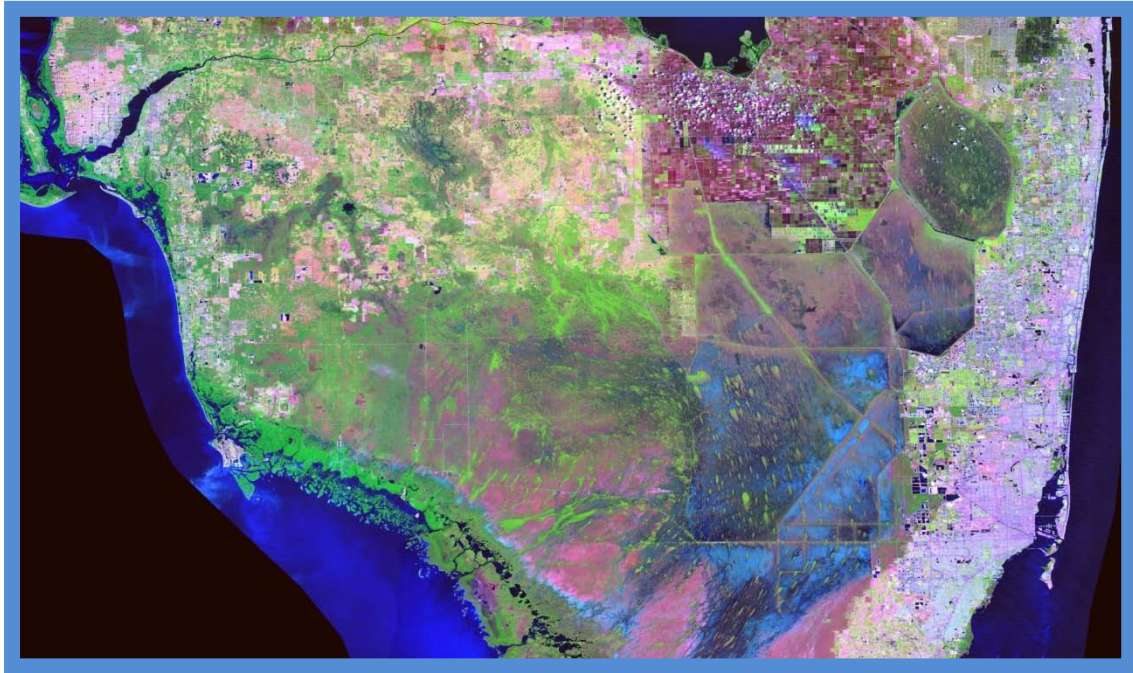


*Everglades Geological Society*

# ***BULLETIN***



Volume 19, Number 3

January 2013

**Meeting This Month: Tuesday, January 15, 2013**

**Speaker: *Ed Rectenwald, P.G., MWH AMERICAS***

Topic:

**INVESTIGATION OF FLOW PATTERNS USING GEOCHEMICAL TRACERS IN THE  
FLORIDAN AQUIFER SYSTEM, NAPLES, FLORIDA**

### **INSIDE THIS ISSUE**

- |     |                                       |
|-----|---------------------------------------|
| 2   | Announcements/News                    |
| 3   | President's Address                   |
| 4-5 | Topic, Abstract, Biography of Speaker |
| 6   | Map, and Application Locations        |
| 7   | Our Sponsors                          |

*Everglades Geological Society*  
*P. O. Box 61684*  
*Fort Myers, FL 33906*

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.

**EGS Officers**

**President:** Kim Arnold, PG  
*Johnson Engineering*  
[KArnold@johnsoneng.com](mailto:KArnold@johnsoneng.com)

**Vice President:** Joseph Abbott, PG  
[abbottjl@gmail.com](mailto:abbottjl@gmail.com)

**Secretary/Treasurer:** Kelly Probst  
*MWH Americas, Inc.*  
[Kelly.Probst@us.mwhglobal.com](mailto:Kelly.Probst@us.mwhglobal.com)

**Editor:** Pierre Bruno, PG  
*Florida Department of Environmental Protection*  
[Pierre.Bruno@dep.state.fl.us](mailto:Pierre.Bruno@dep.state.fl.us)

**Director:** Kapo Coulibaly  
*Schlumberger Water Services*  
[KCoulibaly2@fort-myers.water.slb.com](mailto:KCoulibaly2@fort-myers.water.slb.com)

**Director:** Rick Stross, PG  
*Professional Geologist*  
[RowenaRick@aol.com](mailto:RowenaRick@aol.com)

Advertising Rates:  
Advertisements may be purchased in the Bulletin at the following rates for ten issues of the newsletter.

