Air-water interface in an estuarine lake: chlorophyll and nutrient enrichment

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INTRODUCTION

The surface microlayer of water (SML) is a thin layer at the interface between the hydrosphere and the atmosphere and covers the surface of all water bodies. This important biogeochemical and ecological system is critical to a diverse range of Earth system processes (Cunliffe et al. 2013). This air-water interface is inhabited by neustonic microorganisms, both heterotrophic and autotrophic, which exhibit high respiratory and enzymatic activity (Hillbricht-Ilkowska et al. 1997, Mudryk and Dwulit 2004, Mudryk and Skórczewski 2004, 2006, Kostrzewska-Szlakowska and Kiersztyń 2017).

The surface microlayer is a unique buffer for various chemical substances, such as nutrients, chlorophyll, heavy metals, other organic compounds, etc. (Mudryk et al. 2003, Wurl and Obbard 2004, Antonowicz et al. 2015). Moreover, being unique in its physical, chemical and biological characteristics, the microlayer differs from the subsurface water (Hillbricht-Ilkowska and Kostrzewska-Szlakowska 2004). The structure of the surface microlayer is highly dynamic, which continuity can be easily disrupted. It is affected by a number of environmental factors such as...