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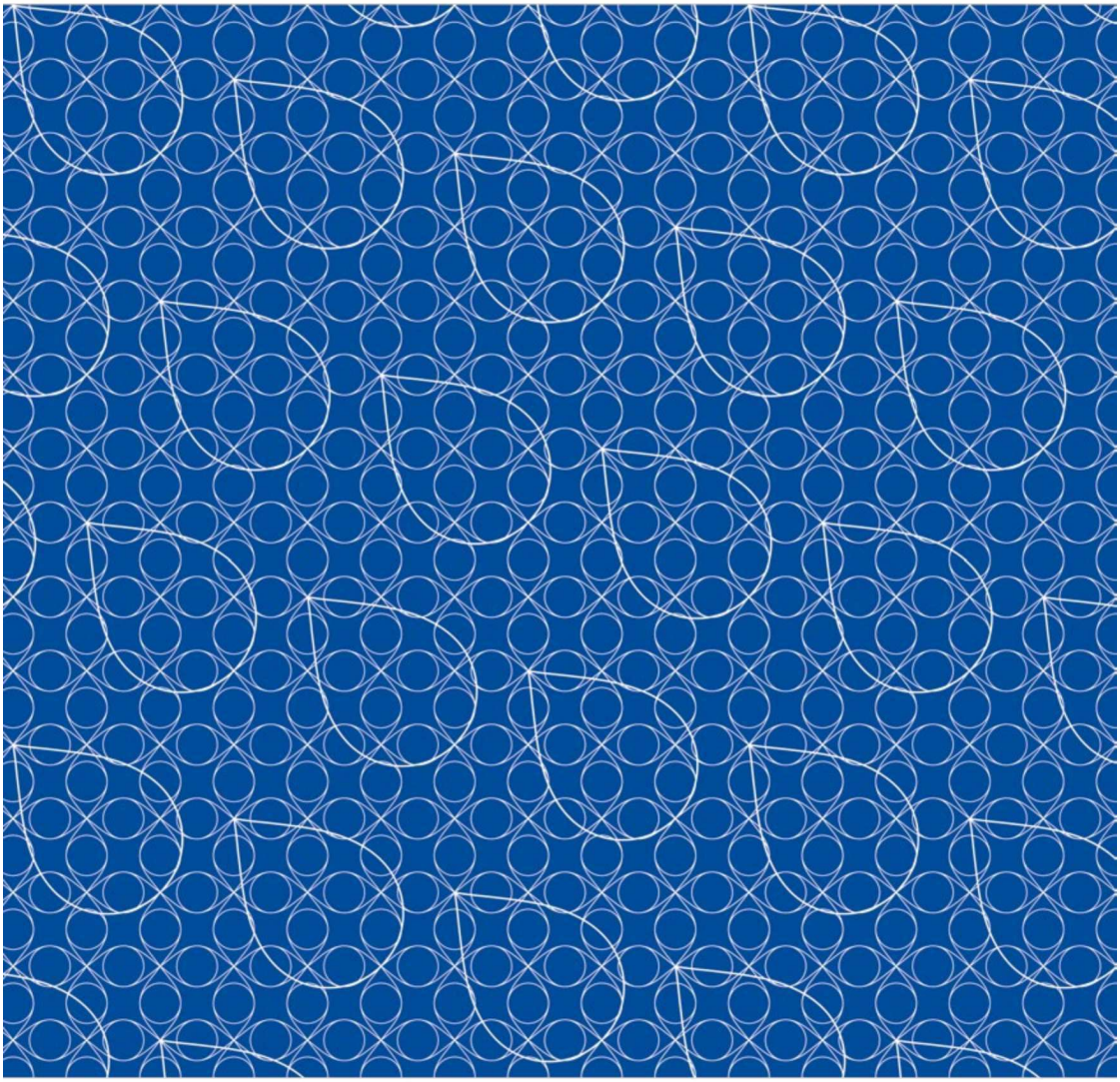

10 SYMPOSIUM FOR EUROPEAN FRESHWATER SCIENCES 2017

ABSTRACT BOOK

PHYTOPLANKTON RESPONSES TO RECENT TEMPERATURE CHANGES IN PRE-ALPINE LAKE LUNZ, AUSTRIA

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Rapid increase in lake temperature recorded recently can affect planktonic populations by entailing a shift toward the dominance of warm temperature tolerant species (e.g. cyanobacteria). Such species are deficient in essential components, i.e. sterols and polyunsaturated fatty acids (PUFA), required for consumers growth and reproduction.
To increase our understanding of how changes in lake physics (such as temperature and mixing) affect phytoplankton composition and consequently the provision of dietary quality to consumers in pre-alpine oligotrophic lakes, we conducted a multi-annual lake study during three years (2013-2015) in the pre-alpine, oligotrophic Lake Lunz and investigated: a) the inter-annual dynamics of water temperature, mixing, and transparency, b) how lake physics affected the inter-seasonal changes in phytoplankton biomass and taxonomy, and, c) how the phytoplankton composition accounted for changes in nutritional quality, as assessed by its lipid and fatty acids (FA) composition. We found that the phytoplankton taxonomic composition in Lake Lunz remained fairly stable during the last years and provided high dietary quality, as assessed by PUFA, to consumers. This suggests that oligotrophic lakes, characterized by low seston quantity, but high dietary quality (i.e. high PUFA), may be less responsive to inter-annual weather changes than shallow and nutrient-rich lakes and are similar to pristine ecosystems as Artic ponds or ultra-oligotrophic lakes. This study may serve as a ‚baseline' for other pre-alpine lakes that concurrently undergo changes, as the case for other lakes worldwide, in an effort to assess short-term changes of phytoplankton and its nutritional quality for consumers at higher trophic levels.

ENGAGING CITIZENS IN LAKE MONITORING – A STEEP LEARNING CURVE FOR CITIZEN AND SCIENTISTS.

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Citizen science, in which scientist and non-scientis work together on scientific projects is recognized to be an important tool for public participation and engagement. Importantly, engaging with citizens will allow scientists to cover larger spatial and temporal scales, raise environmental as well scientific literacy, and bridge the gap between science and society. Levels of engagement can vary from crowdsourcing to participatory science, with joint efforts in problem definition and collection. Citizen science has entered a new era, as past expertise can now increasingly be combined with emerging technologies including apps on mobile phones.
Within the COSTaction NETLAKE we aimed at engaging citizens in lake monitoring, capitalizing on the potential of a network of lakes observatories throughout Europe. During an initial pilot, we explored several levels of engagement in water quality monitoring, working with different citizen groups, ranging from local school children to semi-professional divers associations. To gauge the interest of both scientist and citizens in collaborating in scientific project we conducted multiple (online) surveys, and had hands-on meeting with scientists and different citizen groups.
Based on the lessons learned during our initial efforts, we developed an extensive global citizen science campaign around two environmental challenges, carbon storage in aquatic systems and pollution by microplastics. Citizen groups from 11 countries monitored a suit of water quality parameters in 24 lakes, including microplastics, decomposition rate, high frequency temperature, water colour and transparency. Key to the success of our citizen science campaigns was self-organization with identification of citizen scientist champions, community building through hands-on meeting and social media, and having a reward system in place. By actively involving citizens in the whole process of doing lake science, we not only are able to work with citizens as sensors, but also increase environmental and scientific literacy of local end users.