

# *Everglades Geological Society* **BULLETIN**

Volume 11, Number 4

May 2005

May 17, 2005

6:00 P.M. at Brix Grill & Bistro (Grotto Room)  
3583 McGregor Boulevard  
*(social hour starts at approximately 5:00)*

**Speaker:** Robert A. Renken  
U.S. Geological Survey

**Topic:** Wellhead Protection in an Eogenetic Karst Aquifer: Can a Municipal Well Field Co-Exist Peacefully with the Everglades Extractive Mining Industry?

Meeting Sponsored by:



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**Everglades Geological Society**  
**P.O. Box 61684**  
**Fort Myers, FL 33906**  
**[www.evergladesgeologicalsociety.org](http://www.evergladesgeologicalsociety.org)**

The Everglades Geological Society is an organization which seeks to promote interest in and understanding of Geology and the related Earth Sciences, and to provide a common organization for those individuals interested in geology and the related earth sciences. The Bulletin is a publication of the Everglades Geological Society, Inc.

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# EGS MEETING THIS MONTH

## TUESDAY

### May 17, 2005

**Brix Grill & Bistro**  
3583 McGregor Boulevard, Fort Myers  
(please see map on page 5)

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## *Members and Prospective Members Come Join Us!!*

Thanks to Mike Weinberg for lining up the following guest speakers:

<u>DATE</u>	<u>SPEAKER</u>	<u>TOPIC</u>
11/16/04	Frank Rupert (FGS)	Diagnostic Fossils in Florida Stratigraphy
1/18/05	Robert Halley (USGS)	Pulley Ridge – the US's Deepest Coral Reef
3/15/05	Joe Haberfeld (FDEP)	The Confining Characteristics of the Floridan Aquifer in Florida's Deep Injection Wells
5/17/05	Robert Renken	Wellhead Protection in an Eugenic Karst Aquifer: Can a Municipal Well Field Co-Exist Peacefully with the Everglades Extractive Mining Industry?





PRESIDENT'S MESSAGE May 2005  
by Gordon Kennedy

Your Responsibility as a Member!

I was in New Orleans recently and upon seeing the NOGS Log's President's Column I had to borrow her (Brenda Reilly) opening line. As a member, your basic responsibilities are to pay your dues, attend meetings (as time allows), and cast your vote for next year's officers. Organizations, however, are run by officers and Board of Directors. Members are expected to share in the responsibility of running the organization if they have an interest in seeing the Society survive and flourish. Please cast your vote when called upon, and volunteer your time to help run the EGS. We hope to finalize the nominations for next year's officers at the May meeting and will e-mail ballots out by the end of May.

We would like to thank Mr. Joseph Haberkamp for the excellent talk he gave on injection wells at the March meeting. The turnout for the meeting was good and it was great to see familiar faces we had not seen in a while. Thanks to Johnson Engineering Inc. for sponsoring the meeting. We sure will miss the Holiday Inn/Toucan Charlies meeting location on the river.

Riverfront locations are getting harder to come by, so we thought a golf course view would be the next best thing. We are holding the May meeting in the "Grotto" room at Brix Bar and Grill on McGregor Boulevard. We have a really interesting topic that has obvious relevance here in Southwest Florida.

Mr. Robert Renken of the United States Geological Survey in Miami will be talking about pathogen transport in karst aquifers. Please check out his abstract, you should note the relevance to this area. Bob's background includes attending Franklin & Marshall College with Tom Missimer. We hope he has some good college stories for us.

Ms. Susan Cone, a recipient of the EGS scholarship fund, will also be presenting a poster session of the research work she did on sea level changes in South Florida under Dr. Michael Savarese at FGCU.

Instead of our annual picnic at the beach, this year we are planning a canoe trip/fossil collecting trip on the Peace River. Details will be available at the meeting. We are also planning a field trip to some rock mines in the Immokalee area.

This month's meeting is being sponsored by MWH Americas (fka Montgomery Watson). We would like to thank the staff at MWH for providing a generous contribution to defray the meeting room and speaker costs.

And last but not least (again), for you former members we have not heard from lately, please continue to support your organization by renewing your membership.

