

# UConn

UNIVERSITY OF CONNECTICUT

Department of Marine Sciences  
Presents a Seminar by

**Jonathan Morrison**

**USGS, New England Water Science Center, East Hartford, CT**

## **Use of a Continuous UV-Nitrate Sensor to Compute Total Nitrogen Concentrations and Fluxes in the Tidal Connecticut River at Middle Haddam, Connecticut**

In 1985 the Long Island Sound study identified nitrogen as the leading cause of hypoxia in Long Island Sound. The United States Geological Survey (USGS) has been calculating tributary loading of nitrogen to Long Island Sound. The Connecticut River delivers approximately seventy percent of the fresh water to Long Island Sound and is considered to be a significant source of nitrogen to the Sound. The Connecticut River has tidal flows for most of its length in Connecticut (greatly complicating flow and nitrogen load calculation), and therefore, the furthest downstream water-quality monitoring station for calculating nitrogen loads was located at the gaging station at Thompsonville, just south of the Connecticut-Massachusetts State line. In order to expand the understanding of nitrogen loading from the Connecticut River watershed, a tidal streamflow gaging station and water-quality monitoring station using a UV-nitrate sensor were established on the Connecticut River at Middle Haddam. This expanded the nitrogen load calculations for the Connecticut River by 1,240 mi<sup>2</sup> of additional drainage area downstream of Thompsonville, and an additional 24 municipal wastewater treatment facilities. A regression model to estimate total nitrogen concentrations using data from the UV-nitrate plus nitrite nitrogen and turbidity sensors along with 315 water-quality samples was developed for the period 2011-2014. The regression model predicted the concentration of total nitrogen consistently well with an adjusted R-squared value of 0.61. The daily and annual nitrate plus nitrite and total nitrogen loads from the Connecticut River at Middle Haddam were calculated using nitrate plus nitrite nitrogen data from the sensor and total nitrogen concentration data from the regression model along with 15-minute and daily mean values of streamflow from this tidal reach of the Connecticut River. Annual total nitrogen load estimates at the Connecticut River at Middle Haddam, Connecticut were compared with the upstream load estimates at the Connecticut River at Thompsonville, Connecticut site, just south of the Massachusetts state border. Annual gains in total nitrogen loads ranged from 7 to 35 percent or 900 to 6,700 metric tons respectively.

**Host:** Penny Vlahos

**Time & Date:** 11:00 am, Friday, October 12, 2018

**Place:** Marine Sciences Building, Seminar Room 103

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