

ECOLOGICAL STATE OF DUROWSKIE LAKE

HYDROLOGY AND WATER QUALITY

WĄGROWIEC – POZNAŃ 2018

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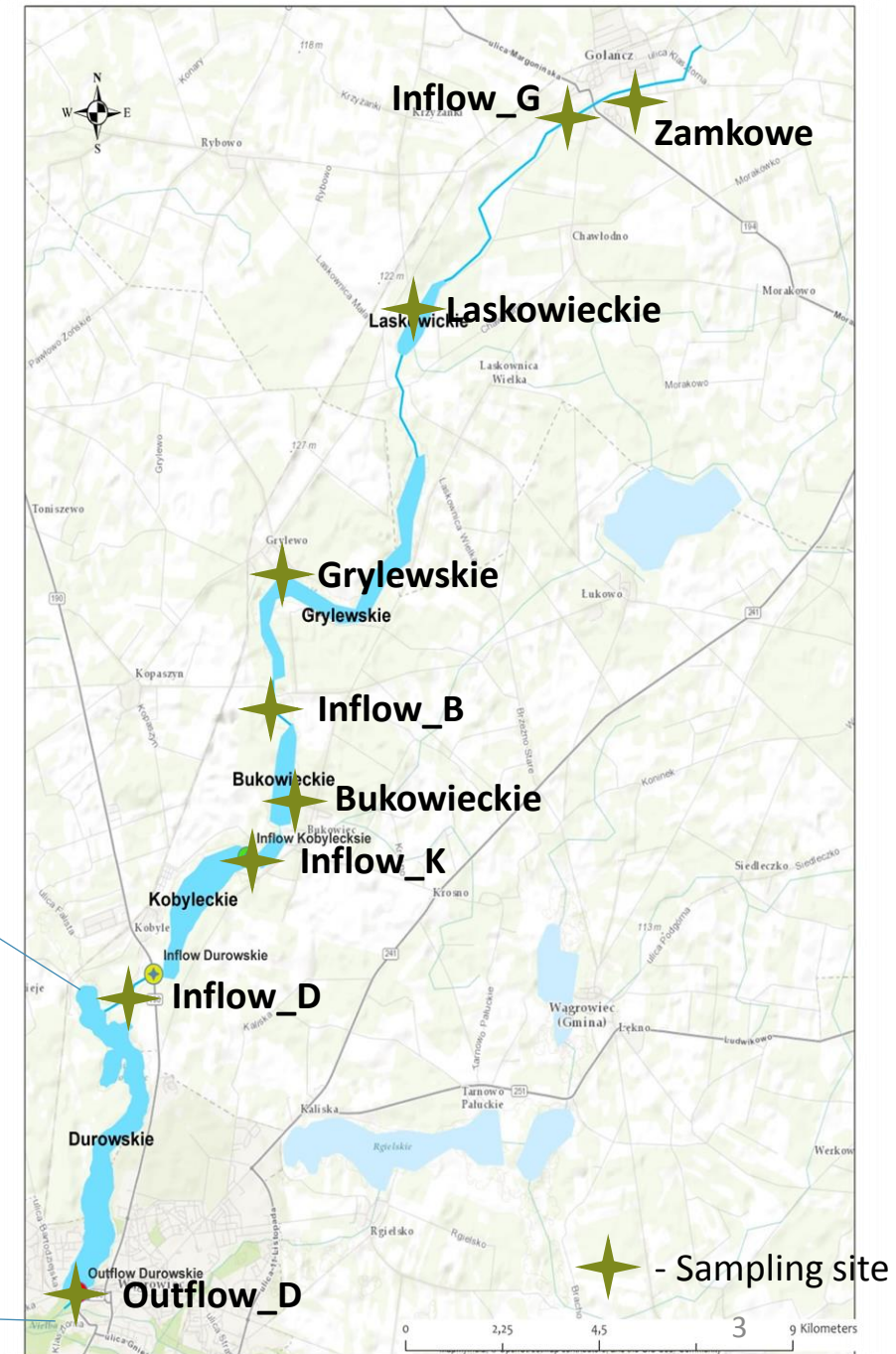
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Objectives

- Assessment of the current ecological state of lake water quality
 - Evaluation of the long-term changes of the water quality
 - Determination of nutrient inflows and outflows of the lake
 - Recommendations for the lake state improvement

Study area and sampling sites

Lake Durowskie



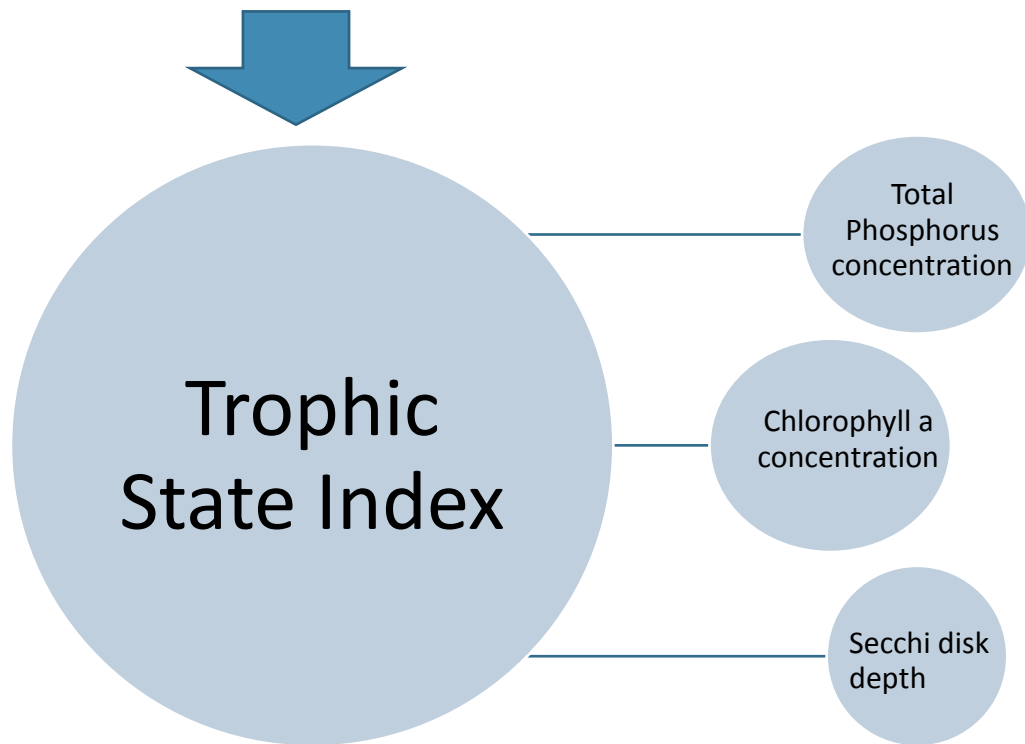
Field Methods

- Flow velocity
- pH
- Conductivity
- Dissolved Oxygen Concentration
- Water Temperature
- Secchi Disk

