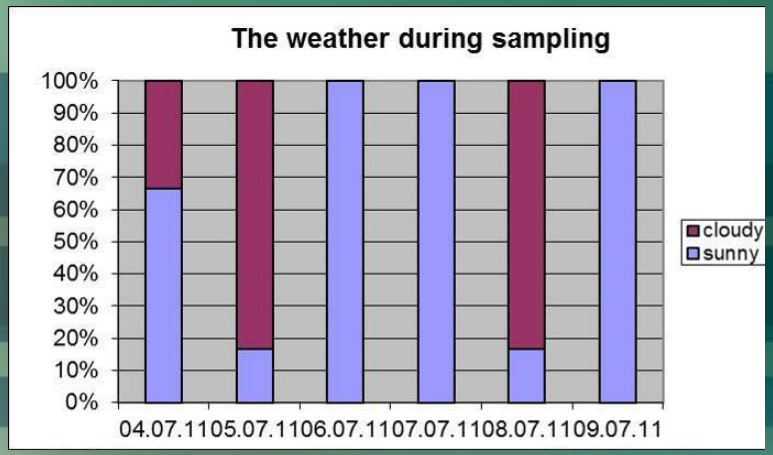
Physicochemical indicators

of water in Durowskie Lake

Purpose of research

- To figure out, what is current situation in the lake
- To compare results of our research with former monitoring results and therefore to find out tendency in development of Durowskie Lake
- To find out, what to do in order to improve water quality

Area of research and sampling sites



Sampling & measuring

Measured indicators

- Chlorophyll „a” concentration
- Oxygen concentration
- Water saturation with oxygen
- Conductivity
- Temperature
- pH
- Total Dissolved Solids (TDS)

Measuring methods

- All indicators, apart of chlorophyll „a” concentration, were measured on field, using multiparameter water quality sonde.

(the one on picture differs a bit from the device we had)

Sampling water for measuring chlorophyll „a”

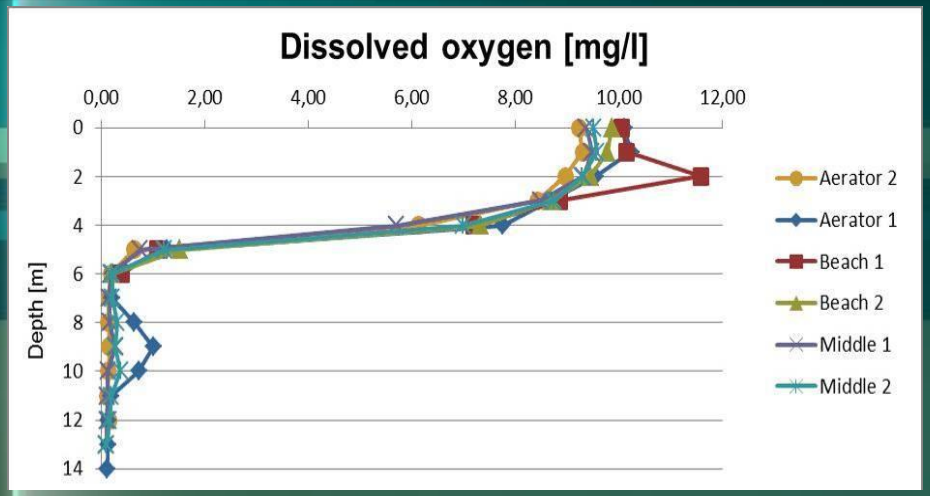
- Samples of water were taken into bottles and filtrated.
- Filters were stored in the fridge and then, transported to laboratory in Poznań.

