



Joint management of Latvian – Lithuanian
transboundary river and lake water bodies
(TRANSWAT)

Zooplankton in transboundary lakes

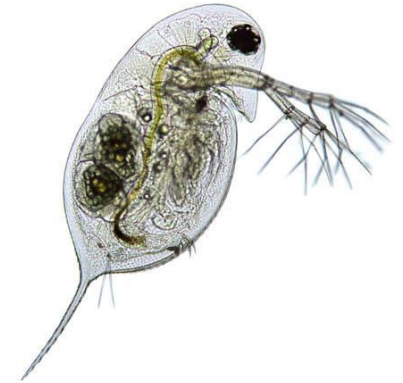
PhD Inta Dimante-Deimantovica, researcher

What is zooplankton...in a context of WFD?

- Animal plankton;
- Drifting in all kind of water habitats;
- Usually microscopic size;
- Having significant ecological role;
- **Not included in the WFD.**



Copepoda



Cladocera



Rotifer

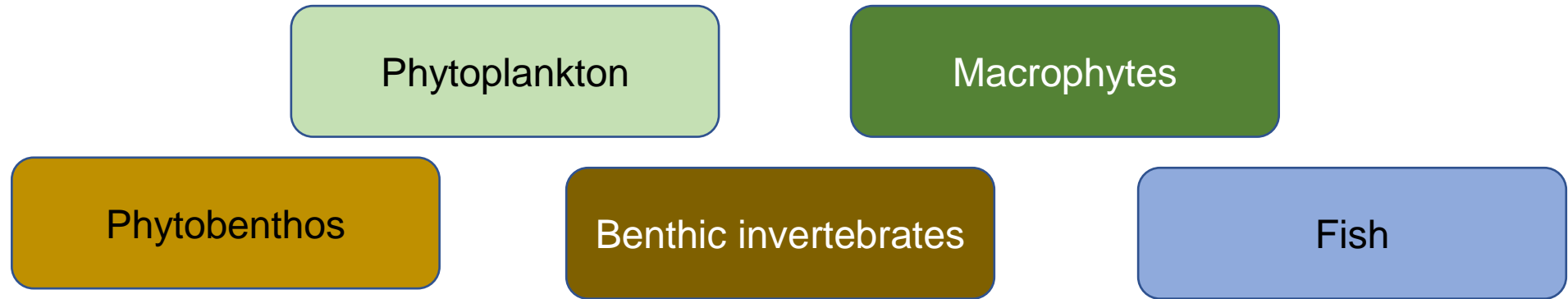
What is WFDin a context of zooplankton?



- **Water protection is one of the priorities of the Commission;**
- Standards for rivers and lakes used for **drinking water** (1975);
- In 1991 - adoption of the **Urban Waste Water Treatment Directive** and the **Nitrates Directive**, addressing water pollution by nitrates from agriculture;
- New Drinking Water Directive in 1998;
- Directive for **Integrated Pollution and Prevention Control** (1996), addressing pollution from large industrial installations, later transformed into the **Industrial Emissions Directive**.

What is WFDin a context of zooplankton?

- Ecological status is determined based on biological quality elements:

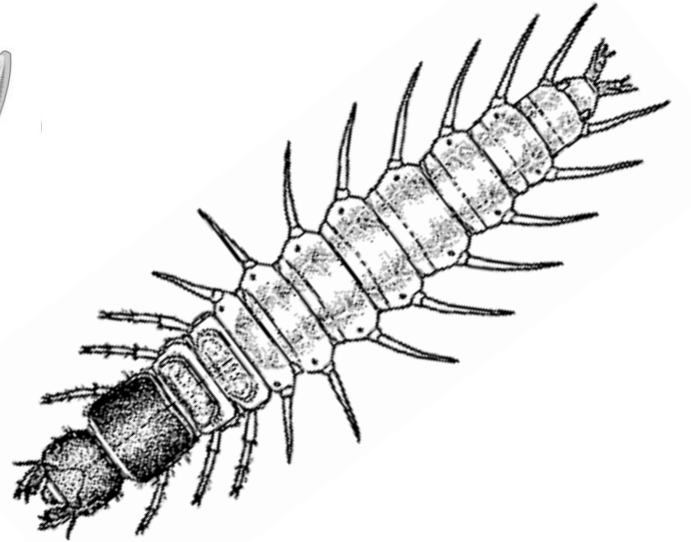
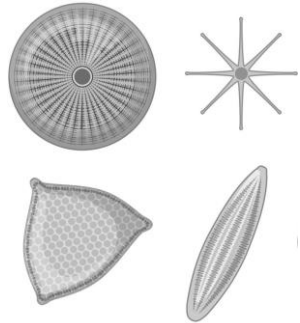
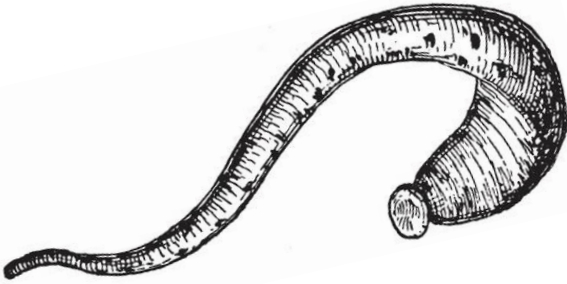
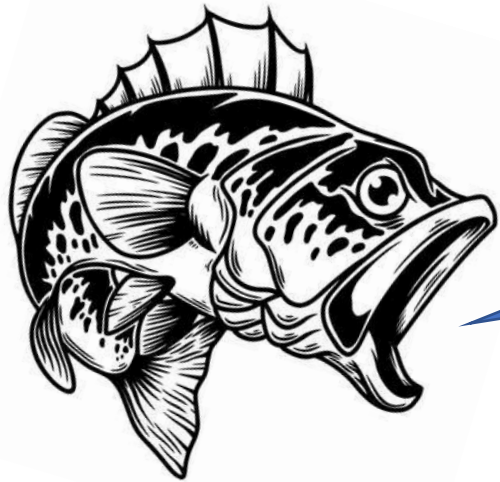