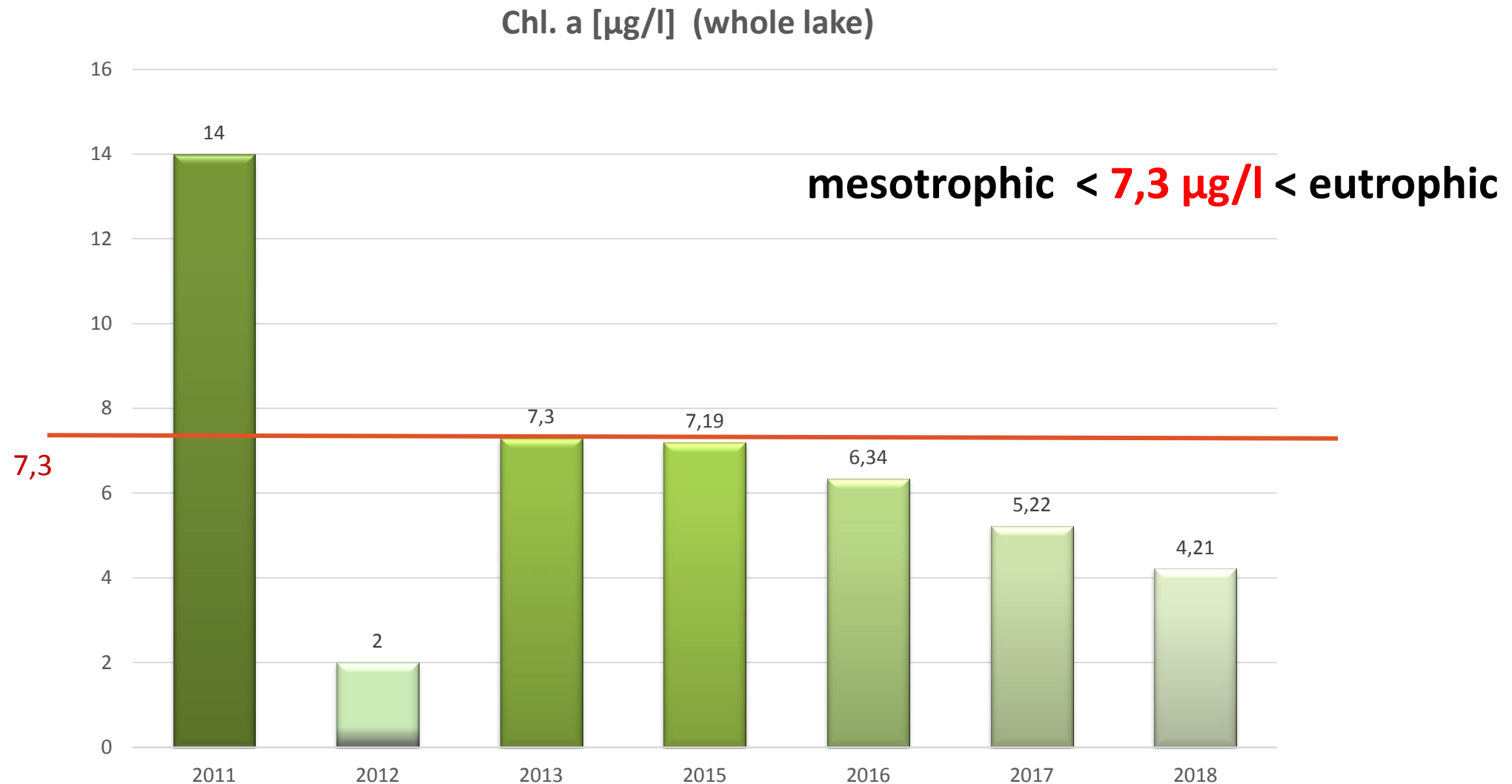


Laboratory Methods

- Chlorophyll *a* concentration
- Nutrients concentration

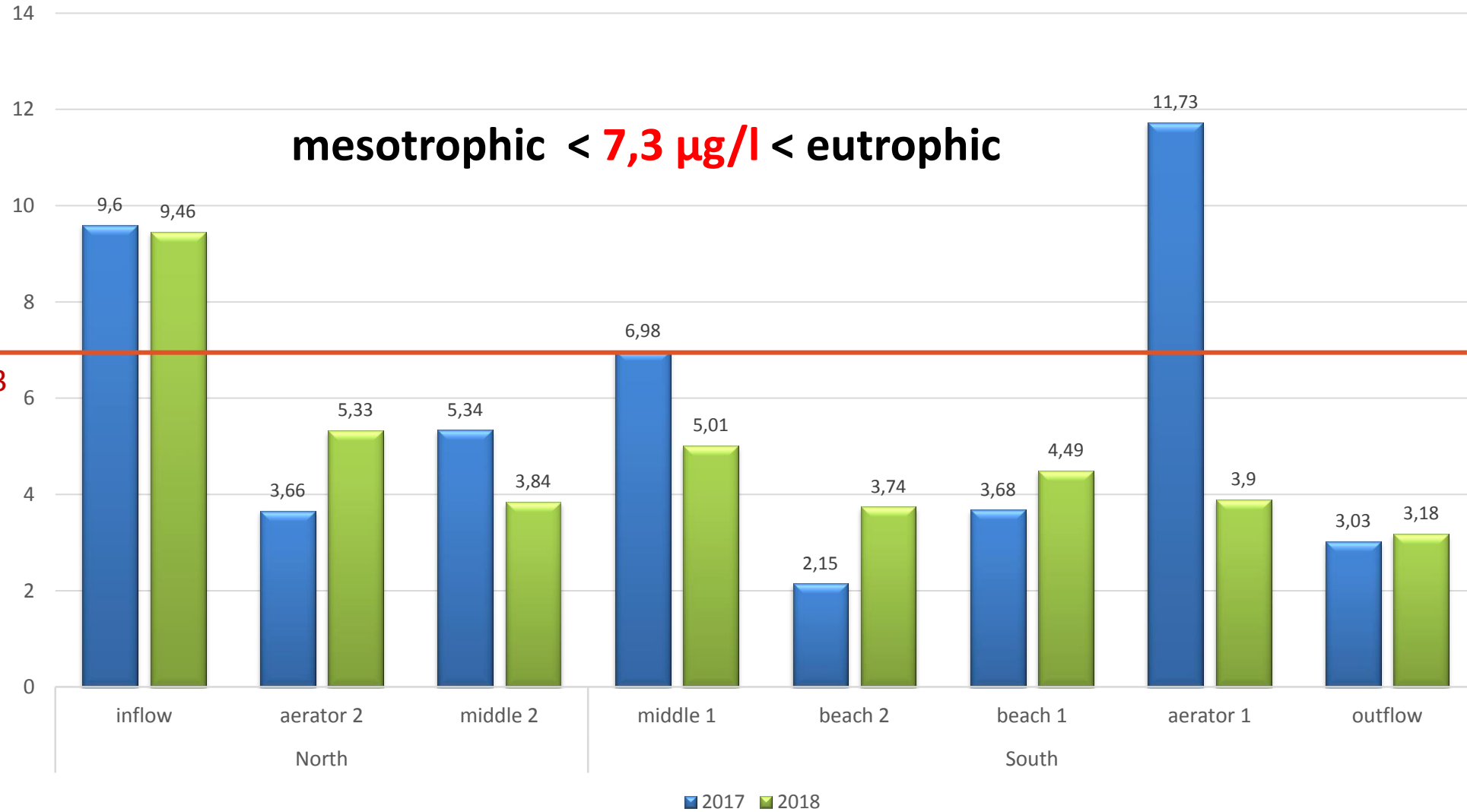


