TRAINING OPPORTUNITY FOR TEACHERS

American Ground Water Trust

Ground Water Institute for Teachers™
Riverside, California

Western Municipal Water District (main office)
450 Alessandro Boulevard, Riverside, CA 92508

Riverside, California, December 2-3, 2005

Institute sponsors:
Inland Empire Utilities Agency
Western Municipal Water District
Metropolitan Water District of Southern California

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 example of the applications of science and technology to water issues. Over 30 Institutes have been completed in 17 states involving 1,000+ educators. Past California Institute programs have been held in San Jose (2), Fresno (2) and Claremont.

Endorsement: Dr. Peter G. Mehas, State of California, Fresno County Superintendent of Schools
"The Ground water Institute for Teachers would be at the top of my rating system, and I don't give out A's easily. I have participated first hand in many institutes and what makes this number one on my list is the fact that they have people who are knowledgeable in their related fields, teaching it. They understand first hand what the classroom teacher is facing on a day-to-day basis, so you have expertise, people who know how to teach the content material and thirdly, they have a real passion for what they're doing. They're motivating, they're inspiring, and the teachers that I talked to after participating in the Ground Water Institute said, "We want to come back again". I would highly recommend the Ground Water Institute for teachers because it is so professional, so relevant and so timely."

Registration:
The registration fee for this two-day program is $25.00. Teachers will receive a handout package including a video, publications, informational pamphlets etc. with a $50+ value. The program registration includes lunches and snack breaks for both days. Teachers participating in the program will be added to the Trust / USGS educator e-mail list and will be able to receive information about ground water research, USGS reports and the availability of educational materials and resources related to water. All attendees will receive a certificate for 1.2 CEU credits. (12 hours).

Register on-line http://www.agwt.org/teachers/institutehome.htm (Teacher Institutes)

Funding for Substitute teachers:
The American Ground Water Trust will work with school districts to cover the costs of substitutes. We are able to provide funding for twenty teachers, allocated on a first-come, first-served basis to teachers who register for the Institute. Application forms for substitute funding will be e-mailed to teachers when they register.

Questions? - Contact Andrew Stone, American Ground Water Trust, Concord, NH (astone@agwt.org) (603) 228-5444

Program: Friday, December 2nd

8:30 – 9:15
WELCOME & INTRODUCTION
John Rossi, General Manager, Western Municipal Water District, Riverside, CA
- Overview of water supply management in Southern California
- Responsibilities of Water Districts
- Potential problems for the future

9:15 – 10:15
HYDROLOGIC SYSTEM: BASICS OF HYDROLOGY & ECONOMICS
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH
- Geology fundamentals (rock types/ geologic structure/ aquifer geometry)

- Concept of water balance (hydrologic accounting at local & regional scales)
- Perceptions of water as a shared resource (who owns it?)
- Global & national economic realities of competing water demands

10:15
BREAK

10:30 – 11:30
MONITORING AND ASSESSMENT OF GROUND-WATER QUALITY IN CALIFORNIA
Justin Kulongoski, Hydrologist, US Geological Survey, San Diego, CA
- Design and objectives of sampling program
- Chemical analytes (low-level detection limits, broad scope, tracers, emerging contaminants)
- Basin-scale data collected in a consistent manner (compare basins, evaluate at regional and state scales)
- Develop understanding and identify potential risks to the ground-water resource

11:30 – 12:30
MANAGEMENT DEALING WITH LEGAL AND WATER QUALITY ISSUES
Mel Blevins, (Formerly San Fernando Valley Water Master), Groundwater Consultant for Watermaster and Los Angeles Department of Water & Power, Los Angeles, CA
-The Association of Ground Water Agencies (AGWA)
- A water supply story (Los Angeles vs. San Fernando)
- The work of a "Water Master"
- The real story behind hexavalent chromium problems

12:30 – 1:15 **LUNCH** (Invited) speaker from **Metropolitan Water District**

1:15- 2:15
WATER PLANNING
Martha Davis, Executive Manager for Policy Development, Inland Empire Utilities Agency, Chino, CA
- Future Water Needs
- Water Management Strategies
- The Role of Groundwater in an Integrated Water Management Plan

2:15 – 3:15
THE WORK OF GROUND WATER CONSULTANTS
Richard Rees, Senior Hydrogeologist, Geomatrix Consultants, Corona, CA
- Academic Training and Skills Needed for Hydrologic Science and Engineering Consulting Work:
- California Water Problems and the Future Need for Ground Water Experts
- Types of Ground Water Work:
- Water Quality
- Water Supply Exploration, Production, and Treatment
- Aquifer Storage and Recovery
- Saltwater Injection/Disposal
- Environmental Contamination (Hazardous Substances Releases)
- Case Studies of Ground Water Science and Technology in California

3:15 – 4:15
GROUND WATER TOPICS AND THEIR CONNECTION TO SCIENCE TEACHING
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH
- Arsenic in ground water and the impact of the EPA ruling of 10ppb for drinking water
- In-stream flows, wetlands & ground water
- MtBE and other ground water contaminants
- Aquifer tests (interpreting relationships between well pumping and water level changes)
- Water dowsing as a classroom discussion topic

4:15 End of Day One Program

Program: Saturday, December 3rd

8:30am – 10:15am
WATER WELLS AND AQUIFERS
Meet at: (Geohydrology Laboratory Suite 7, 1306 Monte Vista Avenue, Upland)
(Coffee & Doughnuts available)

1. Field Visit to Geohydrology Laboratory at University of Southern California

Bob Turnbull, Chief Hydogeologist, Roscoe Moss Company, Los Angeles, CA and,
Professor Dennis Williams, University of Southern California, Upland, CA

-The geologic origins and hydrology of California's aquifers
- Examples of the development of ground water resources
- How much ground water is there in Southern California?
- The design and construction of the large scale ground water demonstration model
- Hydrologic research using the ground water model
- The basics of water flow from an aquifer to a well

10:45 – 12:15
Meet at: Layne Christensen, Fontana Facility, 1101 Etiwanda Avenue, Fontana)

2. Field Visit to Layne Christensen's Well Drilling Facility

Bob Ereth, Branch Manager, Layne Christensen, Fontana, CA
- Equipment and technology used to access ground water in California
- Matching well drilling technology with geological conditions
- Ground water projects and case studies from Southern California
  (Municipal wells, saline intrusion, injection wells, dual purpose wells, contamination monitoring etc.)
- What to do with wells that are no longer needed

12:15pm LUNCH (Return to Western Municipal Water District, Riverside HQ Riverside)

2:00 – 3:15
WHAT DO WE HAVE TO DO TO ENSURE THAT SAFE, CLEAN WATER CONTINUES TO COME OUT OF THE TAP?
Jean Moran, Senior Hydrogeologist, Stetson Engineers, San Rafael, CA
- Watershed Approach to the Hydrologic Budget (In - Out)
- Quantification of Surface- and Ground-Water Resources (In)
- Quantification of Surface- and Ground-Water Use and Demand (Out)
- Water Quality and Environmental Constraints
- Field Trips, Class Room Exercises, and Resources for Teaching the Hydrologic Budget

3:15 – 4:00
WRAP UP:
Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH
- Lessons learned? Questions not answered?
- Ground water education strategies that work
- Where to find additional education materials on ground water and hydrology
- Complete Institute evaluation forms
- Complete continuing education credit paperwork

4:00
Adjourn