- Supporting physico-chemical & hydromorphological quality elements:

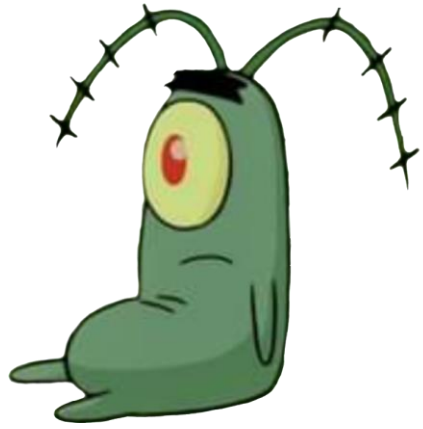


- But....where is zooplankton?

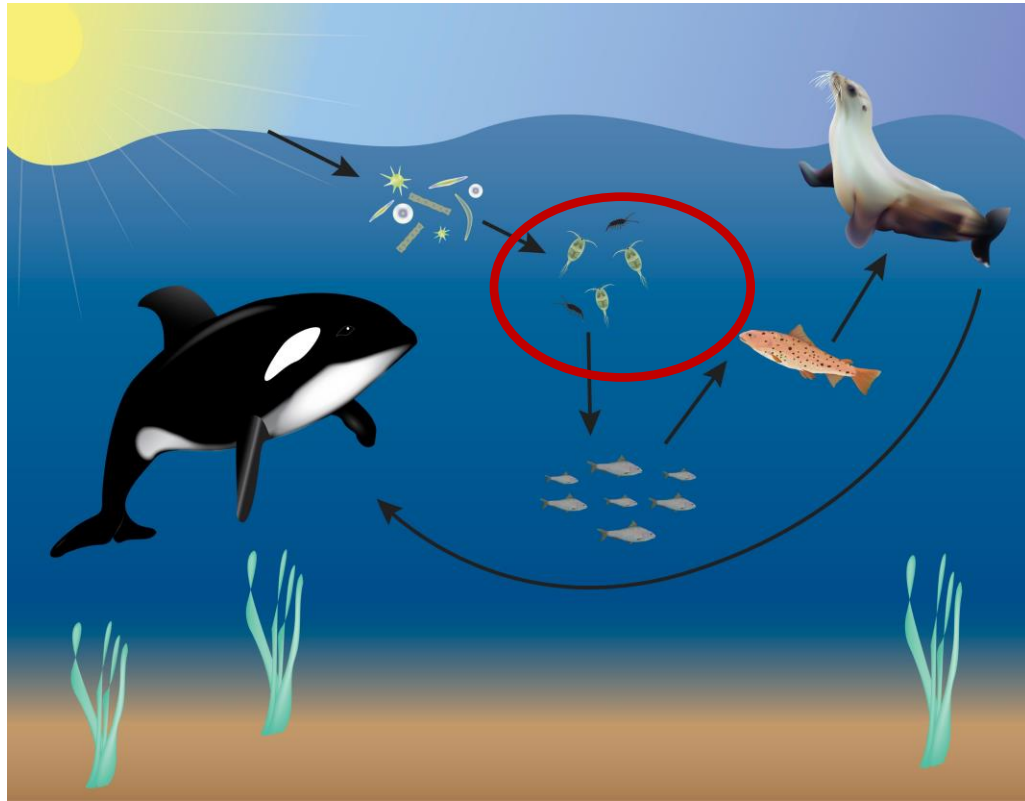




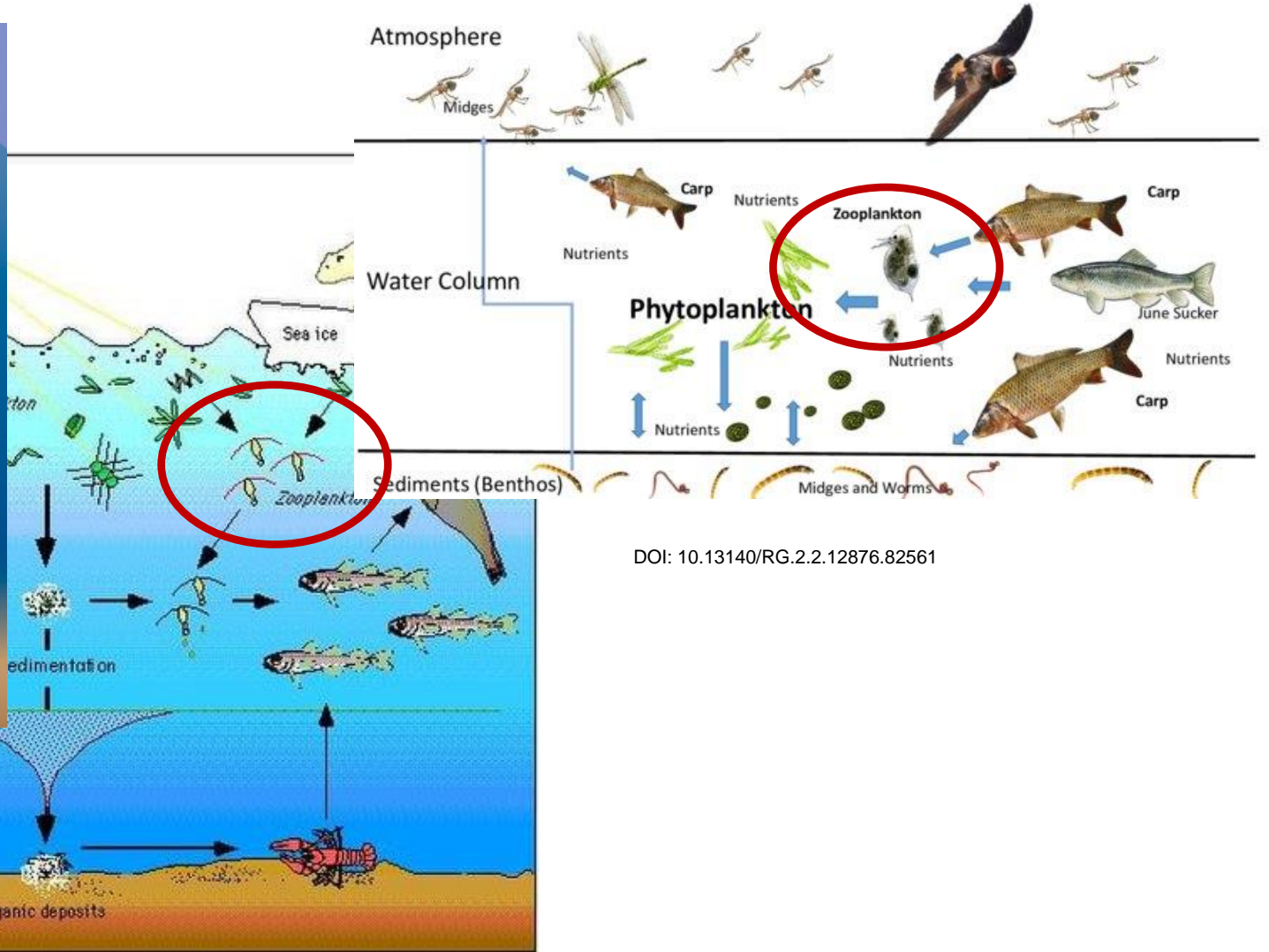
LOSER!



Despite its central role...



https://thereaderwiki.com/en/Marine_food_web



DOI: 10.13140/RG.2.2.12876.82561

<https://www.learnz.org.nz/argofloats142/bg-standard-f/ocean-food-webs-and-food-chains>

...and researchers efforts




THE POTENTIAL OF ZOOPLANKTON
COMMUNITIES FOR ECOLOGICAL
ASSESSMENT OF LAKES: REDUNDANT
CONCEPT OR POLITICAL OVERSIGHT?

Rossana Caroni and Kenneth Irvine

CLADOCERA AS INDICATORS | [Published: 03 August 2011](#)

Zooplankton as indicators in lakes: a scientific-based plea for including zooplankton in the ecological quality assessment of lakes according to the European Water Framework Directive (WFD)

[Erik Jeppesen](#) , [Peeter Nõges](#), [Thomas A. Davidson](#), [Juta Hablauridsen](#), [Martin Søndergaard](#), [Carl Sayer](#), [Reet Laugaste](#), [Lisel L. Amsinck](#)

[Hydrobiologia](#) **676**, Article number: 279 (2011) | [Cite this article](#)
4159 Accesses | **214** Citations | **4** Altmetric | [Metrics](#)

