



AMERICAN GROUND WATER TRUST

Training Workshop – Concord, NH

WATER TOPICS FOR NEW HAMPSHIRE TEACHERS



The program is for teachers and educators covering water issues, water management and the importance of ground water resources

February 24, and February 25, 2014 (9:00 – 4:00 both days)
Richard M. Flynn Fire Academy, 222 Sheep Davis Road, Concord, NH (off Route 106)



Program organized in cooperation with
New Hampshire Department of
Environmental Services



PROFESSIONAL DEVELOPMENT

COST: FREE! Includes lunches, snacks and a (big) bunch of handouts

GRADES: All grades welcome – focus is Middle & High School. Other educators welcome.

SUBJECTS: Water reaches all subjects!

Typically we have a full spectrum of teachers who teach science subjects, very few of whom have had much training or prior experience of basic hydrologic or environmental aspects of water, water supply or water related issues. We will give you background on topics such as the state's water resources, impacts of hydraulic fracturing, road salt and ground water quality, use of gray water, climate change and water supply, how water softeners and iron removal systems work, where and how wells are drilled and (see program detail on following pages)

ACTION: Sign-up NOW! Space limited... First come – first served (www.agwt.org/events)

BACKGROUND:

The American Ground Water Trust has organized over 60 training programs for teachers in 17 states. The very first water program was held in Waterville Valley, NH in 2000. The 2013 NH program was held in Tamworth last July.

The program will give a unique opportunity for teachers to explore aspects of water that are relevant to New Hampshire. Water science and water management experts from the water industry and government agencies will be presenting the program. We recognize that teachers in all grades must adhere to state standards for content and required learning objectives, and so our approach, through class sessions, demonstrations, discussions and handouts, is to demonstrate how to integrate water topic subject matter into existing curricula. The program will show that exciting and practical "water science" can be applied to many traditional subject areas.

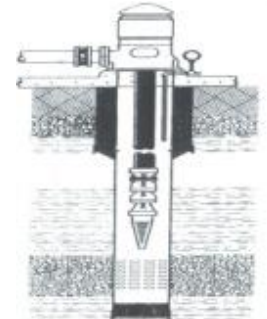
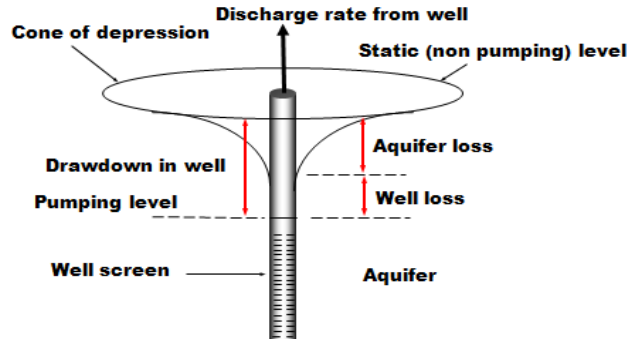
We believe that teachers who are excited about environmental education and who are provided with some training in water-related cause-and-effect will be more likely to effectively teach environmental concepts to their students with a positive and motivating style. Our Institutes get teachers excited and focused. There are thousands of school storerooms groaning with unused curriculum materials. The institutes get teachers fired up to make use of the many excellent materials that are already available.

Students made aware of the economic and environmental importance of water resources and aquatic habitat are likely to become motivated to protect and conserve resources. As the future voting citizens in New Hampshire we hope students impacted by water-savvy teachers will recognize the connected and integrated nature of the environment and therefore be empowered to play an active role in protecting resources for sustainable use.

Many decision makers, whose actions impact water resources, did not grow up understanding the science basics of water management and protection. An appreciation of the role of water in our state environment and economy should now be

part of the learning heritage of every adult and child. To be effective stewards of our water resources, there must be greater awareness and understanding of the science behind the resource.

