

INTRODUCTION

As freshwater from rainfall and snow melt flows downhill, some of it will accumulate in features on the land surface forming lakes, streams, and wetlands and contributing freshwater to estuaries. These systems are collectively referred to as surface water. Other portions of this water will percolate through the soil or seeps through cracks and fissures and sinkholes on the land surface to recharge and be stored in underground formations (aquifers) as groundwater. Still other portions of this water will be taken up by plants, used to support their survival and growth, and eventually released back into the atmosphere as “evapotranspiration.” Throughout this hydrological cycle, water, which has been called the “universal solvent,” will dissolve a variety of minerals, metals, and trace elements that are natural constituents of soil and geologic formations with which water comes in contact. As water flows on the land surface, its quality will be influenced by the amounts of solids that it dissolved or caused to be suspended and by the quality of runoff received from adjacent lands. In a similar process, the quality of groundwater will be determined by the length of its residence time in aquifers and the geochemical make up of the aquifer material, especially its solubility in water.

Compared to the natural processes described above, man-made (anthropogenic) activities will generate a variety of pollutants that once they find their way to surface water or groundwater will exact a more serious toll on the quality of these resources. Carcinogenic, toxic, mutagenic or teratogenic chemicals, along with pathogenic and infectious microorganisms, are discharged from a variety of human activities ranging from agriculture to septic systems to pharmaceutical, industrial, and mining operations.

Although the two water resources (groundwater and surface water) have been referred to in the scientific and regulatory literature as two separate media, they are in reality components of the same watershed along with others such as soil, sediments, and the vadose zone. Atmospheric deposition is a factor in determining both the quantity and the quality of water in a watershed. The degree of interaction between these components varies with the hydrogeological setting associated with the watershed or the ecosystem in question. In Florida, where the predominant geology is highly permeable, and is frequently channelized limestone (karst) covered with a thin veneer of sandy soil, the interaction between watershed components is at a maximum. Visible manifestations of such interaction include sinkhole formation, subsidence, high recharge rates, disappearing streams, and the prevalence of caves and springs.

In addition to these natural phenomena, interaction can facilitate--indeed exacerbate-- the impacts of man-made activities on the quality and integrity of the state's ecosystems. To illustrate this point, one may consider past events caused by over withdrawal of water from aquifers through agricultural irrigation or public water supply wells: wetlands have dried up, springs have ceased flowing, sinkholes have opened, saltwater has intruded into coastal aquifers, and pollutants

have moved into well fields. The economical, environmental, and public health costs of such occurrences to society are staggering.

The extreme vulnerability of groundwater to contamination in Florida has been coupled in recent decades with a phenomenal population growth in the state. This has increased the demand for water; on the one hand, and generated huge volumes of waste that must be treated and disposed of, on the other. Unless measures are taken to reverse the trend, both of these needs will continue to put additional stresses on the state's environment and its finite water resources. For such measures to be effective, we must have a thorough understanding of not only the threats facing our aquatic resources but also the dynamics of interaction between components of the watershed or ecosystem that support the health and integrity of these resources.

This workshop was an effort to bring scientists, resource managers, and politicians and other decision makers together with concerned and affected citizens in order to develop strategies for addressing one critical component of the ecosystem described in the above--namely springs. Springs are viewed by many as the "crown jewels" of Florida's ecology providing popular recreation destinations for tourists and native Floridians alike, refuge for wildlife, and sources of pure drinking water. For hydrogeologists, however, springs are also the portals that allow a direct encounter with that mysterious subterranean world of groundwater and how that world interacts with the surface of the land and waters residing thereon.

Workshop Description and Format

Below is the announcement for the workshop along with the registration form and agenda:

A Workshop to Develop Blue Prints for the Management and Protection of Florida's Springs

Purpose:

The purpose of this two day workshop is to provide a forum to facilitate discussion between scientists, resource managers and the public regarding the significance of springs as valuable natural systems that must be preserved and protected for the benefit of the State's ecology, environment, economic well being and quality of life.

Intended Audience:

Planners, resource managers and scientists from local, regional and State governments, as well as the private sector, involved in making land use, zoning and water management decisions.

Workshop Format:

Invited experts will be grouped into three panels (several speakers each) that will discuss each of the topics listed below in breakout sessions and develop session findings into specific conclusions and recommendations to be reported back to the plenary session for discussion.

Topics of Discussion for Panels:

1. Inventory of springs in Florida:

This panel will discuss the level and availability of knowledge and data on springs number, location and status regarding water quality, discharge volume, public or private ownership, types of land use in the vicinity of springs and existing or anticipated threats to the integrity of these systems. The panel will also address the issue of un-documented or un-discovered springs, traditional and any new or innovative technologies such, as remote sensing, applicable to locating new upland and submarine springs.