Business Card Size .....\$25.00  
1.8 x 3.5 inches  
One-Quarter Page .....\$80.00  
3.5 x 4.5 inches  
One-Half Page ..... \$175.00  
7 x 5 inches

**Meeting This Month:**  
**TUESDAY January 15, 2013**  
**6 pm (Social hour starts at 5 pm)**

**The Edison**  
3583 McGregor Boulevard  
Fort Myers, Florida

---

*Thank you to our Sponsors!*  
*Please check them out on page 6!!*

---

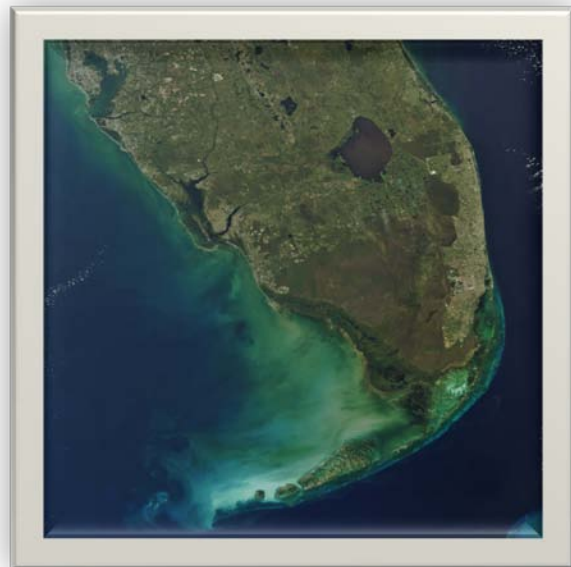
*Would you like to advertise in our bulletin? Please contact one of the EGS officers.*

---

*Do you know someone that would like speak at one our meetings? Please let us know.*

---

[www.evergladesgeologicalsociety.com](http://www.evergladesgeologicalsociety.com)



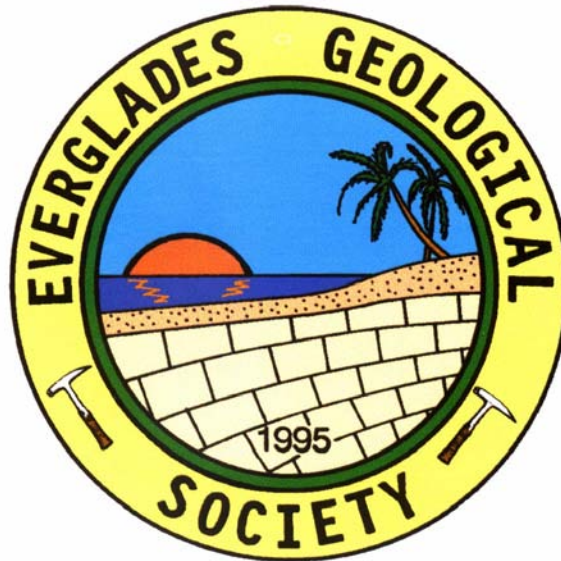
## PRESIDENT'S ADDRESS

Kim Arnold, P.G.

Hydrogeologist  
JOHNSON ENGINEERING, INC.

**Editor's note:** the President's message was not completed at "Press Time" and I am out of here for some respite. Sorry Kim.

Serendipity is being swamped with billable geology work.



## **THIS MONTH'S TOPIC**

### ***INVESTIGATION OF FLOW PATTERNS USING GEOCHEMICAL TRACERS IN THE FLORIDAN AQUIFER SYSTEM, NAPLES, FLORIDA***

*presented by*

***ED RECTENWALD, P.G. – MWH AMERICAS***

#### ***ABSTRACT***

Scientific This study investigated flow patterns and tested Kohout's theory of "cyclic-flow" in the Floridan aquifer system (FAS) within the south western Florida Peninsula of Naples Florida. Cyclic flow means ocean water enters the lower Floridan aquifer, flows inland, migrates upward into the upper Floridan aquifer, and then flows back to the ocean. Kohout (1967) was the first to identify cyclic groundwater flow from his anomalous temperature measurements in the Floridan aquifer. He suggested that cold, dense seawater flows inland through the cavernous dolomite in the deep part of the lower Floridan aquifer, where it becomes progressively heated by geothermal heat flow. The reduction in density produces an upward convective circulation which brings seawater into contact with freshwater.