Abstract

With the implementation of the EU Water Framework Directive, we have to classify the ecological status of surface waters for the first time. It was a matter of some surprise to lake ecologists that zooplankton were not included as a biological quality element (BQE) despite their being considered to be an important and



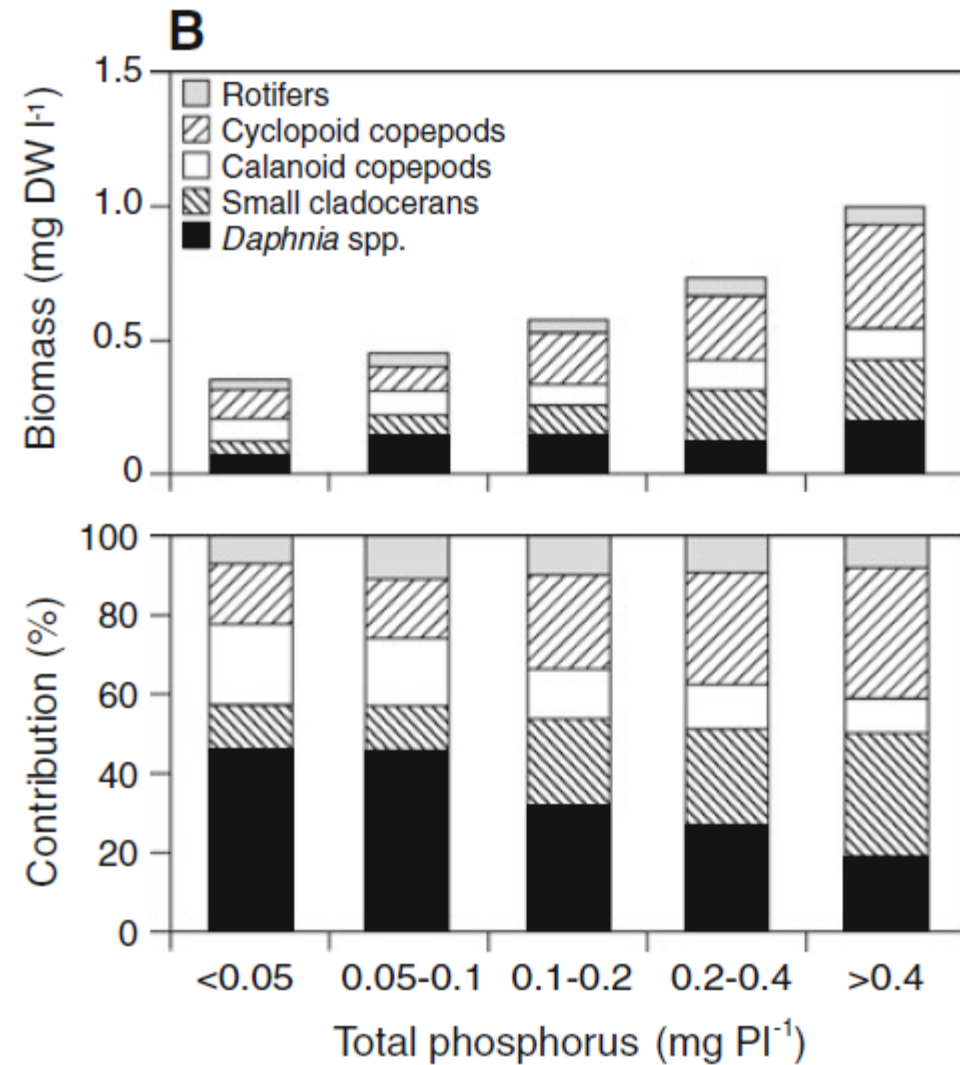
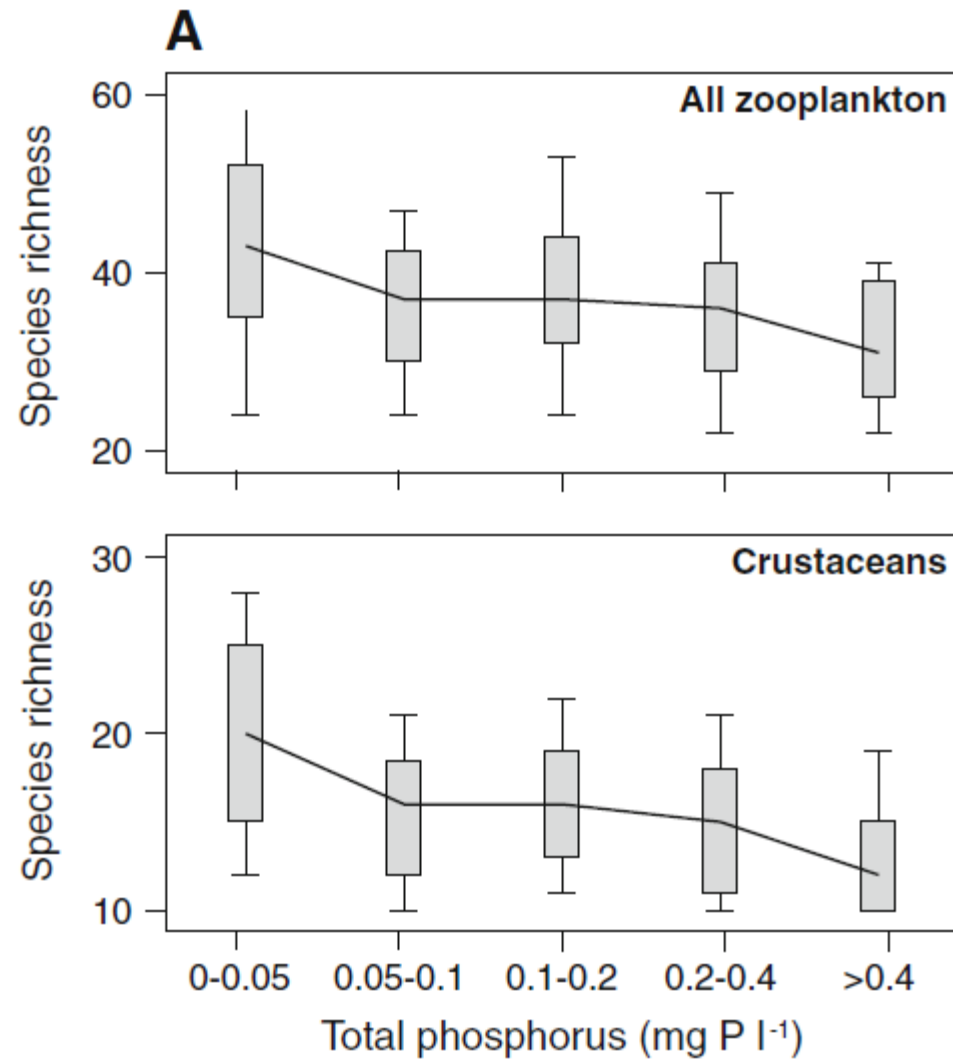
Limnologia

