

Freshwater ecosystems under  
natural conditions and  
anthropogenic impact – Lake  
Ladoga  
Course report 2010

# Course objectives:

- Differences between small and big lakes
- Study macrophytes, zoo- and phytoplankton species common to the region of Valaam
- Negative or positive correlations between basic limnological parameters
  - Temperature
  - CO<sub>2</sub> concentration
  - pH and conductivity
  - Nutrients
  - Colour of water
  - O<sub>2</sub> concentration

# Sampling stations

Monastery

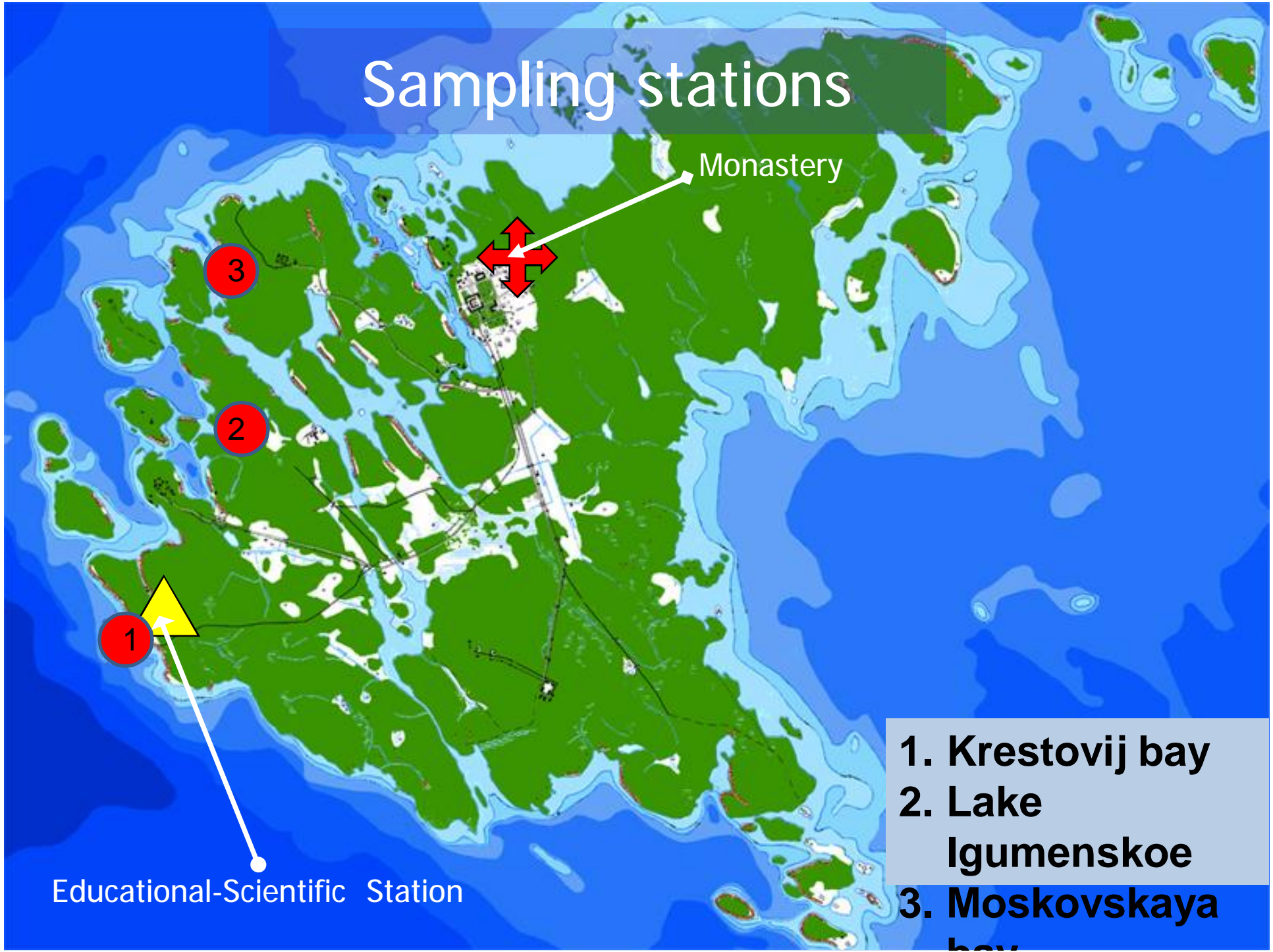
3

2

1

Educational-Scientific Station

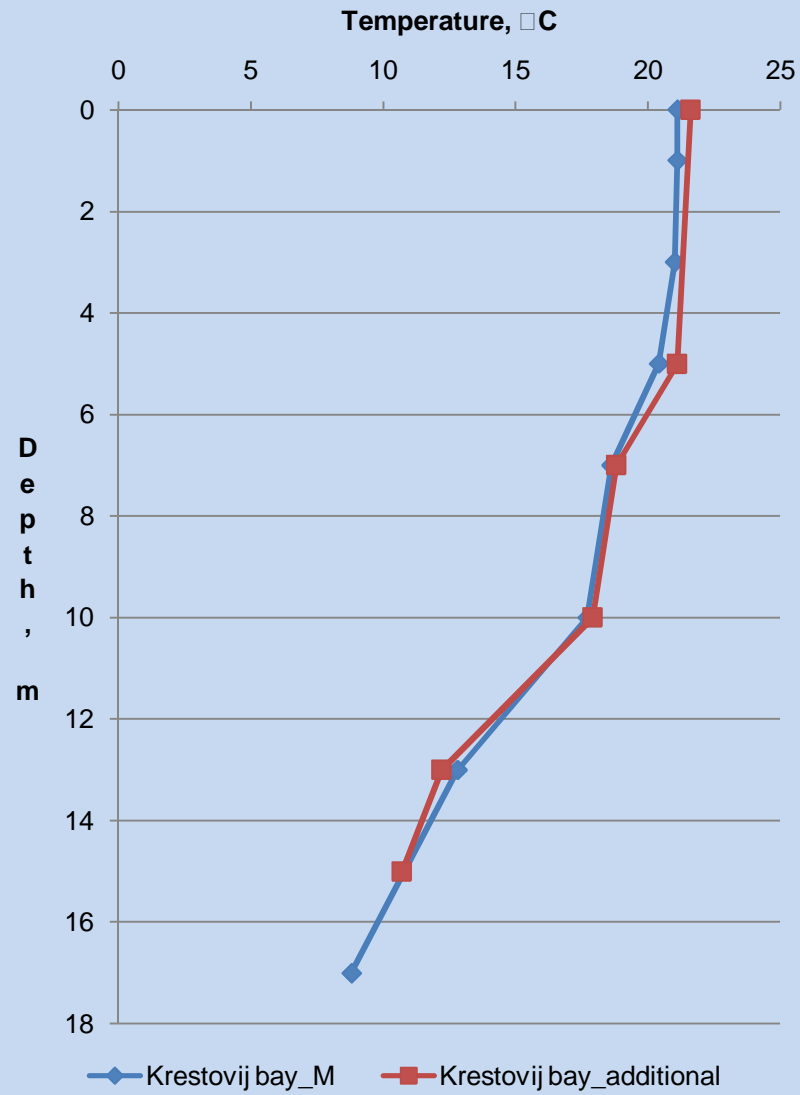
- 1. Krestovij bay
- 2. Lake Igumenskoe
- 3. Moskovskaya bay