Chlorophyll a concentration trend of the lake Durowskie

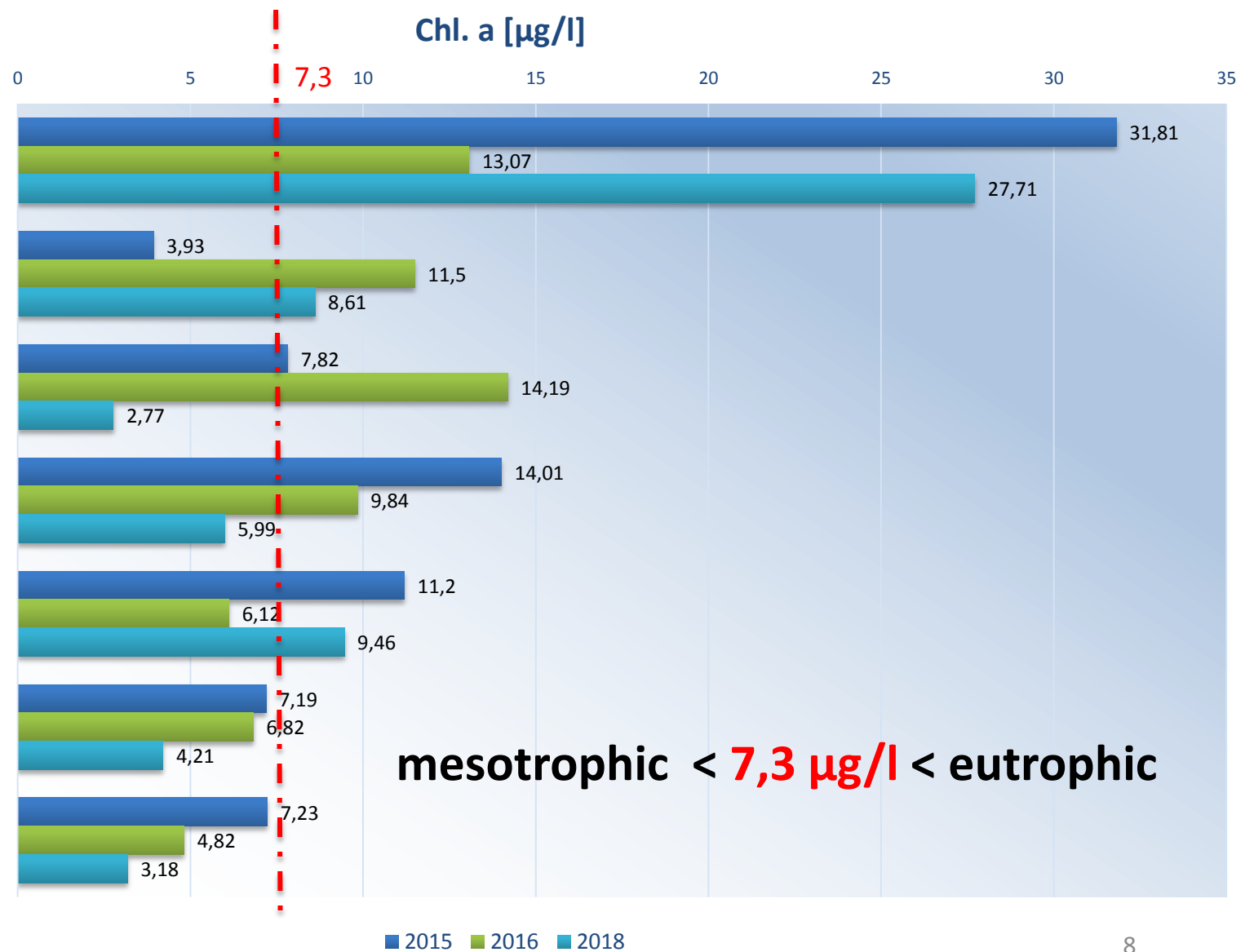
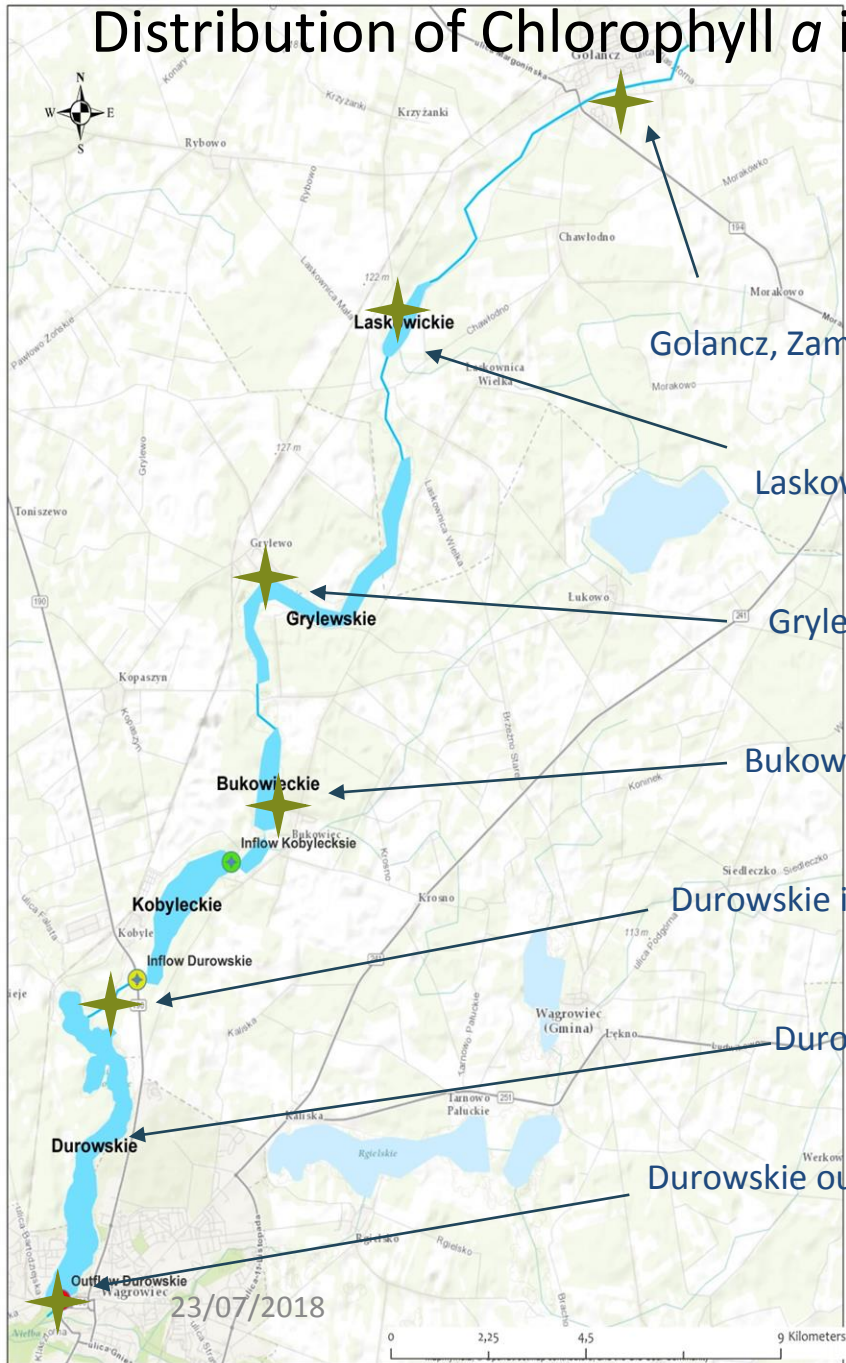


