SUMMER SCHOOL

Ecological state of Durowskie Lake during restoration measures:

Physico-Chemical properties of the water

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Outline

- Purposes
- Field area
- Measured parameters
- Methods
- Results
  - Current situation
  - Comparison
- Conclusions
- Recommendations

Purposes of research:

1. Investigate the current physico-chemical condition of lake
2. Show trends in water quality over time
3. Ascertain nutrients load coming in and out of lake

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Area of sampling

Measured Parameters

- Chlorophyll *a*
- Conductivity
- Temperature
- pH
- Dissolved oxygen
- Total Dissolved Solids (TDS)
- SD (transparency)
- Flow Velocity
- Nutrients

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Methods

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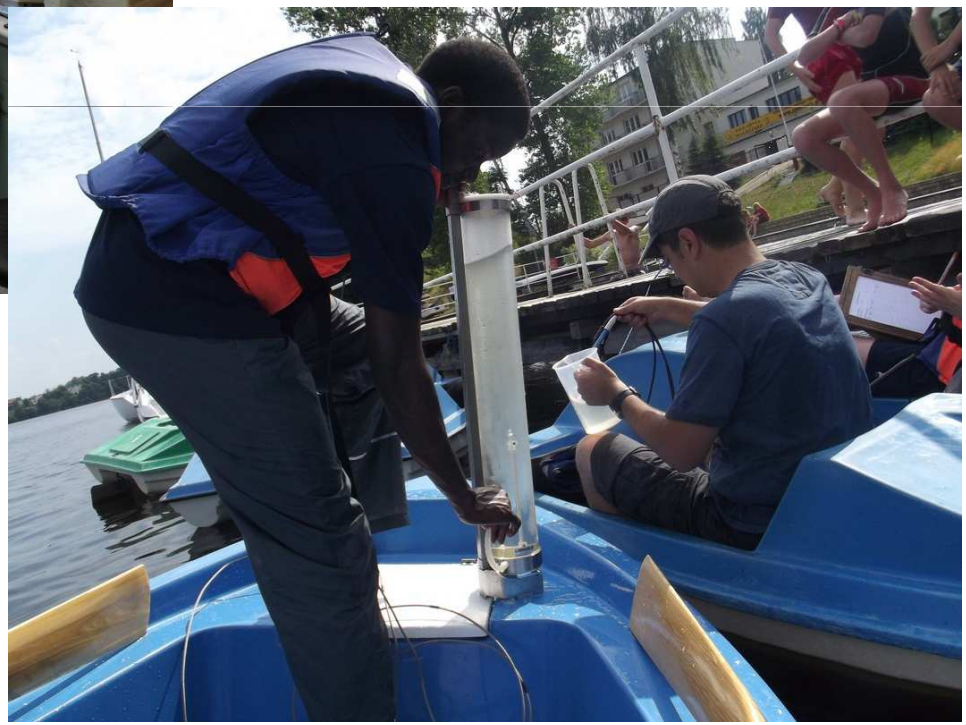
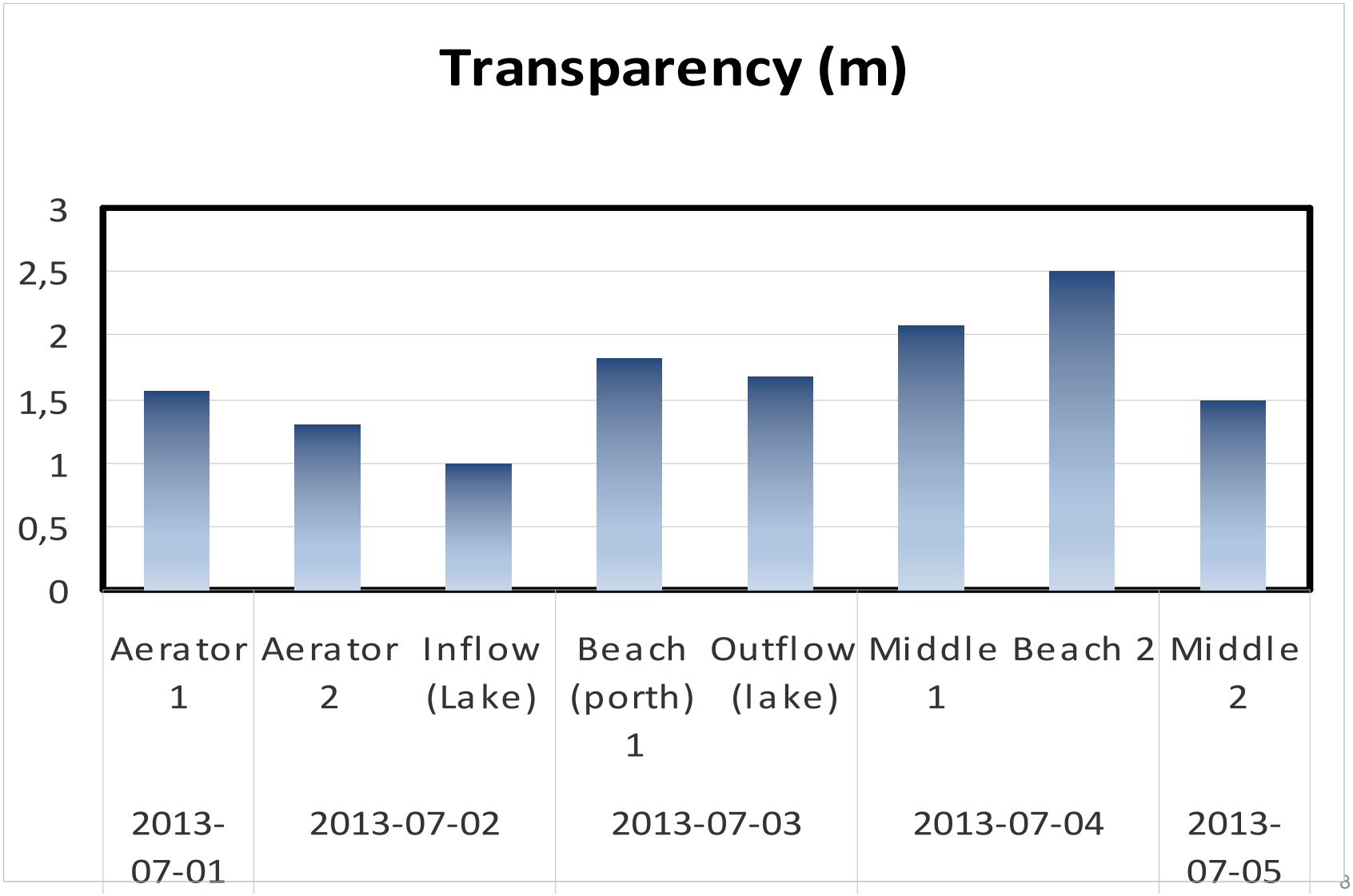
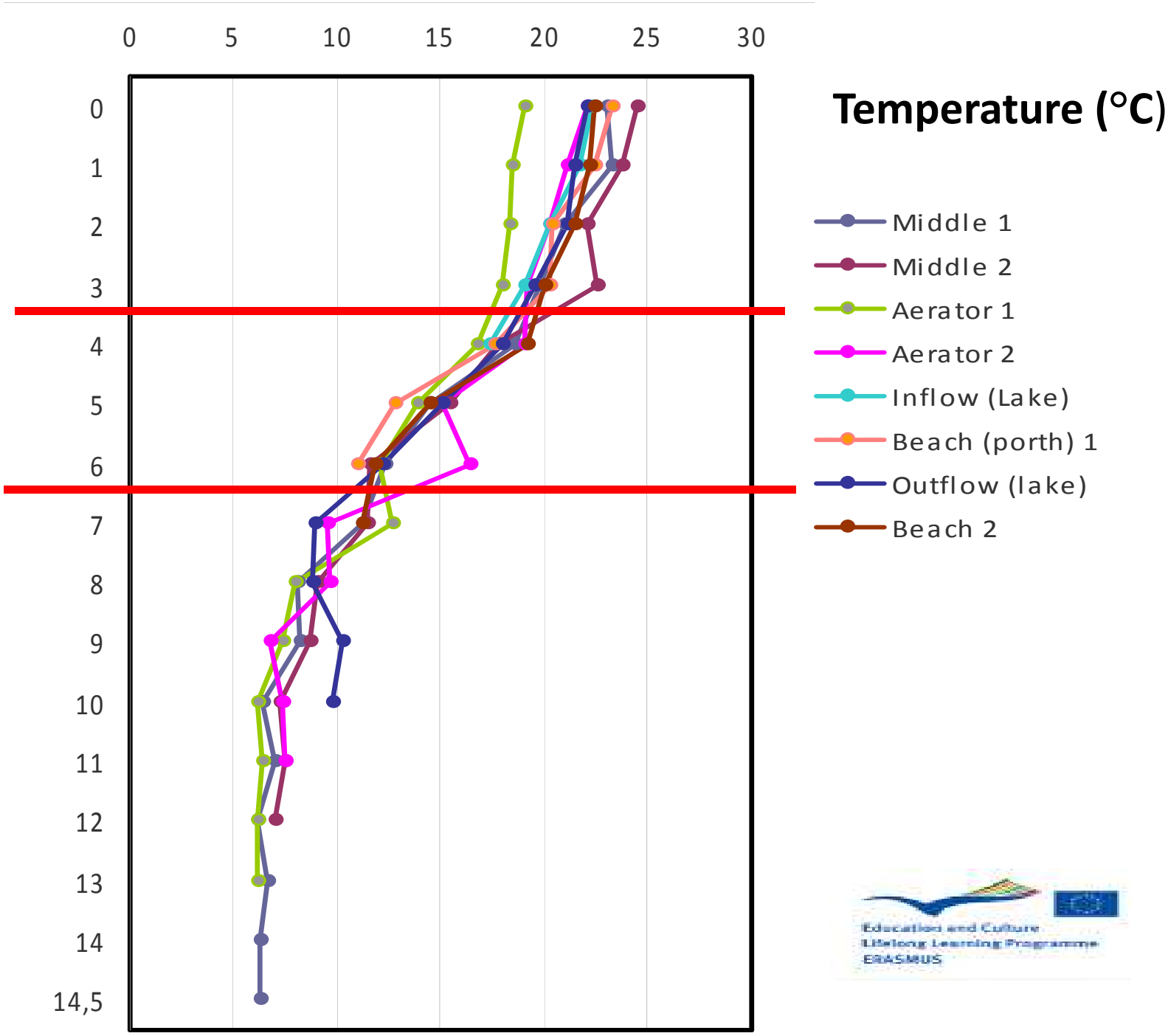