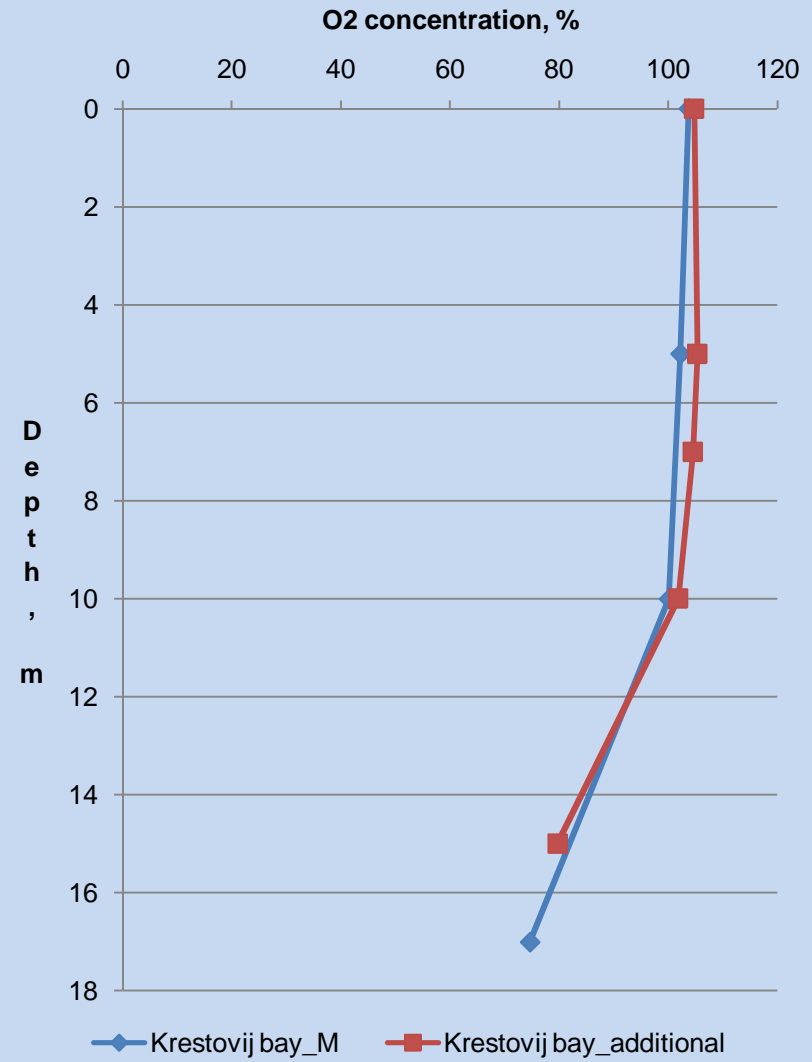
# Krestovij Bay



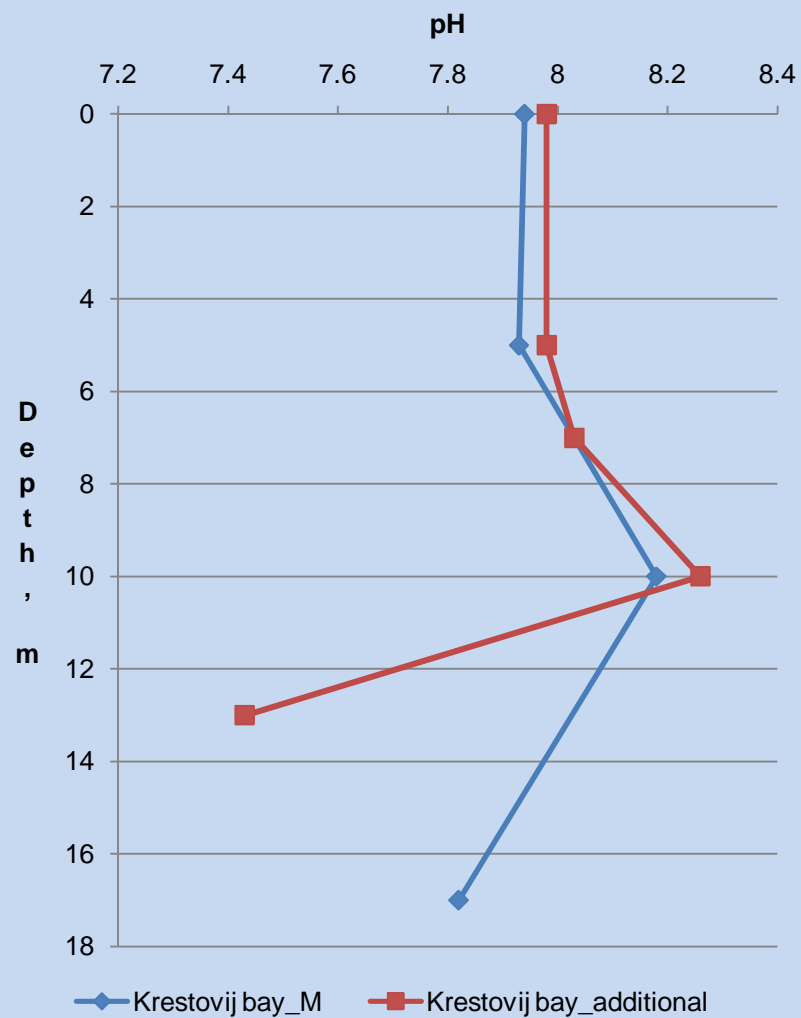
## Ladoga 3.8.10 Krestovij bay



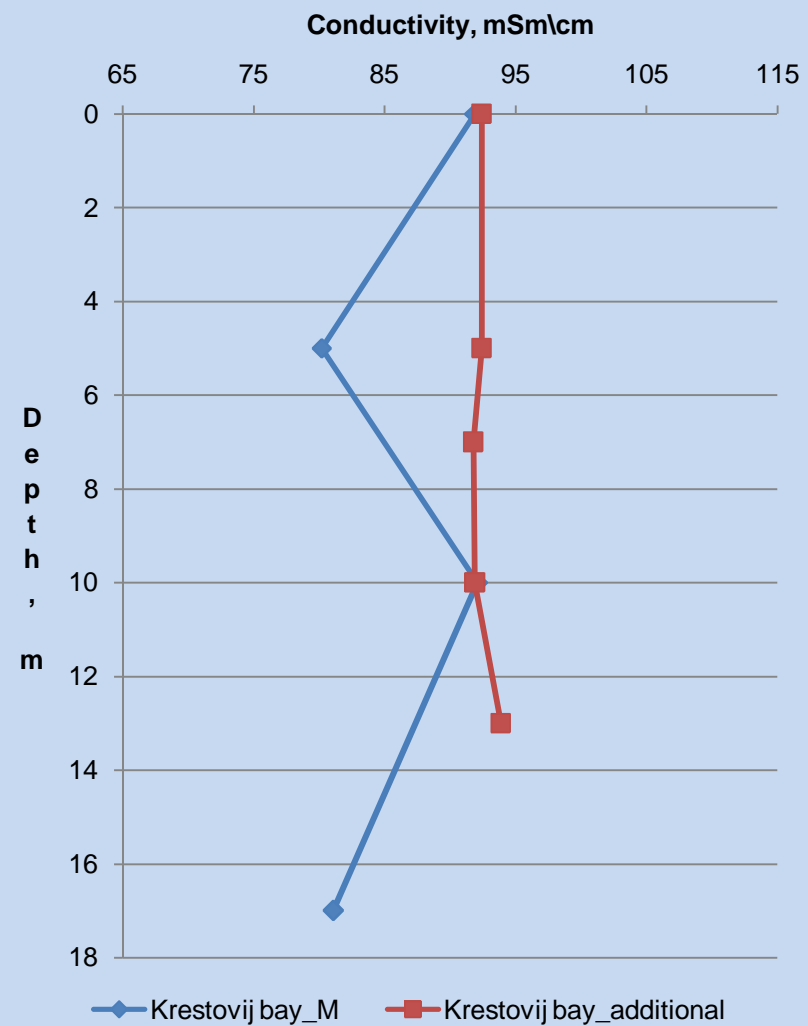
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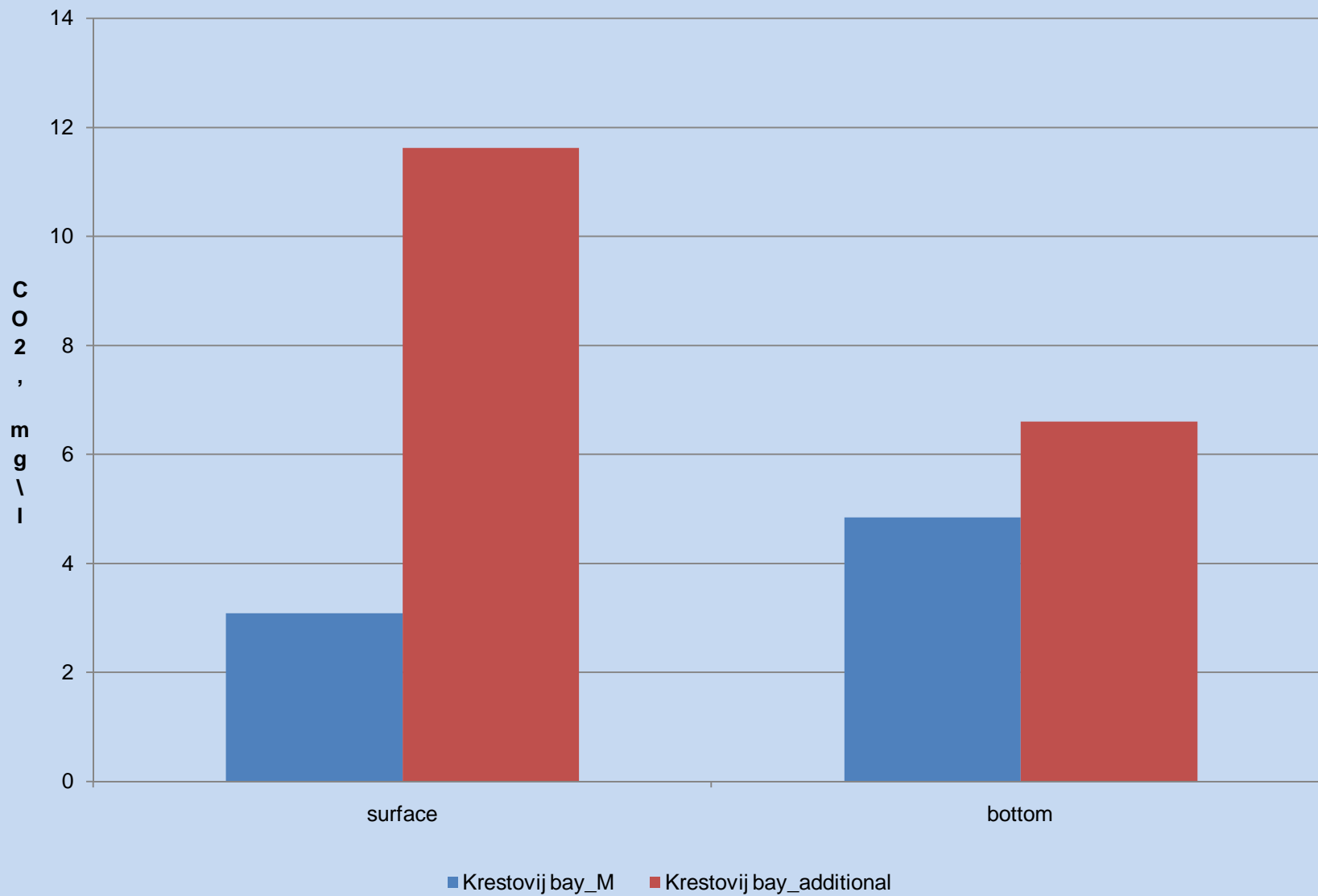
