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

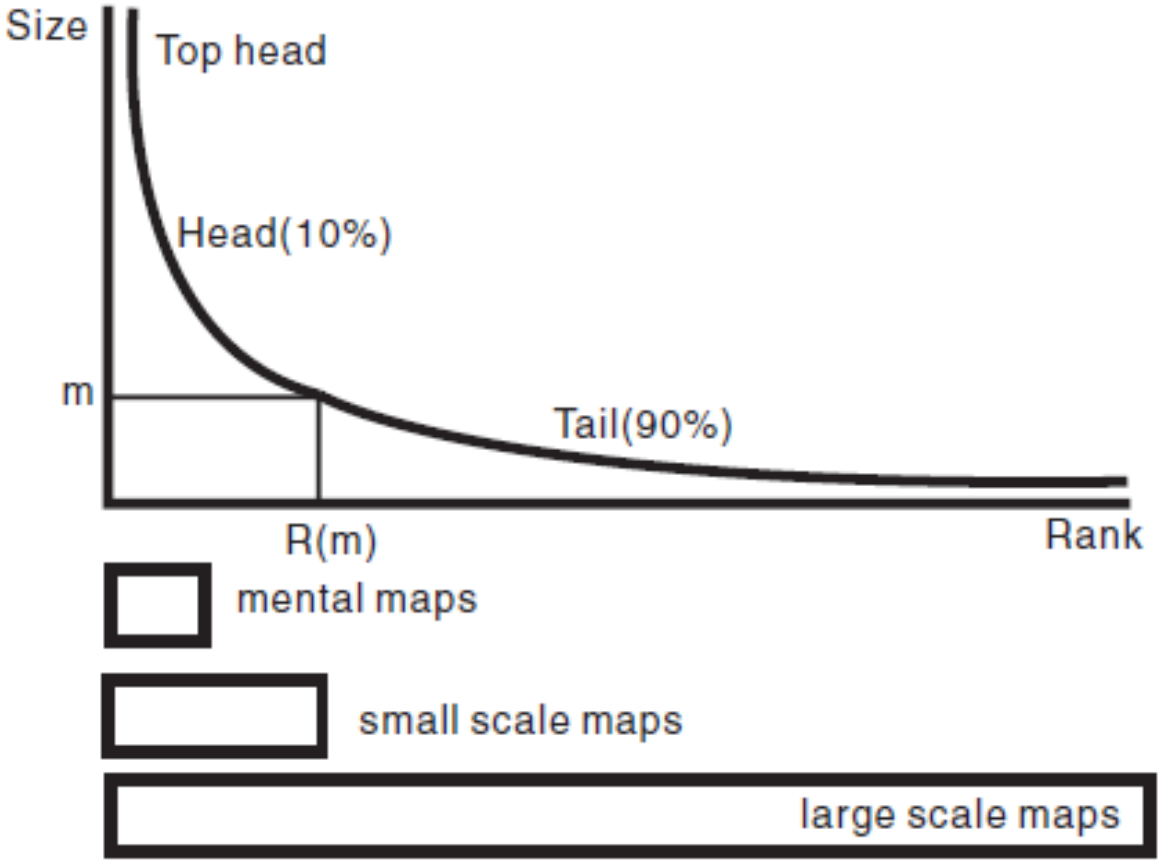
Scaling = far more small things than large ones

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 <= 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…