Results

Current situation





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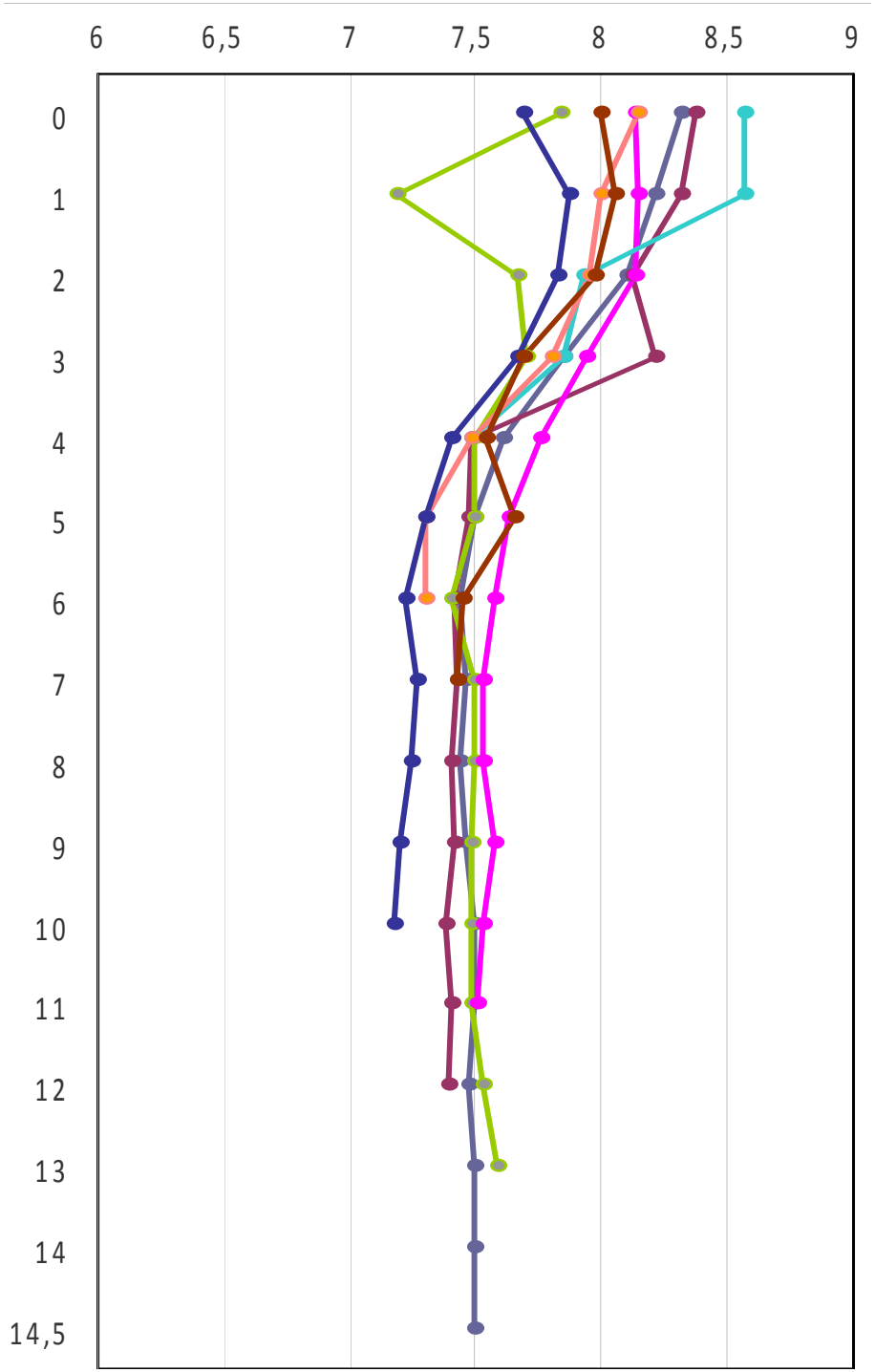

pH

- Middle 1
- Middle 2
- Aerator 1
- Aerator 2
- Inflow (Lake)
- Beach (porth) 1
- Outflow (lake)
- Beach 2