The study area covers approximately 175 square miles around the city of Naples, Collier County, Florida. Four Floridan monitoring wells were used for the study. The tri-zone Floridan monitor well (I75-TW), property of the South Florida Water Management District (SFWMD), was the core monitor well used for this investigation. Three nearby dual-zone Floridan monitor wells, property of Collier County, Florida, were used to support the data from the I75-TW.

This investigation utilized a geochemical analysis of groundwater samples from the FAS to better identify groundwater flow patterns in the vicinity of Naples, Florida. These groundwater samples were analyzed for major cations ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ ), anions ( $\text{Cl}^-$ ,  $\text{HCO}_3^-$ , and  $\text{SO}_4^{2-}$ ), stable isotopes ( $^2\text{H}$ ,  $^{18}\text{O}$ ), radiocarbon ( $^{14}\text{C}$ ), and noble gas data collected from monitor wells located within the study area. Temperature logs were also conducted in the aforementioned monitor wells and analyzed to aid in identifying the possibility of cyclic flow in the FAS.



## PROFESSIONAL SUMMARY

Ed Rectenwald, P.G.  
Supervising Hydrogeologist

Business Unit Leader  
MWH Americas

Mr. Rectenwald has over 17 years of experience in various hydrologic, geologic, and environmental investigations. This experience includes project management, construction and testing oversight of Class I injection wells, Class V Aquifer Storage and Recovery (ASR) wells, public and industrial supply wells, irrigation wells, monitor wells, and rehabilitation of deteriorated wells. Mr. Rectenwald has successfully managed field staff on ASR system construction, wellfield construction and expansion projects, and assisted with field team management during Class I and Class V injection well facility construction on numerous projects. Mr. Rectenwald is also involved with regional studies of the Floridan Aquifer System by constructing detailed subsurface hydrostratigraphy maps from data obtained from exploratory well drilling, geophysical logging, and aquifer hydraulic testing and analysis results.

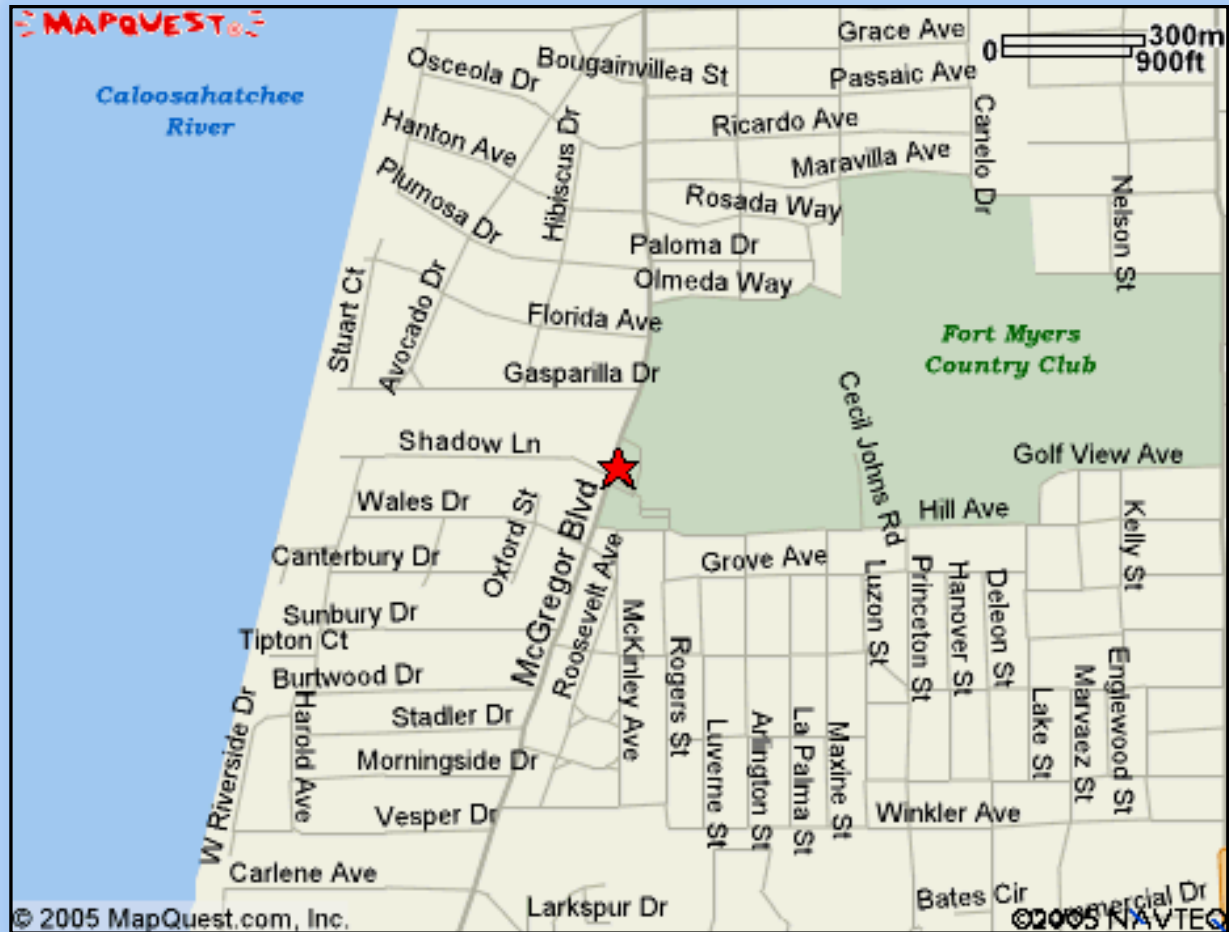
His investigational experience includes borehole geophysical log analyses, formation lithology interpretation, hydrogeologic modeling, and long term water level/water quality studies, as well as analyzing and interpreting stable isotopes, carbon-14, and noble gases to better define different water bodies and flow patterns within the Floridan Aquifer System. Mr. Rectenwald has also written various technical specifications for the construction and testing of Class I deep injection wells, Class V aquifer storage and recovery wells, monitor wells, deep exploratory wells, and raw water production wells. Mr. Rectenwald has analyzed and interpreted various geophysical logs for many surficial and Floridan aquifer wells throughout the state of Florida.



