifers. In addition to the many wetlands, marshes, and coastal features that receive groundwater discharge, Ramsar sites include springs, fens, groundwater supported lakes, karst areas and more. The Ramsar Convention has long recognized the critical need to understand the inter-relationships between groundwater and wetlands. Under Resolution VIII.40 (Guidelines for rendering the use of groundwater compatible with the conservation of wetlands) the Ramsar conference of the contracting parties urges parties to:

- Study the impact of the use of groundwater on the conservation of their wetlands...;
- Ensure that a more decisive effort is made, within the framework of wetland-related education, communication and public awareness activities, with regard to groundwater...;
- Give more attention to the role of groundwater in maintaining the ecological functions of wetlands...

To aid contracting parties with these recommendations, the Ramsar Convention Secretariat published a Handbook⁴ specifically for water managers of Ramsar sites. The Handbook focuses on the role of groundwater in maintaining wetland character and ecosystem services; the role of wetlands in groundwater recharge and discharge; and the management of impacts on wetlands from changes in groundwater quality and quantity.

Contracting parties should be implementing the seven-step '*Framework for the development of groundwater management strategies*' as set out in the Handbook. The framework contains key areas of concern where Ramsar site managers can communicate and collaborate with water resources managers in order to ensure that the protection and maintenance of wetland ecosystems is taken into account in

² Millenium Ecosystem Assessment (2005). Available at www.maweb.org, accessed August 11th, 2014.

³ Ramsar sites list, available at www.ramsar.org, accessed August 11th, 2014.

⁴ Managing groundwater: Guidelines for the management of groundwater to maintain wetland ecological character, Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 11. Ramsar Convention Secretariat, Gland, Switzerland, 2010, www.ramsar.org, accessed August 11th, 2014.

groundwater and surface water management planning. A handbook, however, is a poor substitute for a well-trained hydrogeologist and effective implementation of the framework will almost certainly require groundwater expertise. This is where IAH members can help.

A key role for IAH members

We encourage IAH members to get involved. Please contact Ramsar site managers to offer help or input on hydrogeological issues. Encourage site managers to consider the role of groundwater in ecosystem health and function and to take action when the supply or quality of groundwater is threatened. Work with the in-country administrative authority to designate significant GDE locations as Ramsar sites.

To directly assist the Groundwater & Ecosystems Network in its efforts to partner with the Ramsar Secretariat, we ask willing members to share their hydrogeological characterizations of Ramsar sites to enable the Network to become knowledgeable at the Country level. Documentation can consist of published literature or a short write up. Please respond to Joe Gurrieri at joe.gurrieri3@gmail.com. To locate the Ramsar Convention Administrative Authority within your country, please inquire at this web site www.ramsar.org.

Sincerely,

/s/ Joe Gurrieri
Director, IAH Groundwater & Ecosystems Network