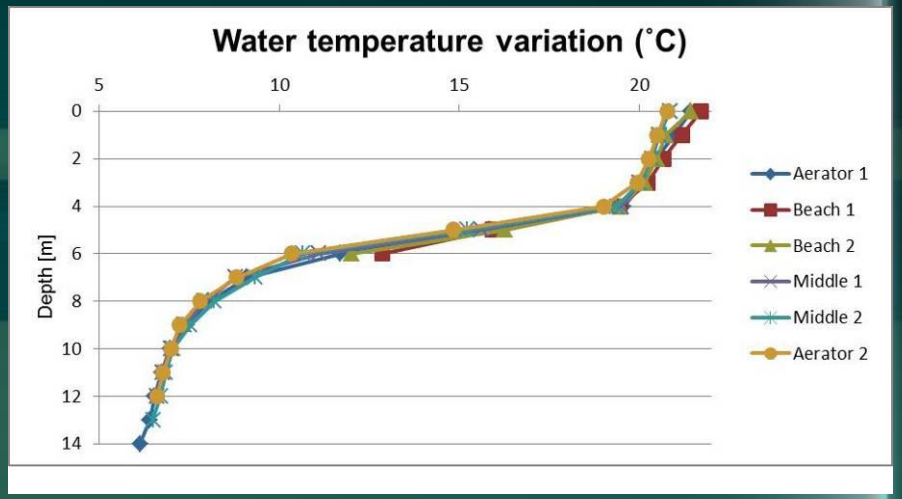
Picture: device used for filtrating water samples

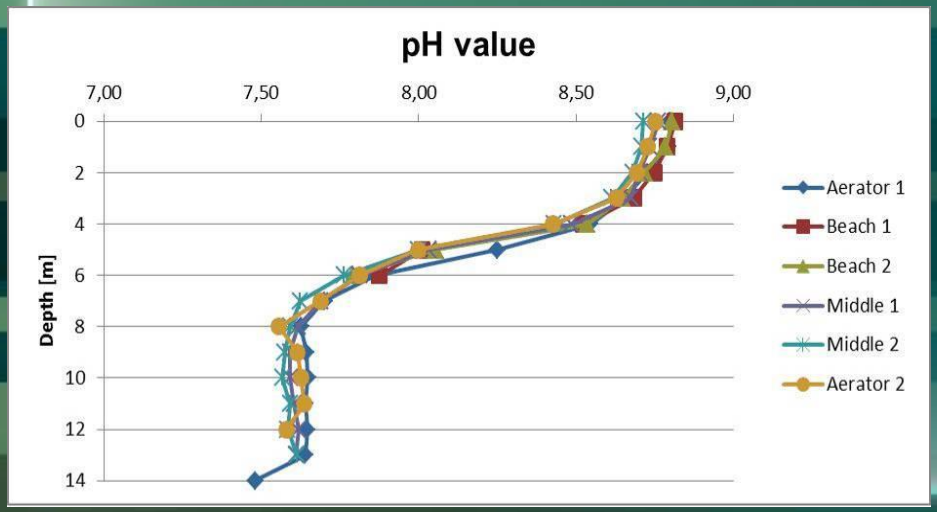
Laboratory work for measuring chlorophyll „a” concentration

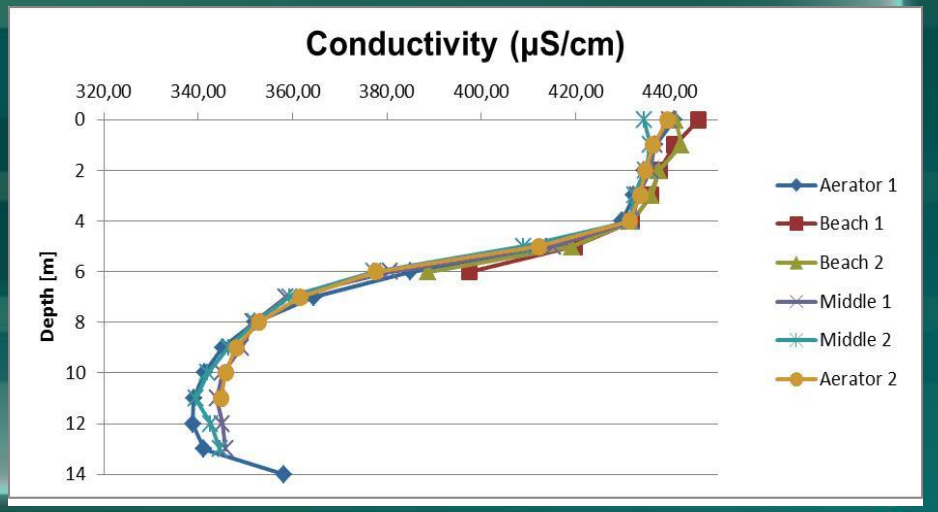
- Pounding filters with acetone
- Extracting in 24 hours
- Spectrophotometric measuring of chlorophyll „a” concentration