## This Month's Speaker and Topic:

### **Wellhead protection in an eogenetic karst aquifer: can a municipal well field co-exist peacefully with the Everglades extractive mining industry?**

*Robert A. Renken, Hydrologist, U.S. Geological Survey*

Proposed expansion of extractive lime-rock mines within 800 to 3000 ft of the Miami-Dade Northwest well field, Florida's largest municipal well field, has garnered intense scrutiny by the government, public, environmental stakeholder's, and media due to concern that mining will increase the risk of pathogen contamination. Existing county ground-water flow and particle tracking models do not provide adequate information regarding the ability of a karst aquifer to limit the advective movement of pathogens and other contaminants. Integrated laboratory and in-situ field experiments have been used to assess the role of preferential flow paths in solute and microbial transport behavior. Chemical transport properties and pathogen mobility within vuggy, conduit flow zones were delineated using deuterium, sulfur hexafluoride, halon, and bromide conservative tracers and carboxylated polystyrene microspheres as a surrogate for *Cryptosporidium parvum* oocysts. A forced gradient tracer test using Rhodamine WT and deuterated water indicates that apparent mean advective flow between the point of injection and production well (300 ft) is 1 to 2 orders of magnitude greater than previously measured within the well field. Preliminary data indicate that karst, touching-vug, stratiform ground-water flow zones of relatively high permeability represent efficient horizontal pathways for conservative and colloidal tracer movement.



*A north-facing oblique aerial photo showing a partial view of Miami-Dade County Northwest well field and active lime-rock borrow-pit mines that lie to its north.*

# Biography

## Robert A. Renken, Hydrologist

Hydrologist, U.S. Geological Survey, Florida Integrated Science Center (FISC), Center for Water and Restoration Studies (CWRS), 9100 NW 36<sup>th</sup> St. Suite 107, Miami, FL 33178 (305) 717 5822 FAX: 305 717 5800 [raerken@usgs.gov](mailto:raerken@usgs.gov)

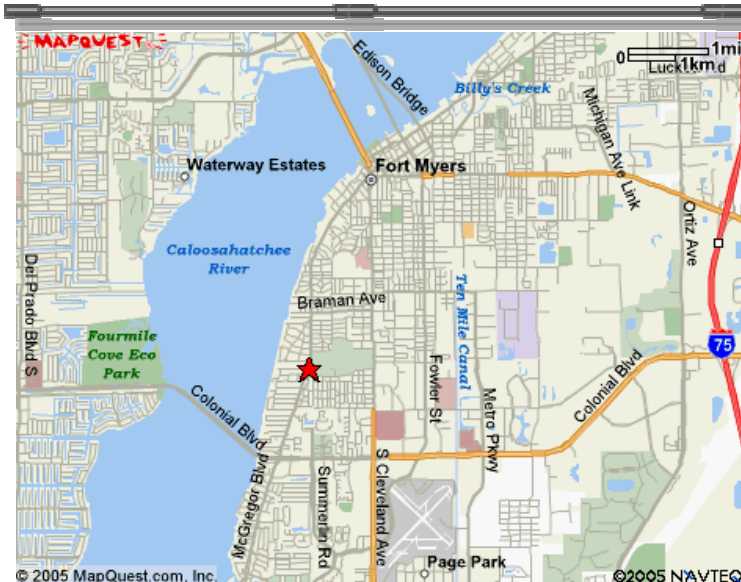
**Education:** M.S., Miami University of Ohio, B.A., Franklin and Marshall College

**Professional Experience:** Hydrologist, USGS, Miami, FL (1998-present), USGS, Norcross, GA (1981-1998), USGS, Metairie, LA, (1976-81), Moody and Associates, 1973-74, Harrisburg, PA.; Professional Geologist (Georgia)

**Technical focus:** Broad experience in regional ground-water hydrologic investigations in the southeastern US Coastal Plain and in U.S. Caribbean area; authored segment of the National Ground Water Atlas. More recent technical focus has been on the long-term impact of anthropogenic development on ground-water hydrology in southeast Florida; wellhead protection issues and use of conservative tracers to assess karst aquifer vulnerability to contamination.

**Florida Assignments:** Florida Integrated Science Center-Center for Water and Restoration Studies Ground-Water Specialist; member of USGS Florida Science Council, CERP ASR Regional Project Management Plan Team; the reformed South Florida Task Force ASR Issue Team.

**Publications:** a variety of publications including two USGS Professional Papers.



**EGS MEETING CALENDAR**  
**2004-2005**  
**November 16**  
**January 18**  
**March 15**  
**May 17**

**Everglades Geological Society**  
Meets on the third Tuesday every other month. Social hour starts at 5:00 PM. The meeting begins at 6:00 PM. No meetings are held in June, July or August.