SIGN-UP: Online at <http://www.agwt.org/events> or call 800 423 7748. Please feel free to call Andrew Stone at American Ground Water Trust, (603) 228-5444, email, astone@agwt.org. or contact Laurel Pushee at NH DES (Project WET) (603) 271-4071, e-mail Laurel.Pushee@des.nh.gov if you have questions or need more information



Program – Monday February 24th (9:00am – 4:00pm)

8:30 – 9:00 SIGN-IN + FRUIT, COFFEE & DONUTS

9:00 – 9:15 WELCOME - ANNOUNCEMENTS & LOGISTICS

9:15 – 10:00 INTRODUCTION - WATER TOPICS (Hydrology by Stealth)

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

- The importance to teachers of a foundation of basic environmental concepts
- Adding “water and environmental issues” to traditional subjects
- The importance of having citizens understand environmental “cause and effect”
- Seven Building Blocks to Hydrologic Literacy

10:00 – 10:30 THE GOVERNOR’S COMMISSION ON WATER SUSTAINABILITY

Member of the Commission (invited)

- Commission’s purpose
- Why a Water Sustainability Commission?
- Findings – Goals - Moving forward

10:30 – 10:45 BREAK

10:45 – 11:15 THE BASICS OF ROCKS & WATER

Andrew Stone, American Ground Water Trust, Concord, NH

- Geology fundamentals (Rock types and origins)
- Geologic structure

11:15 – 12:00 CONSTRUCTION OF WATER WELLS AND PROTECTION OF GROUNDWATER

Richard Schofield, Water Well Program Manager, NH DES, Concord, NH

- How Wells Are Drilled (video)
- Typical equipment that goes into a water well and home water system
- Typical water well construction in New Hampshire. (Home wells and water utility wells)
- Measuring well yield and the use of hydrofracture in low-yield wells
- Water tests and well maintenance to assure a safe supply for the state’s 200,000+ private wells
- Groundwater and water-well information available from DES

12:00 – 12:45 LUNCH (provided)

12:45 – 1:30 DEVELOPING & MAINTAINING SUSTAINABLE GROUNDWATER SUPPLIES IN NH

Dr. James Vernon, Senior Hydrogeologist, Nobis Engineering, Concord, NH

- Replacing Town water supply wells in a limited aquifer with limited open space (case study)
- Developing a new community well vs. rehabilitating an existing well with problems (case study)
- The role of water conservation for supply and demand management
- Discussion: What are the pros and cons of permitting bottled water operations?

1:30 – 2:30 NEW HAMPSHIRE'S GEOLOGY AND IT'S WATER SUPPLY

Lee Wilder, Public Outreach Coordinator, NH Geological Survey, NH DES, Concord, NH

- The Water Cycle and New Hampshire's Geology
- Aquifers in NH: Locations and Origins
- The NH Geological Survey's Water Well Network
- The interaction of human activity and the Water Cycle in NH

2:30 – 3:00 THE PROGRAM SO FAR.... HOW DO WE MAKE USE OF ALL THIS IN THE CLASSROOM?

Everybody – discussion

3:00 – 3:15 BREAK

**3:15 – 4:00 MOUNT WASHINGTON OBSERVATORY:
UNDERSTANDING WATER THROUGH OBSERVATION, EDUCATION, AND RESEARCH**

Will Broussard, Outreach Coordinator Mount Washington Observatory North Conway, NH

- Introduction and background of the Observatory
- Water literacy as it relates to weather and climate
- Distance-learning, outreach, and trips programs
- Research projects at the Observatory

4:00 END OF DAY ONE

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Program – Tuesday February 25th (9:00am – 4:00pm)

8:30 – 9:00 FRUIT, COFFEE & DONUTS

9:00 – 9:45 THREATS TO WATER QUALITY

Andrew Stone, American Ground Water Trust, Concord, NH

- Sources of biological and microbiological threats
- Sources of chemical compounds that could impact water quality
- Challenge of competing water demands for homes, agriculture and industry
- Hydraulic fracturing and environmental impacts (hot national issue)

9:45 – 10:30 NH DES and PROJECT WET (Water Education for Teachers)