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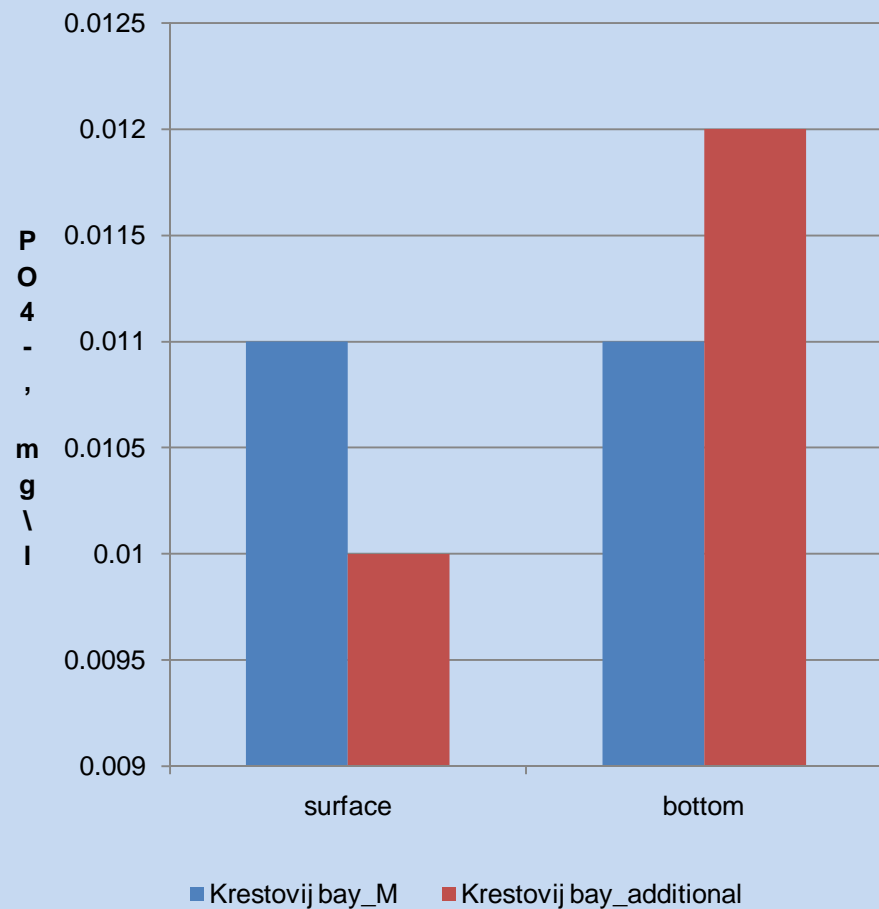
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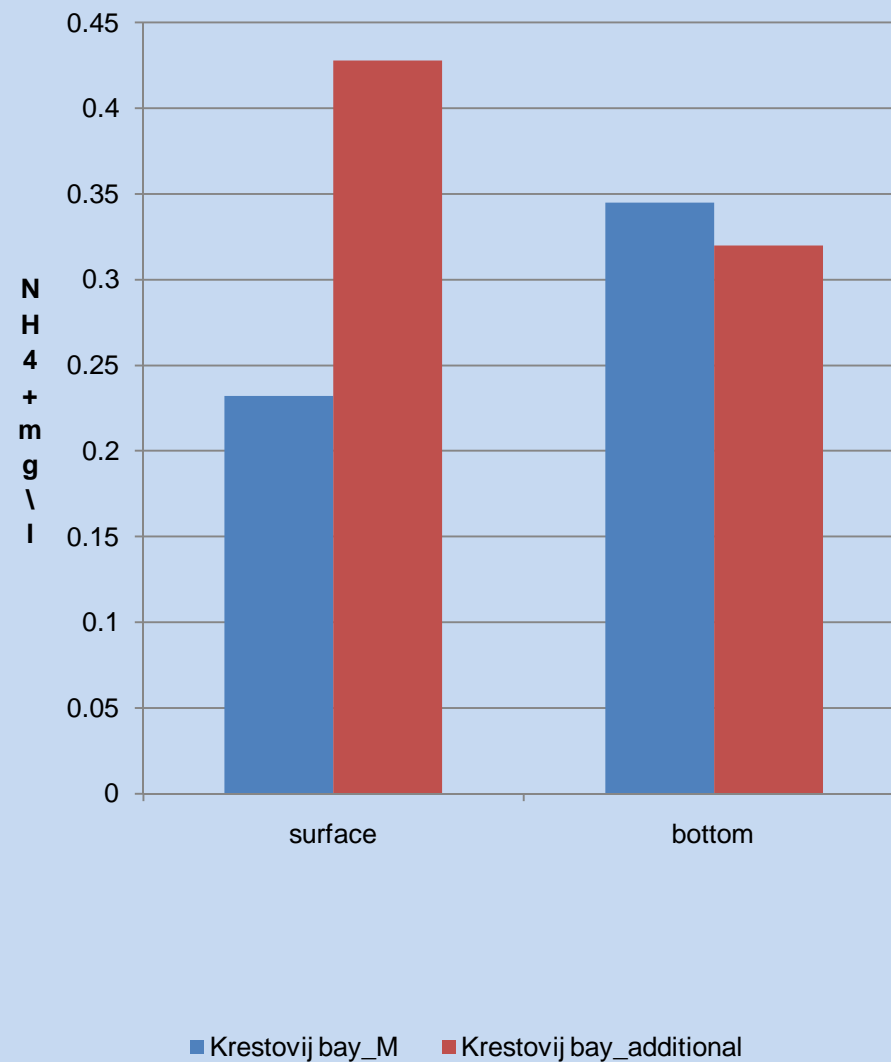
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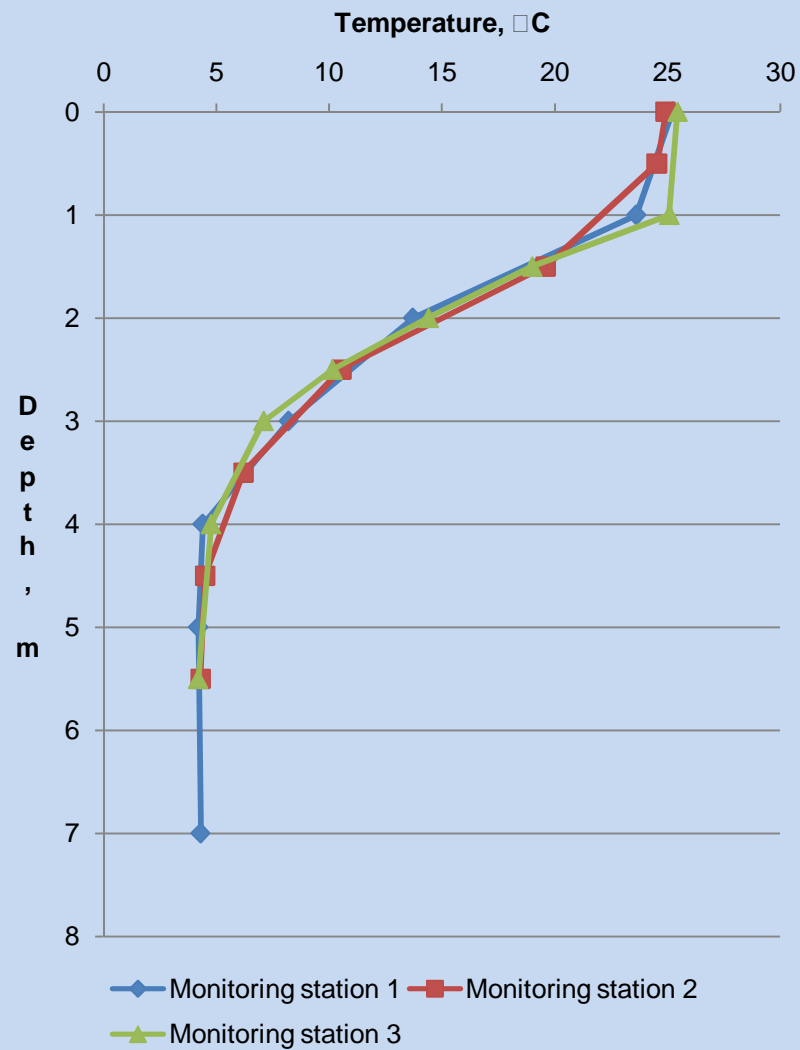




