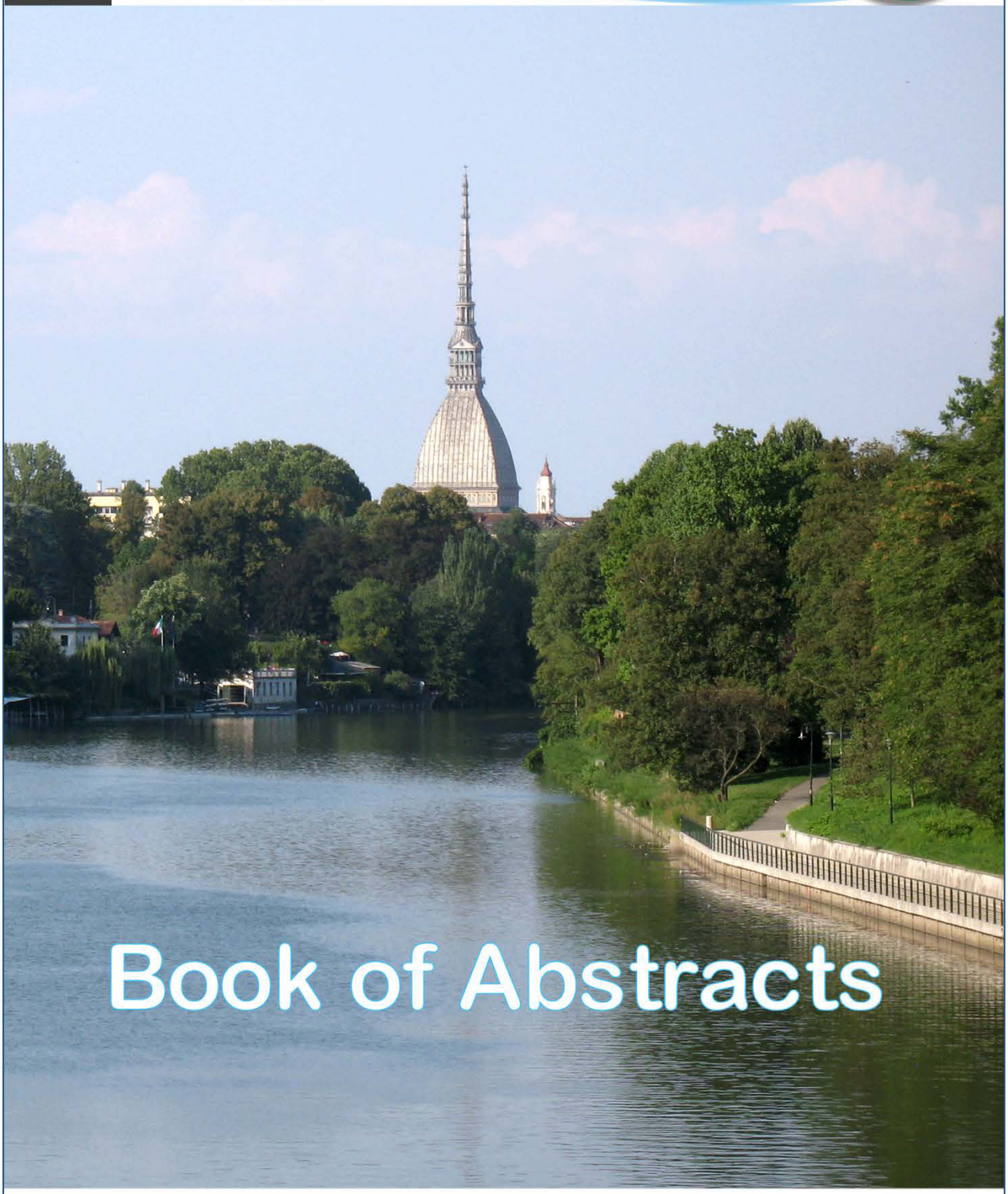
SIL 2016
TORINO ITALY

XXXIII CONGRESS

31 JULY
5 AUGUST



Book of Abstracts

International Society of Limnology

39-P Bentification in Naroch Lakes (Belarus). *B. Adamovich, T. Makarevich , Yu. Veras, H. Zhukava, T. Zhukava*

