

# The Role of Geography in Automated Generalisation

Mackness, W.A.<sup>1</sup>, Gould, N.M.<sup>2</sup>

<sup>1</sup>School of GeoSciences, The University of Edinburgh  
Email: [william.mackness@ed.ac.uk](mailto:william.mackness@ed.ac.uk)

<sup>2</sup>Geography and Environmental Management, Manchester Metropolitan University Email:  
[nickgould@live.co.uk](mailto:nickgould@live.co.uk)



# Key message

- A need to explore beyond the topographic
- Revise our thinking about what the purpose of generalisation is: *making sense of things*
- Stress the importance of the geographic in the design task

# A topographic legacy

Focus on the topographic:

- Frameworks for generalising *existing* data
- Task: data reduction
- Customer: generalist
- Question: open ended

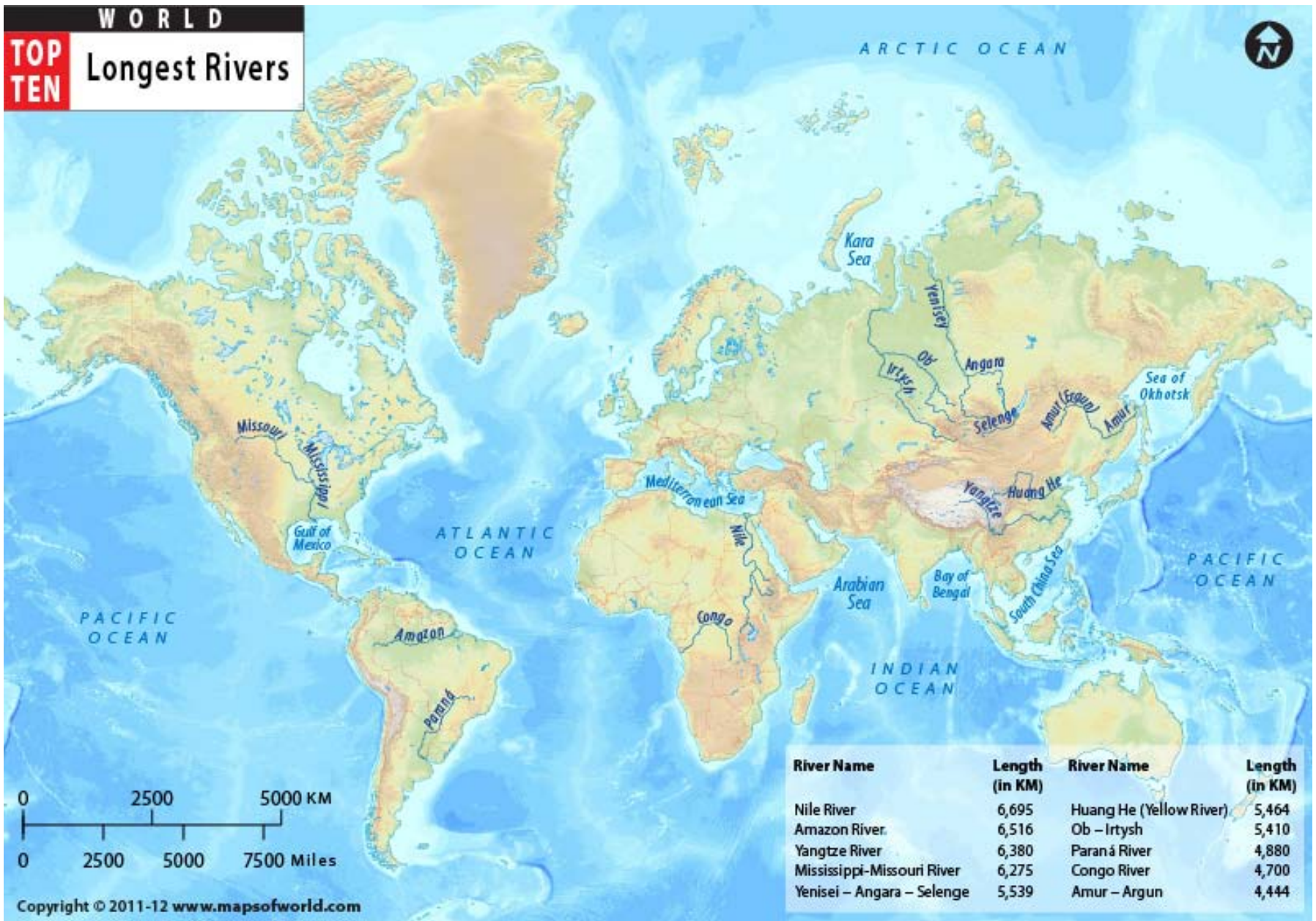
# A thematic perspective:

Instead:

- Start from a blank canvas
- Start with a question:

‘A map showing the name / location of the 10 longest rivers in the world please’

**WORLD**  
**TOP TEN** Longest Rivers



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geographic  
reasoning:

## 1. Models that link the query/ task to the selection of scale

- 10 longest rivers requires a global image
- Salient info: 10 rivers can fit on A4/A5 paper
- So a scale 1: 150,000,000 seems fair

geographic  
reasoning:

## 2. Models that select contextual content based on salient content

Geographical context is fundamental to meaning

- **Salient:** rivers (length, name) for the whole world
- Dataset of 'lake systems', (density, size, name);
- **Contextualising:**
- Outline of the continents (name)
- relief map of the world (height information)
- Dataset of sea regions (name, depth)

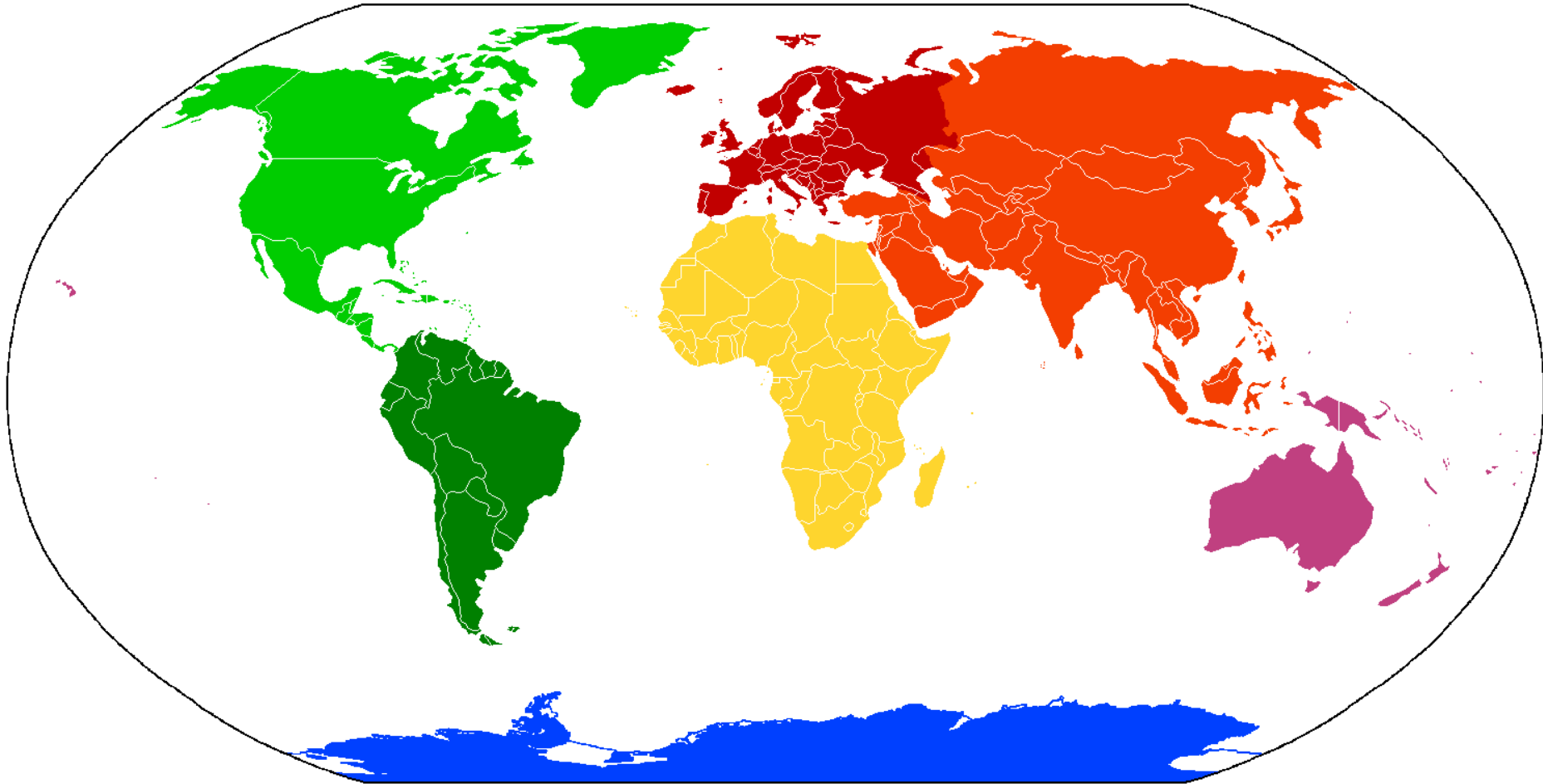
cartographic  
reasoning:

### 3. Content Models linked to generalisation methods

- What if we modify the task: say, show the 30 longest rivers?
- Would A5/ 1: 150,000,000 no longer be suitable?
- Solution: A5 but with continents colour coded according to how many rivers per continent



# Longest rivers by continent



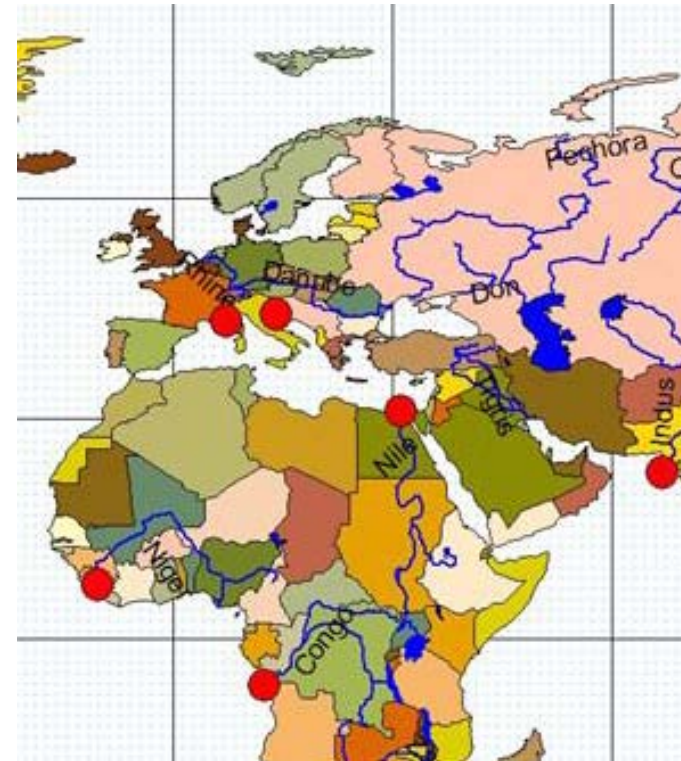
geographic reasoning: **4. Saliency/ contextual models that control the choice & degree of generalisation method**

- Salient information is generalised differently from contextual information
- Less detail in the contextual, softer choice of colours
- Greater flexibility in removal of contextual if salient not sufficiently discernible