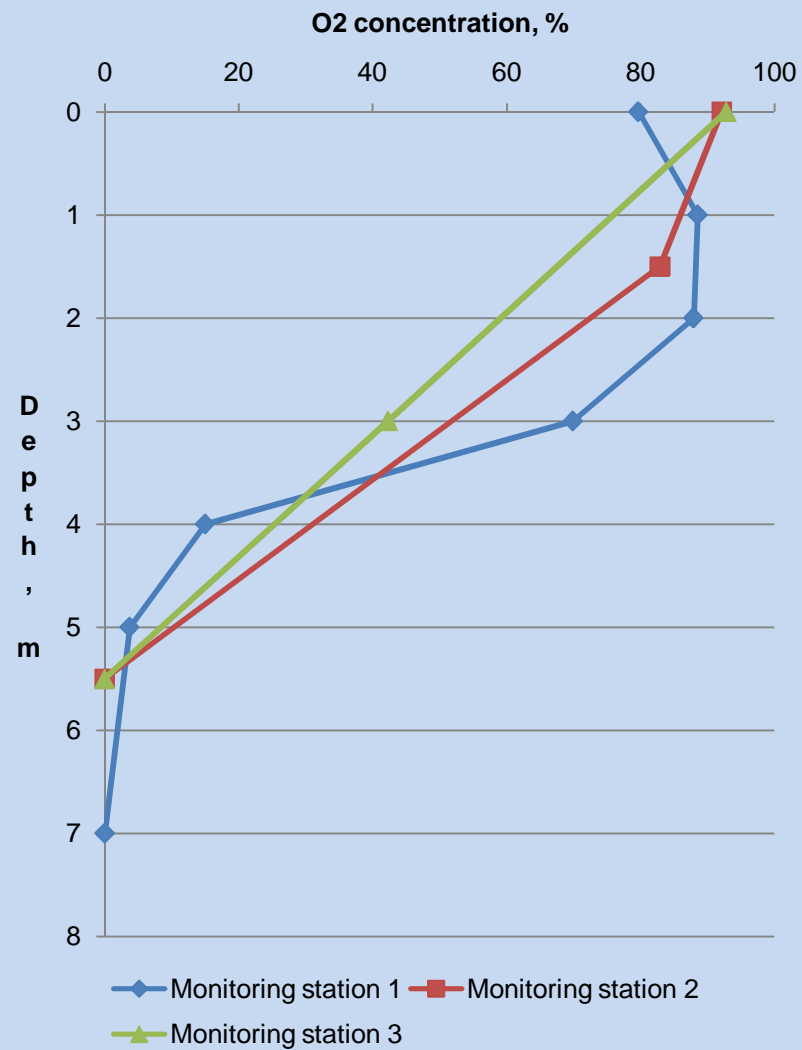
# Lake Igumenskoe



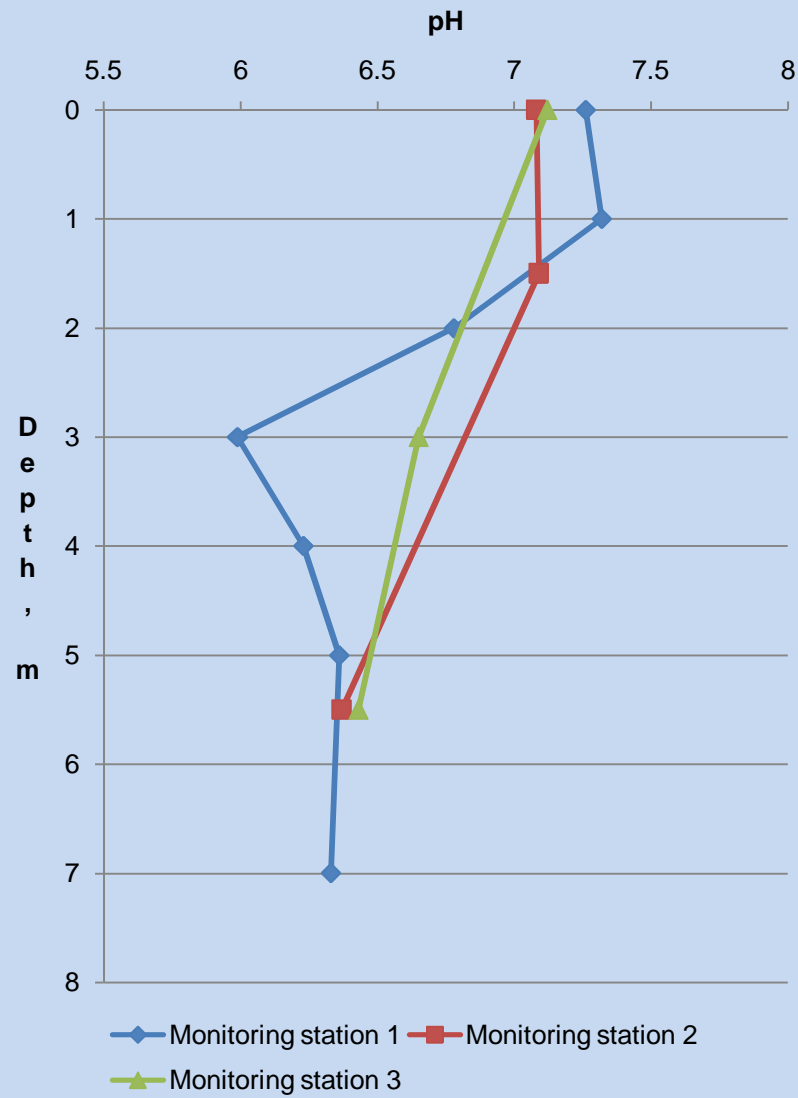
## Lake Igumenskoe 4.8.10



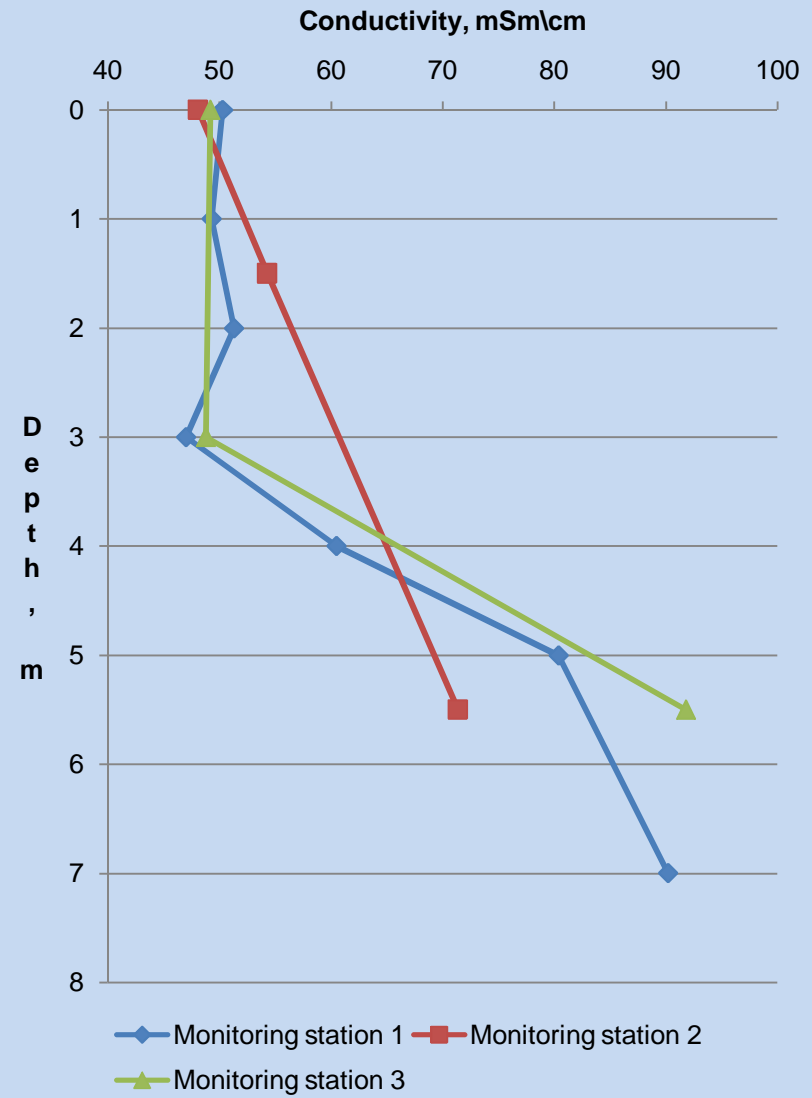
## Lake Igumenskoe 4.8.10

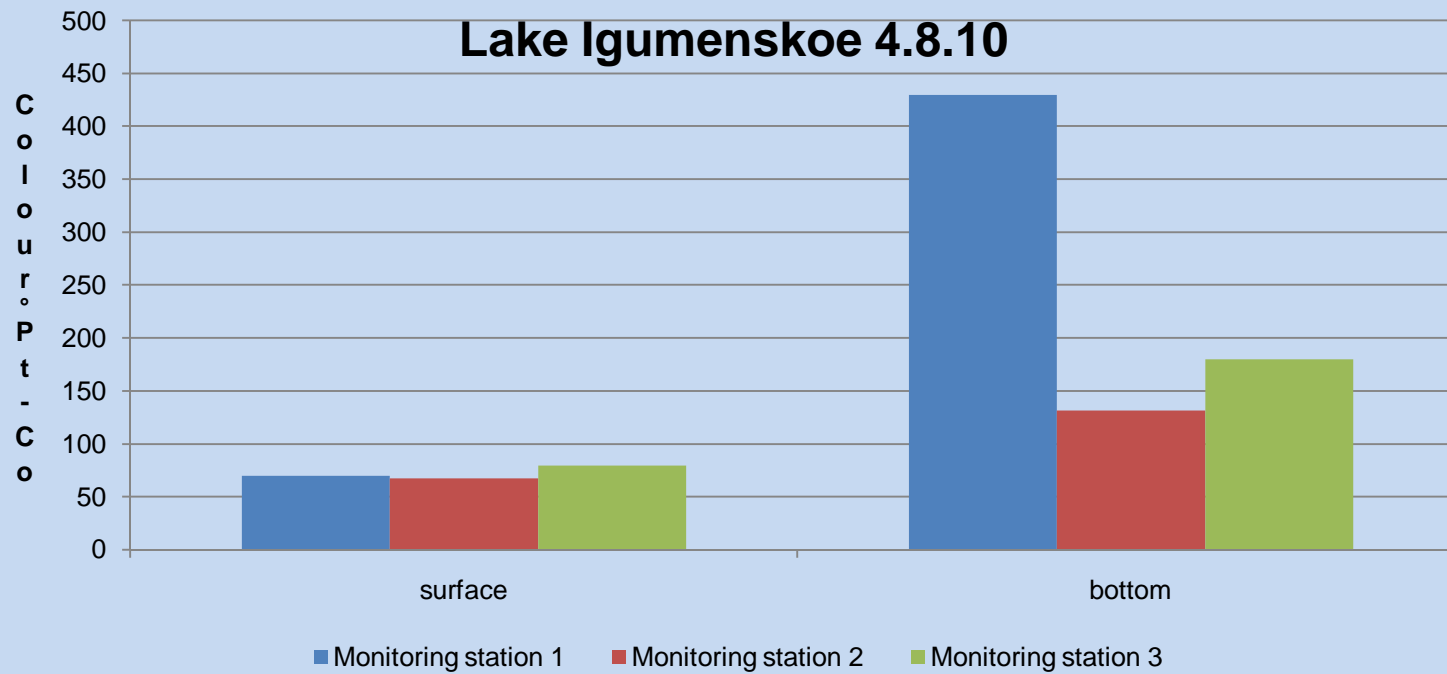
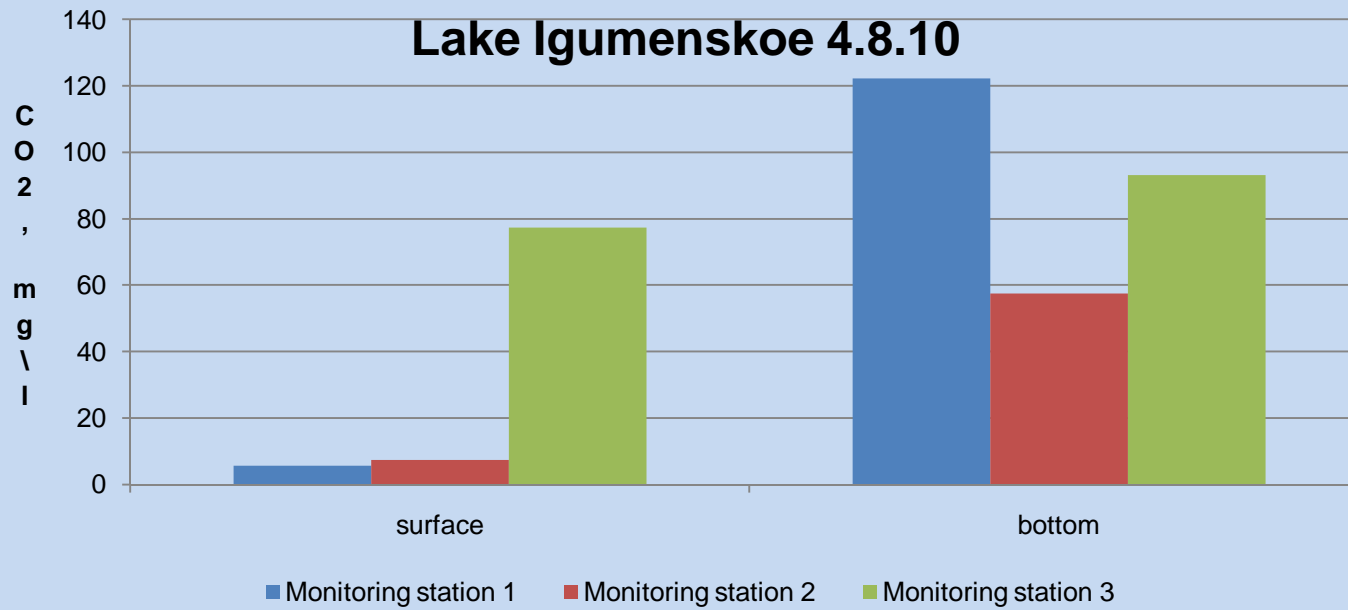


