

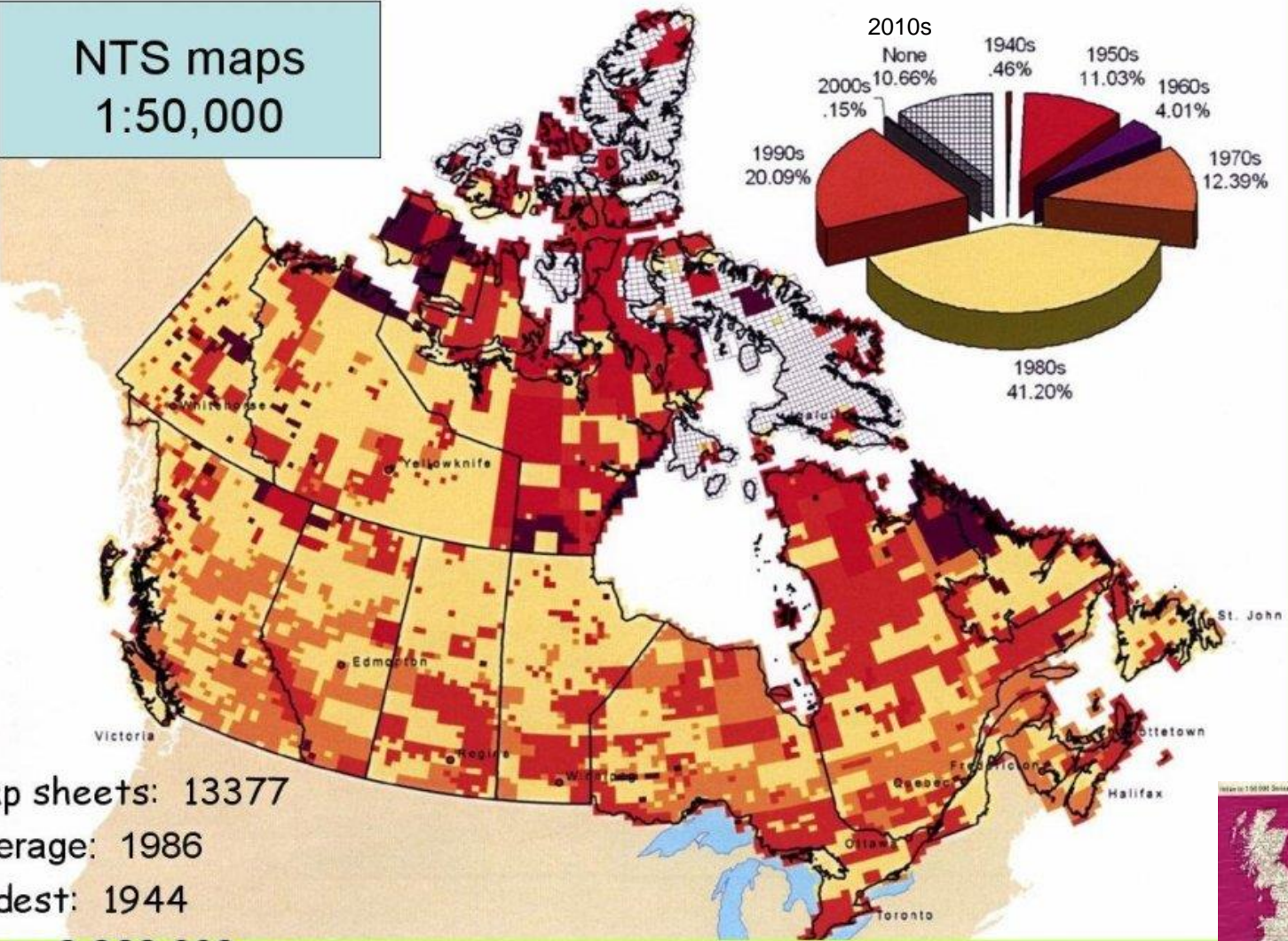
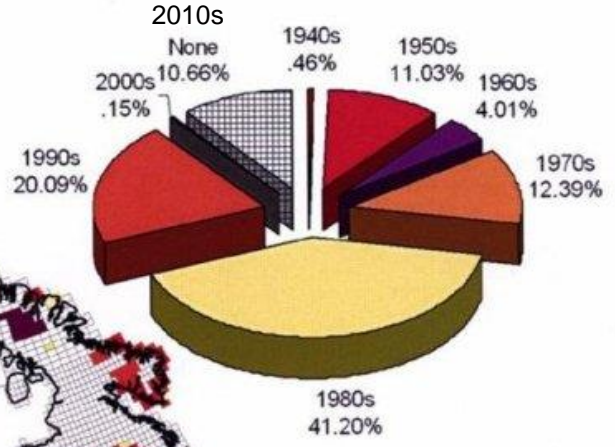
Map Basics lecture - summary

