



Comparison of gliding box and box-counting methods in river network analysis.

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Two structure of river basins images with different spatial arrangements were analyzed to calculate their generalized dimensions (D_q). The first partitioning method applied in these calculations was box-counting, in which a grid is used to study the local distribution of the river on different scales. In both images, network was found to exhibit multi-scaling behavior in the larger box sizes only. Several were obtained by restricting multifractal analysis (MFA) to these box sizes, but this resulted in very few points for linear regression analysis and only a short number of boxes per size due to image size limitations. The gliding box method was subsequently applied to the same range of box sizes using the multiplier method. This yielded less uncertain values, particularly for negative values of q . The gliding box method was therefore found to be more suitable for MFA where the range of usable scales is narrow. Both the numerical differences between D_q values and their standard errors are discussed.