Volume 69, March 2018, Pages 46-54



Zooplankton abundance: A neglected key element in the evaluation of reservoir water quality

[Jara García-Chicote](#)  , [Xavier Armengol](#), [Carmen Rojo](#)



A Box-plot showing the species richness of total zooplankton and cladocerans in five different TP classes. The full line represents median values. Also shown are 10, 25, 75 and 90% percentiles of the variables. **B** Time-weighted

summer mean biomass and percentage contribution of zooplankton to total biomass in five different TP classes (from Jeppesen et al., 2000)



L. Garais/Ilge

L. Galiņu/Salna

L. Lielais Kumpinišku/Kampiniskiai

L. Laucesas/Laukesas

L. Skirnas

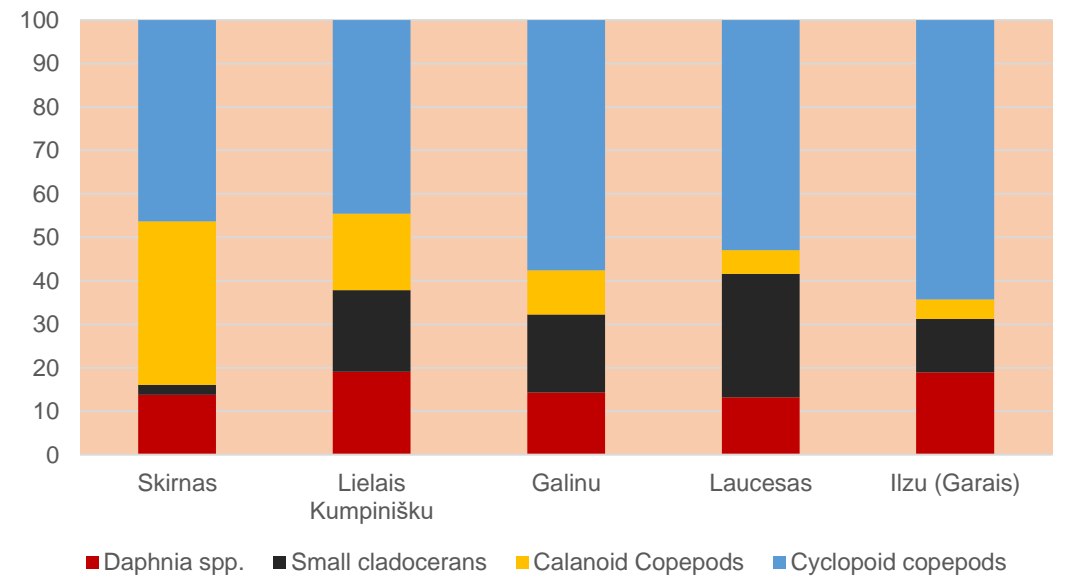
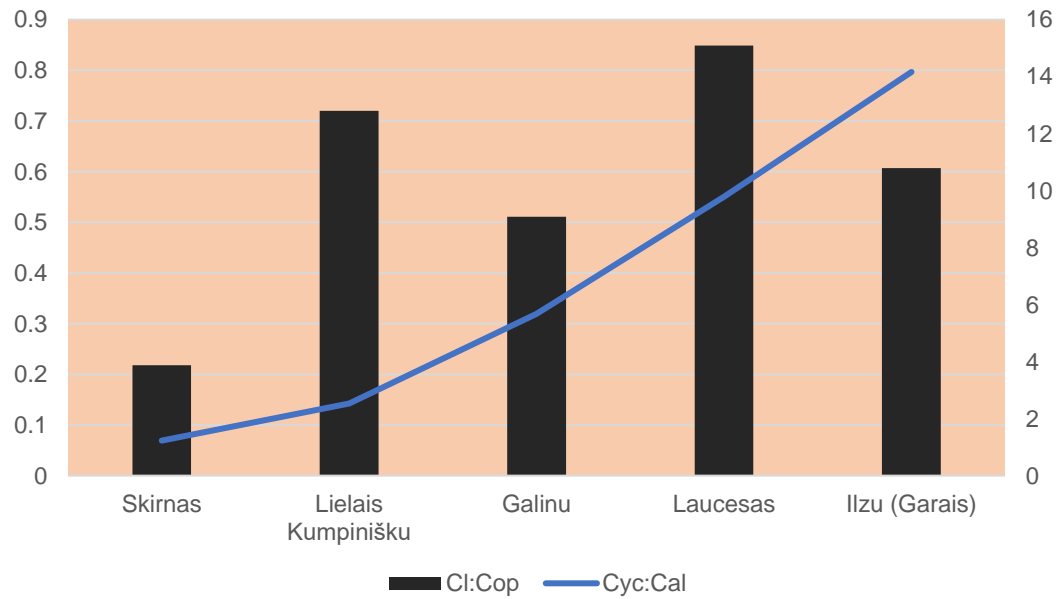
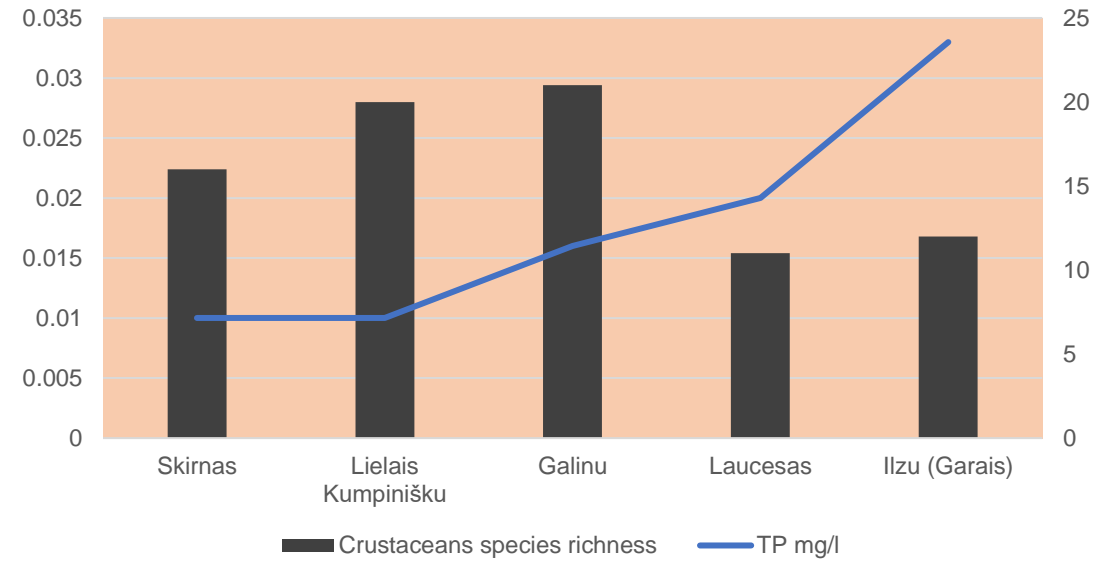
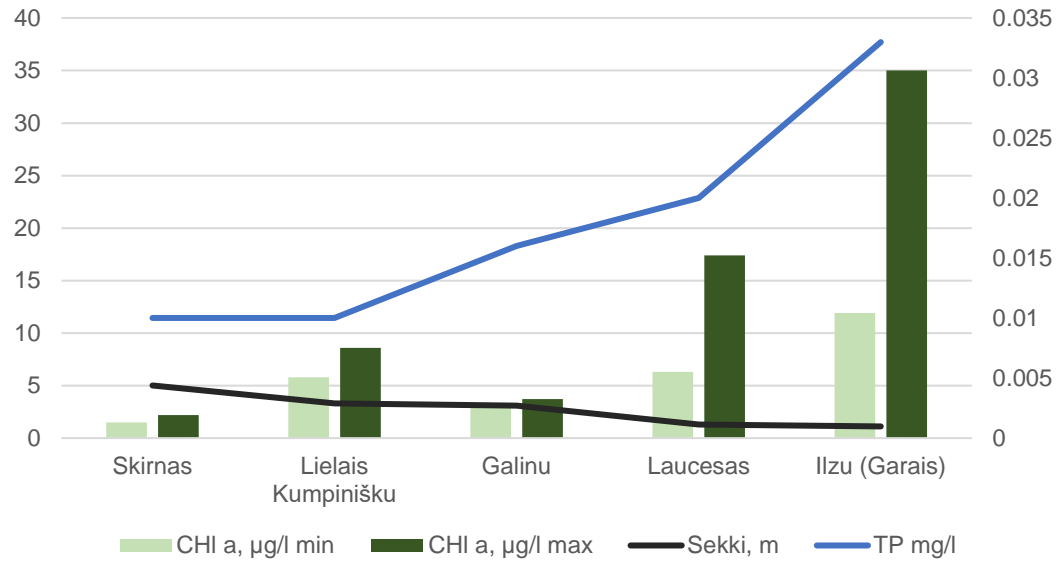


