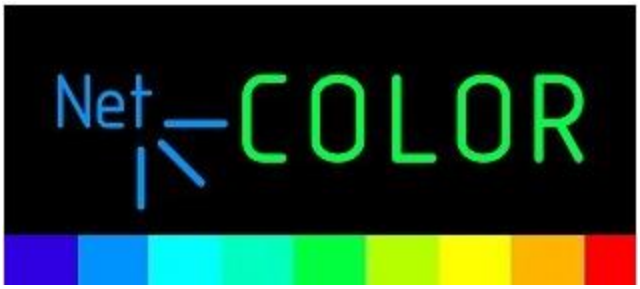

Webinar agenda Wednesday, September 29th, 2021 (2 – 3pm EST)

Zoom link : https://bit.ly/3AB86Fz

Chair: Anders Knudby

First speaker (15min): Rakesh Kumar Singh, Postdoctorate at AquaTel (Laboratoire d'optique Aquatique et de Télédétection, UQAR)

Title: Satellite-derived photosynthetically active radiation reaching the Arctic seafloor: role of sea ice and water turbidity.

Abstract: Sea ice in the Arctic Ocean is declining rapidly, leading to unexpected changes in the coastal ecosystem. In particular, the reduction in seasonal ice cover over the Arctic Ocean has increased fetch and shoreline erosion. The increased resuspension of organic matter and higher turbidity reduces water transparency with effects on the underwater light field and the dynamics of primary production. The change in photosynthetically active radiation (PAR) limits both pelagic (microalgal) and benthic (macroalgal) photosynthetic production, reducing both the growth and distribution of vegetation with effects on the availability of carbon to support coastal food webs. Therefore, it is vital to study PAR in the coastal Arctic Ocean to assess the extent of the change in the magnitude of light reaching the seafloor (PAR(z)). However, the extreme solar geometry and increasing optical complexity in the ice-free coastal waters of the Arctic Ocean (because of increased terrestrial discharge and accelerated hydrological cycles) increases the difficulty of PAR(z) estimation. Additionally, the rising atmospheric turbidity from increased cloud cover adds to the intricacy in estimating PAR in the polar regions. The present study aims to estimate PAR in various Arctic coastal zones using a unique satellite-based method specifically designed to estimate PAR(z). The maps showing the variation of PAR will help to identify vulnerable locations with significant changes in the underwater light field and assist in efforts to model the effects of changes in primary production.

Second speaker (15min): Carlos Araújo, PhD candidate at AquaTel (Laboratoire d'optique Aquatique et de Télédétection, UQAR)

Title: Seasonal succession and optical characterization of phytoplankton assemblages within surface waters of a subarctic coastal bay

Abstract: Recent advances in Earth Observation satellite missions provide information of coastal water quality and processes at unprecedent spatial and temporal scales. However, an attempt to use optical remote sensing to infer about phytoplankton community structure in such areas is generally hindered by its complex nature and the dominance of other optical properties over the ones directed influenced by phytoplankton itself. In this work, a comprehensive in situ data was used to identify major phytoplankton assemblages in a coastal bay in the northern Gulf of St. Lawrence, the Bay of Sept-Îles. The phytoplankton assemblages were obtained by Hierarchical Cluster Analysis of pigments and cell size concentrations information, and their spatial (order of 100 to 101 km) and temporal (seasonal) variability were investigated. The major physical environment and nutrient pool associated with each assemblage revealed distinguishable ecological niches. The investigated optical environment considered the major inherent optical properties (IOPs), namely the spectral absorption of chromophoric dissolved organic matter, non-algal particles, and phytoplankton, and the particulate backscattering. In turn, the IOPs variability within each phytoplankton assemblage was used to support explaining the variability of the remote sensing reflectance (also obtained in situ). The framework developed in this study represent a first effort towards satellite monitoring of phytoplankton assemblages in the study area, and the obtained results are promisingly for applications in other areas with similar oceanographic and optical complexity.