Results of research









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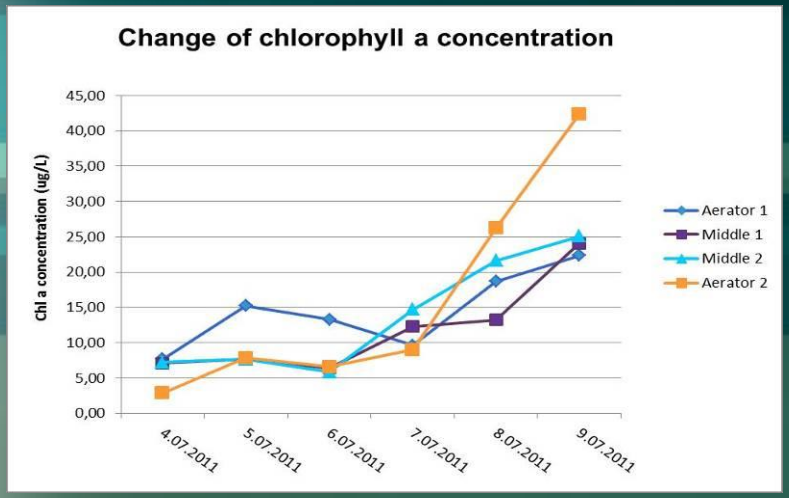
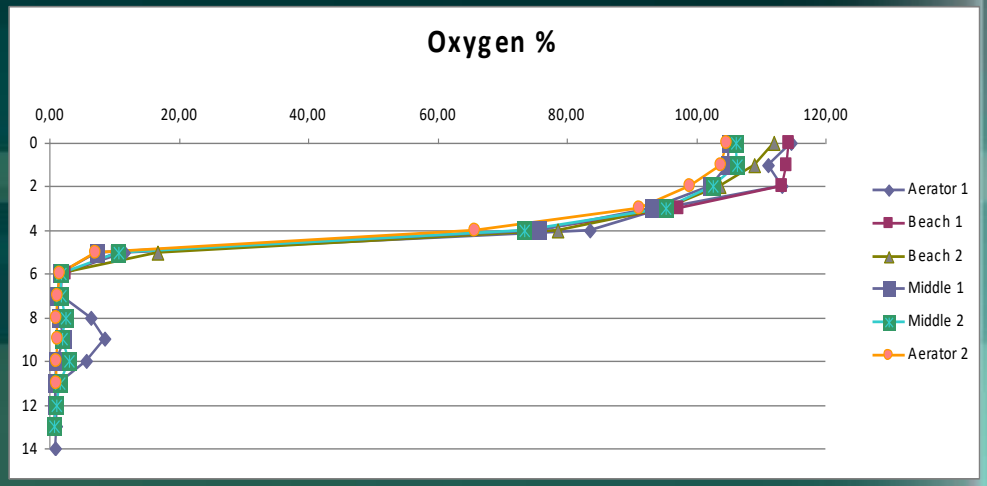
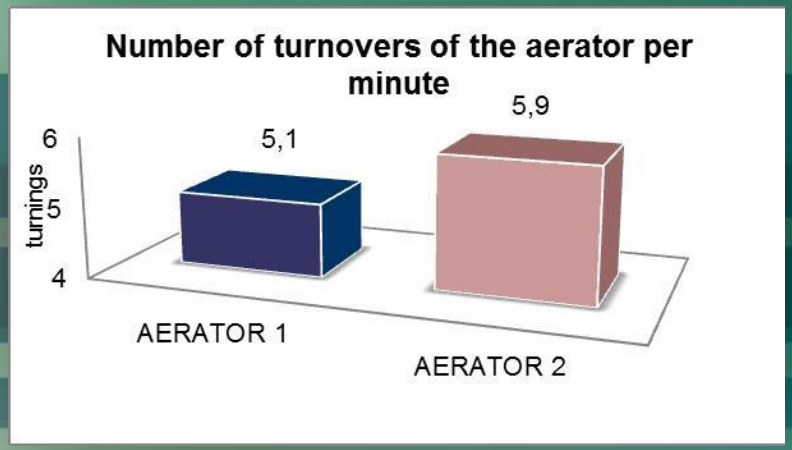
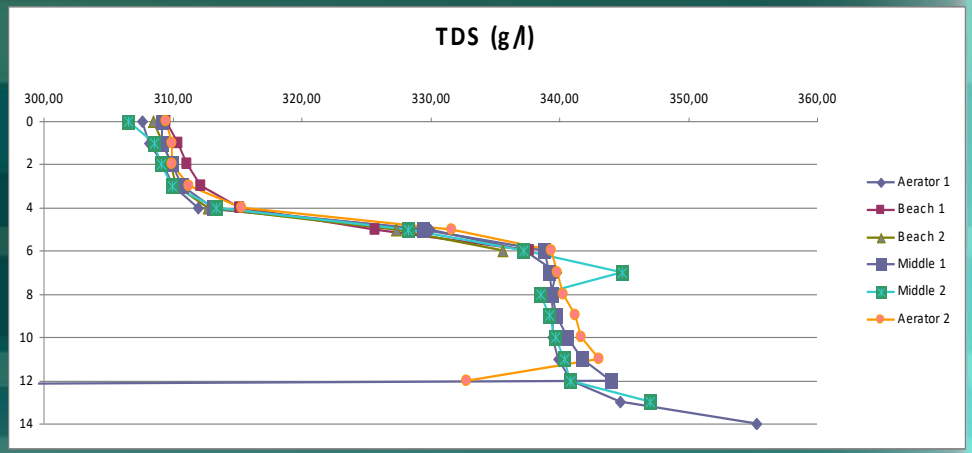








