Provisional Program (some presenters still to be confirmed)

American Ground Water Trust

Ground Water Institute for Teachers™
Crystal River, Florida — April 17–19, 2008

Citrus County Marine Science Station
12646 W. Fort Island Trail
Crystal River, FL 34428

Thursday, April 17	**4 to 8 p.m.**
Friday, April 18	**8:30 a.m. to 4 p.m.**
Saturday, April 19	**8:30 a.m. to 3 p.m.**

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, April 17 — 4 to 8 p.m.

4:00 REGISTRATION

4:30 – 5:00 INTRODUCTION TO THE INSTITUTE PROGRAM
Hugh Adkins, Director, Citrus County Marine Science Center, Crystal River, FL
Andrew Stone, American Ground Water Trust, Concord, NH
Mary Alice Makoid, 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 – 5:50 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

5:50 – 6:40 FLORIDA'S GROUND WATER AND WATER SUPPLY
Mike Weatherby, Hydrogeologist, MWH Americas, Tampa, FL
- ABCs of Florida's geological past
- The state's major aquifers
- The potential sources of water available to supply Florida's needs
- The water manager's toolbox (dams, rivers, wells, artificial recharge, conjunctive use, etc.)

How to make use of this information in the classroom
Facilitated discussion with ideas and insights recorded for distribution to all participants

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 critter

Friday, April 18 — 8:30 a.m. to 4 p.m.

8:30 – 11:15 WATER QUALITY ISSUE — FIELD TRIP ON KINGS BAY
Veronica Craw, Environmental Manager, SWFWMD
Gary Williams, Senior Environmental Scientist, SWFWMD
The program will involve a land-based talk, 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

11:30 – 12:30 Lunch (discussion during lunch)

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12:30 – 2:30 FOLLOW THE STORM WATER AND LEARN MATH AND ENVIRONMENTAL SCIENCE
Daniel Hayes, Youth Education Coordinator, SJRWMD; Educational Contractor for SWFWMD
(Field trip to a nearby location shows how the urban and suburban landscape can be used to demonstrate to students where and how storm water flows. The field experience will show the basics of stormwater drainage design in the built environment and the potential impacts of both quality and quantity of stormwater flows on groundwater recharge and on streams and estuaries.)

2**:30 – 3:30 FLORIDA'S SPRINGS — WINDOWS TO OUR AQUIFER**
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?

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4:00 (End of day two)

Saturday, April 19 — 8:30 a.m. to 3 p.m.

8:30 – 9:15 GROUND WATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING
Andrew Stone, American Ground Water Trust, Concord, NH
- Arsenic in ground water
- Aquifer tests (interpreting relationships between well pumping and water level changes)
- The difference between groundwater renewability and sustainability
- Assessing and accessing ground water for economic use
- Integration of climate change issues in teaching

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9:45 – 10:30 WATER QUALITY ISSUES RELATED TO ON-SITE WASTEWATER DISPOSAL
Joan P. Bradshaw, UF/IFAS Citrus County Extension, Lecanto, FL
- The biologic processes that make septic systems work
- Why and how to maintain on-site wastewater systems
- The problems with compounds and chemicals in the waste stream

10:30 – 10:45 BREAK

10:45 – 11:30
FLORIDA YARDS & NEIGHBORHOODS PROGRAM
John A. Korycki, UF/IFAS Hernando County Extension, Brooksville, FL

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

How to make use of this information in the classroom
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12:00 – 12:30 LUNCH

12:30 – 2:30 EDUCATIONAL RESOURCES AND CLASSROOM IMPLEMENTATION
Mary Torrusio, Youth Education Specialist, SWFWMD, Brooksville, FL
Mary Alice Makoid, Youth Education Specialist, SWFWMD, Brooksville, FL

12:30 – 1:00 AQUIFER AND 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

1:00 – 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
- Quick review of a selection of video resources

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