10 km

© Karšu izdevniecība Jāņa sēta

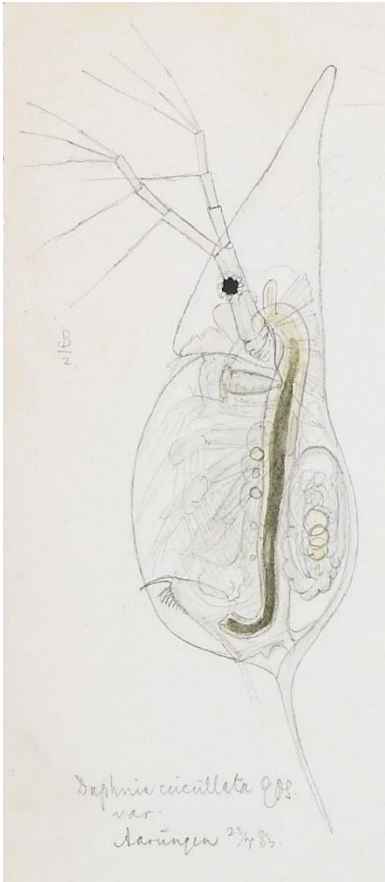
Lake	Country	Biology	Hydromorphology	Physico-chemistry	Total status
Ilzu (Garais)/Ilge	LV	Poor	Moderate	Moderate	Poor
	LT	Moderate	Less than good	Moderate	Moderate
Lielais Kumpinišku/Kampiniskiai	LV	Good	Good	Good	Good
	LT	Good	Good	Good	Good
Galiņu/Salna	LV	Good	Good	Good	Good
	LT	Good	Good	High	Good
Lake Skimas	LV	Good	Good	Good	Good
	LT	Good	Good	High	Good
Laucesas/Laukesas	LV	Moderate	Moderate	Moderate	Moderate
	LT	Poor	Less than good	Good	Poor

Parameter	L. Ilzu (Garais) / Ilge		L. Galiņu / Salna		L. Lielais Kumpinišku / Kampiniskiai		L. Skirnas		L. Laucesas / Laukesas	
	LV	LT	LV	LT	LV	LT	LV	LT	LV	LT
Physico-chemistry										
Phytoplankton										
Macrophytes										
Benthic invertebrates										
TOTAL CLASS	P	M	M	G	G	M	G	G	M	P



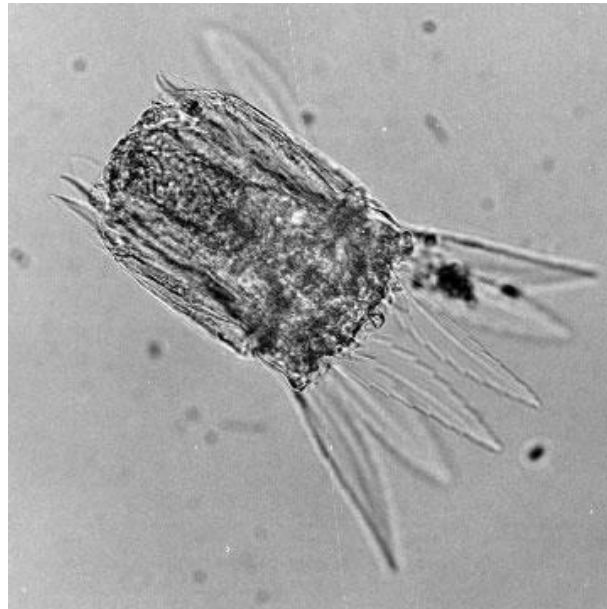
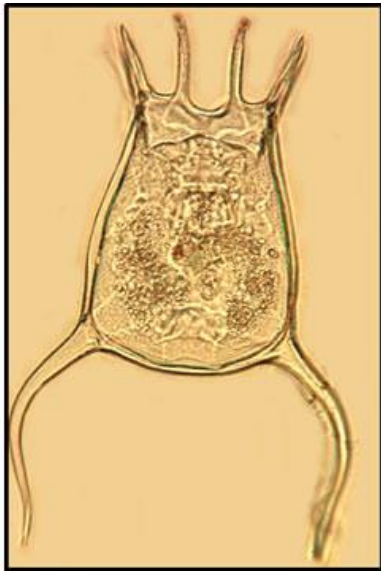
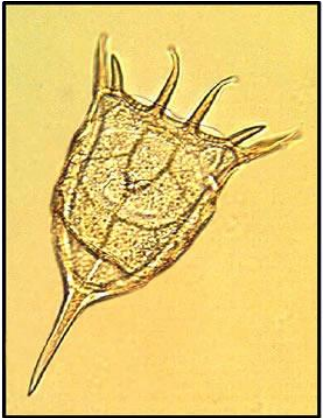
Ilzas/Garais