Classification of lake based on our measurments

- We compared our results with the newest law for classification of waters.
- This Ordinance of Enviromental Ministery (2008) is compatible with the Water Framework Directive.

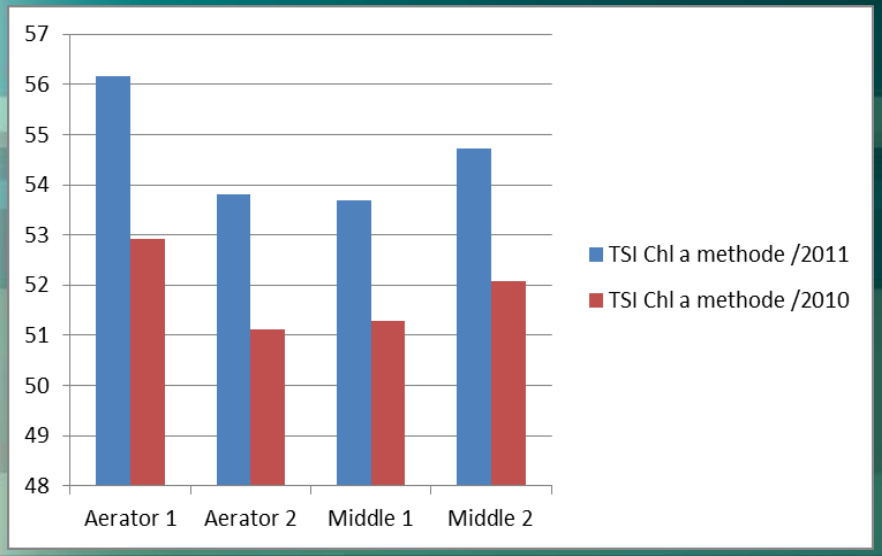
Parameter	Value	Classification
Chlorophyll „a”	13,7 µg/L	III class, but almost II class
Oxygen concentration (hypolimnion)	0,23 mg/L	Bad *(but still over 0 level)*
Secchi Disc	2,02 m	Good
Conductivity	395 µS/cm	Good

