

Clean Waters of Rhode Island

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Final Report

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By

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Abstract

There were two thrusts to this project. The first was to create a conference to provide background and knowledge for working professionals in the clean water field as well as to educate graduate and undergraduate student in the scope of the clean water field. This first Rhode Island conference on clean water was organized and information was gathered to create a model for an annual conference. The second major activity of this project was the hosting of a summer camp at the University of Rhode Island for high school students to introduce students to clean water concepts and promote interest in clean water careers.

Keywords: Water Quality, Conference, Summer Camp, High School Students, Clean Water Careers, Rhode Island

Objectives

The project had two objectives. The first was to advance the awareness and knowledge of the importance of clean water in Rhode Island and provide insight into the various factors affecting the ability to obtain clean water for multiple uses in Rhode Island by hosting a major Clean Water Conference. The creation of the conference provided background and knowledge for the work of professionals in the clean water fields. This conference was used as a model to make the conference an annual event. Graduate students were encouraged to take courses in environmental areas and undergraduates were encouraged to consider pursuing degrees related to the clean water profession.

The second objective was the hosting of a summer camp at the University of Rhode Island for high school students to introduce students to clean water concepts with a goal of promoting interest in clean water careers.

Outcomes: Clean Water Conference

The Clean Water Conference was held on November 10, 2006. Planning for the conference was extensive and involved other professors at the University of Rhode Island, Water Professionals and graduate students. The conference effort was guided by a steering committee. The steering committee provided guidance in choosing keynote speakers and presenters and hosting special break-out sessions. Specific representation on the committee included a representative from the Providence Water Supply Board, a member of the board of the Kingston Water Supply, the Director of the RI Water Resources Center, the leader of the RI Pollution Prevention Center, and a Chemical Engineering Faculty member with research activity in environmental engineering.

Over fifty people attended the conference including water professionals, graduate students and undergraduate students. The morning keynote speakers were Juan Mariscal and Dan Varin from the RI Water Resources Board. The RI Water Resources Board is the main planning organization for the State of Rhode Island. The afternoon speaker was Karen McGuire from the Boston Office of the Environmental Protection Agency. She spoke on current and future federal water quality regulations. Other speakers presented the practical aspects of water quality from the local perspective. Industry speakers presented new methods for water cleanup and production. The conference was held in the Cherry Auditorium of the College of Engineering.

The full program for the conference is given below:

**CLEAN DRINKING WATER CONFERENCE
PROGRAM**
UNIVERSITY OF RHODE ISLAND, CHERRY AUDITORIUM

November 10, 2006

AGENDA

8:30 to 9:00am Registration. Coffee, Rolls

9:00 to 9:15 Welcome: Dean Nassersharif, Dr. Thiem, Dr. Knickle

Session 1: 9:15 to 10:00 am

Juan Mariscal, Dan Varin

RI Water Resource Board

- **Future State Perspective**

What is in the future regarding controls on water extraction and uses in RI?

Session 2: 10:00 to 10:50 am

- **State Regulators Perspective**

- Water Treatment Regulations

DOH: June Swallow, Chief, Drinking Water Section:

Status of system disinfection, Pb and Cu, and other possible new regulations

DEM: Dr. Michael Sullivan, Director RIDEM

Siting constraints-Water Supply

Session 3: 11:10 TO NOON

New Approaches to meeting demands and satisfying regulations

- Pamela Marchand, Chief, Providence Water Supply Board
- Henry Meyer, Manager, Kingston Water District

Session 4: 12:45 to 1:30 pm

New federal rules on controls of water

- **Karen McGuire, Chief, EPA Drinking Water Section**

Session 5: 1:30 to 2:30 pm

Industrial Perspective including New Technology for Water Treatment

- **Erik Schoepke, Brian Hernon, General Electric Systems**
- **Greg Webster, MIOX Treatment**
- **Display Tables**

2:30 pm ADJOURN

Outcomes: Summer Camp for High School Students

The second major activity was the hosting of a summer camp at the University of Rhode Island for high school students to introduce them to clean water concepts with a goal of promoting interest in clean water careers. High school students were recruited from Rhode Island to participate in the summer camp. Recruitment took place by visiting the schools and meeting the science teachers. With their help, students were recruited that have an interest in clean water careers.

The camp was scheduled from Monday to Friday from July 24 to July 31, 2006. Students arrived at 9:00 am and left at 3:30 pm. Lunch was provided. No fees were charged for this summer camp and lunch was provided.