## Lake Igumenskoe 4.8.10



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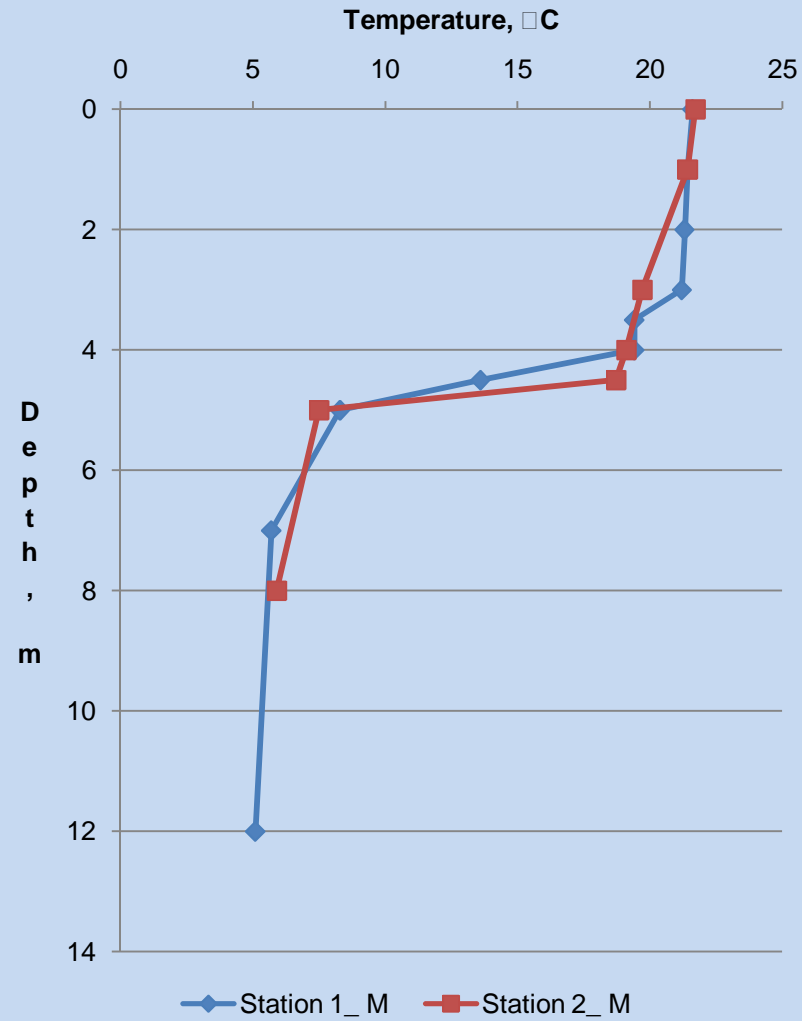
# Moskovskaya Bay (Nature Stream monitoring station)



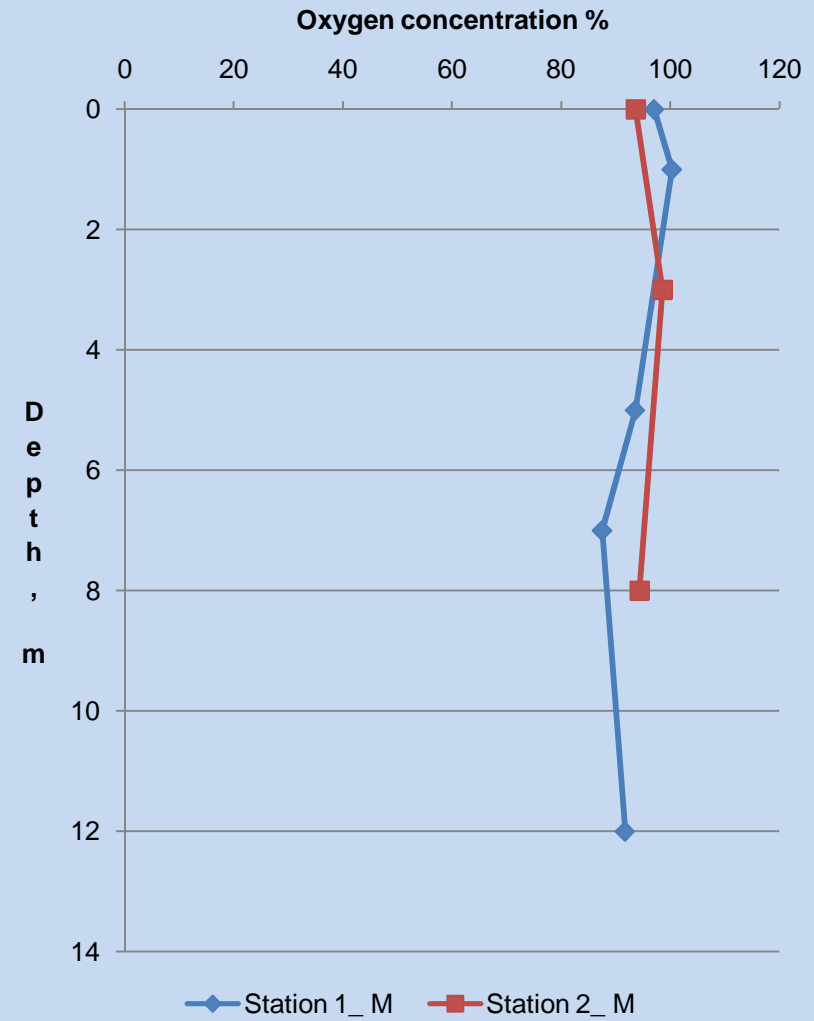
# Catchment area of Moskovskaya bay

- Bedrock of catchment area is mainly gabbro-diabase. Layer of soil is thin and you can see bedrock in many places. There is in practice no peat in ground.
- Forest in the catchment area is mainly old spruce herb forest. There is no any clear-cut areas.