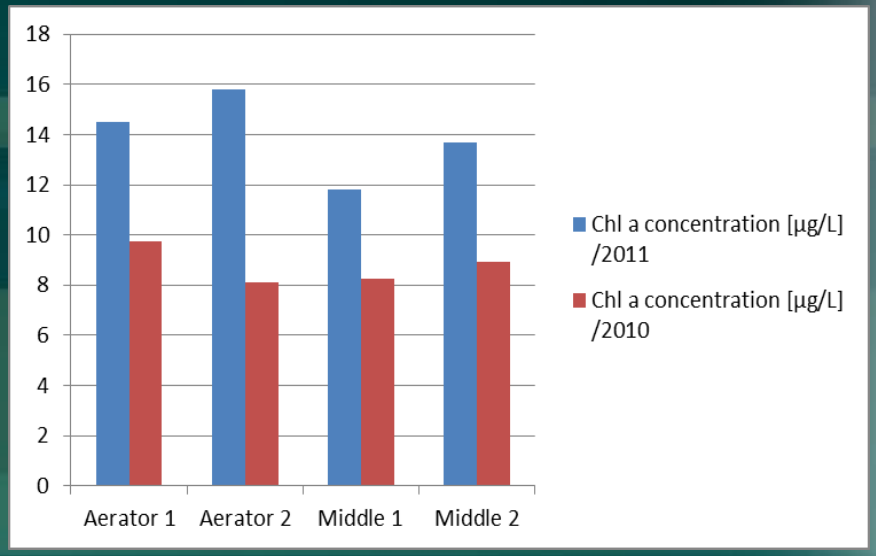
Trophic State Index (TSI)

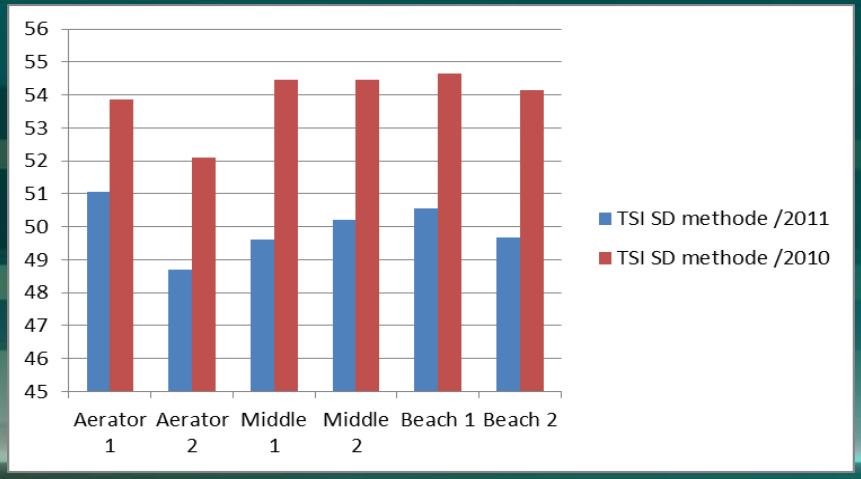
- We calculated TSI basing on 2 methods: Secchi Disc visibility method and Chlorophyll a method
- Our calculations indicated, that the water quality is in lower range for eutrophic state (almost border with mesotrophic).

Trophic state	oligotrophic	mesotrophic	eutrophic	Hypertrophic	Durowskie lake
TSI value	<40	40-50	50-70	>70	SD: 50 Chl a: 55