Chl. a [$\mu\text{g/l}$] content comparison

mesotrophic < **7,3 $\mu\text{g/l}$** < eutrophic



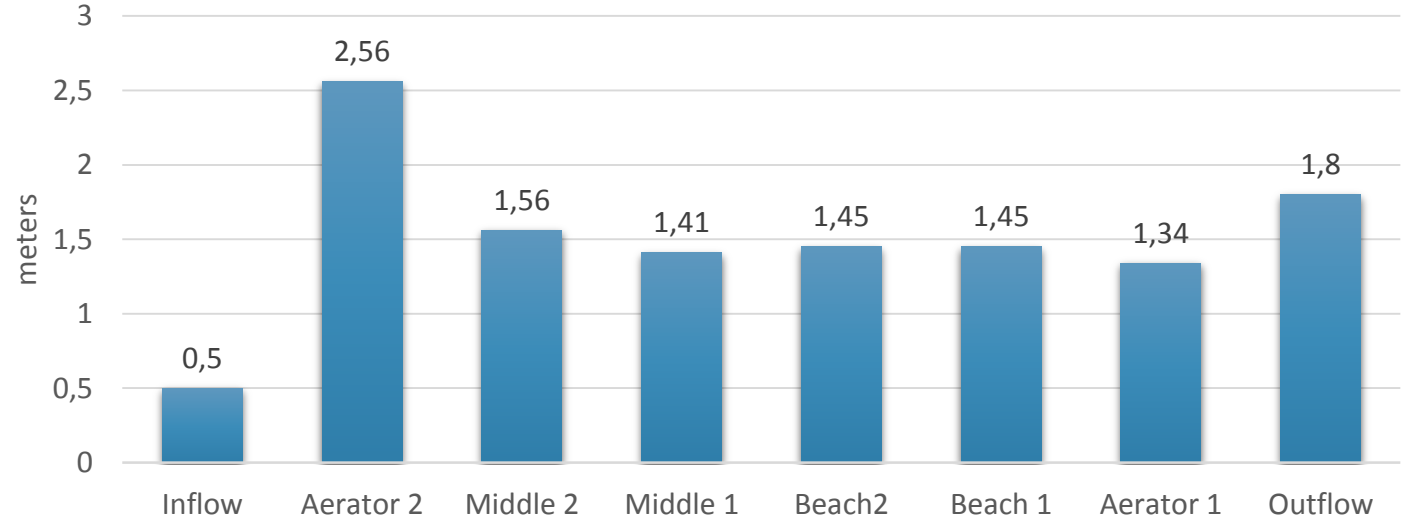
Distribution of Chlorophyll *a* in the upper lakes and in Durowskie Lake in 2015, 2016, 2018



