
Scaling As a Design Principle for Cartography in the Era of BIG Data

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The full set of slides from which the three slides are extracted is available at: https://www.researchgate.net/publication/280732530_Scaling_As_a_Design_Principle_for_Cartography_in_the_Era_of_BIG_Data

Scaling and head/tail breaks

Scaling = far more small things than large ones

Recursive function **Head/tail Breaks**:

Break a whole into the head and the tail;

// the head for those above the mean

// the tail for those below the mean

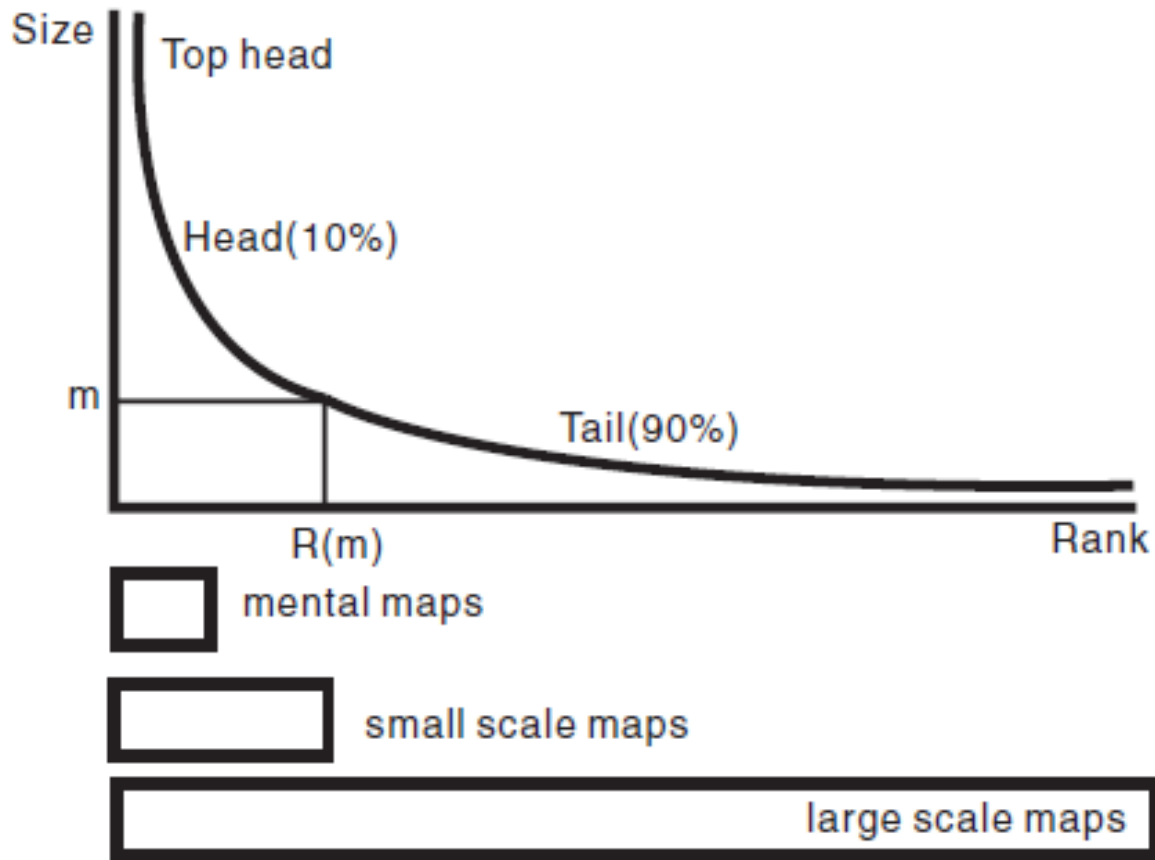
while (head \leq 40%):

Head/tail Breaks (head);

End Function

Jiang B. (2013), Head/tail breaks: A new classification scheme for data with a heavy-tailed distribution, *The Professional Geographer*, 65 (3), 482 – 494.

Unification of cognitive and cartographic mapping



Jiang B. (2013), The image of the city out of the underlying scaling of city artifacts or locations, *Annals of the Association of American Geographers*, 103(6), 1552-1566.

Summary

- Geographic features, or big data in general, are **scaling or fractal** seen from a right perspective and scope.
- While mapping, we have to shift our paradigms from Euclidean geometry and Gaussian thinking to fractal geometry and Paretian thinking, because
 - Scaling is **more normal than normal** distribution.
 - Head/tail breaks is **more natural than** natural breaks.
- Scaling **can, should, and must** be formulated as the first law of cartography, because it has long been an iron law in other sciences, e.g., Zipf's law, Pareto law, Benford's law, Bradford's law, Lotka's law...