

American Ground Water Trust
Ground Water Institute for Teachers™
Sarasota, Florida — June 12–14, 2008



The Board Room at
Girl Scouts of Gulfcoast Florida
4780 Cattlemen Road
Sarasota, FL 34233



Thursday, June 12 4 to 8 p.m.
Friday, June 13 8 a.m. to 4 p.m.
Saturday, June 14 8 a.m. to 3 p.m.



Institute Sponsor: Southwest Florida Water Management District

To register: www.agwt.org (Teacher Institutes)
Questions: 1 800 423-7748

Contacts:

U.S. Geological Survey: Ann Tihansky (727) 803-8747, ext. 3075 [tihansky@usgs.gov]
American Ground Water Trust: Andrew Stone (603) 228-5444 [astone@agwt.org]
SWFWMD: Mary Alice Makoid (800) 423-1476, ext. 4771 [maryalice.makoid@WaterMatters.org]

Background:

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.

Grade Levels:

The Trust’s Ground Water Institute for Teachers program is a content-focused training opportunity with applicability to many grades. The exciting and practical “science” of ground water can be applied to existing curriculum in many traditional subject areas. This training program has applicability way beyond the typical “earth science” perspective. Institute presenters are all top experts with a wealth of expertise. The program provides real-life examples of the applications of science and technology to water issues. Over 50 Institutes have been completed in 17 states involving 1,200+ educators. Past Florida Institute programs have been held in Zephyrhills, St. Petersburg, Crystal River, Tampa, Sarasota, Fort Myers and Arcadia.

4:00 – 4:30 REGISTRATION (Board Room at Girl Scouts' main administrative building)

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

Mary Alice Makoid, SWFWMD, 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 – 5:45 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)
- The hydrologic system in a geologic environment
- Geology fundamentals (rock types, geologic structure and 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

5:45 – 6:30 TAKING THE LID OFF GROUNDWATER CONSULTING

Laura Baumberger, Professional Engineer, Carollo Engineers, Sarasota, FL

- What are the background/requirements needed to be in the water profession?
- What does consulting engineering entail?
- How do water engineers use math/science in their profession?
- Examples of water resource projects in Sarasota/Manatee
- Current and future water supplies in Sarasota/Manatee

6:30 DINNER (presentation while you eat)

6:45 – 7:45 STORM WATER MANAGEMENT: ITS IMPORTANCE IN FLOOD CONTROL AND POLLUTION MINIMIZATION

Hank Higginbotham, P.E., Regulation Performance Management Department, Southwest Florida Water Management District, Tampa, Florida

- Accuracy vs. Precision: How it relates to Storm Water Management
- Flooding – what are the issues?
- Storm water pollution – what are the issues?
- Lesson plans to assist Middle & High School science teachers
- Hydrology versus Hydraulics – what is the difference?
- Storm water ponds – what function do they serve?
- Types of Surface Water Management Systems
- Free GIS information from SWFWMD for Middle & High School science teachers
- Free Web Soil Survey information from NRCS for Middle & High School science teachers
- Extensive web links & free (or low cost) reference materials that will assist Middle & High School science teachers

7:45 – 8:00

How to make use of this information in the classroom.

8:00 (End of Day One activities)

8:00 – 8:15 COFFEE, DONUTS and FRUIT (Board Room in main administrative building)

8:15 - 9:15 MYTHS AND REALITY ABOUT FLORIDA'S SINKHOLES

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

- Special features of karst geology in Florida
- How sinkholes form and where they are most likely to occur
- Research on springs, caves and sinkholes
- Background to the USGS mission and an outline of its programs in Florida
- Education resources available from the USGS

9:15 – 10:00 ENVIRONMENTAL ISSUES IN THE SARASOTA BAY WATERSHED

Julia Burch, Public Outreach Coordinator, Sarasota Bay Estuary Program

(Learn how you and your students can get involved in projects that help restore Sarasota Bay!)

- What is stormwater pollution? How is Sarasota Bay doing?
- Coastal Habitats curriculum (free resources for teachers K–8)
- New High School Curriculum (watersheds, fire ecology and invasive plants)
- Bay Buddies program (family-friendly volunteer habitat restoration program)
- Water Atlas (figure out your subdrainage basin)
- How to use the Enviroscope watershed model (demonstration)
- Stormdrain marking programs and litter control (why, how and how effective?)