2. Delineation of the boundaries of spring basins or “spring sheds”:

This panel will focus on the methods traditionally used to delineate zones of capture or zones of contribution to springs. How does one evaluate ground water vulnerability to contamination within a spring basin? What are the scientific and research needs necessary to develop and validate models that may be applicable in karst settings?

3. Currently used or recommended measures for managing and protecting springs:

This panel will discuss regulatory measures or land use and management practices that have been successful or have shown promise in protecting springs in Florida and elsewhere. It will delve into specific ordinances, regulation, statutes and policies as well as best management practices that have been attempted by the various levels of government in different localities. The panel will also address the economic benefits and/or impacts on the communities where these practices have been attempted. How have these measures been received by the development community, by the environmental advocacy groups, by the scientific community and by the general public?

Registration and Accommodations:

This two day workshop, co-sponsored by the Florida Geological Survey, the Hydrogeology Consortium and the Florida State University, will be held in Ocala, Florida on May 8th and 9th 2002, at the Hilton Ocala; 3600 SW 36th Avenue, Ocala Fl. 34474. Special rates of \$ 94.00 (single and double) per night will be available if reservations are made by April 25 2002. Hotel number for reservations: (352) 854 1400 or www.Hiltonocala.com

Interested individuals may register by e mailing or faxing the following information to Dr. Rodney S. DeHan at the Florida Geological Survey:

Rodney.dehan@dep.state.fl.us

Fax: (850) 412 0495

Registration Information:

Name:

Affiliation:

Phone:

Fax:

E mail:

Panelist or attendee:

Registration fee of \$ 75.00 (invited panelists will not be charged a registration fee) is payable to the Hydrogeology Consortium by a check; mailed to:

The Hydrogeology Consortium
Geophysical Fluid Dynamics Institute
18 Keen Building
Florida State University
Tallahassee, Fl. 32306-4360

Cash will also be accepted at the registration desk on the morning of the workshop; the Consortium is not able to accept credit cards. The registration fee will cover two banquet lunches, continental breakfasts, coffee breaks and copies of the Proceedings in CD ROM format.

Agenda:

Wednesday May 8th:

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| 7:30 – 8:30 AM | Continental breakfast and registration |
| 8:30 – 8:45 AM | Welcome and opening remarks
<i>Dr. Walt Schmidt, FGS</i> |
| 8:45 to 9:00 AM | Description of workshop format and goals and instructions to panels
<i>Dr. Rodney DeHan, FGS</i> |
| 9:00 – 10:30 AM | Concurrent breakout sessions of the three panels |

Panel I. Inventory of springs

Moderator: Dr. Rick Copeland, FGS

Panelists: Dr. Tom Scott, FGS
Mr. David Hornsby, SRWMD
Mr. Eric De Haven, SWFWMD
Mr. James McClean, FGS
Ms. Laura Morse, Fl. DEP

Panel II. Delineation of spring shed boundaries

Moderator: Dr. Jon Arthur, FGS
Panelists: Dr. Sam Upchurch, SDII Global Corp
Mr. Brian McGurk, SJRWMD
Mr. Wes Skiles, karst Environmental Services
Mr. Hal Davis, USGS
Dr. Todd Kincaid, Hazlett-Kincaid, Inc

Panel III. Currently used or recommended measures for the management and protection of springs

Moderator: Dr. Rodney DeHan, FGS
Panelists: Mr. Gary Maidhof, Citrus County
Mr. Chris Rison, Marion County
Mr. Bruce Day, Withlacooche RPC
Mr. Charles Gauthier, Fl. DCA
Ms. Lucinda Roberts, Fl. DEP
Mr. Dan Pennington, 1000 Friends of Florida

10:30 – 11:00 AM	Coffee break
11:00 AM – 12:30 PM	Continuation of panel discussions
12:30 – 1:30 PM	Banquette lunch
	Luncheon speaker <i>Mr. Jim Stevenson, Fl. DEP</i>
1:30 – 3:30 PM	Continuation of panel discussions
3:30 – 3:45 PM	Coffee break.
3:45 – 5:00 PM	Panel discussion and adjourn first day.

Thursday May 9th

8:00 – 8:30 AM	Continental breakfast.
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8:30 – 9:00 AM	Initial feedback from panels and format for report back to the plenary session; facilitated by Dr. Rodney DeHan.
9:00 – 10:45 AM	Resumption of concurrent panel discussions
10:45 – 11:00 AM	Coffee break
11:00 AM – 12:30 PM	Panels to develop findings and recommendations for reporting back to the plenary session.
12:30 – 1:30 PM	Banquette lunch Luncheon speaker and slide presentation <i>Dr. Todd Kincaid</i>
1:30 – 3:00 PM	Panels report back to the plenary session, open discussion by all the participants and the development of overall workshop recommendations; facilitated by Dr. Walt Schmidt.

ADJOURN WORKSHOP