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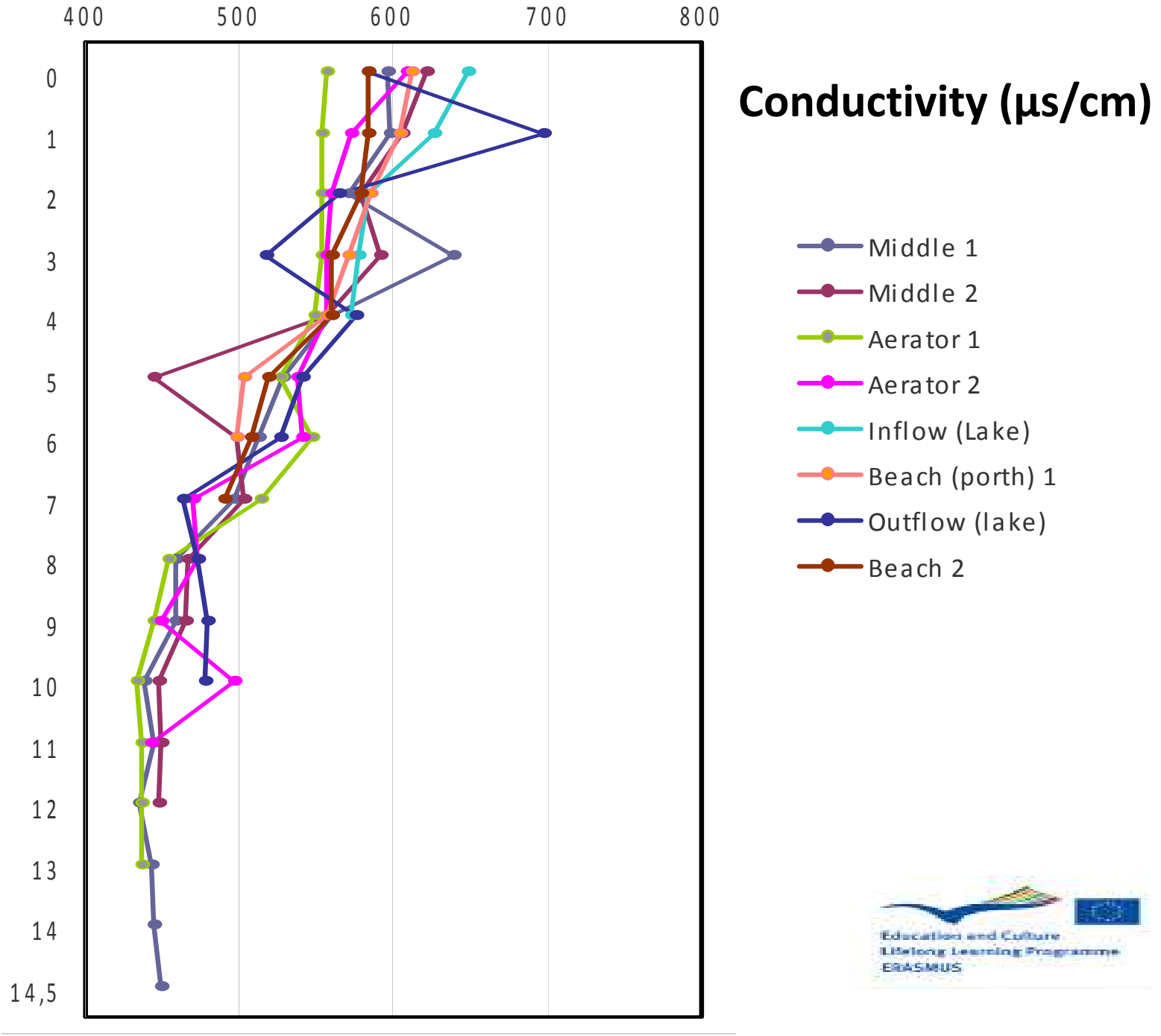

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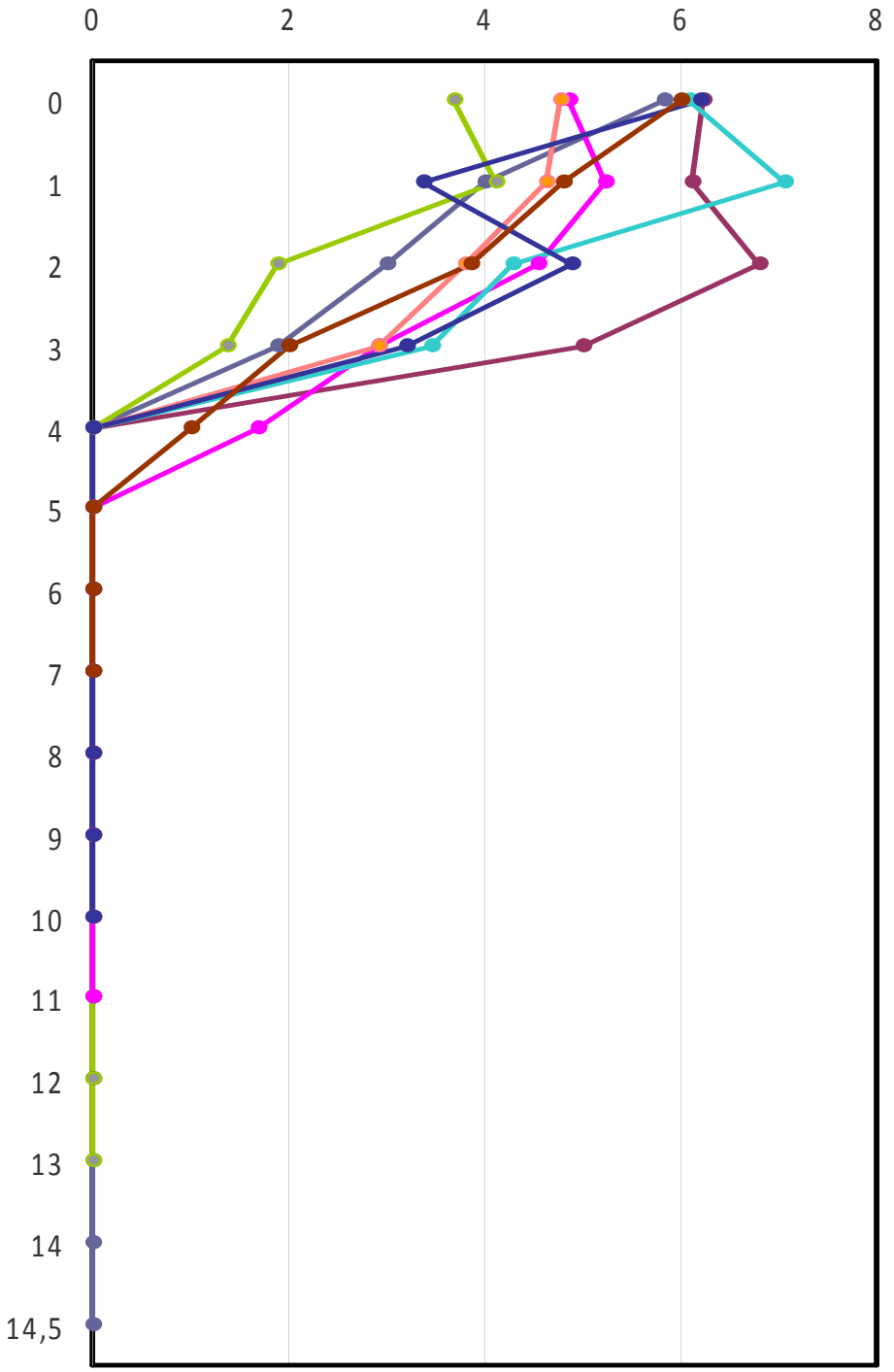