**Ed Rectenwald about to show this drill rig who's the boss.**

## Everglades Geological Society

Meets on the Third Tuesday every other month at The Edison on McGregor Blvd at the Fort Myers Country Club in Fort Myers, Florida. Social hour starts at 5:00 PM. The meeting begins at 6:00 PM. No meetings are held in July or August.



## Join Everglades Geological Society

Application forms are available:  
at meetings, by mail and on our web site.  
[www.evergladesgeologicalsociety.com](http://www.evergladesgeologicalsociety.com)

**Charles T. Ferber, P.A.**

---

CHARLES T. FERBER  
Attorney At Law

Attorney and Professional Geologist  
Services assisting attorneys with environmental litigation.  
[www.charlesferberlaw.com](http://www.charlesferberlaw.com)

2125 First Street Suite 100      Phone: (239) 334-1555  
Ft. Myers, Florida 33901      Fax: (239) 334-4855



MWH Americas, Inc.  
2503 Del Prado Blvd.  
Suite 430  
Cape Coral, Florida 33904  
[www.mwhglobal.com](http://www.mwhglobal.com)

Telephone: 239 573 5959  
Facsimile: 239 573 6007

**BUILDING A BETTER WORLD**

**listen. think. deliver.**

Water  
Environment  
Transportation  
Energy  
Facilities



**CDM Smith**  
cdmsmith.com

*10 offices throughout Florida*



Your project. Our passion.

land development | surveying & mapping  
planning | landscape architecture  
water resources | utilities improvements  
transportation design | CEI

**239.334.0046**  
[www.johnsonengineering.com](http://www.johnsonengineering.com)

Fort Myers | Naples | Port Charlotte | LaBelle | Land O'Lakes



Ground Water Sampling, Monitoring  
& Remediation Equipment

**1-800-304-5325**

**Geotech Environmental Equipment, Inc.**  
12165 Metro Parkway, Unit 25B  
Fort Myers, Florida 33966  
Phone 239-476-8891 FAX 239-476-8893  
[www.geotechenv.com](http://www.geotechenv.com)

*Quality equipment for:*  
Groundwater Sampling  
Water Level & Pressure  
Water Quality  
Sample Filtration  
Free Phase Remediation  
Total Fluid Remediation  
Dissolved Phase Remediation  
Vapor Phase Remediation  
Soil Sampling  
Geophysical Measurements  
Air Quality  
Rental & Repair  
Field Equipment & Supplies

**Wm. Scott Manahan, P.E.**  
Operations Manager  
Schlumberger Water Services USA Inc.



1567 Hayley Lane, Suite 202  
Fort Myers, Florida 33907  
Tel. +1 239 481 6494

[SManahan@slb.com](mailto:SManahan@slb.com)  
[www.water.slb.com](http://www.water.slb.com)