Particulate element composition and phytoplankton biomass in Puddefjorden & Store Lungegårdsvannet during spring 2021

Dark waters in Bergen?

BACKGROUND

An established elemental stoichiometry is believed to be the requisite for naturally in the environment, pollution due to anthropogenic influence (e.g., sewage, construction materials, harbor activity, etc.) can radically change that fragile

phytoplankton growth and reproduction. While nutrients and heavy metals exist balance. Puddefjorden (PUD) and Store Lungegårdsvannet (SLV) were two of the most polluted coastal locations in Bergen since the begining of the indrustrialisation. The aim of the current study is to investigate the main driving factors of phytoplankton growth as well as the potential impact of heavy metals that have been introduced in the past due to pollution, on the algal biomass.

Nutrients as the major drivers of phytoplankton

- C and N developed in a similar pattern as Chla, while P levels were steady
- Si fluctuated almost identically as Chla and marked a 42%(PUD) & 50%(SLV) increase, during the Chla peak, indicating that phytoplankton community was dominated by diatoms





¹Parsons T. R., Y. Maita and C. M. Lalli . 1984. A manual of chemical and biological methods for seawater analysis. Pergamon Press, Oxford New York, 1: 101-111. ²Paulino, A. I., M. Heldal, S. Norland, and J. K. Egge. 2013. Elemental stoichiometry of marine particulate matter measured by wavelength dispersive X-ray fluorescence (WDXRF) spectroscopy. Journal of the Marine Biological Association of the United Kingdom 93:2003-2014. Picture: http://marcus.uib.no/instance/photograph/ubb-kk-n-324-037





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Chemical element \exists C \leftrightarrow N \triangleq P

REFERENCES

To read more about this project you can access the blog "Dark waters in Bergen" by scanning this QR code \longrightarrow

Iliana-Vasiliki Ntinou, Tatiana M. Tsagaraki, Jorun K. Egge Department of Biology, University of Bergen, Pb7803, N-5020 Bergen, Norway



Relative numbers of particulate heavy metals

- The values were higher in SLV (p=0,0349)
- No significant increase in these heavy metals implies they were not taken up by the phytoplankton during the study period (p=0,6972)



TAKE-HOME MESSAGE

This study contributes to the understanding of the complex abiotic(chemical elements) - biotic(phytoplankton) interaction in the coastal ecosystem of Bergen. Expanding our knowledge on this area will help in monitoring more effectively the sources of urban pollution.





Iliana-Vasiliki Ntinou MSc in Marine Biology

Chemical element = Hg = Pb = As



int001@uib.no +306940380588

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