Dissolved oxygen (mg/l)

- Middle 1
- Middle 2
- Aerator 1
- Aerator 2
- Inflow (Lake)
- Beach (porth) 1
- Outflow (lake)
- Beach 2

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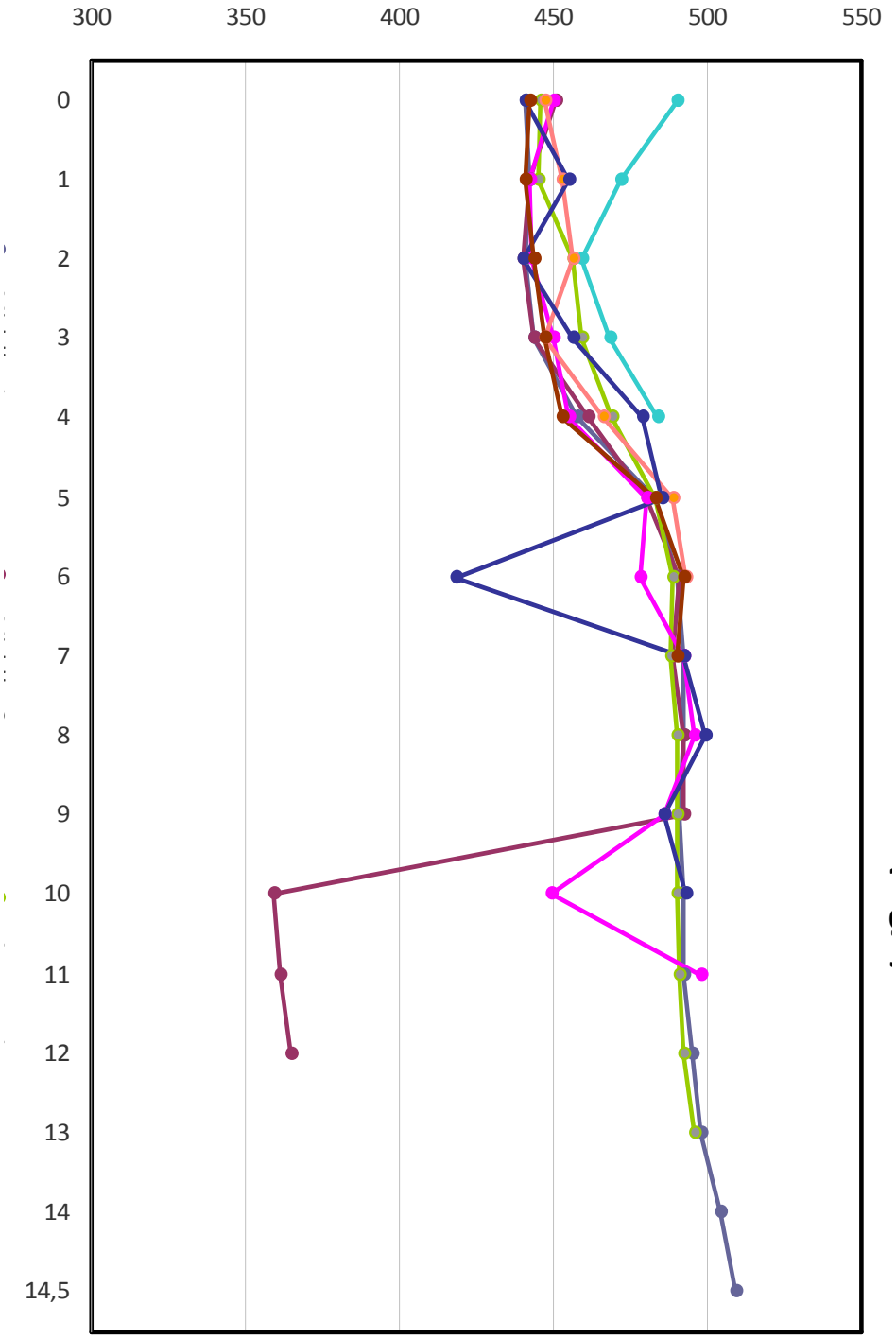

TDS (mg/l)

- Middle 1
- Middle 2
- Aerator 1
- Aerator 2
- Inflow (Lake)
- Beach (porth) 1
- Outflow (lake)
- Beach 2

