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Use of GIS for surface water quality maps production

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The standard output of water quality assessment is a water quality map based on classification into five water quality classes. There are several methods used for a water quality map generation ranging from numerical modeling to expert judgment. Each of the methods has different requirements on data and provides results with different level of reliability. The purpose of such a map is to provide quick and easily understandable information mainly for managers, so we have chosen a simple approach based on a mass balance calculation in each river segment with no degradation processes and reactive transformations considered. The calculation involves annual water quality monitoring data and data on average annual discharges into a stream of calculated quality parameter. The range of calculated quality parameters is limited by availability of data on discharged amounts of pollutants. Therefore we run calculations for dissolved matter, BOD, COD ammonium and nitrates only. All the calculation is executed in RDBMS Oracle where a calculated water quality class is assigned for each river segment. This classification is then visualized in ArcGIS in form of an annual national water quality map for above mentioned quality parameters and additionally an general water quality map is generated based on the worst possible combination of water quality classes of all calculated parameters.