- The nature of mapping
- Maps and data layers
- Types of maps / data
- Uses of maps / data
- Map Scales

Coordinates - Next lecture

The nature of mapping: 1a. Mapping is never finished (especially here)

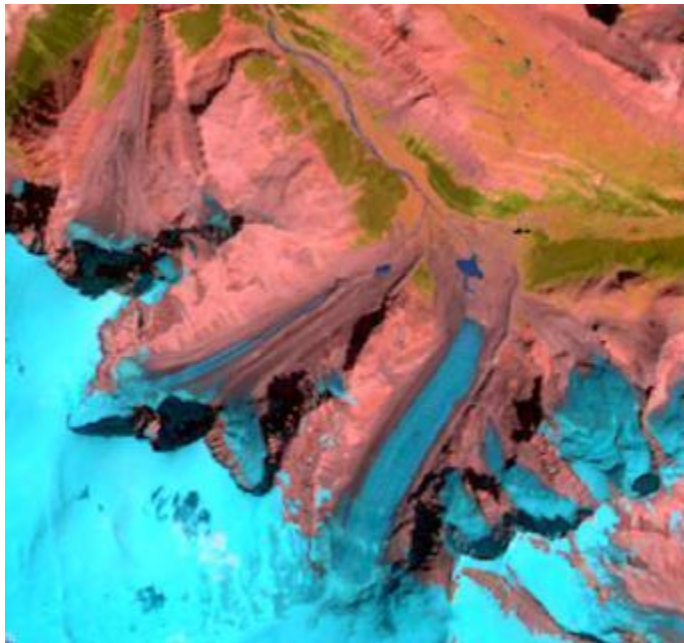
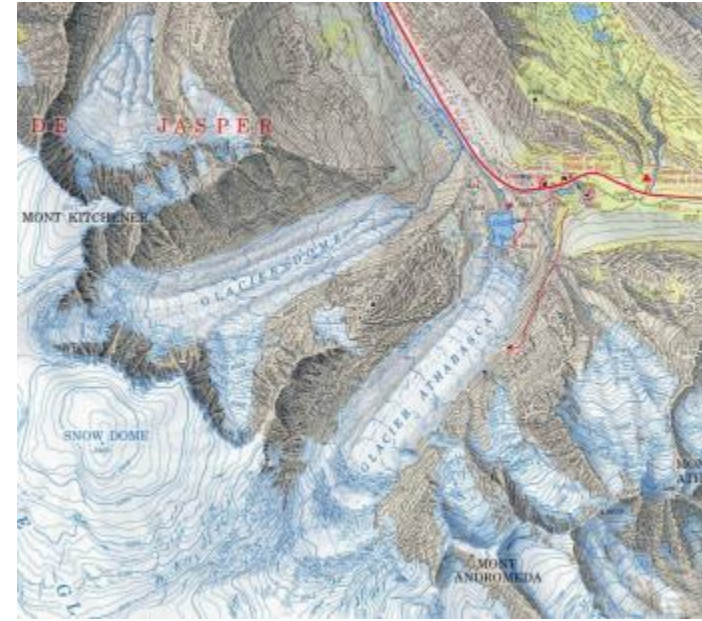
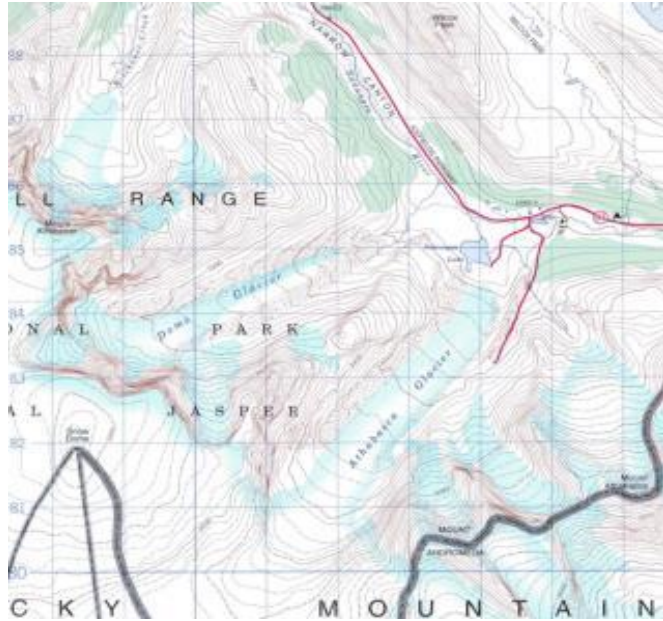
NTS maps
1:50,000