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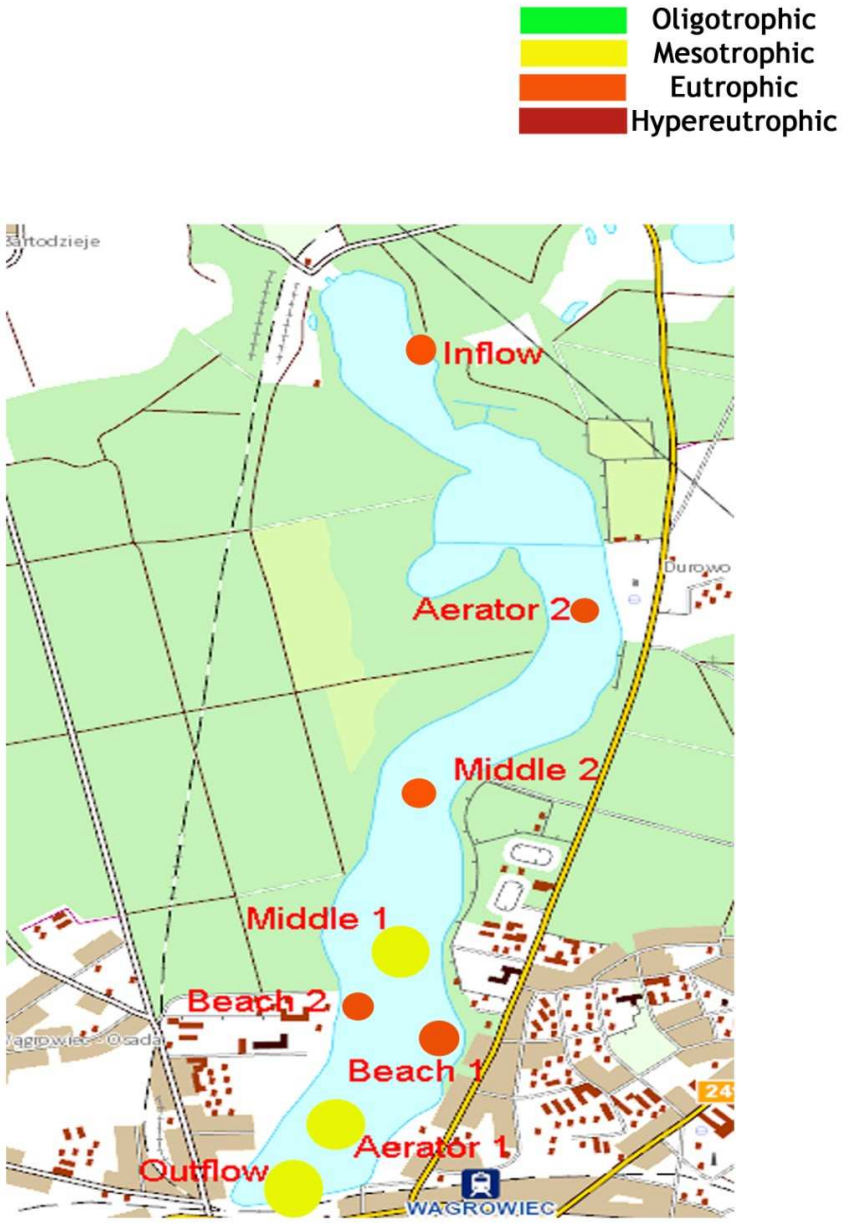
TSI of different points (chlorophyll *a*)



Lake classification

We compared our results with the newest law for classification of waters.

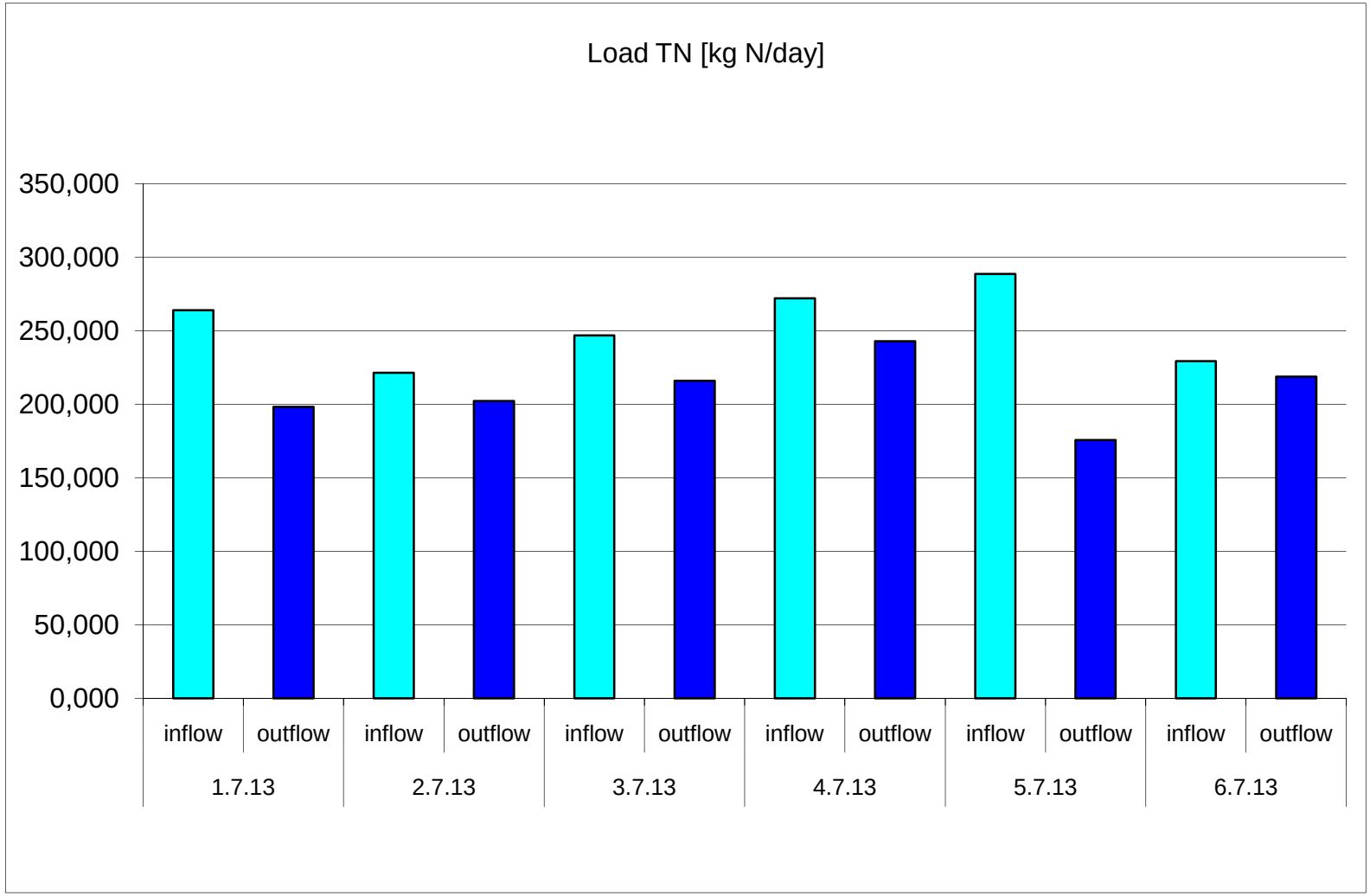
This Ordinance of Enviromental Ministery (2008) is compatible with the Water Framework Directive.

