



Stony Brook University

School of Marine and Atmospheric Sciences

Spring 2015 Lecture Series

Friday, April 17, 2015 7:30 p.m.

Duke Lecture Hall – Chancellor's Hall
Southampton Campus



Dr. Christopher Gobler

Stony Brook University

“State of the Bays, 2015: Crisis and opportunity”

Water is at the core of the Long Island existence. We rely on groundwater to drink. That same groundwater is the primary source of freshwater and nitrogen to our coastal ecosystems. We are surrounded by water within which we swim, boat, and recreate. Since the late twentieth century, aerial coverage of critical marine habitats on Long Island such as eelgrass and salt marshes have declined by up to 80%, Long Island's top shellfisheries (clams, oyster, scallops, mussels) have declined by up to 90%, and nitrogen levels in groundwater have increase by more than 50%. Presently, there is growing concern among the public, politicians, and scientists regarding the negative effects of excessive nitrogen loading on Long Island's coastal marine habitats and fisheries. In 2014, Long Island experienced a series of coastal water body impairments that justified that concern including outbreaks of brown tides, rust tides, toxic cyanobacterial blooms, hypoxia, and acidification, all occurrences now directly and indirectly linked to excessive nitrogen loading. In freshwater ecosystems, Suffolk County experienced a greater frequency of blue green algal blooms than any other county in NY and nitrogen continues to be identified as a factor intensifying the toxicity of these events. New links were made between excessive nitrogen loading, the loss of salt marshes, and coastal flooding. New research initiatives in 2014 examined Long Island estuaries from Queens to Montauk and performed cruises circumnavigating Long Island from the East River, across Long Island Sound, through the Peconic Estuary, and across the South Shore Estuary Reserve. All of these efforts utilized continuous data logging devices and, therefore, facilitated unprecedented levels of temporal and spatial resolution and provided a series of new insights regarding the state of Long Island's coastal waters. Through these efforts, the widespread nature of night-time hypoxia in Long Island coastal waters was discovered with more than two-thirds of sites studied experiencing dissolved oxygen levels below 3 mg per liter for an extended period during 2014. Furthermore, the south shore estuaries of Suffolk County were identified as experiencing the most intense marine algal blooms in NY, a finding consistent with their small tidal range and extended residence times. Solutions to water body impairments are emerging. Observations in 2014 continued to provide evidence from estuaries and coastal ponds that enhanced ocean flushing can protect water bodies against excessive nitrogen loads and efforts to stem nitrogen loads in some regions of Long Island are yielding improved levels of dissolved oxygen. Finally, this presentation will discuss the founding of the new Clean Water Technology Center at Stony Brook University that will focus on advancing technologies capable of removing nitrogen and other contaminants from wastewater before they enter groundwater and drinking water supplies.