Map sheets: 13377
Average: 1986
Oldest: 1944
Area: 9,988,029 sq km
BC: 1168 map sheets



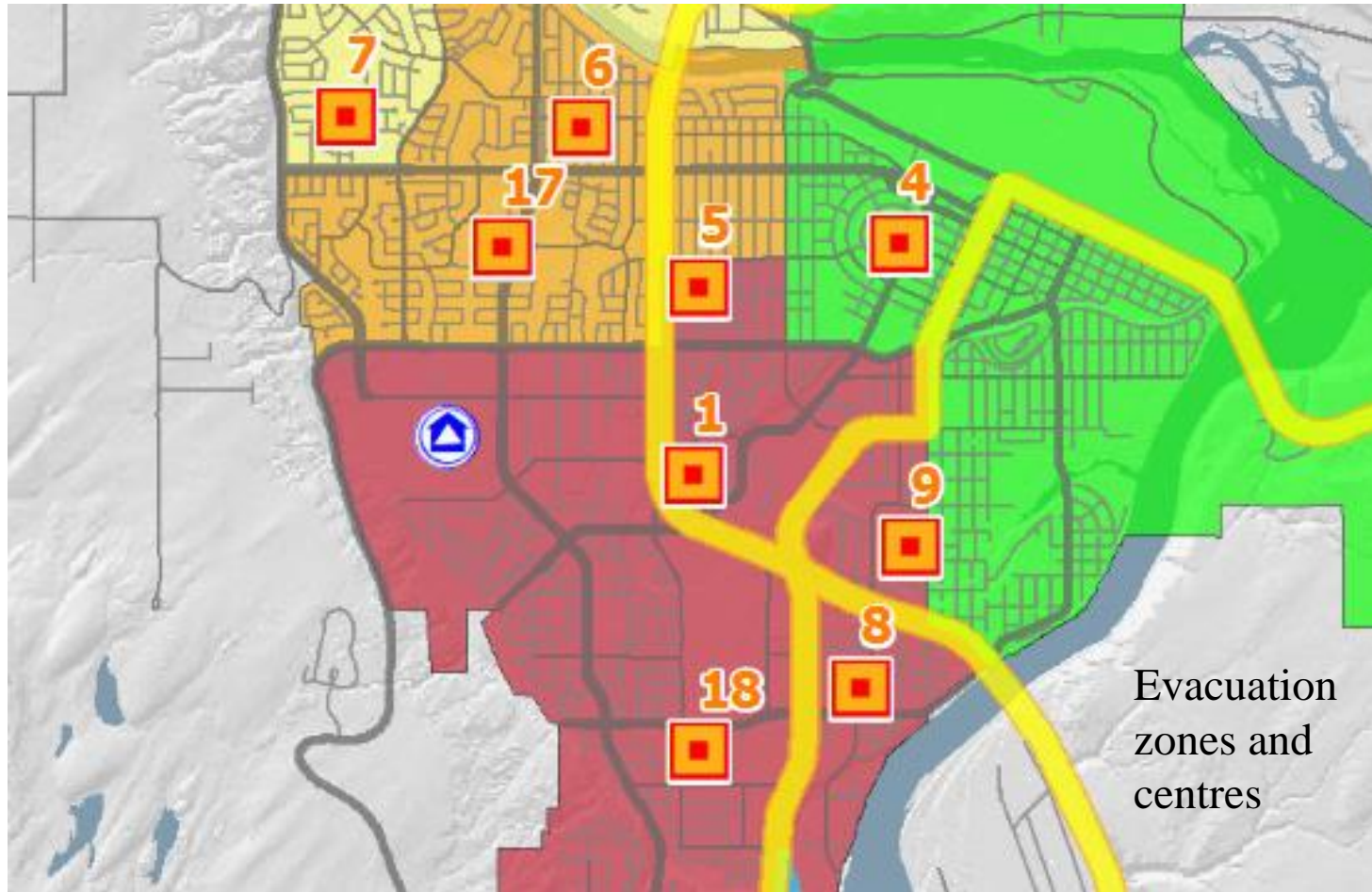
1b. There are multiple types / scales of maps for the same area