Comparing with last year

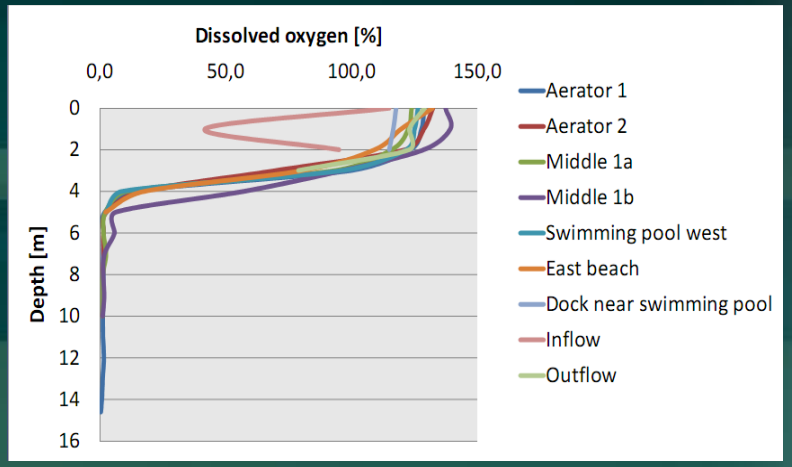


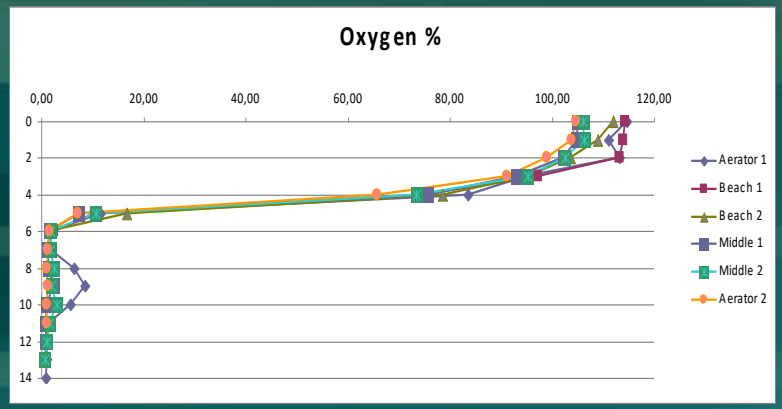




Improve in oxygen conditions

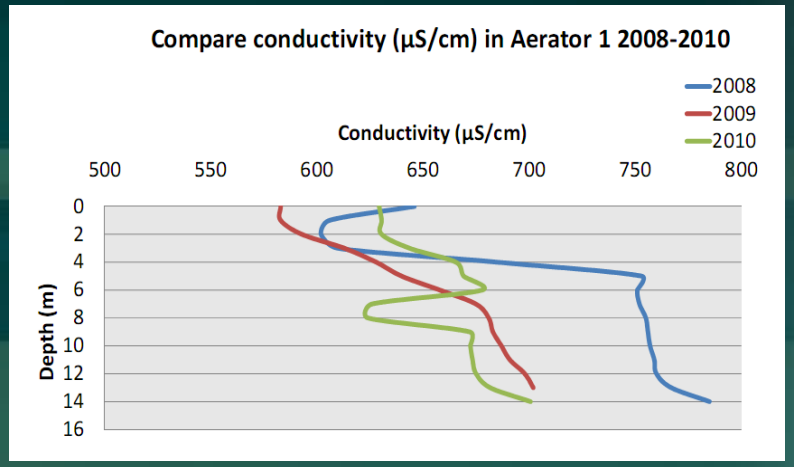
- Until last year oxygen conditions in upper hypolimnion improved a lot in Aerator I sampling state.

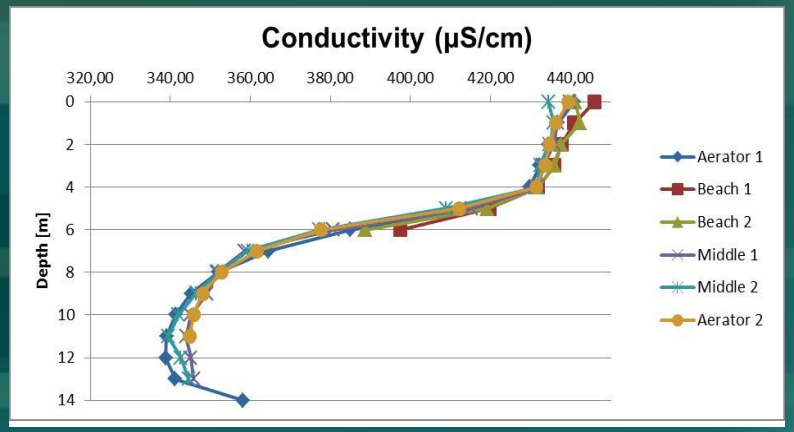




Conductivity improvement

- Conductivity value decreased a lot from last year
- Also, the gradient of conductivity in water profile is reversed: it proves, that resuspention of nutrients from sediments has been stopped.





What are the changes?

Year	2010	2011
Chlorophyll „a”	≈ 9 µg/L	≈ 14 µg/L
Conductivity	≈ 650 µS/cm	≈ 400 µS/cm
pH on surface	≈ 8	≈ 8,7
Transparency	≈ 1,5 m	≈ 2 m
TDS (surface)	0,41 g/L	0,31 g/L
Diss. oxygen	10 mg/L (surface)	10 mg/L (surface)

Conclusion

- The ecological state of water is improving, especially oxygen concentration and conductivity.
- Now, the most important thing is to reduce loads of nutrients incoming from catchment area, and keep recultivation activities on proper level.
- The lake is on a good way to satisfy the Water Framework Directive

Thank You!