

American Ground Water Trust Ground Water Institute for Teachers™ Tampa, Florida — May 15–17, 2008

For teachers in Pasco, Pinellas and Hillsborough Counties

Thursday, May 15 4 to 8 p.m.
Friday, May 16 8:30 a.m. to 4 p.m.
Saturday, May 17 8:30 a.m. to 3 p.m.



Nature's Classroom
13100 Verges Road
Thonotosassa, FL 33592



Southwest Florida
Water Management District

Institute Sponsor: Southwest Florida Water Management District

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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.

Thursday, May 15 — 4 to 8 p.m.

4:00 – 4:30 REGISTRATION (Nature’s Classroom, TECO 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, Southwest Florida Water Management District, Brooksville, FL
Karen Johnson, Site Coordinator, Nature's Classroom, Thonotosassa, 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 – 6:50 SOURCES OF RAW WATER FOR FLORIDA

Richard Walther, Hydrogeologist, MWH Americas, Tampa, FL

- The potential sources of water available to supply Florida's needs
- The water manager's toolbox (dams, rivers, wells, artificial recharge, conjunctive use, etc.)
- Water conservation and recycling

DINNER (presentation while you eat)

6:50 – 7:40 AQUIFER STORAGE AND RECOVERY (ASR)

Michael Micheau, PBS&J, Tampa, FL

- ABCs of ASR technology — pumping water into aquifers for later use
- Where does the water go? How come there is space for it? How do you get it back?
- Overview of ASR projects and programs in the USA and overseas
- ASR projects in Florida — issues and problems (for example, the role of ASR in Everglades restoration)

7:40 – 8:00 How to make use of this information in the classroom.

8:00 (End of Day One activities)

Friday, May 16 — 8:30 a.m. to 4 p.m.

8:30 – 9:15 STRATEGIES FOR REDUCING NUTRIENT POLLUTION

Phil Compton, Regional Representative, Sierra Club, St Petersburg, FL

- Origins of principal contaminants in surface water and ground water
- The solution to pollution is dilution: how urban groundwater recharge can be achieved
- Environmental and economic benefits of preventing pollution
- Innovative reuse of scrap tires for reducing erosion and increasing infiltration

9:15 – 10:00 THE LEGACY PROGRAM

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

- Linking schools to education projects in their community
- Creating interdisciplinary experiential learning opportunities
- Involving students in hands-on service opportunities
- Making the land a 'living laboratory' for schools to apply classroom learning

10:00 – 10:15 How to make use of this information in the classroom.

10:15 – 10:30 BREAK

10:30 – 11:15 FLORIDA'S SPRINGS — WINDOWS TO OUR AQUIFERS

Harley Means, Florida Geological Survey, Tallahassee, FL

- Brief geological overview
- How many springs do we have?
- Where does spring water come from?
- Threats to our springs
- Spring water is our drinking water
- What can we do to protect our springs?

11:15 – 11:30 How to make use of this information in the classroom.

11:30 – 12:00 LUNCH

12:00 – 1:15 LEARNING TO USE STORMWATER AS AN EDUCATIONAL MEDIUM
Daniel Hayes, Youth Education Coordinator, SJRWMD; Educational Contractor for SWFWMD
 (Hands-on activity: Follow the stormwater and learn math and environmental science)

Introduction in classroom – then move outside for field exercise

- How the urban and suburban landscape can demonstrate where and how storm water flows.
- The basics of storm water drainage design in the built environment
- Impacts of storm water flows on groundwater recharge and on streams and estuaries
- Developing a pond as a teaching medium
- Grants available to assist teachers in taking on storm water pond projects
- Relevance to biology, chemistry, math, engineering and agricultural studies

1:15 - 1:30 How to make use of this information in the classroom.

1:30 – 4:00 HILLSBOROUGH RIVER – WATER QUALITY

WATER QUALITY MONITORING: THE BASICS FOR PRACTICAL APPLICATION
Catherine Wolden, Environmental Scientist, SWFWMD, Tampa, FL

- Physical and chemical indicators of water quality
- Methods and equipment used in water quality measurement and sample collection
- Bugs (macroinvertebrates) and water quality

Introduction in classroom – then move outside for field exercise

WATER QUALITY FIELD EXERCISE HILLSBOROUGH RIVER
Karen Johnson, Site Coordinator, Nature’s Classroom, Thonotosassa, FL
Catherine Wolden, Environmental Scientist, SWFWMD, Tampa, FL
Andrew Stone, American Ground Water Trust, Concord, NH

- Typical student river & pond activities
- Measuring river bed morphology cross sections
- Water quality monitoring and measuring
- Checking the macroinvertebrates
- Ecological and environmental importance of the Hillsborough River

4:00 (End of Day Two activities)

Saturday, May 17 — 8:30 a.m. to 3 p.m.

8:30 – 9:30 THE GEOLOGIC FRAMEWORK OF CENTRAL FLORIDA
Ann Tihansky, U.S. Geological Survey, St. Petersburg, FL

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

9:30 – 10:15 GROUNDWATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING

Andrew Stone, American Ground Water Trust, Concord, NH

- The difference between groundwater renewability and sustainability
- Assessing and accessing ground water for economic use
- Water quality concerns (arsenic, radon, perchlorate, pharmaceutical residuals, etc.)
- Aquifer tests (interpreting relationships between well pumping and water level changes)
- Hydrologically functioning homes and schools (low-impact development)
- Integration of climate change issues in teaching
- Perceptions and misperceptions of ground water in history
- The hydrologic cycle in poetry (Shakespeare's hydrology)

10:15 – 10:30 BREAK

10:30 – 11:15 GROUNDWATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING

Andrew Stone, American Ground Water Trust, Concord, NH

(continued)

11:15 – 12:00 FLORIDA YARDS & NEIGHBORHOODS PROGRAM

Marina D'Abreau, UF/IFAS Hillsborough County Extension, Seffner, FL

- The origins of the Florida Yards & Neighborhoods program
- Protecting natural resources, reducing pollution and preserving Florida's unique beauty
- Incorporating Florida-friendly practices into the classroom
- Resources available for teachers

12:00 – 12:15 How to make use of this information in the classroom.

12:15 – 12:45 LUNCH

12:45 – 2:30 EDUCATIONAL RESOURCES AND IMPLEMENTATION

Mary Alice Makoid, Youth Education Specialist, SWFWMD, Brooksville, FL

Mary Torrusio, Youth Education Specialist, SWFWMD, Brooksville, FL

12:45 – 1:15 DEMONSTRATION OF AQUIFER AND WATERSHED MODELS CAPABILITIES AS AN ADJUNCT TO LEARNING

- Set up and operation of the models
- What the models can show
- How the models relate to real hydrologic situations— What students can learn from the model
- Cleanup and storage

1:15 – 2:00 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

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 GROUNDWATER QUESTIONS

Andrew Stone, American Ground Water Trust, Concord, NH

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

2:45 – 3:00 COMPLETION OF INSTITUTE CEU EVALUATIONS

3:00 ADJOURN

