

LOAD TO THE BALTIC SEA FROM TERRITORY OF LATVIA AND IMPACTS ON SEA AND COASTAL AREAS

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The impacts on sea and coastal areas is influenced by chemical composition of waters and loads of dissolved substances to the sea. Surface water pollution are of the main problems affecting human health and the environment. Trace elements, organic xenobiotics, nutrients and natural water ingredients are common environmental pollutants and their occurrence in waters indicate pollution sources. Industrial effluents and non-point pollution sources, as well as atmospheric precipitation, can be sources of increased concentrations of heavy metals. Air masses supplying acidic pollutants from Central Europe carry significant amounts of some metals as well as organochlorines, which can cause significant contamination of the terrestrial and aquatic environments. However, concentrations of metals and their impact can be greatly modified by interaction with natural water ingredients. However the presence of various natural ingredients in waters may adversely influence water quality. Surface water chemistry has been analyzed worldwide, but there are few publications concerning water chemical composition and pollution levels in waters of Latvia. The aim of this study is to describe long term changes of surface water quality in Latvia, spatial variability of water chemical composition, possible impacts of pollution sources, and the measures to protect national water resources.

Within this study, the concentrations of major water ingredients and microelements in the major rivers and lakes of Latvia have been determined. Metal concentrations in river and lake waters were compared with water chemical composition. The mean concentrations of trace metals in inland waters of Latvia are appreciably lower than the estimated world averages for river waters, and close to or lower than background values, except in some cases of unique local geochemistry. This may be explained by a comparatively lower level of anthropogenic load. Direct anthropogenic impacts also are evident in some waters affected by point sources or transboundary transport.

The dynamics of pollutant emissions in Latvia are described, including those emitted by industrial and agricultural production. These changes are especially dramatic during the transition period. The water chemistry of a large number of lakes and rivers has been determined and the possible impact of water chemical composition on water quality has been evaluated.

Regarding the high concentrations of humic substances in lake waters and in sediments, their binding capacities with metal ions were evaluated. The dominating pathways for metals are considered stressing the impact of land-use on metal accumulation. The metal concentrations in waters and sediments were compared to those in aquatic biota. The impact of water chemistry, land-use and other natural conditions on metal accumulation and fluxes are discussed. Water biological quality in Latvia has been evaluated. Recommendations for environmental policy in Latvia and prevention of surface water pollution are presented.