Rtop – an R package for interpolation along the stream network

J. O. Skøien (1), G. Laaha (2), D. Koffler (2), G. Blöschl (3), E. Pebesma (4), J. Parajka (3), and A. Viglione (3)

(1) Institute of Environment and Sustainability, EC Joint Research Centre, Ispra, Italy (jon.skoien@jrc.ec.europa.eu), (2) Institute of Applied Statistics and Computing, University of Natural Resources and Life Sciences, BOKU Vienna, Austria, (3) Institute for Engineering hydrology and Water Resources Management, Vienna University of Technology, Austria, (4) Institut für Geoinformatik, Westfälische Wilhelms-Universität Münster, Germany

Geostatistical methods have a long tradition within analysis of data that can be conceptualized as simple point data, such as soil properties, or for regular blocks, such as mining data. However, these methods have been used to a limited extent for estimation along stream networks. A few exceptions are given by (Gottschalk 1993, Sauquet et al. 2000, Gottschalk et al. 2006, Skøien et al. 2006), and an overview by Laaha and Blöschl (2011). Interpolation of runoff characteristics are more complicated than the traditional random variables estimated by geostatistical methods, as the measurements have a more complicated support, and many catchments are nested. Skøien et al. (2006) presented the model Top-kriging which takes these effects into account for interpolation of stream flow characteristics (exemplified by the 100 year flood).

The method has here been implemented as a package in the open source statistical environment R (R Development Core Team 2011). Taking advantage of the existing methods in R for working with spatial objects, and the extensive possibilities for visualizing the result, this makes it considerably easier to apply the method on new data sets, in comparison to earlier implementation of the method.

In addition to user feedback, the package has also been tested by colleagues whose only responsibility has been to search for bugs, inconsistencies and shortcomings of the documentation. The last part is often the part that gets the least attention in small open source projects, and we have solved this by acknowledging their effects as co-authors. The model will soon be uploaded to CRAN, but is in the meantime also available from R-forge and can be installed by:

> install.packages("rtop", repos="http://R-Forge.R-project.org")

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