- *Daphnia cucullata* - common in eutrophic waters;
- *Chydorus sphaericus* – widely known species;
- *Bosmina (Eubosmina) coregoni thersites* - population will decrease due to eutrophication?



Ilzas/Garais – other dominating species related to increased eutrophication

- *Keratella cochlearis*;
- *K. quadrata*;
- *Polyarthra* sp.;
- *Mesocyclops leuckarti*;
- *Thermocyclops oithonoides*



Lielsais Kumpinišķu

- *Keratella cochlearis*;
- *Daphnia cucullata*;
- *Bosmina (B.) longirostris*;
- *Chydorus sphaericus*

Dominant species reflect development of eutrophication.

- New finding for species *Cyclops bohater* - *could it be indicator species?*



Galiņu

- *Daphnia cucullata*;
- *Bosmina (B.) longirostris*;
- *Chydorus sphaericus*

Dominant species reflect development of eutrophication.

- *Cyclops bohater*;
- *New finding for Acroperus angustatus* – not tolerating eutrophication?
- *Polyphemus pediculus* ?
- *Bythotrephes* sp. - species dominance is decreasing due to eutrophication increasing

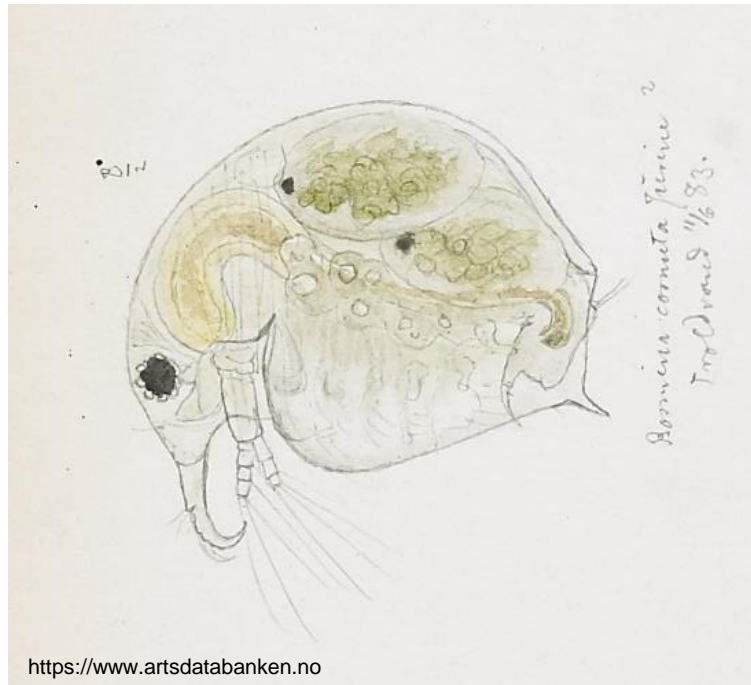


Laucesas

- *Keratella cochlearis*;
- *Chydorus sphaericus*;
- *Bosmina (B.) longirostris*.

Dominant species reflect development of eutrophication.

- *New finding for Acroperus angustatus* – not tolerating eutrophication?





Skirnas

- *Keratella cochlearis*;
- *Daphnia cucullata*.

Dominant species reflect development of eutrophication.

- New species for Latvia *Paracyclops poppei*;
- New finding for *Cyclops bohater*;
- New finding for *Acroperus angustatus*;
- *Bythotrephes* sp. - species dominance is decreasing due to eutrophication increasing;
- The only lake with 2 calanoida species (other lakes had only 1 species):
 - *Eudiaptomus graciloides* (common species);
 - *Heterocope appendiculata* - typical for biotopes with low trophy;

New species!

Paracyclops poppei (Rehberg, 1880)

Copepod, so far not found in Latvia, new species record, detected in samples from Skrinas Lake, littoral part.



Thank you!

✉ Inta.dimante-deimantovica@lhei.lv



Joint management of Latvian – Lithuanian
transboundary river and lake water bodies
(TRANSWAT)