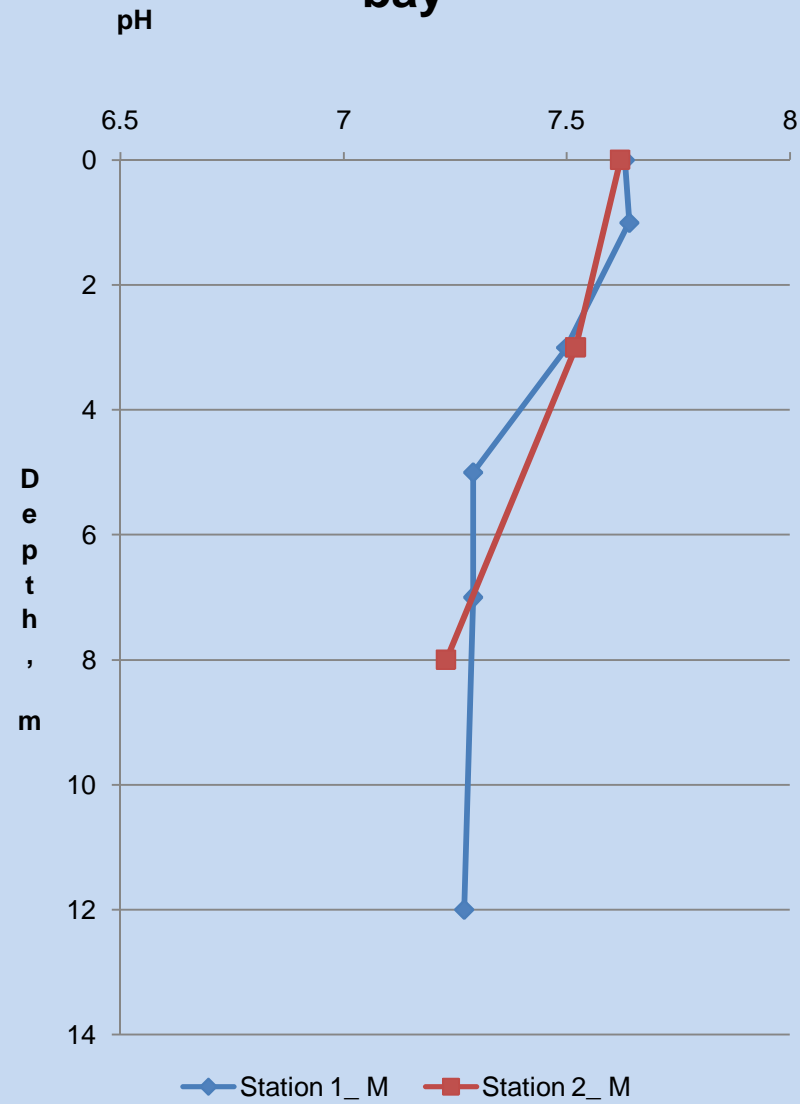
## Ladoga 5.8.10 Moskovskaya bay



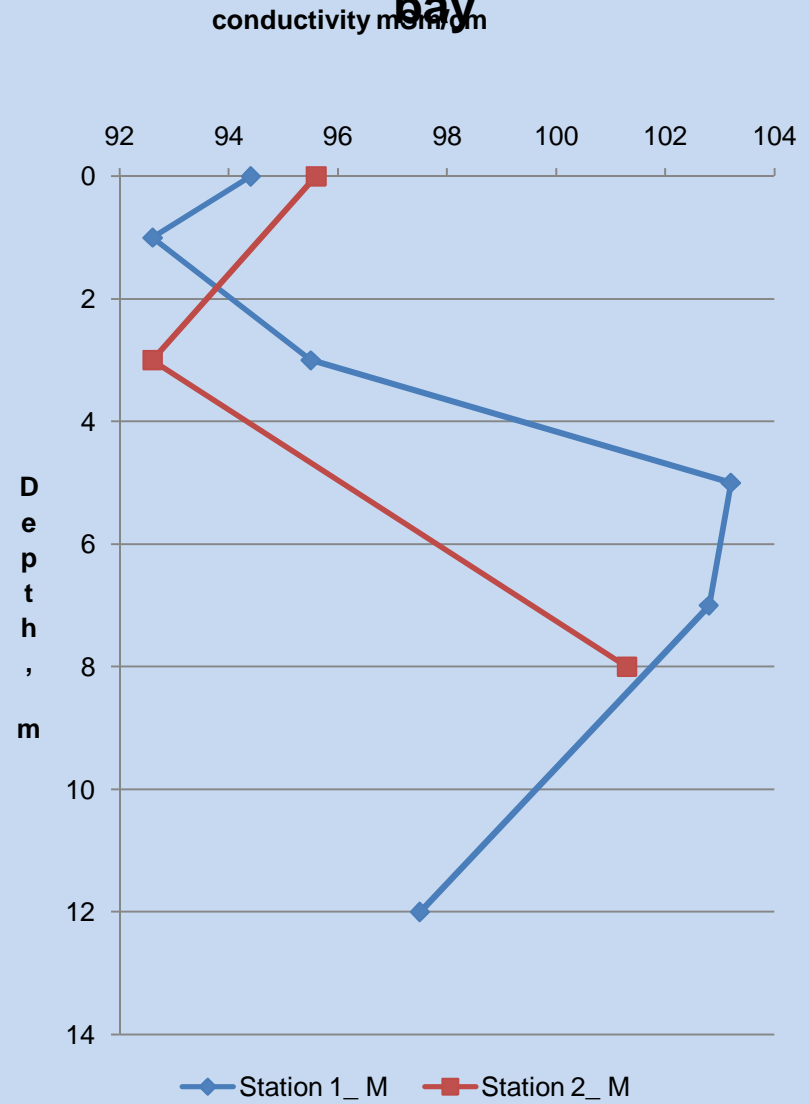
## Ladoga 5.8.10 Moskovskaya bay



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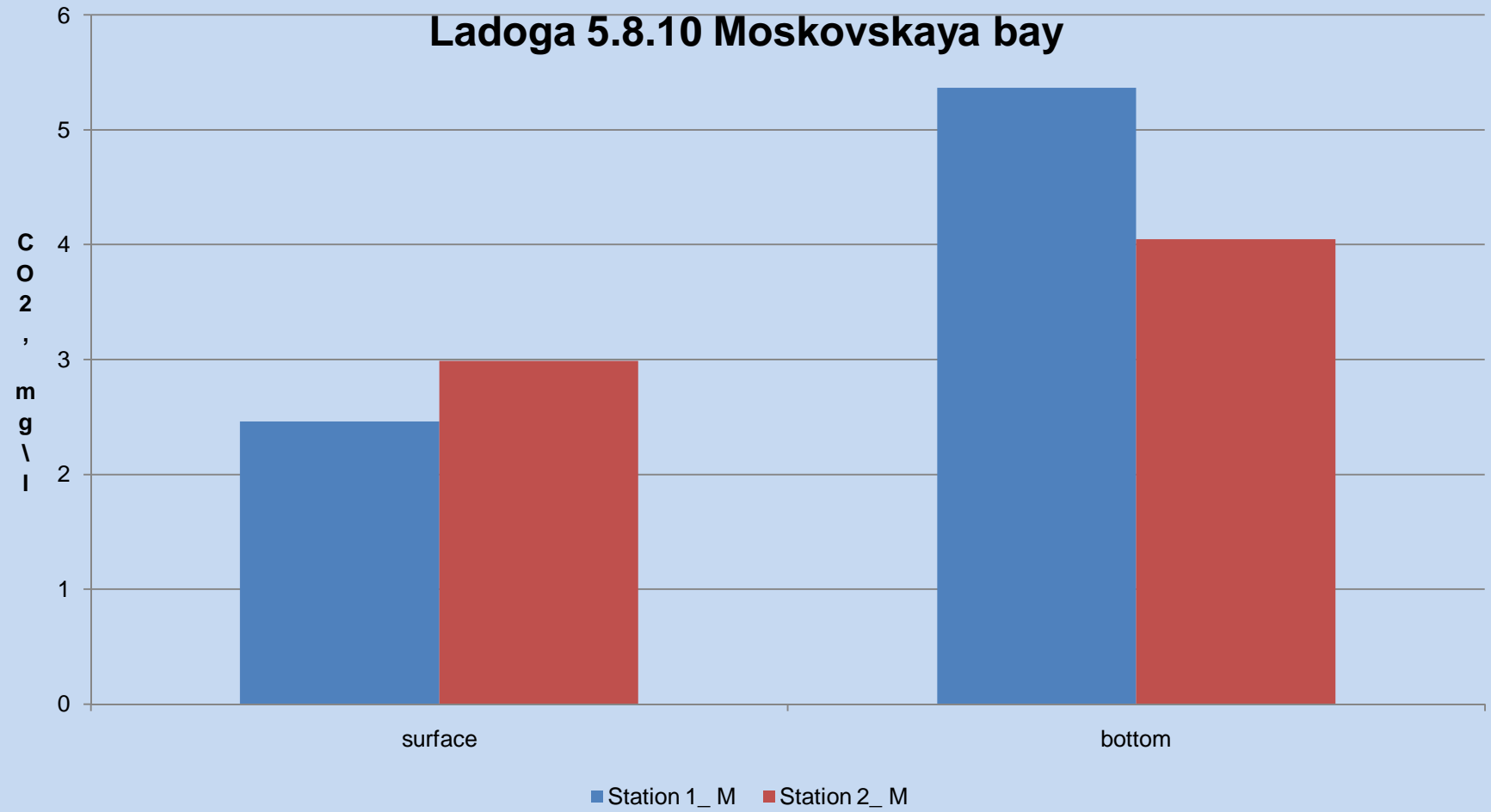


# Ladoga 5.8.10 Moskovskaya bay





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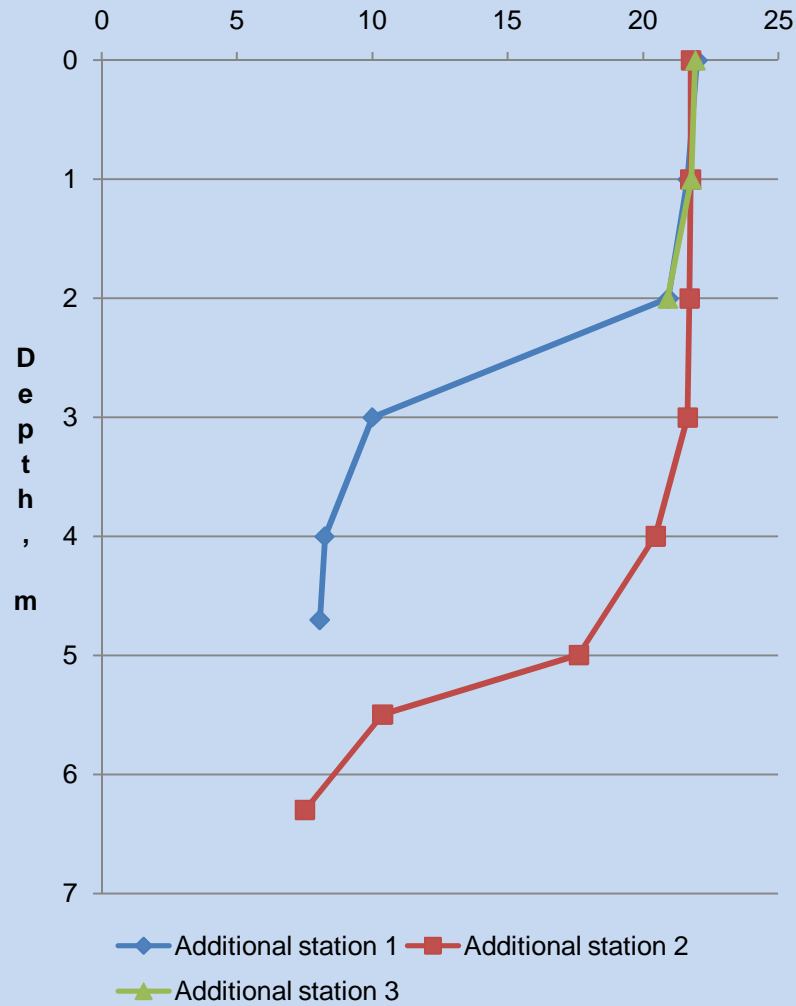