2. Maps and data layers

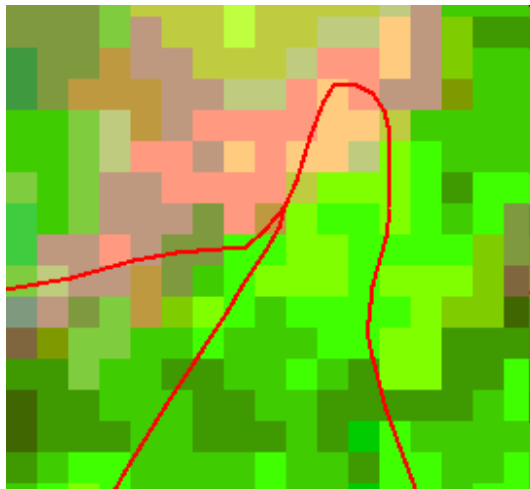
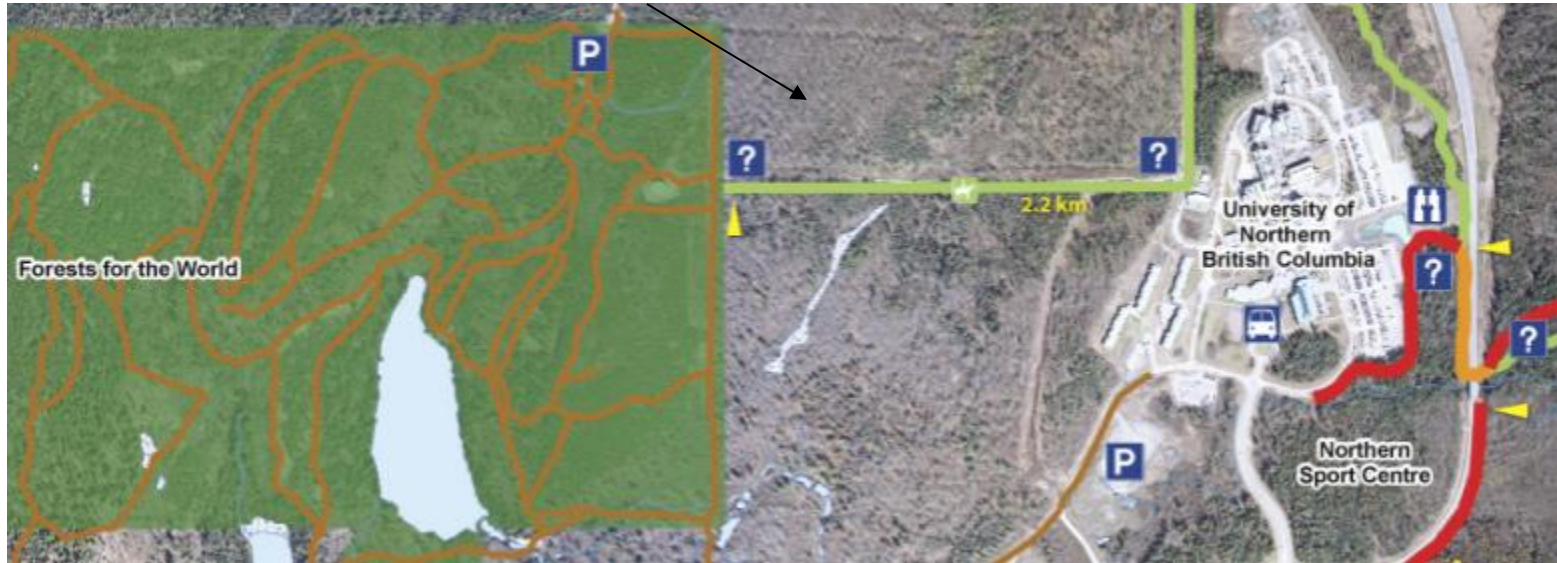
Maps and datasets are composed of layers or themes –
'feature' types are organised in **layers** e.g. roads, rivers etc..