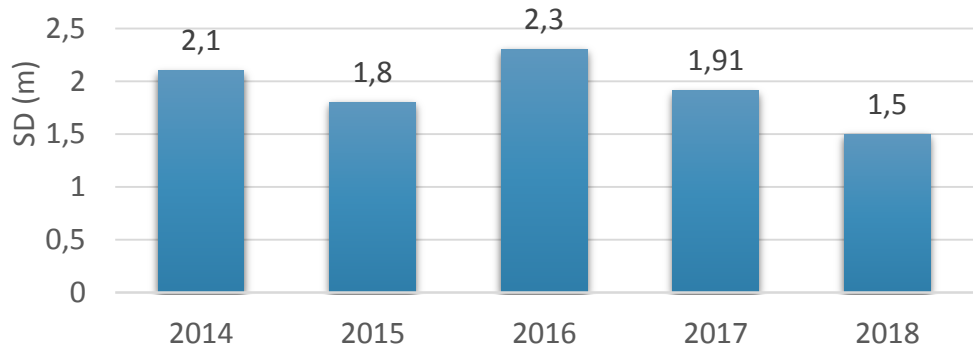
Transparency 2018



Transparency (m)
2018

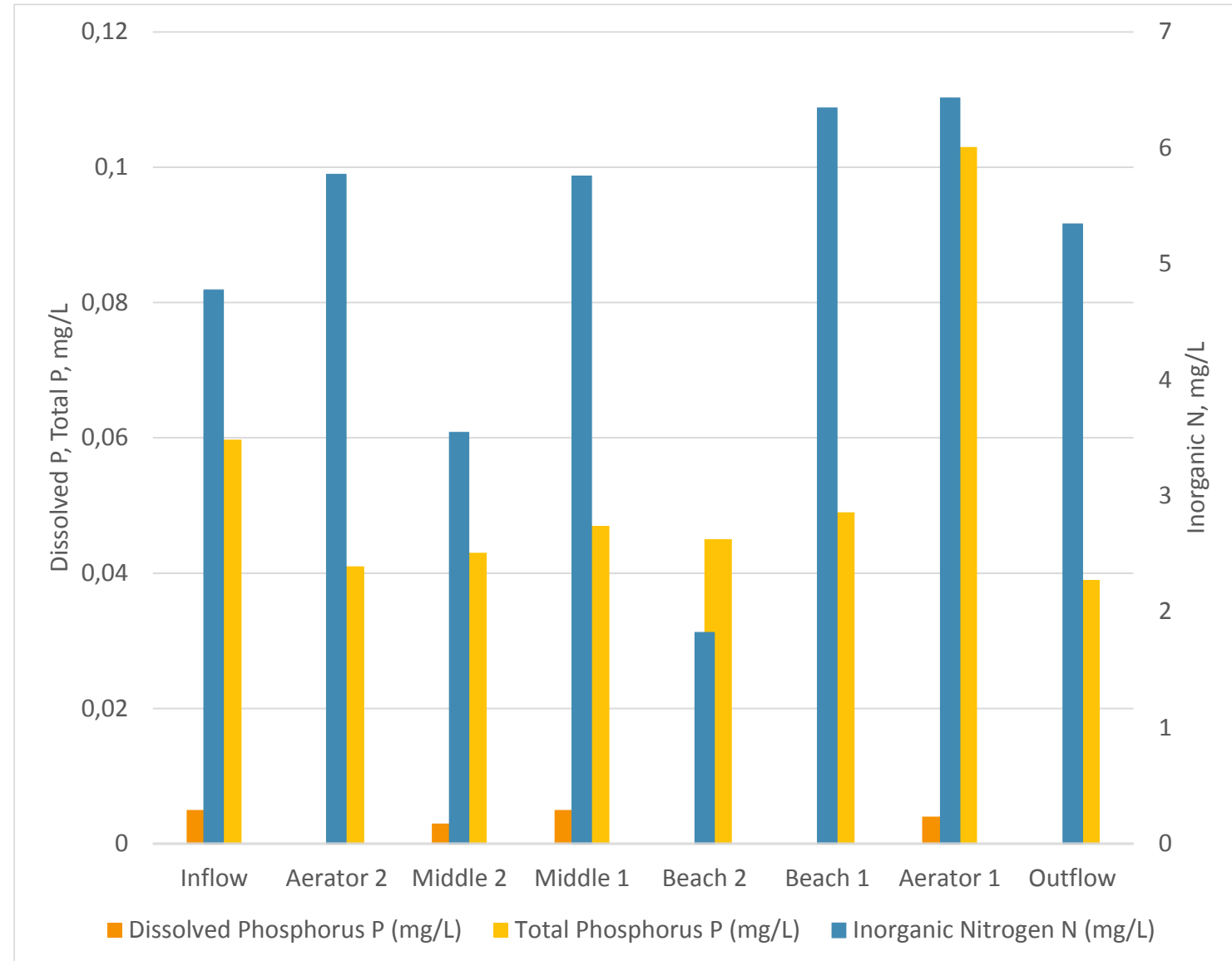
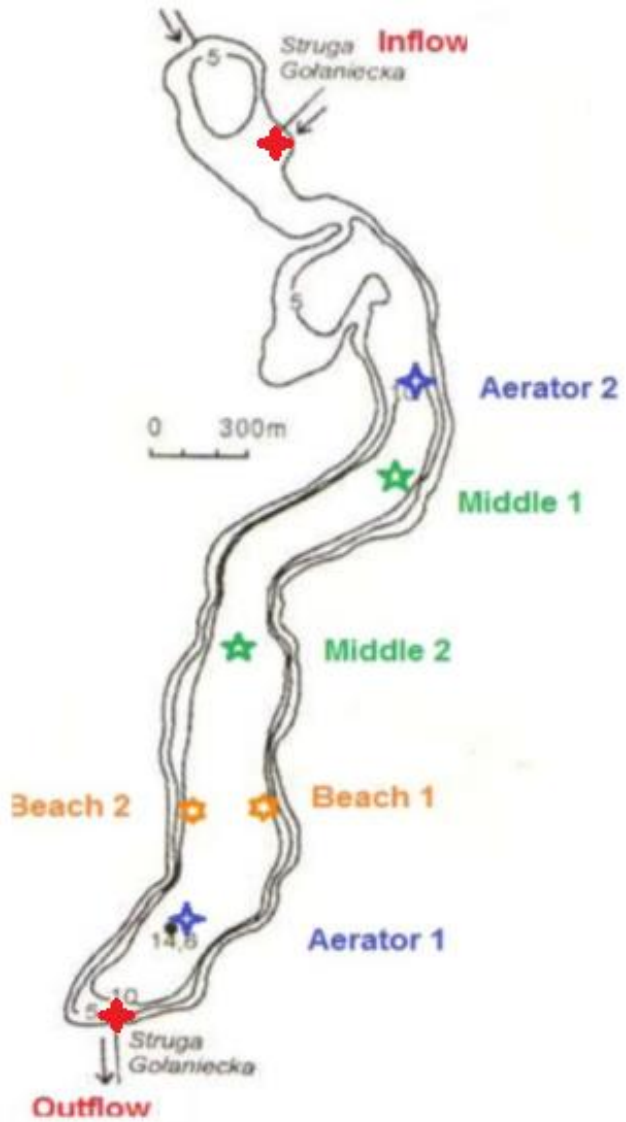