# Moskovskaya Bay (additional station)



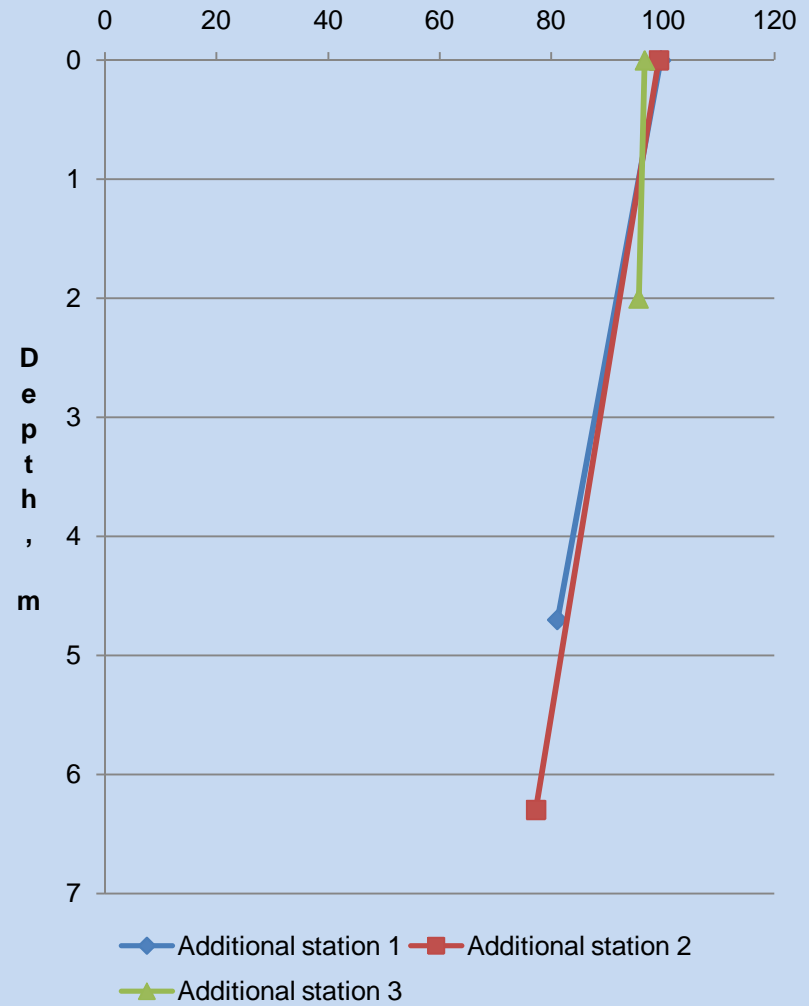
# Ladoga 5.8.10 Moskovskaya

Bay  
Temperature, °C

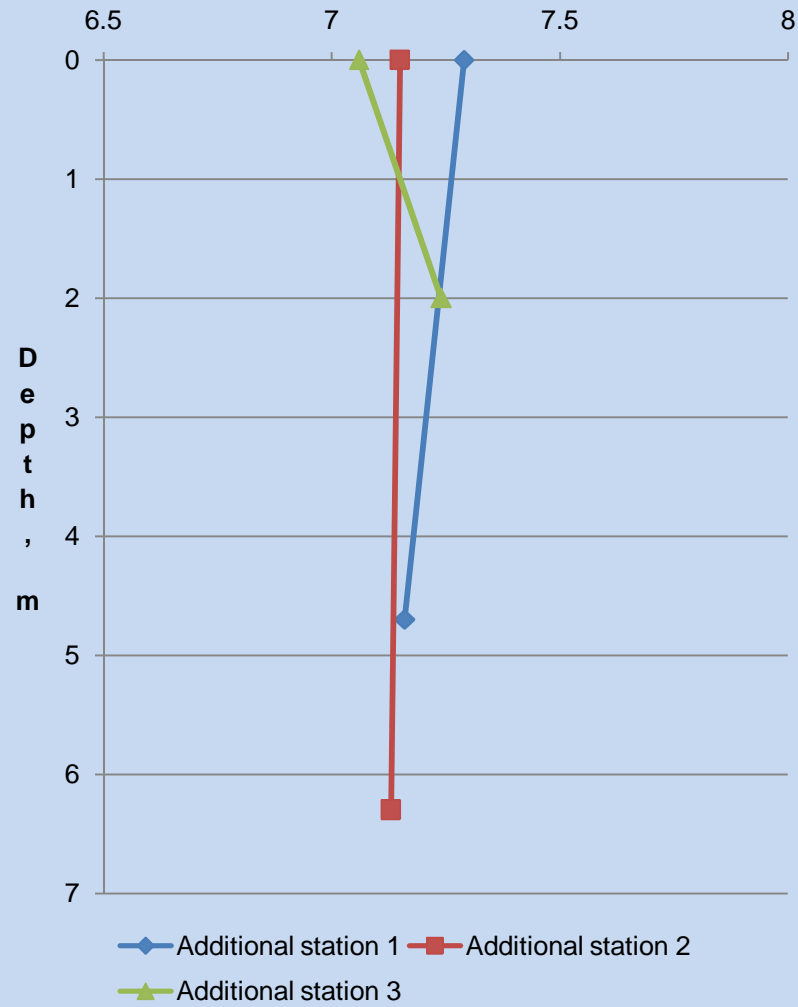


# Ladoga 5.8.10 Moskovskaya

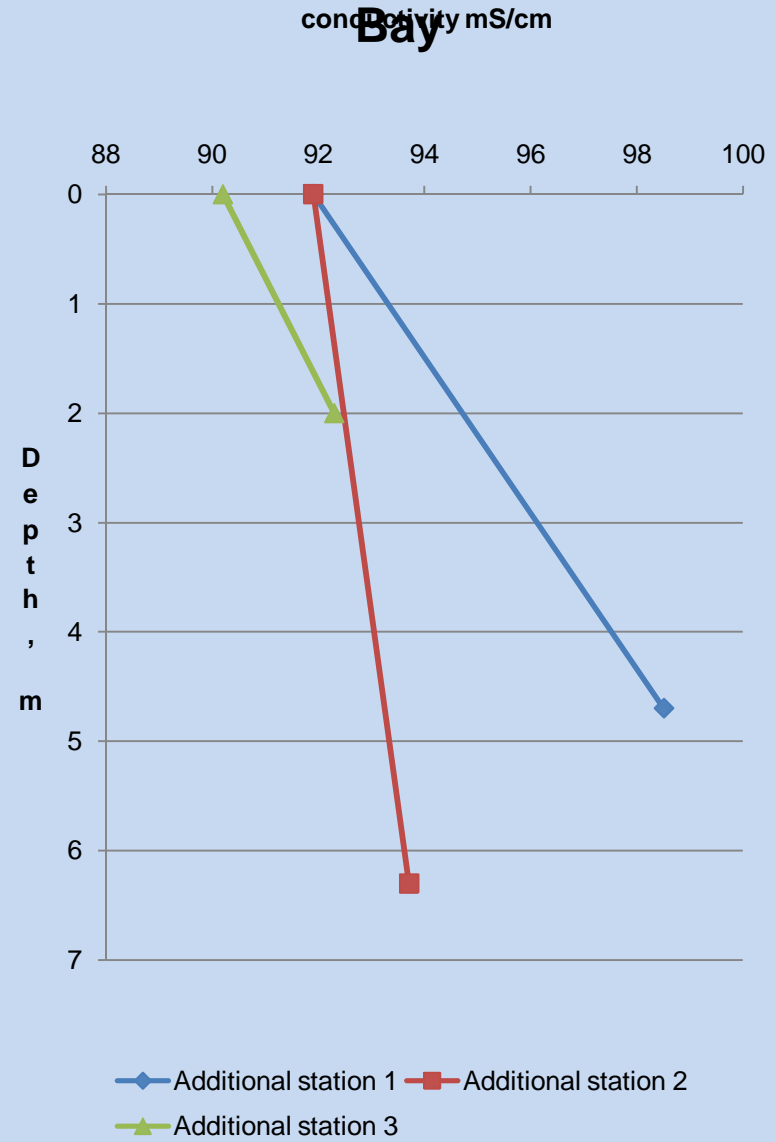
Bay  
Oxygen concentration %



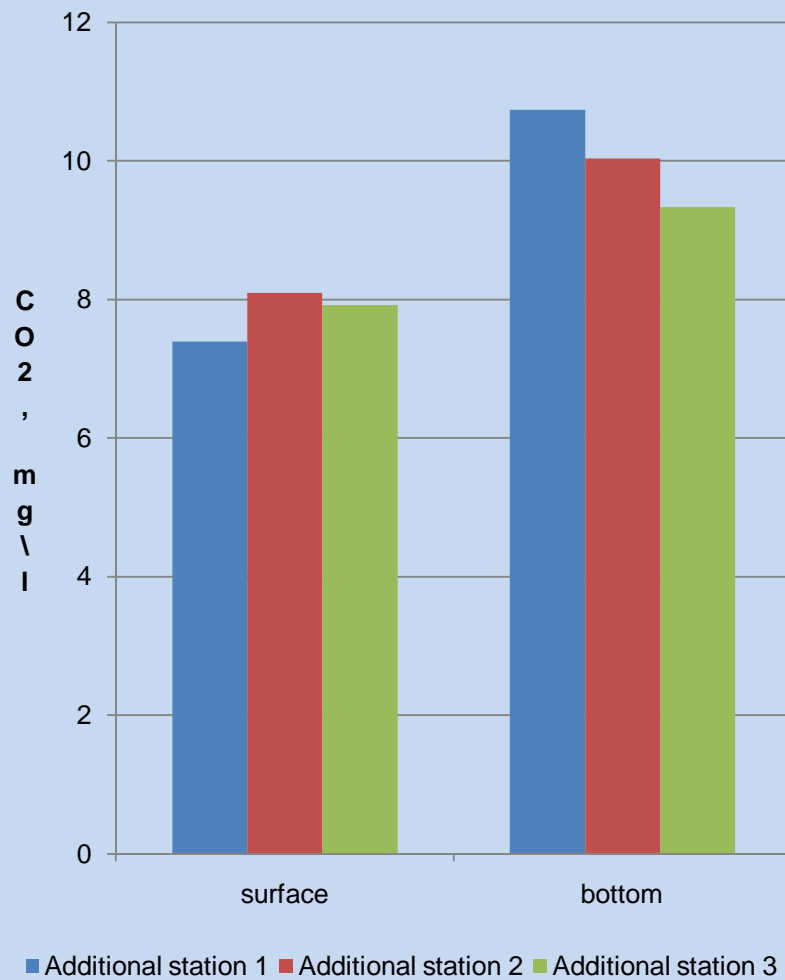
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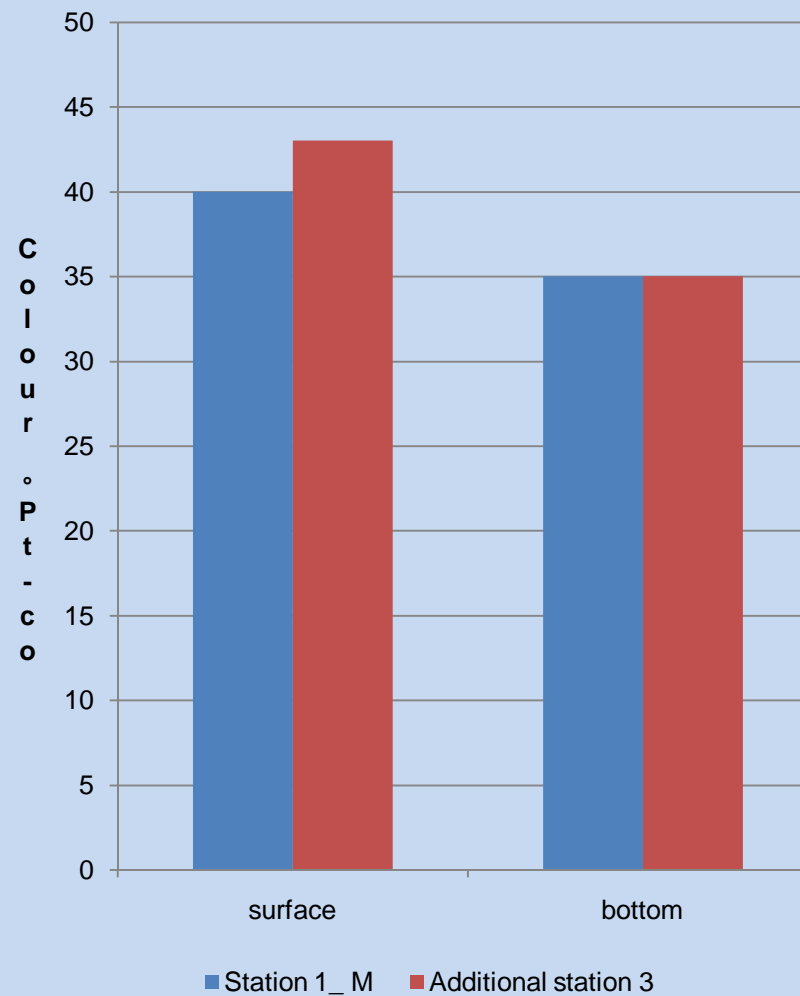
# Ladoga 5.8.10 Moskovskaya Bay



