

RI WRC Newsletter

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Message from the Director



Dr. Leon Thiem, Director

During fiscal year 2015 the Rhode Island Water Resources Center will be providing funded to two research projects and one education project.

Current Projects and Activities

Professor Angelo Lucia proposed to complement and improve the understanding and management of groundwater contamination by using computer modeling simulation to model the flow and transport of multi-component, multi-phase behavior through porous media. He will be addressing the more challenging issue of non-point source pollution from sources such as runoff and failing septic systems. This research will address the issue of oil spills in Rhode Island. His research will address a RIDEM study that states that “Available monitoring data reveal non-point pollution as a widespread problem affecting every watershed in the State. Non- point sources are suspected on contributing to the impairments in a majority of the surface waters included on the state’s impaired waters list”.

Professor Pradhanang proposes to mitigate some of the disadvantages caused by the widespread use of chlorine as a disinfectant. Even though chlorine is the most widely used disinfectant in the U.S. because of its efficiency in killing certain harmful pathogens there is a growing concern regarding the use of chlorine due to the formation of disinfectant byproducts (DBPs). In Rhode Island, the formation of carbonaceous and non-carbonaceous DBPs continues to be a concern. Her research will focus on understanding the relationship to water quality in Rhode Island and the potential to form DBPs.

The education project will be headed by Associate Professor Christopher Hunter and will consist of two approaches to provide “Outreach to Promote Clean Water in Rhode Island.” The first part will be a continuation of the Annual Clean Water Conference to provide background and knowledge for working professional in the water resources field and a learning opportunity for college students, both graduate and undergraduate. The second approach is intended to promote interest in clean water to high school students via a week long summer camp held on the University of Rhode Island campus.

Other activities sponsored by the Rhode Island Water Resources Center include publication of newsletters and interviews with water professionals. The RI Water Resources Center will continue to maintain and enhance its website.

Future projects are presented on the next page.

Water Purification via Hydrogels with Voltage-Controlled Electrodynamic Properties

by *Samantha A. Meenach*

Rhode Island's industrial and commercial endeavors present a high potential for water contamination. As a result, many municipalities have strict restrictions on the types and amounts of contaminants that can be released to wastewater treatment facilities and ultimately the greater



Dr. Meenach, PI

water supply in Rhode Island. As a result, there is a strong demand for water pre-treatment strategies. Such strategies must involve the selective removal of specific contaminants and safety in transporting the removed contaminants. The ability to reuse materials for the removal of water contaminants is also desired. We proposed the use of hydrogels (materials that can absorb large amounts of water) that contain a conductive polymer that can selective remove contaminants from wastewater. The highly porous hydrogel materials will provide a flexible and dynamic water treatment system that is highly beneficial to the state of Rhode Island.

Occurrence and formation of N-DBPs in source waters of Rhode Island

by *Soni Pradhanang*

Nitrogenous disinfection byproducts (N-DBPs) are emerging pollutants that may be present in natural source waters or industrial or wastewater discharge as well as byproducts of water treatment plant (WTP). N-DBPs. These byproduct to



Dr. Pradhanang, PI

nitrosamine formation are ubiquitous in many drinking water sources in Rhode Island or can actually be formed in distribution systems. The information obtained in this study will be used to propose strategies to minimize N-DBPs exposure, such as improved treatment, changes in source water selection, or perhaps instituting waste and agricultural management practices that minimize inorganic and organic nitrogen discharges to potential drinking water supplies.



Summer Camp: Laboratory



Field

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