

2005
NEW ENGLAND
GROUND WATER INSTITUTE PROGRAM
Lowell, Massachusetts – July 26-27, 2005



Hosted at:
Tsongas Industrial History Center/University of Massachusetts-Lowell
Under the auspices of the Lowell National Historical Park and the
Institute of Museum and Library Services.

Invited Speakers and Topics

TUESDAY JULY 26, 2005

8:30 AM – 9:00 AM Registration and Continental Breakfast

9:00 AM - 10:00 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 New Hampshire
- Are ground water, streams and wetlands connected?

10:00 AM - 10:15 AM Networking Break

10:15 AM - 11:15 AM Class Session

Tom Mack, Hydrologist, United States Geological Survey, Pembroke, NH

Where are New England's Aquifers? -- Computer Modeling NH's Coastal Ground Water

- Rock types and aquifer characteristics
- Where are the best aquifers located?
- Which aquifer types protect ground water quality best?
- How do we model a regional ground water system – NH Seacoast Example

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TUESDAY JULY 20, 2004 (CONTINUED)

11:15 AM - 12:15 PM Class Session

Joe Ayotte, Hydrologist, United States Geological Survey, Pembroke, NH

MtBE, Statistics and Ground Water Contamination - What is the Reality?

- Ground Water and Contaminant Data Collection
- Geologic and Statistical Data Assessment
- New Hampshire MtBE Ground Water Occurrences – Statistical Assessment

12:15 PM – 1:00 PM Lunch (Provided on Site)

1:00 PM – 2:00 PM Class Session

John Kastrinos, Senior Engineer, Haley and Aldrich, Boston, MA

Ground Water and the “Big Dig” - Third Boston Harbor Tunnel Project

- Introduction to dewatering, groundwater control and the Big Dig
- Design considerations in controlling ground water and drawdown
- Engineering methods that were used to control ground water and drawdown during construction?
- How the tunnel and other underground structures affect ground water flow

2:00 PM – 3:00 PM Class Session

Stephen Estes-Smargiassi, Director of Planning, Massachusetts Water Resources Authority, Boston, MA

A History of the Boston Water System – 19th Century to 21st Century

- Why and how were the Quabbin and Wachusett Reservoirs constructed?
- What are the primary water sources for the MWRA?
- How significant was the availability of ground water in development of the MWRA system?
- What are the major historical and current environmental threats to the MWRA water supply?
- What are the primary methods and costs of protecting the MWRA water supplies from environmental threats?

3:00 PM - 3:15 PM Networking Break

3:15 PM – 4:30 PM Class Session

Rhonda Fields, Director, Premier Laboratory, Dayville, CT

The Chemistry of Ground Water - What is Water?

- The basic chemistry of natural ground and surface water – Are they the same?
- Is a “polar molecule” only found at the North Pole?
- How and why do substances dissolve in water?
- How and why do substances adsorb in water?
- How does water effect the processes of adsorption and absorption?

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WEDNESDAY JULY 27, 2005

8:30 AM – 8:45 AM **Second Day Check-in**

8:45 AM - 9:45 AM **Class Session**

Douglas Heath, Hydrogeologist, US Environmental Protection Agency, Boston, MA

Road Salt Impacts to Lakes and Streams Interstate 93 and Adjacent Roads in Southern New Hampshire

- What are the effects on adjacent freshwater ecosystems from applying deicing salt to roadways?
- What are the chronic and acute chloride toxicity standards for freshwater habitats?
- Are aquatic habitats degraded in the study area from excessive chloride concentrations?
- Are the impacts from winter deicing applications sustained throughout the year or longer?
- What monitoring tools work well to measure salt impacts to streams?

9:45 AM – 10:00 AM **Networking Break**

10:00 AM – 12:00 PM **Class Session**

Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA

Water Sampling and In-situ Testing - Merrimack River

- Water quality sampling and testing
- Commodification of water resources
- History of the built and natural environments surrounding Lowell's canals and the Merrimack river

12:00 AM – 1:00 PM **Lunch – (Provided on site)**

1:00 PM – 2:00 PM **Class Session**

Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA

The Lowell Typhoid Epidemic of 1890 - How and Why

- Interactively explore the cause of the Lowell Typhoid epidemic of 1890-91
- Trace the scientific research that uncovered the epidemic's cause.
- Concept: unforeseen consequences of urbanization and industrialization on water resources
- Concept: water quality and human health

2:00 PM – 3:00 PM **Class Session**

Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA

Ground Water Simulation Tank and USGS MODFlow Example

- How groundwater flows and contaminant transport
- Interconnectedness of ground and surface water
- Computer modeling of water table contours and flow vectors using MODFlow
- Human impacts on water resources

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WEDNESDAY JULY 27, 2005 (CONTINUED)

3:00 PM – 3:15 PM Networking Break

3:15 PM – 4:15 PM Class Session

Timothy LaVallee, Ph.D., Tsongas Industrial History Center, Lowell, MA

Ground Water Simulation Tank and USGS MODFlow Example (Continued)

- How groundwater flows and contaminant transport
- Interconnectedness of ground and surface water
- Computer modeling of water table contours and flow vectors using MODFlow
- Human impacts on water resources

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