

EP34B-02: Estimating continuous floodplain and major river bed topography mixing ordinal contour lines and topographic points



Wednesday, 13 December 2017

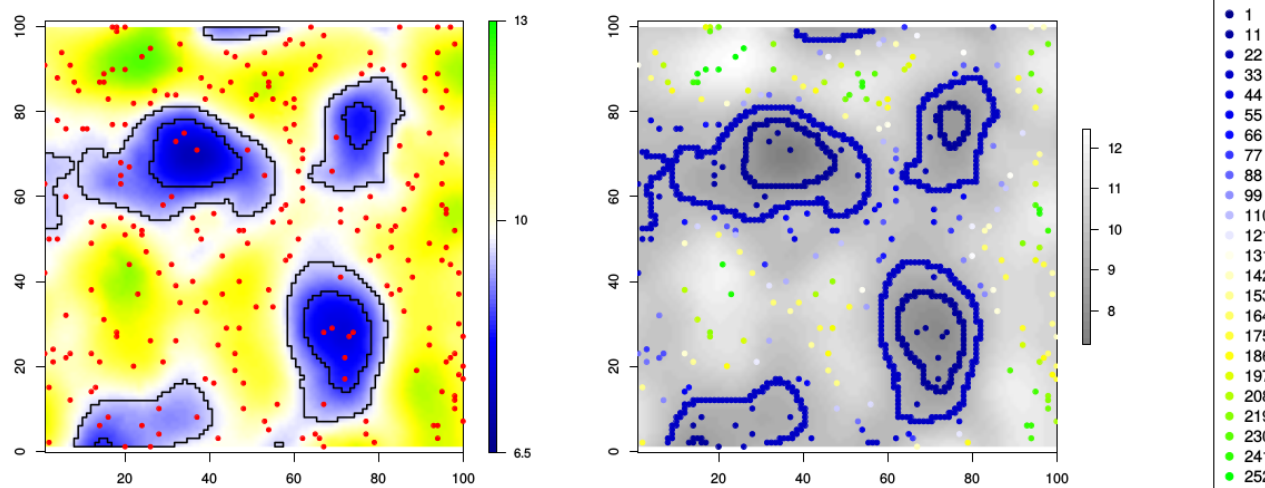
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Floodplain and major river bed topography govern many river biophysical processes during floods. Despite the growth of direct topographic measurements from LiDARS on riverine systems, it still room to develop methods for large (e.g. deltas) or very local (e.g. ponds) riverine systems that take advantage of information coming from simple SAR or optical image processing on floodplain, resulting from waterbodies delineation during flood up or down, and producing ordered contour lines. The next challenge is thus to exploit such data in order to estimate continuous topography on the floodplain combining heterogeneous data: a topographic points dataset and a located but unknown and ordered contourline dataset.

This article is comparing two methods designed to estimate continuous topography on the floodplain mixing ordinal contour lines and continuous topographic points. For both methods a first estimation step is to value each contourline with elevation and a second step is next to estimate the continuous field from both topographic points and valued contourlines. The first proposed method is a stochastic method starting from multigaussian random-fields and conditional simulation. The second is a deterministic method based on radial spline function for thin layers used for approximated bivariate surface construction.

Results are first shown and discussed from a set of synoptic case studies presenting various topographic points density and topographic smoothness. Next, results are shown and discuss on an actual case study in the Montagua laguna, located in the north of Valparaiso, Chile.



Plain Language Summary

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