

American Ground Water Trust  
**Ground Water Institute for Teachers™**  
**Crystal River, Florida – April, 2007**

For teachers and educators in Levy, Marion, Sumter, Citrus & Hernando Counties  
See registration page for details on how to sign-up. (Space is limited)



**Plantation Inn & Golf Resort**  
**9301 West Fort Island Trail**  
**Crystal River, Florida 34429**



Thursday, April 26th 4:00pm to 8:00pm  
Friday, April 27th 8:30am to 4:00pm  
Saturday, April 28th 8:30am to 3:00pm



**Institute Sponsor: Southwest Florida Water Management District**

Contacts:

**American Ground Water Trust: Andrew Stone (603) 228-5444 [astone@agwt.org]**  
**U.S. Geological Survey: Ann Tihansky (727) 803-8747, ext. 3075 [tihansky@usgs.gov]**  
**SWFWMD: Raina O'Neil (800) 423-1476, ext 4774 [raina.oneil@watermatters.org]**

The aim of the Ground Water Institute for Teachers program is to increase water awareness of teachers, school students, citizens and communities so they may recognize the connected and integrated nature of the environment and be empowered to play an active role in protecting resources for sustainable use. The Trust believes that teachers who are excited about environmental education and who are provided with training in environmental principles will be more likely to effectively teach environmental concepts to their students. Students made aware of "cause and effect" related to water resources and aquatic habitat are likely to become motivated to protect and conserve resources. Increasing the environmental awareness of citizens and communities is a vital need worldwide, and specifically in Florida because of the state's finite resources and increasing environmental pressures.

**Thursday, April 26th 4:00pm to 8:00pm**

**4:00 REGISTRATION**

**4:30 – 5:00 INTRODUCTION TO THE INSTITUTE PROGRAM**

**Andrew Stone, American Ground Water Trust, Concord, NH**

**Ann Tihansky, U.S. Geological Survey, St. Petersburg, FL**

**Raina O'Neil, Southwest Florida Water Management District, Brooksville, FL**

- Welcome to the program
- Background to the National Institute Program (Trust / USGS partnership)
- Objectives of this Institute
- Expectations of the teacher / educator participants

**5:00 – 6:00 HYDROLOGIC SYSTEM: BASICS OF HYDROLOGY AND ECONOMICS**

**Andrew Stone, American Ground Water Trust, Concord, NH**

- Things you didn't know about rocks and water (Geology – Hydrology)
- "Ground water is the part of the hydrologic system that occurs in a geologic environment"
- Geology fundamentals (rock types, geologic structure, aquifer geometry)
- Concept of water balance (hydrologic accounting at local and regional scales)
- Perceptions of water as a shared resource (who owns it?)
- Global and national economic realities of competing water demands

**6:00 – 7:00 THE GEOLOGIC FRAMEWORK OF THE AREA**

**Ann Tihansky, U.S. Geological Survey, St. Petersburg, FL**

- USGS programs in Florida
- Overview of geology and hydrologic system of central Florida
- Special features of karst geology and hydrology
- All you ever wanted to know about sinkholes

**DINNER** (presentation while you eat!)

**7:00 – 8:00 ASSESSING AND MONITORING THE BIOTA OF FLORIDA KARST**

**Steve Walsh, U.S. Geological Survey Fisheries Biologist, Gainesville, FL**

- Nutrient enrichment; contaminants; minimum flows and levels
- Benchmark data: macroinvertebrate and fish communities
- Role of biological monitoring in assessing water quality and quantity
- The overlooked treasures: troglobites, lilliputians, and cryptic critters

**Friday, April 27th**

**8:30am to 4:00pm**

**8:15** (meet at the Crystal River Dive Shop)

**8:30 – 11:15 WATER QUALITY ISSUE - FIELD TRIP ON KINGS BAY** (two groups)

**Veronica Crow, Environmental, Manager, SWFWMD**

**And Gary Williams, Sr. Environmental Scientist, SWFWMD**

The program will involve a land-based talk and hands-on water quality activities and a boat-based visit to the point of emergence of the freshwater springs in Kings Bay.