Parameter	Value	Classification
Chlorophyll *a*	≈ 8.45 µg/L	Good (II class)
Oxygen concentration	≈5.47 mg/L	Good
Conductivity	≈525.8 µS/cm	Good
Secchi disc	≈1.68 m	Bad

Trophic State Index (TSI)

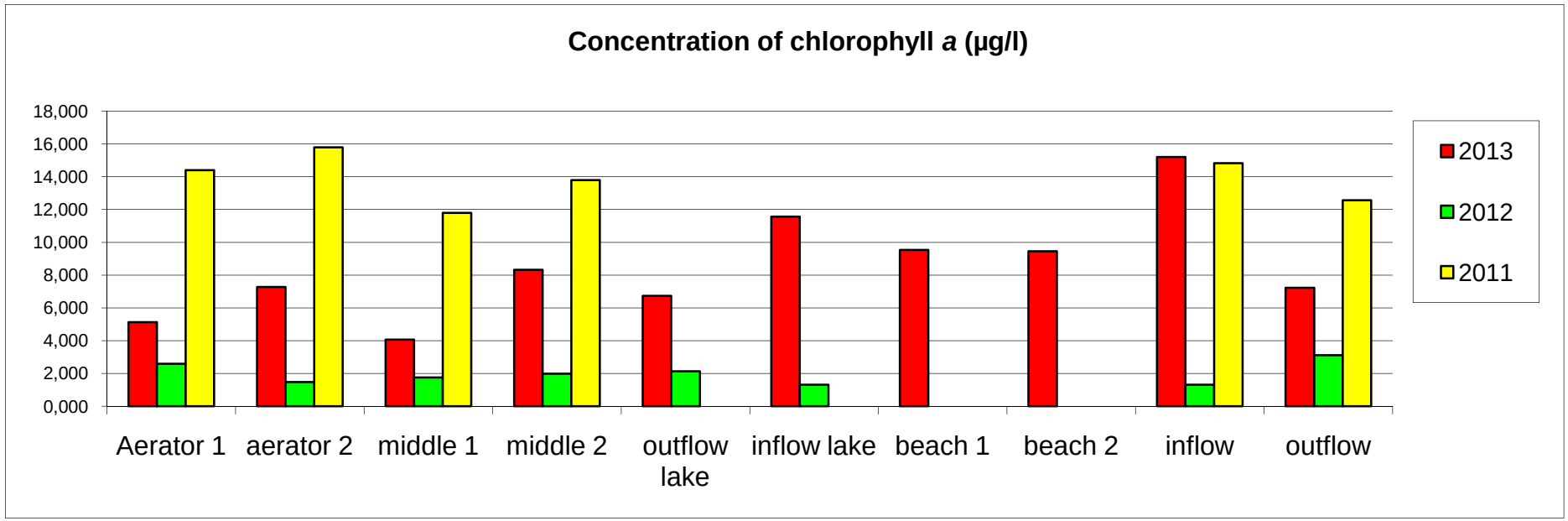
Trophic State Index was calculated based on chlorophyll *a* and Secci Disc.

Trophic state	Oligotrophic	Mesotrophic	Eutrophic	Hypertrophic	Durowskie Lake
TSI Value	**<40**	**40-50**	**50-70**	**>70**	**TSI SD= 53.06** **TSI Chl *a*=50.22**

