



**PROGRAM**  
**2006 COLORADO**  
**GROUND WATER INSTITUTE PROGRAM**  
*Denver, Colorado – July 11-12, 2006*



*Convened by the  
American Ground Water Trust in partnership with the US Geological Survey*

**Hosted at:**  
**United States Geological Survey Training Facility**  
**Denver Federal Center - Building 810 (Room S-29, Ice Core Lab) – Gate 1 off of Kipling St.**

## Invited Speakers and Topics

**TUESDAY JULY 11, 2006**

**8:00 AM – 8:45 AM**

**Registration and Continental Breakfast**

**8:45 AM – 9:45 AM**

**Class Session**

*Garret Graaskamp, Hydrogeologist, American Ground Water Trust, Concord, NH*

**Ground Water Fundamentals**

- Introduction, Welcome and Institute Objectives
- Overview of the hydrologic system and the geologic environments that influence the nature and occurrence of ground water in Colorado
- How does a Home Water System work (Wells and Pumps)?
- Are ground water, streams and wetlands connected?

**9:45 AM - 10:45 AM**

**Class Session**

*Peter Barkmann, CPG, Hydrologist, Colorado Geological Survey, Denver, CO*

**The Geology and Hydrologic Characteristics of Colorado Aquifers**

- Geologic Setting
- Major Classifications of Aquifer Types in Colorado
- Major Alluvial Aquifers
- Sedimentary Rock Aquifers
- Mountainous Region Aquifers

**10:45 AM – 11:00 AM**

**Networking Break**

**11:00 AM - 12:00 PM**

**Class Session**

*Kenneth Watts, Hydrologist, United States Geological Survey, Pueblo, CO*

**Front Range Water from Fractured Rock Aquifers – Where is it?**

- How and why does water flow in an aquifer?
- Why does flow vary with different rock types?
- Is an unconfined aquifer better than a confined aquifer?
- How do we study and record flow in fractured rocks?

# 2006 COLORADO GROUND WATER INSTITUTE PROGRAM

**TUESDAY JULY 11, 2006 (CONTINUED)**

**12:00 PM – 1:00 PM**

**Lunch (Provided on Site)**

**1:00 PM – 1:30 PM**

**Class Session**

*Joyce Wallace, Jefferson County, CSU Cooperative Extension, Golden, CO*

**Teacher Resources and the Colorado State University Cooperative Extension System**

- What is the Cooperative Extension?
- CSU Cooperative Extension Programs for Teachers
- Curriculum Resources

**1:30 PM – 2:30 PM**

**Class Session**

*Bob Longenbaugh, P.E., former Asst. State Engineer, Colorado Division of Water Resources, Denver, CO*

**The Importance of Colorado Ground Water in Our Lives**

- Agriculture Irrigation – Ground Water a Major Source
- Domestic and Livestock Uses – Ground Water is a Principle Source
- Ecology and Habitat – Ground Water is a Necessary Component
- Geothermal Heating – Ground Water is a Renewable Energy Source

**2:30 PM – 2:45 PM**

**Networking Break**

**2:45PM – 3:30 PM**

**Class Session**

*Timothy A. Crawford, Hydrogeologist, Bishop-Brogden Associates, Inc., Englewood, Co.*

**River Augmentation - Case Study of a project to use Denver Basin Non tributary Ground Water to Augment the Impact of Pumping a South Platte Alluvial Well**

- Who gets the water in the Denver Basin?
- What is Water Augmentation and why do we need it?
- What is Aquifer Storage and Recovery (ASR)?
- Does Augmentation change who is entitled to Colorado's water resources?

**3:30PM – 4:30 PM**

**Class Session**

*Geoffrey Hargreaves, Hydrologist,, United States Geological Survey, Denver, CO*

**Tour of the USGS Ice Core Facilities and Laboratory**

**WEDNESDAY JULY 12, 2006**

**8:30 AM – 9:30 AM**

**Class Session**

*Suzanne Paschke, Ph.D., Research Hydrologist,, United States Geological Survey, Denver, CO*

**Denver Basin Study - Techniques for Evaluating Colorado Aquifers**

- Mapping potentiometric surfaces and aquifer configuration
- Aquifer properties
- Ground-water quality
- Computer simulations

American Ground Water Trust  
16 Center Street, Concord, NH 03301  
July 11 - 12, 2006

# 2006 COLORADO GROUND WATER INSTITUTE PROGRAM

WEDNESDAY JULY 12, 2006 (CONTINUED)

**9:30 AM – 10:30 AM**

## **Class Session**

*Christopher Spears, Meteorologist, KMGH TV, Denver, CO*

### **Colorado Drought - We have a great climate but . . . it's darn dry!**

- What is drought?
- Does Colorado get more water from rain or snow and why?
- How is precipitation distributed across Colorado?
- Is drought in Colorado a common historical occurrence?
- How does Colorado's precipitation pattern effect the availability of water resources?

**10:30 AM – 10:45 AM**

## **Networking Break**

**10:45 AM – 12:30 PM**

## **Field Trip**

*Peter Barkmann, CPG, Hydrologist, Colorado Geological Survey, Denver, CO*

### **Tour of Lower Clear Creek Canyon - Geology and Aquifer Characteristics**

- Primary and secondary porosity
- Permeability controls
- Interstitial and fracture porosity

**12:30 AM – 1:30 PM**

## **Lunch – (Provided)**

**1:30 PM – 4:15 PM**

## **Field Trip**

### **Tour of Coors Brewing Company - Water Rights Overview and Water Treatment Facility**

- The history of the water rights and use at the Coors Brewery  
*Ken Vaught, Manager, Water Resources Development*
- The science of brewery water treatment - the water is important!  
*Jeff Tyus, Chief Plant Operator and Gordon Whittaker, Chemist*
- Tour of Water Treatment Plant/ Tour of Brewing Facility  
*Tom Bueb, Environmental Compliance Manager*

**4:15 PM – 4:30 PM**

## **Wrap-up**

*Garret Graaskamp, American Ground Water Trust*

- Where to find additional education materials on ground water and hydrology

**Institute Adjourns**