



**American Ground Water Trust
2009
Ground Water Institute for Teachers™**



Chino Basin Water Conservation District

**Two-day program training program for teachers covering water issues,
water management and the importance of ground water resources**

Pre-registration required – program is **FREE** for teachers

(Includes copious handouts and dinner on day one and lunch on day two)

Substitute Reimbursement for classroom teachers is available for Day 2 of this Institute.

Register at www.agwt.org (Institutes)

Questions:

American Ground Water Trust: Andrew Stone, (603) 228-5444 [astone@agwt.org]

Chino Basin Water Conservation District: Debby Figoni, (909) 267-3230.....[figoni@cbwcd.org]

When:

Tuesday, Nov 3 (4:30-8:30pm) and Wednesday, Nov 4, (8:00am – 4:30pm)

Where:

Chino Basin Water Conservation District HQ, 4594 San Bernardino St., Montclair, CA 91763

Who should attend?

The Institute is aimed at teachers and educators from schools and organizations in the Chino Basin Water Conservation District. [District boundaries include the Cities of Montclair, and Chino, and portions of the Cities of Rancho Cucamonga, Ontario, Chino Hills and Upland.]

Institute sponsor:

Chino Basin Water Conservation District

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 California 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 most 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 60 Institutes have been completed in 17 states involving 1,500+ educators. Past California Institute

programs have been held in Riverside/ Diamond Valley Lake (4), Chino, Claremont, Fresno (2) and San Jose (2).

California Science Standards:

(State's mandated curriculum content standards for public schools)

The Institute specifically addresses:

- Section 9c of the Earth Science Content Standards for Grades 9 through 12
- Section 9, (Investigation & Experimentation) for 8th Grade Physical Science
- Sections 4a, 6b and 7 (Focus on Earth Science) for 6th Grade
- Sections 1g,h,i,j,k,& l of (Investigation & Experimentation) for Grades 9 through 12

Program Requirements:

(See web-site for information related to substitute funding)

Teachers who are granted substitute funding for Friday's absence from school must also attend the Thursday evening program.



Program - Tuesday, 3 Nov (4:30-8:30pm)

4:00 – 4:30 Sign-in

4:30 – 5:00 CHINO BASIN WATER CONSERVATION DISTRICT

Unice Ulloa, General Manager, Chino Basin Water Conservation District

- Welcome to the Institute
- Background to the work of the District

5:00 – 5:45 BASICS OF HYDROLOGY and GEOLOGY

Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH

- Geology fundamentals (Rock types/ geologic structure/ aquifer geometry)
- Ground water (Where is it, how did it get there, where is it going?)
- Concept of water balance (Hydrologic accounting at local & regional scales)
- Perceptions of water as a shared resource
(Who owns it? Who can use it? Who is responsible for it?)

5:45 – 6:45 GROUND WATER QUALITY: TACKLING QUESTIONS IN CALIFORNIA!

Tim Cliffe, Hydrographer, US Geological Survey, Poway, CA

- CA's Water Resources (can students "mentally-map" water across CA?)
- Site-Specific Research Methods (including LA Basin, the Mojave, the Delta)
 1. Nested Monitoring Wells
 2. Depth-Dependent Sampling
 3. Unsaturated-Zone Sampling

6:45 – 7:00 DINNER IS SERVED!

7:00 – 7:45 HOW TO COMMUNICATE ENVIRONMENTAL SCIENCE

Dave Ficke, CREEC Region 10 RIMS Chair, Upland High School, Upland, CA

- The challenge of engaging students
- Classroom techniques that work
- Field-based instruction ideas on water topics

- Experiences from Mongolia: status of environmental awareness and education

7:45 – 8:15 AND NOW FOR SOMETHING COMPLETELY DIFFERENT

Andrew Stone, Executive Director, American Ground Water Trust, Concord, NH

- Graphic descriptions of hydrology from a romantic Poet
- Using internet images to reinforce understanding of the hydrologic system
- Simple class exercise for almost any grade level

8:15 – 8:30

EXPECTATIONS FOR DAY 2 OF THE PROGRAM

- Day two will include professional discussion opportunities for participants to share ideas for teaching strategies (lessons) that will engage student interest and enhance learning about water and water issues.]

8:30pm END OF DAY ONE PROGRAM

Program - Wednesday, 4 Nov (8:00am – 4:30pm)

8:15am Field Visit to Geohydrology Laboratory at University of Southern California
Meet at: (Geohydrology Laboratory Suite 7, 1306 Monte Vista Avenue, Upland, CA 91786-8223)

(Coffee, fruit & Doughnuts available)

Demonstration of the world's largest working ground water model that shows how water moves from aquifers to wells.