- History of the Kings Bay area
- The progression of development and changes in land use
- Long term and seasonal changes in water chemistry and turbidity
- Significance of spring water quality for marine ecology
- Practical measurement of quality indices (Dissolved oxygen, pH, temperature, etc.)
- Manatee response to environmental change

10:00 – 11:15 rotation of groups

11:30 – 12:15 lunch at the Plantation Inn

**12:30 – 1:30 LEGACY STEWARDSHIP PROGRAM - linking schools to education projects in their community.**

**Daniel Hayes, Youth Education Coordinator, SJRWMD; Educational Contractor for SWFWMD**

- Creating interdisciplinary experiential learning opportunities
- Involving students in hands-on service opportunities
- Teaching students to demonstrate aquifer models and envirosapes to other students and/or adult audiences
- Storm water stenciling and outreach in nearby neighborhoods
- Inventorying and monitoring tracts of public lands near schools
- Designing and constructing amenities for the visiting public (trails, kiosks, brochures, etc.)
- Making the land a 'living laboratory' for schools to apply classroom learning

**1:30 – 2:30 LIVING ON THE WATER'S EDGE**

**Rivard Reding, Education Outreach Coordinator, Crystal River/Kings Bay, FL**

- What we can do to insure the health of our water - as we live at water's edge.
- What water front property owners can do to "soften" their impact - as they live at water's edge.
- What can be done to "restore a shore" while living at water's edge.
- What are the benefits of a healthy water's edge.

**2:30 – 3:30 AQUIFER VULNERABILITY – PROTECTING THE STATE'S WATER RESOURCES**

**Harley Means, Florida Geological Survey, Tallahassee, FL**

- What does aquifer vulnerability mean?
- Florida Aquifer Vulnerability Assessment (FAVA)
- Research to identify the key indices that indicate vulnerability
- Application of the WofE method to the three principal aquifer systems in Florida
- Vulnerability maps as resources for planners, developers and policy makers
- Education resources from the Florida Geological Survey available to teachers/ educators -

**3:30 – 4:00 REVIEW OF PROGRAM SO FAR**

**Ann Tihansky, U.S. Geological Survey, St. Petersburg, FL**

**4:00 (End of day two activities)**

**Saturday, April 28th 8:30am to 3:00pm**

**8:30 – 9:30 GROUND WATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING**

**Andrew Stone, American Ground Water Trust, Concord, NH**

- Arsenic in ground water
- Water dowsing as a classroom discussion topic!
- Aquifer tests (interpreting relationships between well pumping and water level changes)
- The difference between ground water renewability and sustainability
- Assessing and accessing ground water for economic use

**9:30 – 10:30 ON-SITE WASTE WATER DISPOSAL (SEPTIC SYSTEMS)**

**Joan P. Bradshaw, UF/IFAS Citrus Co. Extension, Lecanto, FL**

- How does it work?
- Why maintain your systems?
- How to maintain system?
- What can make the system fail?

**10:30 – 10:45 BREAK**

**10:45 – 11:45 To be announced**

**11:45 – 12:30 LUNCH**

**12:30 – 2:30 EDUCATION RESOURCES AND IMPLEMENTATION**

**Southwest Florida Water Management District Staff**

**Raina O'Neil, Youth Education Coordinator**

**Mary Torrusio, Youth Education Specialist**

**Mary Alice Wagner, Youth Education Specialist**

**12:30 – 1:00 DEMONSTRATION OF AQUIFER MODEL CAPABILITIES AS AN ADJUNCT TO LEARNING**

- Set-up and operation of the model
- What the model can show
- How the model relates to real hydrologic situations
- What students can learn from the model
- Clean-up and storage

**1:00 – 2:00 EDUCATION RESOURCES**

- Trends in Environmental Education
- Sunshine State Standards
- Resources for teachers (tools, quizzes and lesson plans)
- SWFWMD education materials and grants
- Real-time USGS data for educators

**2:00– 2:30 ESTABLISHING A LESSON-PLAN TEMPLATE FOR INSTITUTE FOLLOW-UP**

- Potential lesson topics based on Institute presentations
- Preferred format for lesson planning
- Preferred format for report and evaluation of lesson effectiveness

**2:30 – 2:45 WRAP UP – ANSWERS TO UNANSWERED GROUND WATER QUESTIONS  
Andrew Stone, American Ground Water Trust, Concord, NH**

**2:45 - Completion of Institute CEU evaluations**

**3:00 ADJOURN**