**Third Notice 2005 Dues are due**  
Membership dues for the Everglades Geological Society for 2005 are \$18.00 for Active Members and \$9.00 for Associate and Emeritus Members

**Please make checks payable to the Everglades Geological Society and either bring to our next meeting for mail to:**  
**P.O. Box 61684**  
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EVERGLADES GEOLOGICAL SOCIETY  
2005 FINANCIAL REPORT

Curtis R. Klug - Secretary/Treasurer

	<u>General Fund</u>	<u>Scholarship Fund</u>	<u>Speaker's Fund *</u>	<u>Total</u>	<u>Comments</u>
<u>May, 2004</u>					
Starting Balance:	\$706.80	\$280.49	N/A	\$987.29	
Deposits:	\$0.00	\$0.00	N/A	\$0.00	
Withdrawals:	\$0.00	\$0.00	N/A	\$0.00	
Ending Balance:	\$706.80	\$280.49	N/A	\$987.29	
<u>June, 2004</u>					
Starting Balance:	\$706.80	\$280.49	N/A	\$987.29	
Deposits:	\$195.00	\$125.00	N/A	\$320.00	Dues/Donations
Withdrawals:	\$36.94	\$0.00	N/A	\$36.94	Picnic Expenses
Ending Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
<u>July, 2004</u>					
Starting Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
Deposits:	\$0.00	\$0.00	N/A	\$0.00	
Withdrawals:	\$0.00	\$0.00	N/A	\$0.00	
Ending Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
<u>August, 2004</u>					
Starting Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
Deposits:	\$0.00	\$0.00	N/A	\$0.00	
Withdrawals:	\$0.00	\$0.00	N/A	\$0.00	
Ending Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
<u>September, 2004</u>					
Starting Balance:	\$864.86	\$405.49	N/A	\$1,270.35	
Deposits:	\$0.00	\$0.00	\$500.00	\$500.00	Sponsorship
Withdrawals:	\$0.00	\$0.00	\$0.00	\$0.00	
Ending Balance:	\$864.86	\$405.49	\$500.00	\$1,770.35	
<u>October, 2004</u>					
Starting Balance:	\$864.86	\$405.49	\$500.00	\$1,770.35	
Deposits:	\$0.00	\$25.00	\$0.00	\$25.00	Last Polo Shirt
Withdrawals:	\$0.00	\$0.00	\$0.00	\$0.00	
Ending Balance:	\$864.86	\$430.49	\$500.00	\$1,795.35	
<u>November, 2004</u>					
Starting Balance:	\$864.86	\$430.49	\$500.00	\$1,795.35	
Deposits:	\$15.00	\$0.00	\$500.00	\$515.00	Sponsors, Membership
Withdrawals:	\$0.00	\$0.00	\$0.00	\$0.00	
Ending Balance:	\$879.86	\$430.49	\$1,000	\$2,310.35	

December, 2004

Starting Balance:	\$879.86	\$430.49	\$1,000	\$2,310.35	
Deposits:	\$0.00	\$0.00	\$0.00	\$0.00	
Withdrawals:	\$0.00	\$0.00	\$0.00	\$0.00	
Ending Balance:	\$879.86	\$430.49	\$1,000	\$2,310.35	

January, 2005

Starting Balance:	\$879.86	\$430.49	\$1,000	\$2,310.35	
Deposits:	\$0.00	\$0.00	\$0.00	\$0.00	
Withdrawals:	\$0.00	\$0.00	\$341.26	\$341.26	Holiday Inn/Ann. cake
Ending Balance:	\$879.86	\$430.49	\$658.74	\$1,969.09	

February, 2005

Starting Balance:	\$879.86	\$430.49	\$658.74	\$1,969.09	
Deposits:	\$0.00	\$0.00	\$0.00	\$0.00	
Withdrawals:	\$76.00	\$0.00	\$0.00	\$76.00	P.O. Box
Ending Balance:	\$803.86	\$430.49	\$658.74	\$1,893.09	

March, 2005

Starting Balance:	\$803.86	\$430.49	\$658.74	\$1,893.09	
Deposits:	\$0.00	\$0.00	\$0.00	\$0.00	
Withdrawals:	\$0.00	\$0.00	\$159.00	\$159.00	Holiday Inn - Riverwalk
Ending Balance:	\$803.86	\$430.49	\$499.74	\$1,734.09	

April, 2005

Starting Balance:	\$803.86	\$430.49	\$499.74	\$1,734.09	
Deposits:	\$120.00	\$24.00	\$274.00	\$418.00	Dues/Donations
Withdrawals:	\$90.00	\$0.00	\$0.00	\$90.00	OnSmart Network
Ending Balance:	\$833.86	\$454.49	\$773.74	\$2,062.09	

May, 2005 (to 5/10/05)

Starting Balance:	\$833.86	\$454.49	\$773.74	\$2,062.09	
Deposits:	\$30.00	\$50.00	\$6.00	\$86.00	Dues/Donations
Withdrawals:	\$15.00	\$0.00	\$0.00	\$15.00	OnSmart Network
Ending Balance:	\$848.86	\$504.49	\$779.74	\$2,133.09	
				<u>+ \$96.00</u>	Petty cash for change
				<b>\$2,229.09</b>	<b>TOTAL</b>

\* Meeting Sponsorship and \$3 from each Member's Dues

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