Laurel Pushee, Source Water Protection Education Coordinator, NHDES, Concord, NH

- Background to Project WET in New Hampshire
- Water Pollution risks as a learning opportunity
- WET workshop opportunities for NH teachers
- Water information and educational resources available on the DES web-site

10:30 – 10:45 BREAK

10:45 – 11:30 THE UNITED STATES GEOLOGICAL SURVEY IN NEW HAMPSHIRE

Richard Moore, Research Hydrologist, USGS New England Water Science Center, Pembroke, NH

- USGS Research Projects in New Hampshire
- Aquifer Mapping Programs
- Computer models: Surface water quality in New England

- National network of water quality monitoring
- [Information sources for teachers – USGS web-site]

11:30 – 11:45 SCHOOL SUBJECTS AND CAREERS IN THE WATER INDUSTRY

Andrew Stone, American Ground Water Trust, Concord, NH

- Subjects and skills needed for all aspects of water resource assessment, operation and management
- Hydrologic, environmental, health, engineering, water management, regulatory, planning etc.
- Technicians, operators, construction, maintenance, records etc.

11:45 - 12:30 CLASSROOM DEMONSTRATIONS AND LESSON OPPORTUNITIES

Andrew Stone, American Ground Water Trust, Concord, NH

Laurel Pushee, Source Water Protection Education Coordinator, NHDES, Concord, NH

- Porosity & permeability
- Plant transpiration
- Geologic cross- sections from well-log data
- The water drop journey
- Examples of Project WET water learning curriculum materials

12:30 – 1:15 LUNCH (provided)

1:15 – 1:45 GEOTHERMAL (GROUND SOURCE) HEATING & COOLING FOR HOMES AND BUILDINGS

Garret Grasskamp, Hydrogeologist, American Ground Water Trust, Concord, NH

- How ground-source heating & cooling works
- Economic and environmental benefits

1:45 – 2:30 JAFFREY NH WATER SYSTEM CASE STUDY

Dr. John McClellan, Principal Engineer/Associate, Tighe & Bond, Westfield, MA

- Background/Water System History
- How the system works
 - a. System components, b. Aquifer, c. Water quality & treatment
- Contoocook Well contamination incident
 - a. History/cause of contamination, b. Contaminant plume movement/effect on water supply well

2:30 – 3:00 THE PROGRAM SO FAR.... HOW DO WE MAKE USE OF THIS IN THE CLASSROOM?

(Discussion during break)

- What is in your handout packets?
(Everybody – discussion)

3:00 -3:45 AND NOW FOR SOMETHING COMPLETELY DIFFERENT

- Shakespeare’s hydrology
- Graphic descriptions of the hydrologic system from a 19th Century romantic Poet
- “The Cloud” Class exercises (lessons) for all grades using poems & pictures

3:45 – 4:00 WRAP-UP – Going forward..... how can we help you?

4:00 ADJOURN

4:00 PROGRAM ENDS

WHAT TEACHERS SAY:

*Very informative! Fast paced! No downtime, just like I like it.
The workshop covered KEY water concerns about our future.
The information we received is usable, immediate and relevant.
The information from the experts will add a dimension of realism to my lessons.
A great amount of information was presented in a concise, understandable way.
The expertise of the presenters on water topics was enriching and an eye-opener.*

*This Institute was tremendous for expanding my knowledge of the use of groundwater.
This Institute has provided ammunition to take back to my school to fire them up about the value of water.
The class was awesome! It had wonderful presenters and great information and resources for my students.*

American Ground Water Trust

50 Pleasant Street, Concord, New Hampshire 03301, USA

A 501 (c)(3) Non-profit Education Organization

- ◆ Promoting efficient and effective ground water management
- ◆ Communicating the environmental and economic value of ground water
- ◆ Showcasing science and technology solutions to water issues
- ◆ Increasing citizen, community and decision-maker awareness
- ◆ Facilitating stakeholder participation in water resource decisions



All teachers will receive a certificate of attendance for participating in this program.