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## Ladoga 5.8.10 Moskovskaya Bay



# Surface – Bottom measurement

Sampling point	Temperature	O <sub>2</sub> %	CO <sub>2</sub> concentration mg/l	pH	conductivity	Colour of water
Ladoga Krestovij bay_M	21.1 - 8.8	103.7 - 74.7	3.1 – 4.8	7.9 – 7.8	91.9-81.1	-
Lake Igumenskoe M1	25.2 – 4.3	88.5 - 0.0	5.7 -122.3	7.3 – 6.3	50.3 – 90.2	70 - 430
Ladoga Moskovskaya bay A1	22.0 – 8.1	99.6 - 81.1	7.4 – 10.7	7.3 – 7.2	91.9 – 98.5	43 - 35
Lake Ladoga Moskovskaya bay (Nature stream) M1	21.6 - 5.1	97.0 -91.7	2.5 – 5.4	7.6 – 7.3	94.4 – 97.5	40 - 35

# Differences between surface and bottom measurements

Sampling point	Temperature	O <sub>2</sub> %	CO <sub>2</sub> concentration	pH	conductivity	Colour of water
Ladoga Krestovij bay_M	12.3	29.1	-1.76	0.12	10.8	-
Lake Igumenskoe M1	20.9	88.5	-116.6	0.93	-39.9	-360
Ladoga Moskovskaya bay A1	13.93	18.5	-3.3	0.13	-6.6	8
Lake Ladoga Nature stream M1	16.5	5.3	-2.9	0.36	-3.1	5

# Phytoplankton species

- *Anabaena ellipsoides*
- *Anabaena spiroides*
- *Aphanizomenon flos-aquae*
- *Asterionella formosa*
- *Botryococcus braunii*
- *Ceratium hirudinella*
- *Cosmarium* sp.
- *Dinobryon* sp.
- *Fragilaria crotonensis*
- *Microcystis* sp.
- *Pandorina morum*
- *Planktothrix agardhii*
- *Staurastrum* sp.
- *Tabellaria* sp.
- *Tribonema* sp.
- *Woronichinia naegeliana*

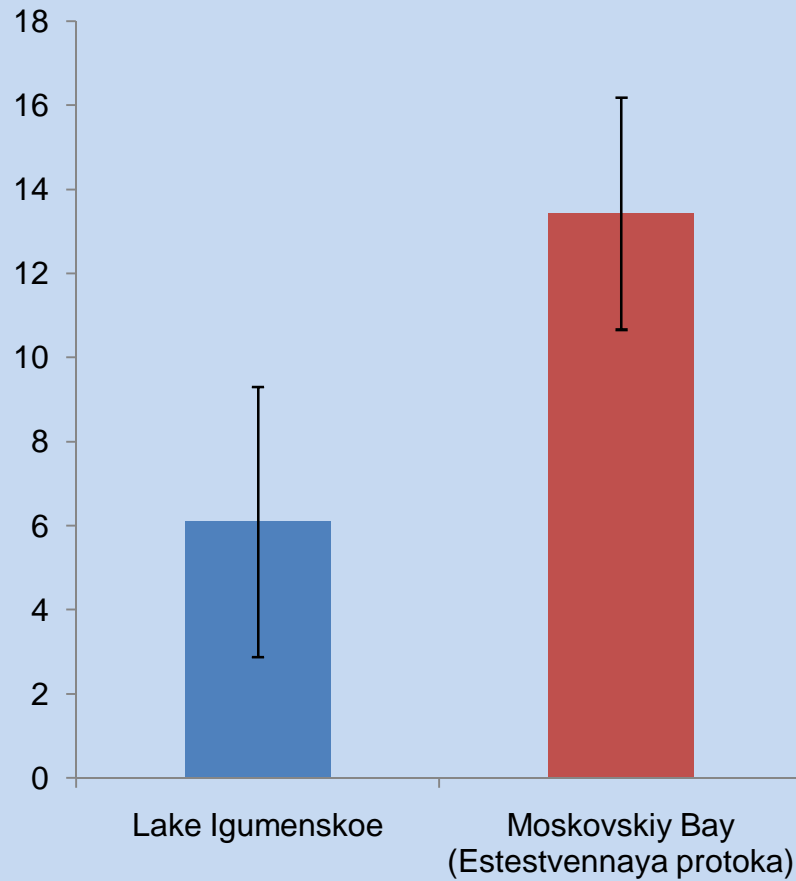


# Zooplankton species

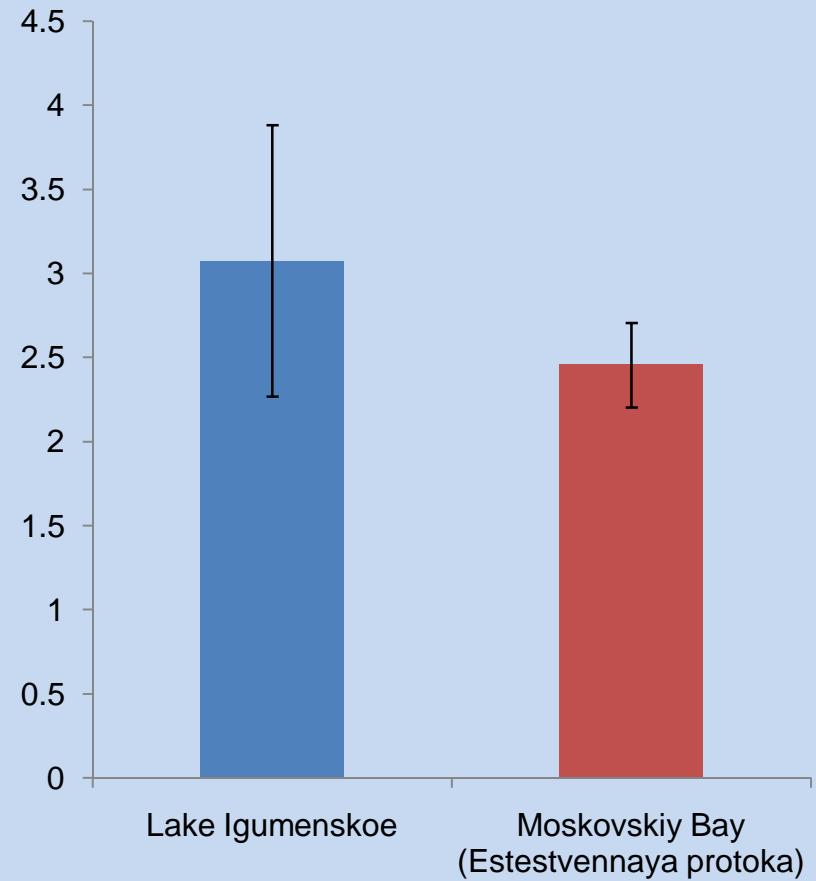
- *Asplanchna priodonta*
- *Bosmina longispina*
- *Bosmina* sp.
- *Ceriodaphnia quadrangula*
- *Chydorus sphaericus*
- *Cyclops lacustris*
- *Daphnia* sp.
- *Diaphanosoma*
- *Eudiaptomus gracilis*
- *Limnocalanus macrurus*
- *Limnosida frontosa*
- *Mysis relicta*
- *Polyphemus pediculus*
- nauplius (Calanoida & Cyclopoida)

# Aquatic macrophytes

**Species richness / station**



**Species abundance / station**



# Aquatic macrophytes

Lake Igumenskoe – 21  
taxons

- *Calla palustris*
- *Carex* sp.
- *Comarium palustris*
- *Elodea canadensis*
- *Hydrocharis morsus-ranae*
- *Nuphar lutea*
- *Scutellaria galericulata*
- *Sparganium emersum*
- *Utricularia minor*
- Chlorophyceae

Moskovskiy Bay  
(Estestvennaya protoka) –  
35 taxons

- *Calamagrostis* sp.
- *Carex acuta*
- *Eleocharis palustris*
- *Elodea canadensis*
- *Equisetum fluviatile*
- *Mentha aquatica*
- *Phragmites australis*
- *Polygonum amphibium*
- *Potamogeton gramineus*
- *Utricularia vulgaris*
- *Eleocharis aciculatis*

# Acknowledgements

- Russian State Hydrometeorological University
- Valaam Educational and Scientific Station

Thank you for all your patience and for waiting, and waiting, and waiting J