The L.A. Colding Lecture Series

in Environmental Science and Technology

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Shedding light on carbon cycling in aquatic environments using optical measurements

Room 51, Building 208

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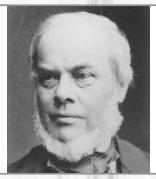
Abstract:

Shedding light on carbon cycling in aquatic environments using optical measurements.

The reservoir of dissolved organic matter (DOM) in the world's oceans is the second largest active carbon pool on Earth, and plays an important role in the global carbon cycle. The amount of carbon in DOM is comparable to that in the atmosphere as carbon dioxide. The net oxidation within a year of 1% of the carbon bound in DOM would lead to a similar production of CO2 to that arising from the anthropogenic emissions. With regards to climate change it is therefore relevant to understand the production and fate of DOM in marine environment. In addition DOM also impacts at smaller scales. Its biological, physical and chemical properties greatly influence the ecology of aquatic ecosystems.

DOM consists of a complex mixture of compounds and its composition, and herein characteristics, vary with changes in supply/production and exposure to degradation processes. The complexity of the mixture results in it being very difficult to characterise with traditional chemical methods. For many years, absorption and fluorescence spectroscopy have been used as both a quantitative and qualitative measures of DOM. This talk will present how these approaches are being applied and developed to studying marine carbon cycling. In addition a range of other applications will be discussed including river catchment management and online monitoring of water quality in natural and engineered systems.



Ludvig August Colding was Copenhagen´s city engineer in the period 1857-1886 and designed the city´s water supply system. He chose to base the supply entirely on groundwater. The system´s general layout and many of its details date back to Colding´s era. From 1869-1886, Colding was a professor at the Technical University of Denmark. At the age of 26, he discovered the law of conservation of energy, simultaneously with, but independently of Joule.

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