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How to compute regional trends in water quality?

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National policies, guided by European legislation such as the Water Framework Directive, ask for information on trends in water quality metrics, such as nutrient concentrations, on relatively large spatial scales, such as catchments, water management units or physiographic provinces. The question is how to estimate these regional trends from point measurements. Traditionally, trends in water quality at the point scale are tested and estimated using non-parametric statistics such as the Seasonal Mann-Kendall test and the Sen slope estimate. Aggregation of these point-scale trends towards regional scales can be done in several ways, each having their own pros and cons. Examples are 1) counting numbers of increasing/decreasing trends, 2) computing trends on prior arealy averaged concentrations, 3) averaging trend magnitudes 4) direct computation of areal trend magnitude by generalising the Sen slope estimate methodology, 5) geostatistical approach to regionalisation of trend magnitude. In this presentation these various approaches are presented, evaluated, compared and discussed.