Naroch Biological Station, Belarusian State University

Naroch Lakes are located in the northwest of Belarus in Neman river basin. The Lakes are connected through channels and include three water bodies: Lake Batorino, Lake Miastro and Lake Naroch. All the lakes are polymictic but differ in trophic state. As a result of about 60 years monitoring observations, a number of external factors that largely determine the stages of ecosystem evolution of Naroch Lakes and their current status have been identified.
In the end of the 20th century all the three lakes were affected by invasion and mass-scale reproduction of the Ponto-Caspian water-filtering mollusk, the zebra mussel (Dreissena polymorpha Pallas). The invasion by the zebra mussel causes complex and diverse rearrangements in the structure and functioning of lake ecosystems (Mayer et al., 2002; Mills et al., 2003).
Zebra mussel invasion led to the bentification process in the Naroch Lakes. Such parameters as nutrient concentration, phytoplankton biomass, chlorophyll and seston content and other indicators of bioactivity have decreased in water, but that was accompanied by appreciable increase in bioactivity of benthic communities (Ostapenya et al., 2012).
Our analysis showed that the responses of all the three lakes with common catchment area to the intensive nutrient load in the early 1980th and its subsequent decrease due to the implementation of the environmental improvement measures in the middle of 1980th were similar. But Dreissena invasion led to divergence in the dynamics of hydroecological parameters between lakes. The main factors that determine the development of zebra mussel population are the amount of available substrate for colonization, the morphometry, and the trophic status of lakes (Burlakova et al., 2006). The differences in the timing of zebra mussel invasion and certain differences in biotic and abiotic features of the lakes could determine the differential impact of the life activities of zebra mussel on each of the Naroch lakes.

39-P Hydrological dynamics affect the development of phytoplankton in a large subtropical reservoir (Hongfeng, Southwestern China). *Qiuhua Li [1,3],Teng ou [1], Jing Xiao [1], Jingfu Wang [2], Jingan Chen [2], Nico Salmaso [3]*

Key Laboratory for Information System of Mountainous Area and Protection of Ecological Environment of Guizhou Province, Guizhou Normal University, People's Republic of China [1], State Key Laboratory of Environmental Geochemistry, Institute of Geochemistry, Chinese Academy of Sciences, , People's Republic of China [2], Fondazione E. Mach - Istituto Agrario di S. Michele all'Adige (Trento), Italy [3]

In the tropical and subtropical reservoirs, the control of primary production is generally exerted by bottom-up processes, especially represented by the control by P and N compounds, and by the hydrological dynamics. Moreover, compared with natural lakes in the temperate regions, top-down control of phytoplankton in tropical regions tends to be less important due to a general smaller size of zooplankton and to the high predation exerted by continuously reproducing omnivorous fish. Given these conditions, situations characterized by periods of low water renewal coupled with high availability of nutrients, can represent a serious hazard, favouring the potential development of nuisance species belonging to cyanobacteria, and compromising the exploitation of the reservoirs.
In this contribution, we will evaluate the influence of the hydrological regime and nutrient temporal dynamics on the development of phytoplankton and cyanobacteria in the sub-tropical Hongfeng reservoir (Southwestern China, Guizhou Province, 26.5°N). The reservoir has a surface area of 57.2 km^2 and a volume of 6.01×10^8 m^3. Since 2000, its major function changed from electricity generation to drinking water supply. From January to May, the water level of the reservoir was stable, oscillating between 1232 and 1234 m a.s.l. (low level). During June, the lake increased its level around 1238-1239 a.s.l. between July and December (high level). The high influx of water, which contributed to prevent the formation of strong temperature gradients, was followed by a decrease in TP concentrations from the low level (ca. 35 µg P/L) to the high level (25 µg P/L) period. At the same time, the phytoplankton community showed a decrease of biovolumes and a shift from cyanobacteria (mostly Oscillatoriales) and large diatoms to specific Morpho-Functional Groups belonging to small chlorophytes (small Naked and Gelatinous chlorophytes) and Small Centric diatoms. Overall, the increasing water influx favoured a decrease of the large species, in favour of smaller species. Changes at the species and at higher taxonomical levels were investigated by applying NMDS ordination techniques coupled with vector fitting. In particular, the phytoplankton sample configurations were significantly linked to the fluctuations of the water level and mean water temperature and, partly, TP.

Overall, the results demonstrated a clear negative link between phytoplankton development and increase in the water level. High influx of water and turbulence levels after spring contributed to control, despite medium-high concentrations of TP, the development of high phytoplankton and cyanobacterial biomasses. This works clearly demonstrates the strong implications originating from the adoption of different water discharge management options on the control of phytoplankton dynamics and potential nuisance species.