10:00 – 10:15 BREAK

10:15 – 10:45 HOW THE SUBURBAN LANDSCAPE FUNCTIONS HYDROLOGICALLY

Andrew Stone, American Ground Water Trust, Concord, NH

- Data sets, maps, plans, sections and scale for calculation and interpretation
- Hydrologic budget concept (in – out +/- change in storage)
- Measurement, and calculation of hydrologic budgets
- Fundamentals of land-use and hydrologic response
- Identifying the components of stream flow or culvert flow (where did the water originate?)
- Water quality related to routes of flow

10:45 [Move outside to field site]

10:45 – 12:45 STORM WATER AS AN EDUCATIONAL MEDIUM

(Hands-on activity: Follow the storm water and learn math and environmental science)

- Identify site-specific land-use categories (how are they connected hydrologically?)
- Follow the water drop - where and how storm water flows (direction, speed and destination)
- Calculation of unit area responses to precipitation input (choose a time-frame and do the math)
- How marbles and chalk can show flow direction and watershed boundaries
- Integration of group project results to overall description of site

12:15 – 12:45 LUNCH

12:45 – 1:45 GEOLOGICAL OVERVIEW OF FLORIDA WITH EMPHASIS ON SOUTHWEST FLORIDA

Clint Kromhout, Hydrogeologist, Florida Geological Survey, Tallahassee, FL

- A geologic cross section of Southwest Florida
- How many springs do we have in Florida?
- Threats to our aquifers are a threat to our springs, and what can be done to help protect them.
- Educational Resources available on the Florida Geological Survey's web site (online demonstration)

1:45 – 2:45 COMPUTER MODELS OF GROUNDWATER FLOW — HOW ARE THEY USED?

Ron Basso, Hydrogeologist, Hydrologic Evaluation Section, SWFWMD, Brooksville, FL

- The basic concepts of hydrologic models
- What are computer simulation models and how do they work?

- Practical application of models
 1. Effects of pumping
 2. Changes in aquifer storage
 3. Defining recharge and discharge zones
 4. Predicting changes due to rainfall variation
- Case studies in west-central Florida — How models have been used as a tool in water resource management

2:45 – 3:00 BREAK

3:00 – 3:45 FUTURE OF FLORIDA'S WATER SUPPLY
Cara Rothfuss, Hydrogeologist, MWH Americas, Tampa, FL

- Historical perspective on Florida's water supply
- Resource pressures from population, agriculture and industry
- The potential sources of water available to supply Florida's needs
- The water manager's toolbox (dams, rivers, wells, artificial recharge, conjunctive use, etc.)

3:45 – 4:00

How to make classroom use of the information from these presentations.

4:00 (End of Day Two activities)

Saturday, June 14 — 8 a.m. to 3 p.m.

8:00 – 8:30 COFFEE, DONUTS and FRUIT (Board Room in main administrative building)

8:30 – 9:15 HOW FLORIDA-FRIENDLY LANDSCAPING PROTECTS OUR WATER RESOURCES
Annemarie Post, Extension Agent, Sarasota County Extension, Sarasota, FL

- Protecting natural resources, reducing pollution and preserving Florida's unique beauty
- Incorporating Florida-friendly practices into the classroom
- Resources available for schools

9:15 – 10:30 GROUNDWATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING
Andrew Stone, American Ground Water Trust, Concord, NH

- The difference between groundwater renewability and sustainability
- Accessing ground water for economic use
- Water quality concerns (arsenic, radon, perchlorate, pharmaceutical residuals, etc.)
- Integration of climate change issues in teaching
- Perceptions and misperceptions of ground water in history
- The hydrologic cycle in poetry (Shakespeare's hydrology)

10:30 – 10:45 BREAK

10:45 – 12:00 WATER SCIENCE CLASSROOM EXERCISES (HANDS-ON)
Andrew Stone, American Ground Water Trust, Concord, NH
Ann Tihansky, U.S. Geological Survey, Tampa, FL

- Porosity and permeability measurement
- What factors control infiltration rates?
- Transpiration as a component of water balance calculations
- What's in the water? Calculation of one part per million

12:00 LUNCH (presentations during lunch)

12:00– 12:45 EDUCATION RESOURCES AND IMPLEMENTATION
Mary Alice Makoid, Youth Education Specialist, SWFWMD, Brooksville, FL
Mary Torrusio, Youth Education Specialist, SWFWMD, Brooksville, FL

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

Educational 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

12:45 – 2:00 THE IMPORTANCE OF FIELD TRIP OPPORTUNITIES

Karen A. Fraley, Around the Bend Nature Tours, Bradenton, FL

- Why Field Studies help learning?
- Whatever happened to the “Wild” in Kid’s Lives? [Richard Louv "Last Child in the Woods"]
- Where can we go? Trip options with correlations to Sunshine State Standards
- Logistics involved in organizing out-of classroom activity
- Sample a field study – hands-on “water” exercise

2:00 – 2:45 WHERE NOW? — INTEGRATING INSTITUTE CONTENT INTO THE CLASSROOM

Andrew Stone, American Ground Water Trust, Concord, NH

- The concept of add-in rather than add-on to existing curriculum
- Potential lesson topics based on Institute presentations
- Completion of “Ideas to Lessons” form
- Completion of Institute evaluation form

2:45 – 3:00 WRAP-UP AND ANSWERS TO UNANSWERED GROUNDWATER QUESTIONS

Andrew Stone, American Ground Water Trust, Concord, NH

Ann Tihansky, U.S. Geological Survey, Tampa, FL

3:00 ADJOURN

