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Deficiency syndromes in Baltic Sea top predators and zooplankton community composition:  
What the long-term data shows?

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Reduced salmon reproduction due to a deficiency syndrome called M74, has been reported in many parts of the Baltic Sea. The magnitude of the deficiency syndromes varies greatly over years, and in some years up to 80 % of the female salmon produce offspring with M74 syndrome. A dietary lack of vitamin B1 (thiamine) seems to cause the syndromes. Large-scale environmental changes have been suggested to affect the transfer of important biomolecules between trophic levels. Potential regime shifts from a stage dominated by diatoms and the copepod *Pseudocalanus acuspes* (before 1980), to the present stage (1990 and onwards) dominated by dinoflagellates, cyanobacteria and other copepod species, like *Acartia* spp has previously been suggested. Despite the surplus of food this may indicate decreased quality of the food for zooplankton and higher trophic levels. We investigated long-term effects of phytoplankton and zooplankton community composition in the Baltic Sea on M74 incidence in Swedish and Finnish rivers, as zooplankton is an important node in the ecosystem funneling vitamins to higher trophic levels. Concurrently, long-term changes in abiotic and biotic factors (e.g. nutrients, salinity, temperature and chlorophyll a) and fish stocks were included to the analyses. Our preliminary result suggests that the level of nutrients, e.g. winter minimum of phosphorus, correlate with M74 incidents indicating impacts to the zooplankton community and higher trophic levels.

Keywords: Deficiency syndrome, M74, Zooplankton, Phytoplankton, Nutrients, Long-term data

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