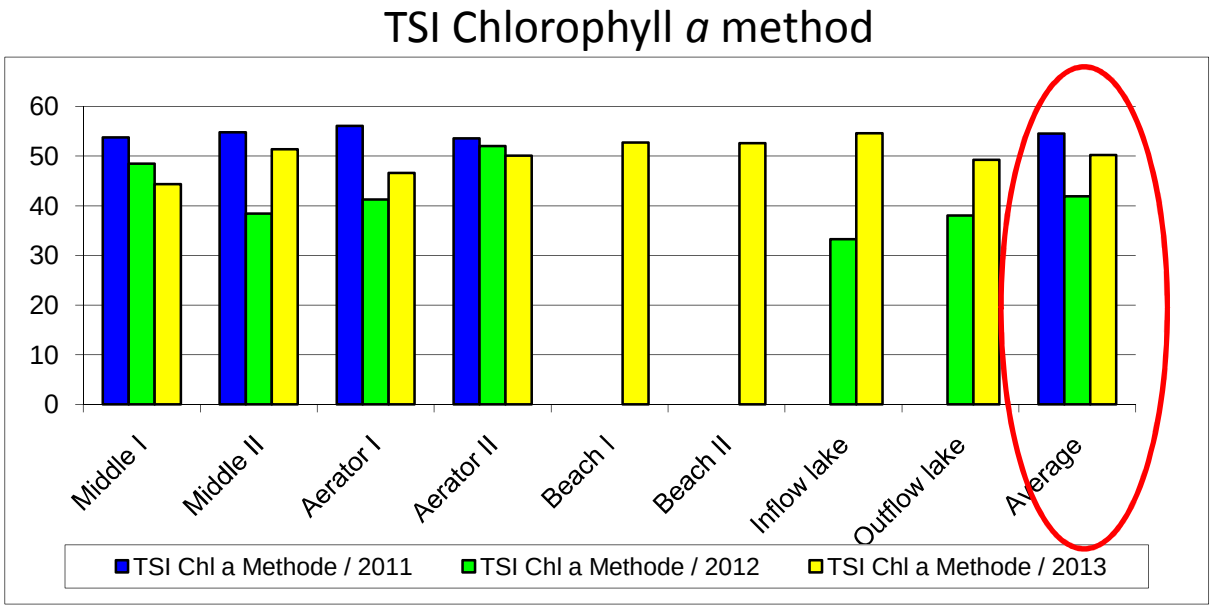


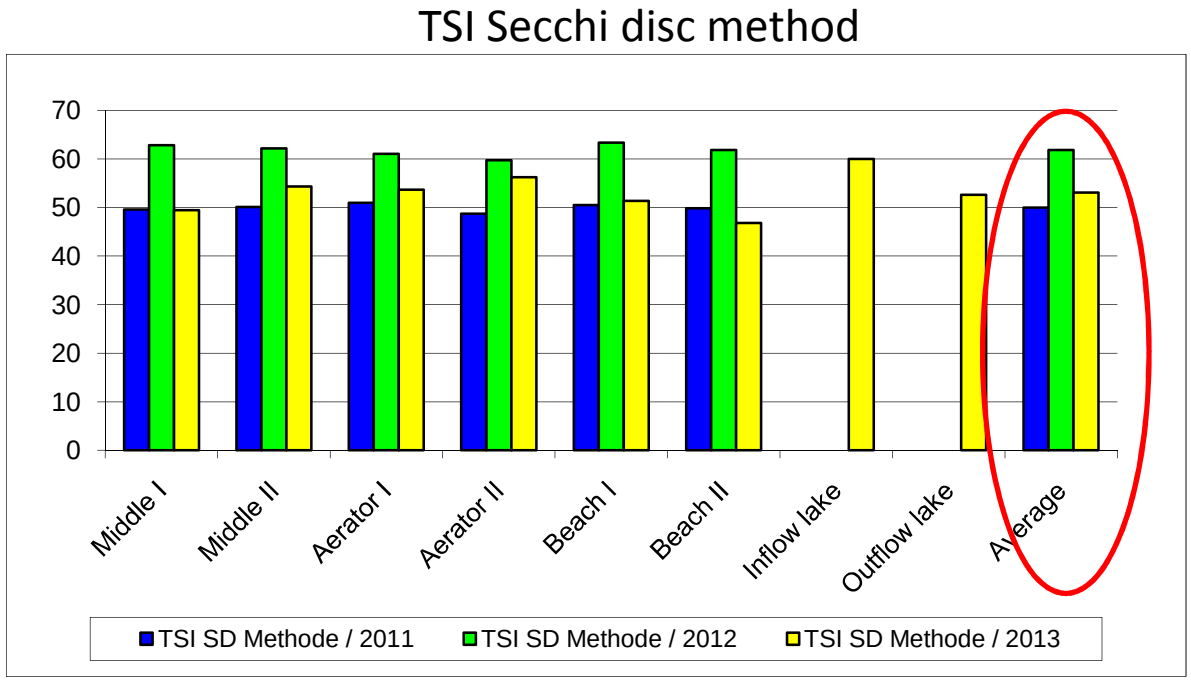
The total load of nitrogen inflow is greater than yield from Durowskie lake by Struga Golaniecka.

Comparison



- A significant increase in the level of chlorophyll *a*, indicating a higher primary production, a deterioration of the quality of the lake and return to the state from two years ago.
- For the river we can observe a similar situation, but only in the inflow the situation is even worse than two years ago.





TSI - Comparison

TSI counted from Chlorophyll *a* method shows that condition of lake is worse this year in comparison with 2012 but is better than 2011.

Changes

Parameter	2011	2012	2013
Chlorophyll *a*	≈ 14 µg/L	≈ 2.2 µg/L	≈ 8.45 µg/L
Electric conductivity	≈ 400 µS/cm	≈648.2 µS/cm	≈525.8 µS/cm
Surface pH	≈ 8.7	≈8.87	≈7.66
SD (Transparency)	≈ 2 m	≈ 0.88 m	≈1.68 m
TDS (surface)	≈ 0.31 g/L	≈ 0.605 g/L	≈0.467 g/L
Dissolved oxygen (surface)	≈ 10 mg/L	≈ 13.5 mg/L	≈5.47 mg/L

Conclusions

- Durowskie lake is still in eutrophic state.
- The north part of the lake is relatively in worse condition.
- The beaches in the southern part are worse than the center of the lake.
- The lake condition is generally similar to the last two years.
- There are more nutrients input than output.

Recommendations

- Measurements of the lakes above
- Reduce the anthropogenic pressure
- Minimize the nutrients input
- Manage the gaps created by the fishermen

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