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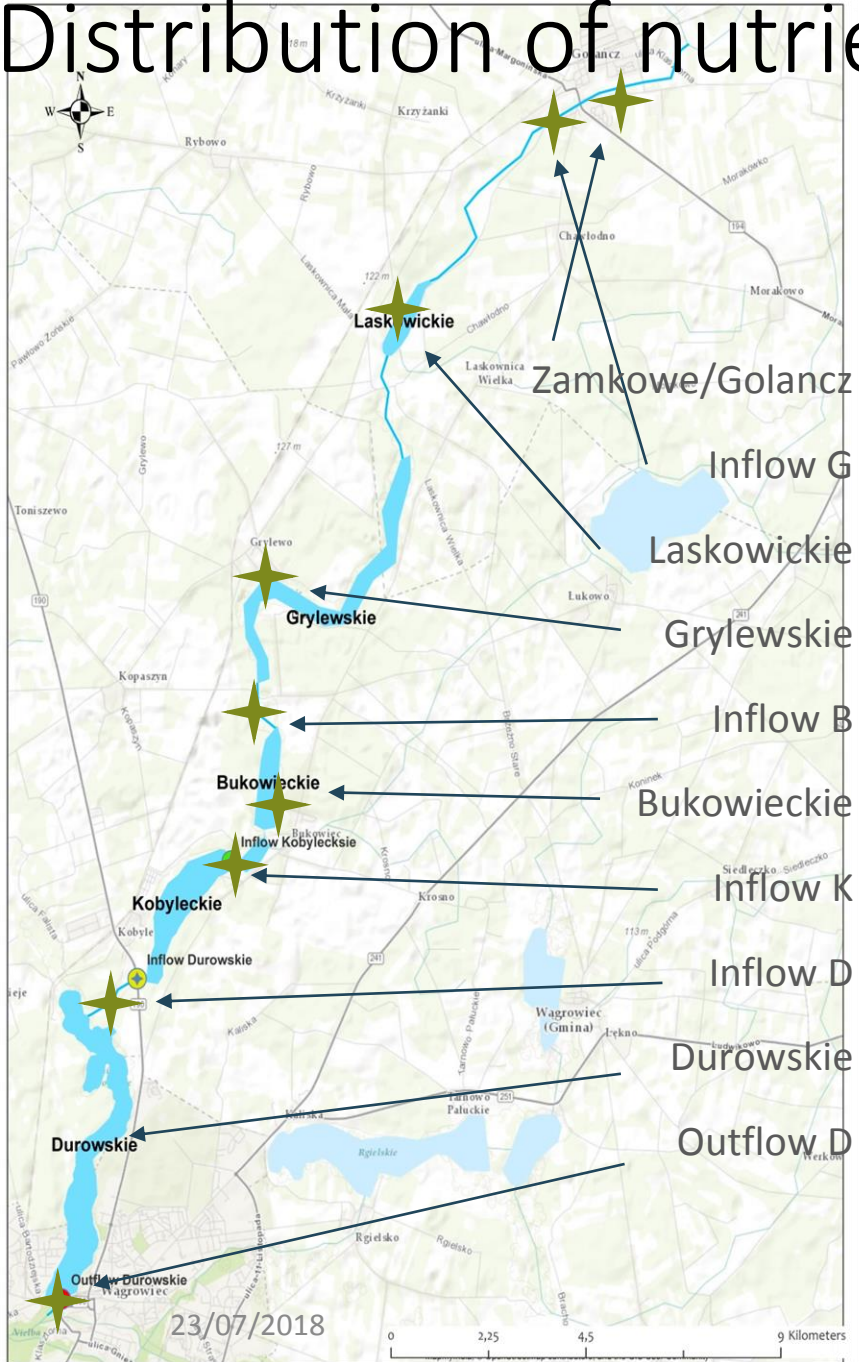
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Nutrient concentration on the lake Durowskie 2018