Activities include presentations of the water cycle, chemistry of water, water quality and treatment, sewage treatment and biological technology, runoff and storm water, industrial water pollution, pollution prevention, and the Blackstone River cleanup. Laboratory exercises included water quality sampling and testing, pH and dissolved oxygen measurement, bacteria pollution testing, conductivity testing, acid rain testing, aeration, adsorption and health effects. The laboratory work was performed in both the environmental and chemical engineering laboratories. Field work included the collection of water samples from various locations and water bodies. Field trips were made to the Scituate Reservoir, a fresh water provider, and to the east Greenwich sewage treatment plant.

The complete detailed schedule of the Summer Camp is given below:

Clean Water Engineering and Science Academy **Summer 2006 July 24-July 28 Final Program** **Detailed Schedule**

Session 1: Monday July 24

- Introduction and Survey
- Intro to Water Cycle
- Intro to Water Chemistry
- LAB: Turbidity, Suspended Solids: Dirt sample, Sand Sample-Settling Times
- Drinking Water Sample Collection, different buildings
- Lunch
- Water Quality Treatment
- LAB: Drinking Water Testing
- pH, Alkalinity, Hardness, Iron, Copper, Chloride, Sulfite
- Free Chlorine, Total Chlorine, Nitrate/Nitrite Nitrogen
- Laboratory Report

Session 2: Tuesday July 25

- **Review of Water Testing LAB: pH, Copper, Alkalinity, Hardness**
- **Introduction to Sewage Treatment**
- **Introduction to Biology Technology**
- **Introduction to COD and BOD**
- **LAB: Filtration, Screening, Skimming, Flow Rate**
- **Lunch**
- **Field Trip to Sewage Treatment Plant - East Greenwich**
- **Initial Screening, Clarifiers, Rotating Biological Contactors, Nitrogen Removal, Ultraviolet Light, Discharge to Bay –Sludge, Floaters**

Session 3: Wednesday July 26

- **Lab Report**
- **Pond Video**
- **Pond water Sampling**
- **Engineering Computer Center**
- **Microbes in Drinking Water Microbe world - Microbiology**
- **www.microbeworld.org**
- **Laboratory Report**
- **Lunch**
- **Scituate Reservoir Route 116**
- **29.6 square miles of watershed**
- **Treatment by Sedimentation, Chlorination, Aeration and Iron Sulfide**

Session 4: Thursday July 27

- **Introduction to Health Effects Associated With Water Quality**
- **Introduction to Pollution Prevention. Dr. Barnett**
- **Introduction to Chemical and Physical Adsorption**
- **Carbon Adsorption**
- **Constructing Flow Sheets for Scituate Reservoir**
- **Introduction to pH**
- **LAB pH**
- **LAB Activated carbon color removal**

Session 5: Friday July 28

- Introduction to Blackstone River Clean Up – Dr Wright
- Introduction to Point and non-Point Sources
- Blackstone River Samples
- Adsorption Experiments
- Introduction to dissolved Oxygen
- LAB Dissolved Oxygen
- LUNCH
- URI water source and Treatment (Wells)
- Sampling at 30 Acre Pond
- Laboratory Report
- Post Assessment Survey
- Certificates

Summary and Conclusion

Water Quality Conference

The Clean Water Conference was very successful. The speakers were professional and knew their topics. The sessions were dynamic and attendees and presenters have a greater appreciation for the complexity of the clean water system. Thirty four professionals and Academics attended. Twenty two graduate and 14 undergraduate students attended.

Summer Camp

Sixteen high school students attended this academy from different cities and towns in Rhode Island. Each student wrote a brief laboratory report for each laboratory exercise and an essay indicating the activities of most interest to each individual student. Also they wrote a description of the water treatment at the Scituate Reservoir. Students wrote lab reports and filled in Lab Forms. Lab performance and behavior was excellent. On the end of the week survey – most students liked the lab experiences and – most were interested in being science and engineering majors

Photos of the students immersed in their laboratory activities have been included.



Student Support

Student Support					
Category	Section 104 Base Grant	Section 104 NCGP Award	NIWR-USGS Internship	Supplemental Awards	Total
Undergraduate	3	0	0	0	3
Masters	1	0	0	0	1
Ph.D.	0	0	0	0	0
Post-Doc.	0	0	0	0	0
Total	4	0	0	0	4

Notable Awards and Achievements

There are two achievements that the Rhode Island Water Resources Center is particularly proud of. The first achievement is the awarding of a grant to Roger Williams University. The grant awarded to Roger Williams University went to support a junior faculty member's research in harvesting and treating collected rainfall to augment traditional water sources. The other achievement was the creation of the first ever Clean Water Conference which brought together water professionals throughout Rhode Island in a conference to present and discuss water issues in Rhode Island. Also part of this information transfer project was the creation of a summer water camp open to high school students interested in a career in the water area.

Publications from Prior Projects