Incorporating lakes into kriging interpolation of stream water chemistry in boreal catchments in Sweden

Hendrik Braun (1), Johan Temnerud (2), and Steve Lyon (1)

(1) Stockholm University, Physical Geography and Quaternary Geology, Stockholm, Sweden (steve.lyon@natgeo.su.se), (2) Swedish Meteorological and Hydrological Institute, Research Department, Norrköping, Sweden

Assessing water chemistry can give insightful information on the ecological status of river systems. Water samples are often collected in onetime snapshot campaigns. Geostatistical methods as kriging can be used to interpolate water chemistry where no samples have been taken in the stream network. The traditional definition of distance (Euclidean distance), however often fails to reflect the spatial structure of streams since they are path-restricted features. In addition, lakes, which are a very common instream feature in boreal watersheds in Sweden, have an impact on the water chemistry. It is hence essential to regard their existence in the interpolation process. This study assesses the possibility to incorporate lakes into the interpolation process by altering the instream distance between points. This is done in consideration on the size of existing lakes in between sampled locations. For assessing the impact of including lakes, the interpolation results using Euclidian distance, simple instream distance and lake-altered instream distance for five chemical measures are compared across four Swedish catchments. The results of this study show that the altered instream distance that includes the influence of instream lakes leads to better results in most cases.