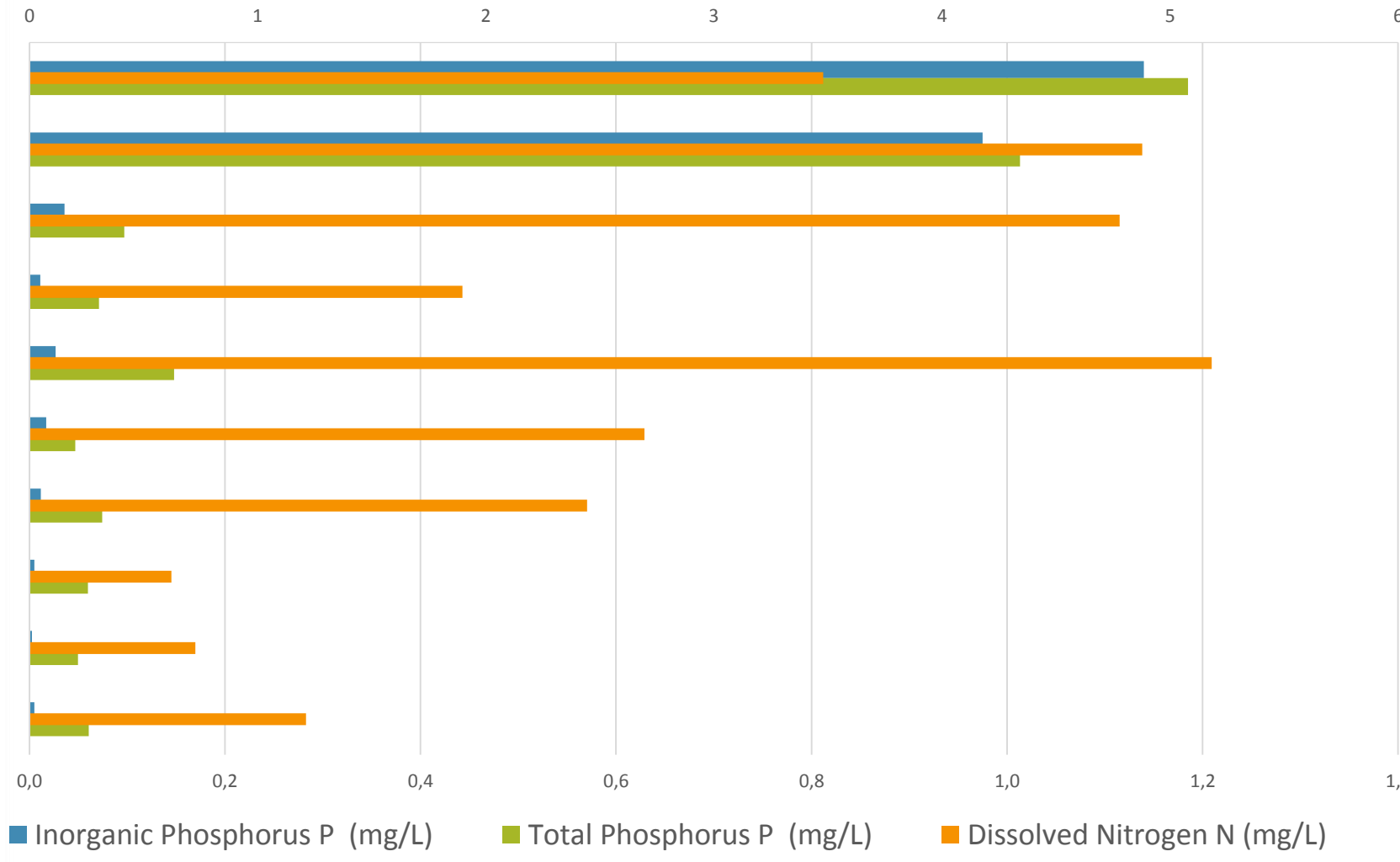


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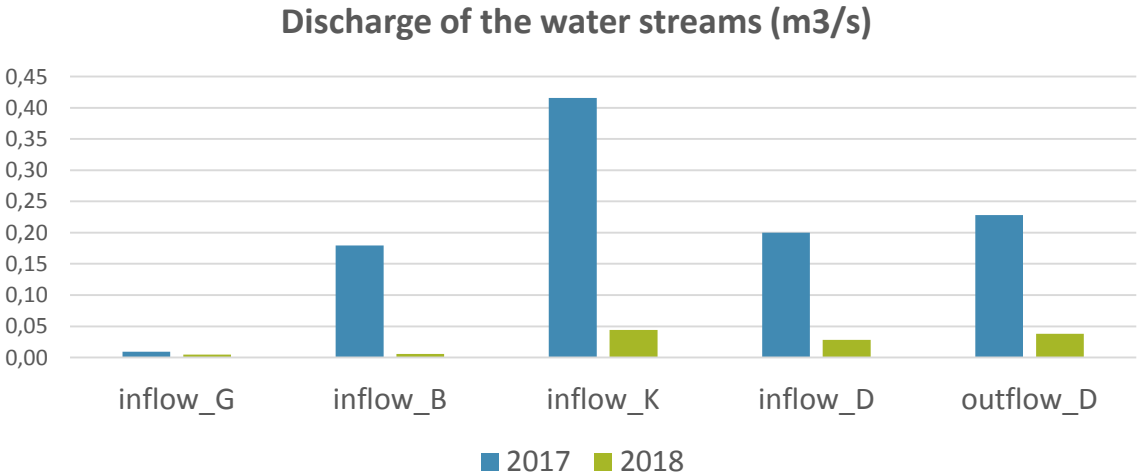
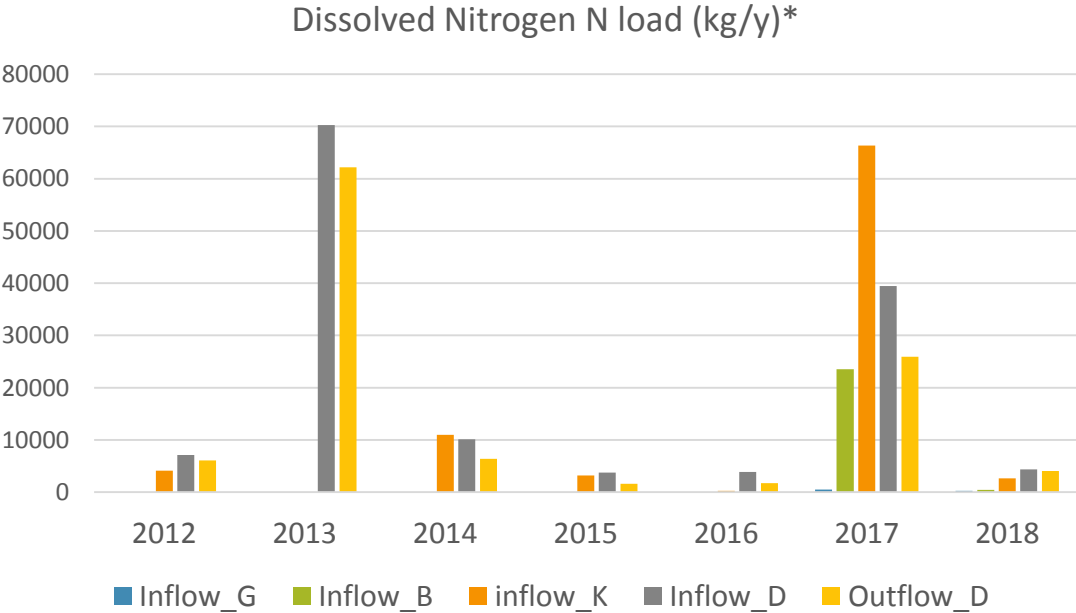
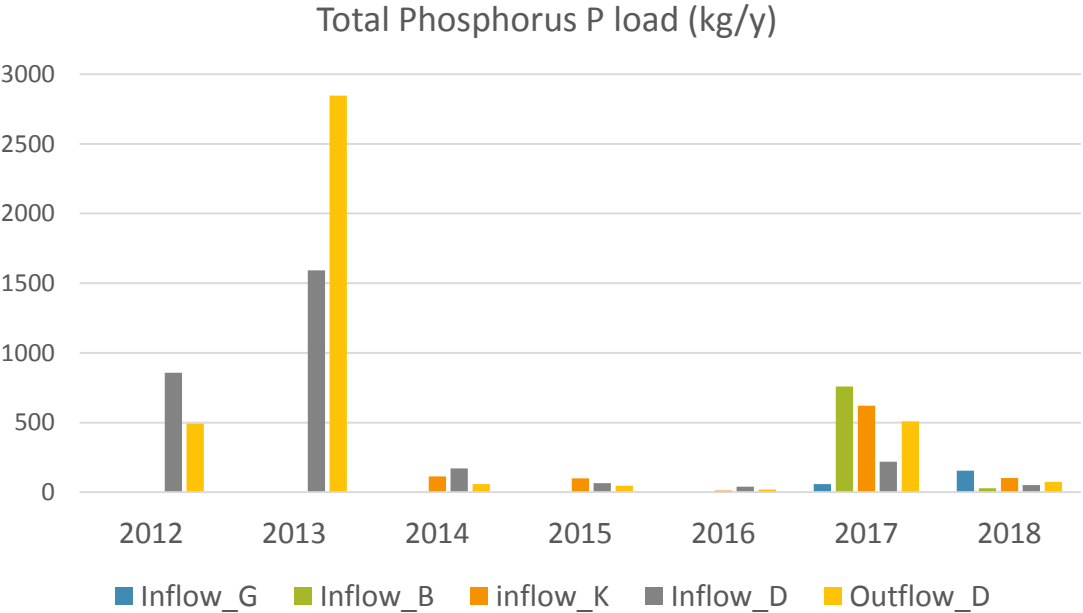
Distribution of nutrient concentration of the lake system



