**Quantifying spatiotemporal patterns of interactions  
between lakes and watercourses in water chemistry**

The goal of this project is to quantify spatiotemporal patterns of interactions between lakes and watercourses in water chemistry. This will be done using geostatistical analysis techniques (spatial linear mixed models) on water chemistry and flow data from Emån River. Models are implemented using the SNN package in R.

Spatial correlations in data pose a special problem in stream water networks since the correlation follow in-stream distances rather than Euclidean distances. In response to this researchers have proposed a model accounting for in-stream correlations and provide an R package for computations of such (SNN, An R Package for Spatial Statistical Modeling on Stream Networks, Ver Hoef et al. 2014). Most of the application of this model so far are made on catchments with no or few lakes.

The Emån catchment includes 450 lakes larger than 2.3 ha. The presence of these lakes can have an important influence on water chemistry in the rivers, especially during dry season and does also complicate the estimation of in-stream correlations. The goal of this project is to investigate the fit of a standard SNN-model on the Emån river and to describe and, if possible, include the effect of lakes on water chemistry and correlation structures in the model structure.

The models fit in SNN in R rely on spatial information from the ArcGIS toolbox STARS and data from this toolbox is available as .snn data structure.

Level: Bachelor/Masters in statistics.

Requirement: good knowledge in R.

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References

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