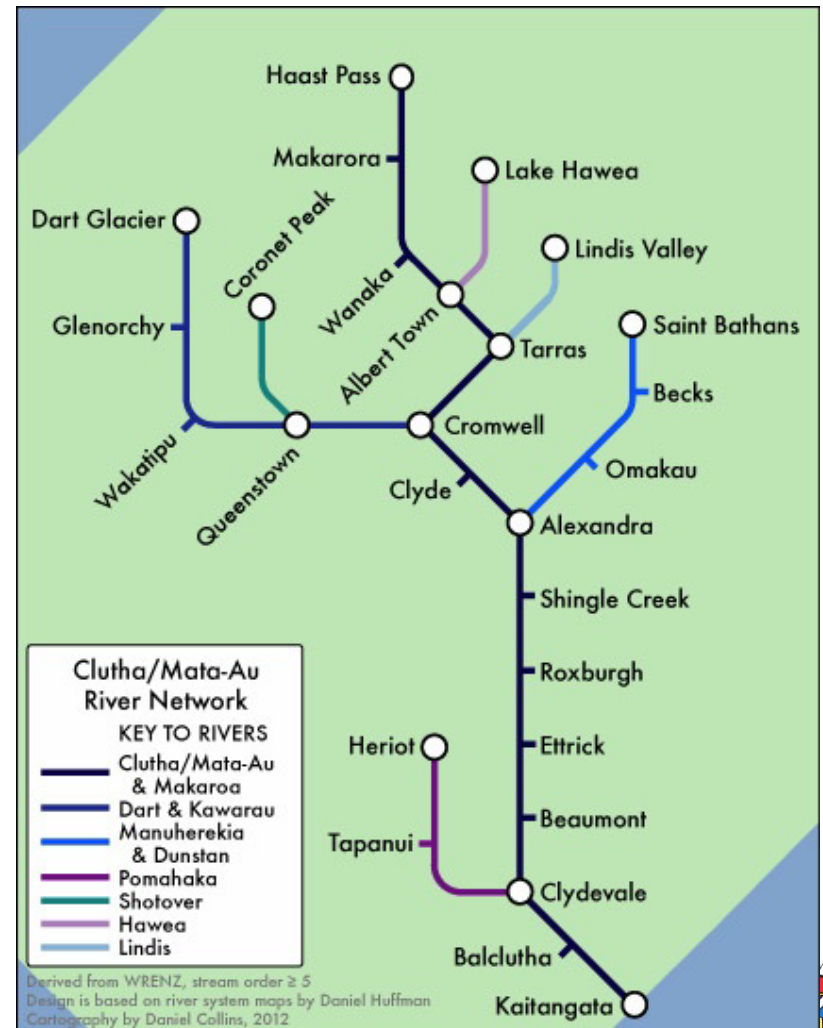
geographic reasoning: **5. Scale models that govern the importance ascribed to different content hierarchies**

- Salient/contextual: **not** a binary. Deltas for example:



geographic reasoning: **6: Explicit modelling/ preservation of relationships during map generalisation**

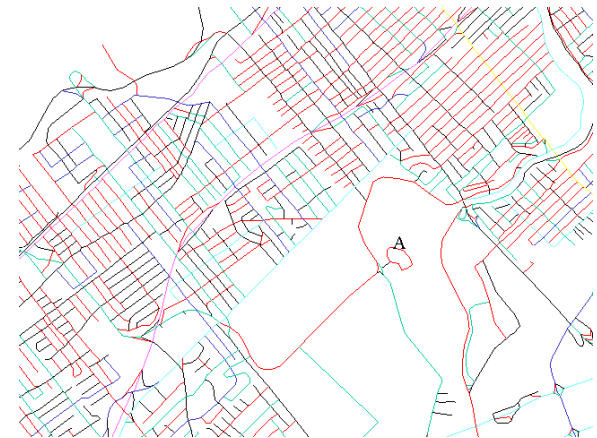
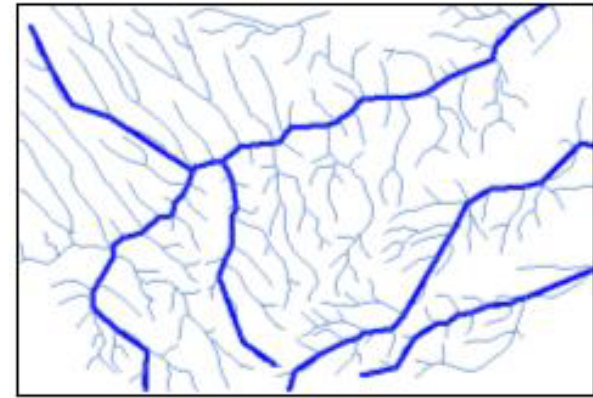
- Geography of the relationship between entities imposes constraints on the generalisation process.



geographic  
reasoning:

## 7: generalisation algorithms sensitive to the behaviour of the entity

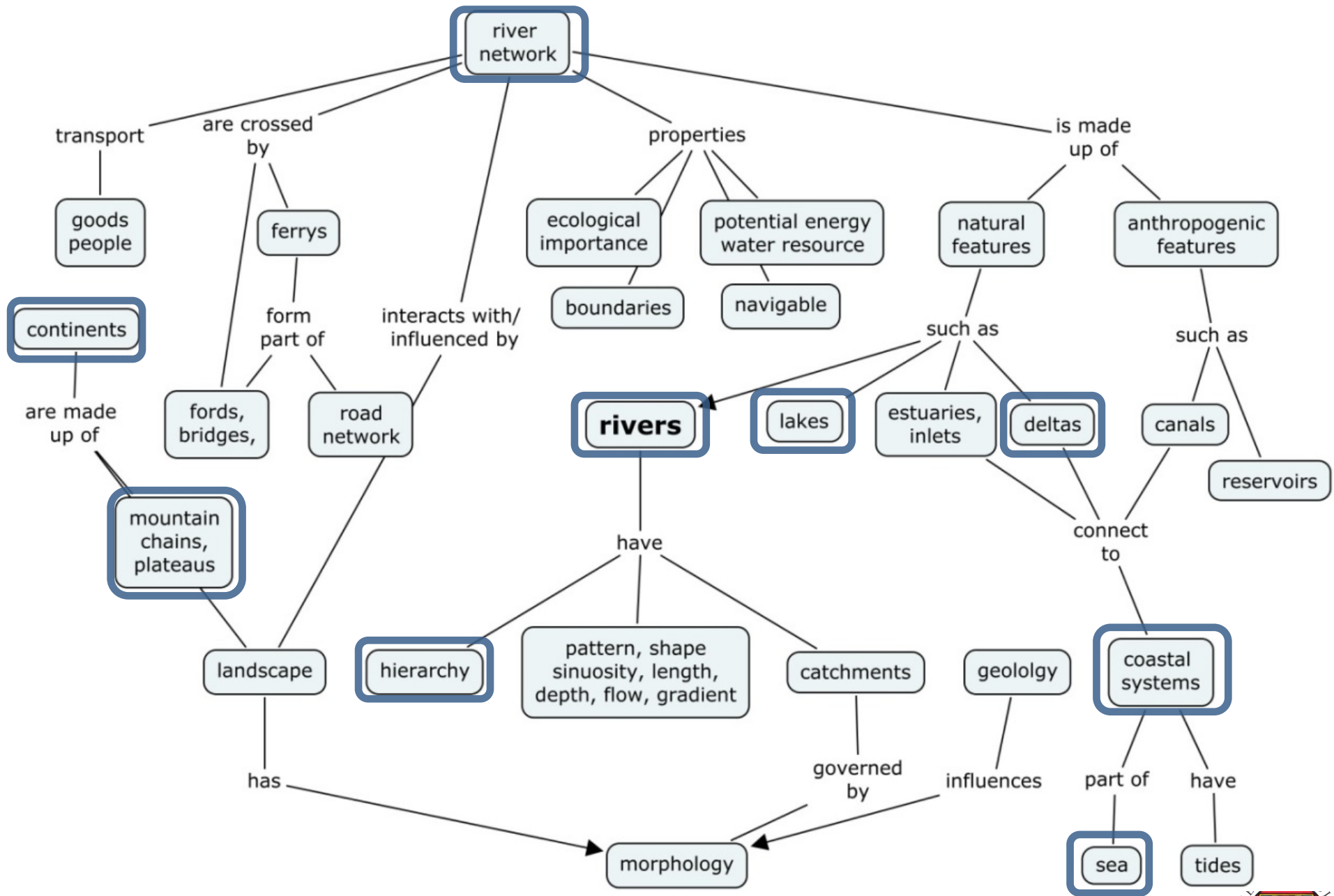
- Geography governs the form of generalisation
- For example: generalisation of natural a cyclic networks is different from anthropogenic ones.



- ‘cartographic generalisation will not reduce to a solution by a lock-step set of deterministic rules’  
Armstrong 1991, p86
- ‘progress in cartographic generalisation will be achieved by attempting to model and generalise real world objects rather than their cartographic representation’ Mark 1991 p104
- We need to model ‘internal meaning’ – properties specific to the entity, AND ‘external meaning’ – relationships among other phenomena. (Nyerges 1991)

Ontological  
modelling:

A need to explicitly model the  
relationships between entities





# Conclusion



# Conclusion

A reasoning system is only as effective as the geographical knowledge that informs it.

We need to ensure that geography centrally underpins all that we do in map generalisation.

From an epistemological perspective, map generalisation should be about revealing different patterns and relationships among geographic phenomena