Distribution of nutrients down the stream



Nutrient load trend 2012-2018

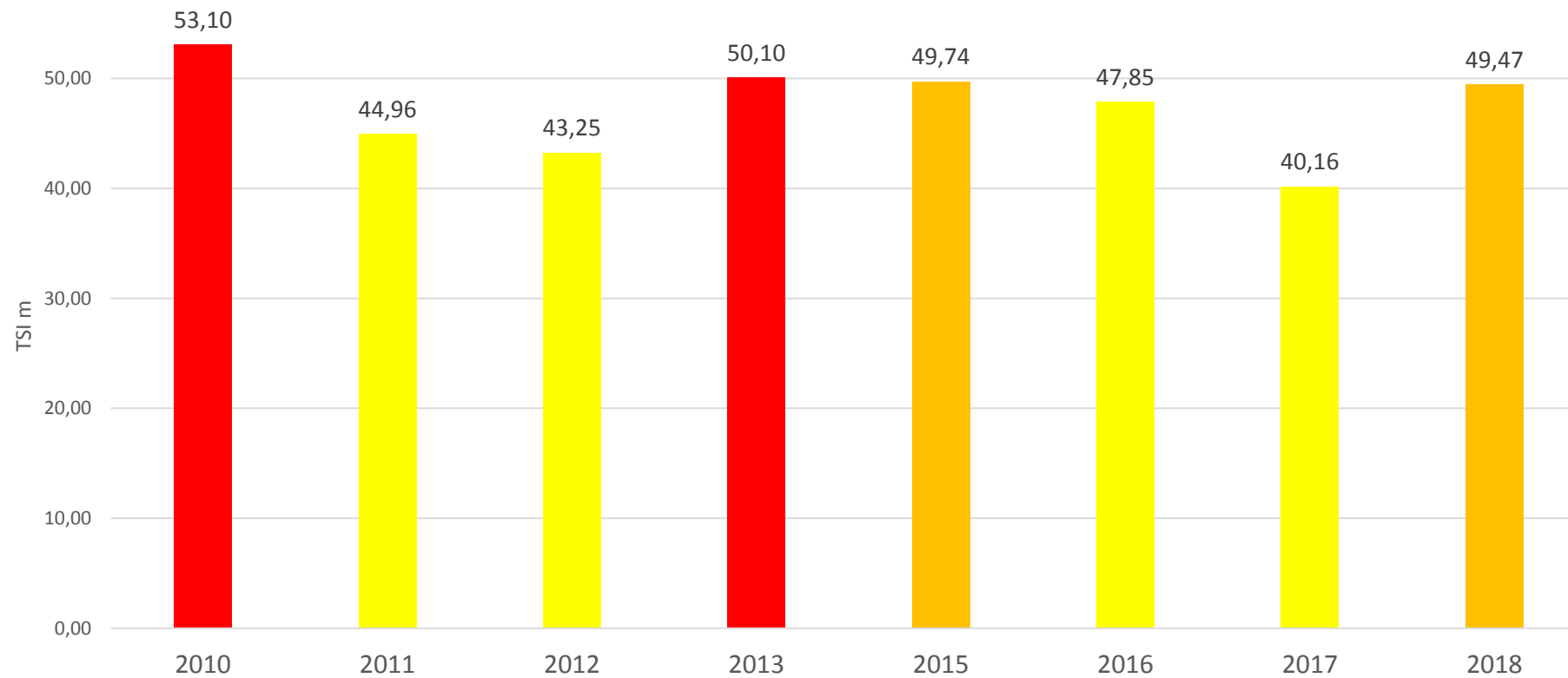


* Dissolved Nitrogen = NO3-N + NH4-N + NO2-N

Trophic State Index trend

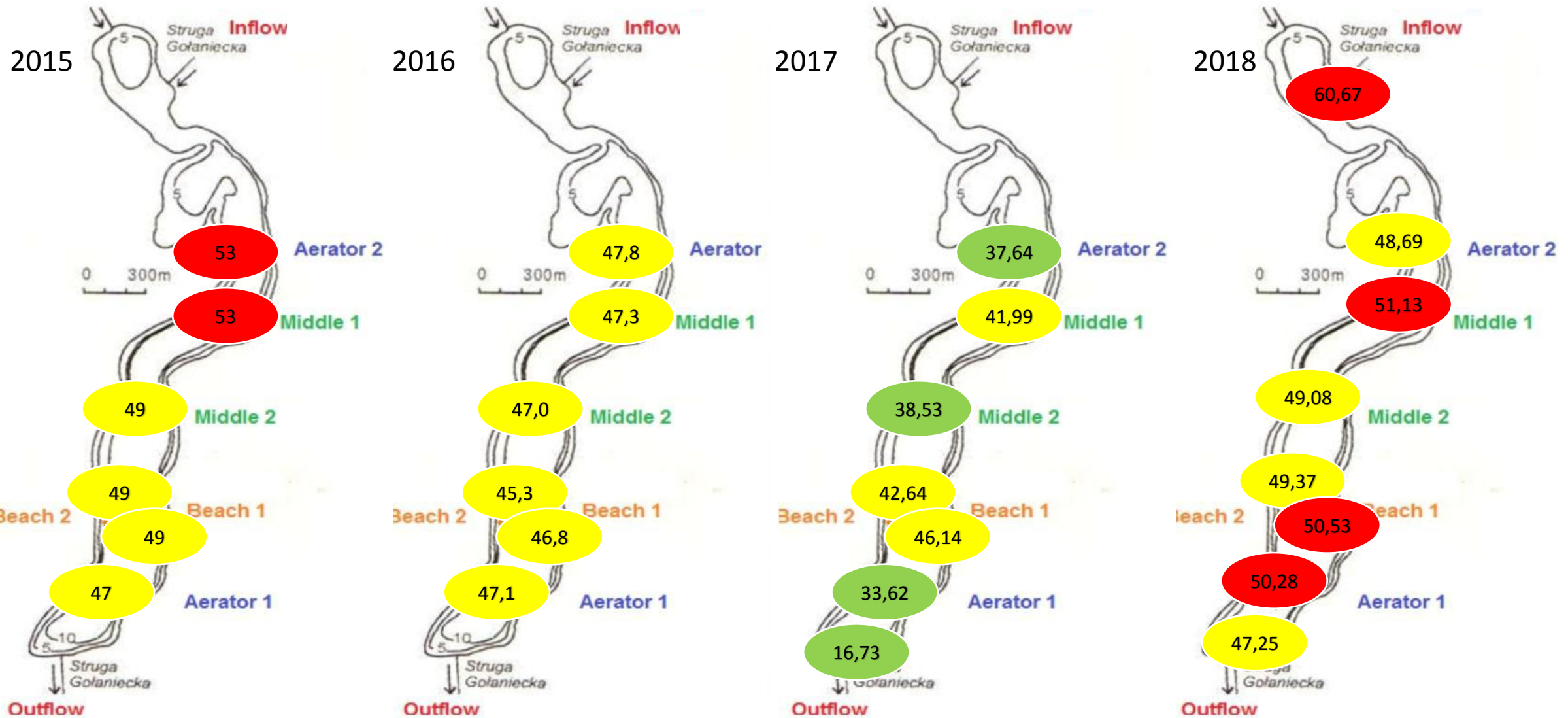
TSI _m	Trophic Class
< 30 - 40	Oligotrophic
40 - 50	Mesotrophic
50 - 70	Eutrophic

Trophic State Index of the Durowskie lake from 2010 till 2018



Trophic State Index trend

TSI _m	Trophic Class
< 30 - 40	Oligotrophic
40 - 50	Mesotrophic
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Recommendations

Recommendations for lake Durowskie:

- Fortification of the slopes with special materials or by increasing the vegetation projective surface for erosion prevention
- Supervision of the households at the lake shores to control the sewage and the recreational activity
- Limit the usage of high-speed water transportation

Recommendation for the lakes:

- Ecological restoration of the lake Zamkowe: either extract the contaminated sediments or conserve them at the bottom and prevent the further dissolution
- Forbid the implication of the project of the raising water level of Laskowieckie
- Control the factories and households and strictly follow all the law prescriptions. For instant, to keep the construction of hazardous buildings close to the water
- Improvement of the purification quality of the residues of the production
- Creation and nourishing the connections of local authorities in order to solve the ecological issue of the lake Durowskie and the whole catchment area

- Education for environmental protection

Conclusion

- The degradation of the current ecological state of the lake Durowskie from TSI_{lm} **40** in **2017** to TSI_{lm} **49** in **2018**
- Ecological state of Durowskie lake is **mesotrophic**, close to **eutrophic**
- The inflow and issues of the lakes above the stream have the most vital impact on the water quality of the lake
- Due to high variability and strong dependence of water quality on weather conditions and other variables the obtained results could represent only the short-term ecological state. Therefore, the more frequent observations are required to assess the results of lake restoration.

Thank you for your
attention!

Questions?