8:30 10:00 WATER WELLS AND AQUIFERS

Dr Chris Harich, University of Southern California, Upland, CA

- How important is groundwater?
- Water Wells in California
- The state's current and future water resources
- Origin and design of the 60 ton well/aquifer model
- The model's data collection systems
- Basic explanation of how water flows from an aquifer to a well
- How correct well design and operation saves millions of dollars

(Return to Chino Basin Water Conservation District HQ, 4594 San Bernardino St., Montclair, CA 91763)

10:15 – 11:00 EDUCATION RESOURCES, CA ACADEMIC STANDARDS AND IMPLEMENTATION

Katharine Havert, Education Coordinator, California Regional Environmental Education Community (CREEC - Region 10)

- All about CREEC
- EEI (Education and Environment Initiative)
- Trends in Environmental Education
- Resources for teachers

11:00 – 12:00 GROUND WATER IN THE CHINO BASIN

Ken Manning, Chino Basin Watermaster, Rancho Cucamonga, CA

- Background to the hydrology of the basin
- Background to ground water quality issues
- Changes in water use and supply sources
- Optimizing the resources for sustainable use

- Future for water supply in southern California

12:30 - 1:30 CHINO BASIN WATER CONSERVATION DISTRICT DEMONSTRATION GARDEN

Dave Schroeder Conservation Specialist, CBWCD

LUNCH (provided, with time for visit to the demonstration garden)

1:30 – 2:15 DEVELOPMENT OF CHINO BASIN BRACKISH GROUNDWATER RESOURCES (invited) Scott Burton, City of Ontario, Assistant Utilities Director for the City of Ontario, CA and Coordinator - Chino Desalter Authority, Ontario, CA

- Chino Basin/CDA Background
- CDA Facilities Overview
- Regional Water Supply Benefits
- Member Agency Water Supply

2:15 – 12:30 GROUND WATER TOPICS (AND THEIR CONNECTION TO SCIENCE TEACHING)

Andrew Stone, American Ground Water Trust, Concord, NH

- Chemicals and compounds in ground water and surface water
 - Ground water contributing to springs and wetlands
 - Geothermal technology (using ground source temperatures for heating and cooling)
- How aquifers are assessed and accessed (well drilling and construction)
- A day in the life of a Hydrogeologist – careers in water resources

2:15 – 3:15

STORMWATER EXERCISES THAN CAN BE ADAPTED FOR DIFFERENT GRADE LEVELS

Andrew Stone, American Ground Water Trust, Concord, NH

- How the suburban landscape functions hydrologically
- How land-use categories affect infiltration & runoff
- Follow the water drop—where and how storm water flows (direction, speed and destination)
- Where does it end up? And how long does it take to get there?

3:45 - 4:15 WHERE NOW? INTEGRATING INSTITUTE CONTENT INTO THE CLASSROOM

Facilitated group discussion and program wrap-up

- 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
- Lessons learned? Questions not answered?

4:30pm

ADJOURN

A selection of 2008 comments from teachers:

The workshop covers KEY water concerns about our future. I will use this information with my lessons.

Lesley Gregory, James L. Day Middle School, Temecula, CA

The expertise of the presenters on water topics was enriching and an eye-opener.

Guadalupe Rowley, Ontario High School, Ontario, CA

This Institute really helped adjust my perspective “lenses” concerning water use and water issues.

Ken Pitts, Santiago High School, Corona, CA

Submerge yourself into the ground and get wet! – Take the Ground Water Institute for Teachers.
Harry Post, Dartmouth Middle School, Hemet, CA

The information from the experts will add a dimension of realism to my lessons due to the local connection.
Susan Cook, Santiago High School, Corona, CA

This Institute helped me understand the importance water has on our state, our community and ourselves.
Danielle Velasquez, Jupiter Community Services District, Mira Loma, CA

A great amount of information was presented in a concise, understandable way.
Erin Snyder, Riverside Corona Resource Conservation District, Riverside, CA

This was an awakening of how much we take water for granted. It is important we become educated on the topic to inform our kids. We all impact the system.
Regina Enriquez, Sunnyside Middle School, Moreno Valley, CA

The instructors were personable, knowledgeable and accessible.
William Burgess, Rancho Verde High School, Moreno Valley, CA

Very informative! Fast paced! No downtime, just like I like it.
Julie Beckius, Temescal Canyon High School, Lake Elsinore, CA

It is rare for teachers to hear from people in the industries – the water industry in this case – to get first hand insight on local scientific areas of importance.
William Dwyer, Academy for Academic Excellence, Lewis Center for Educational Research, Apple Valley, CA

Wonderfully informative, exciting delivery and lots of material to connect it all.
Florence Mowrer, Public Information Specialist, Riverside County Flood Control & Water Conservation District, Riverside, CA

Not only a must for teachers, but any organization who is involved in water conservation and environment.
Dorothy Carlson, Creative Touch Water Solutions, Riverside, CA



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