There are three (vector) types: points, lines and areas (=polygons in GIS)



Raster (grid) layers

In addition to the 3 'feature' types, there are continuous grids (rasters) e.g. for air photos, images, relief models



Pixels

'picture elements'



3. Types of Maps and data

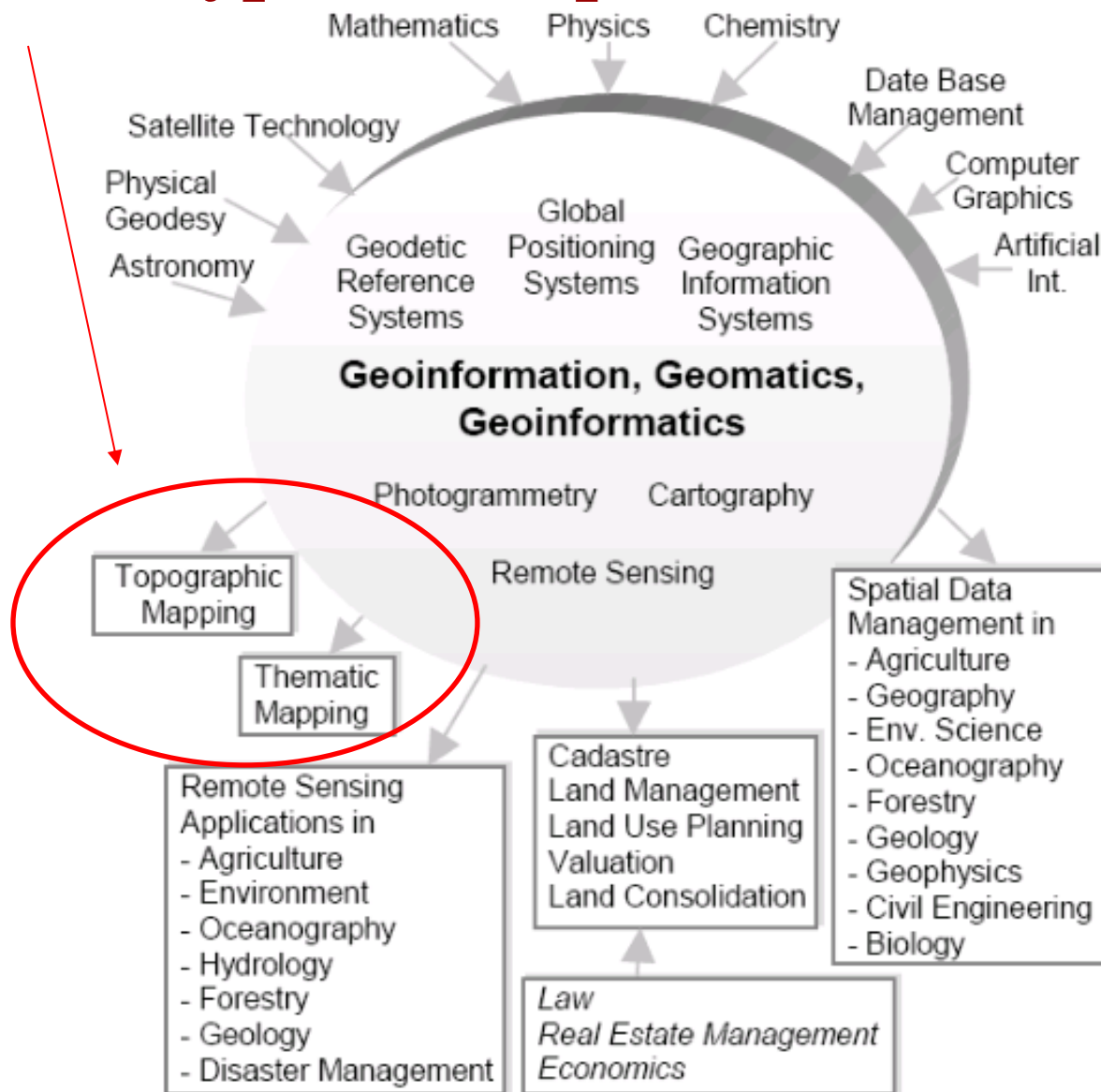
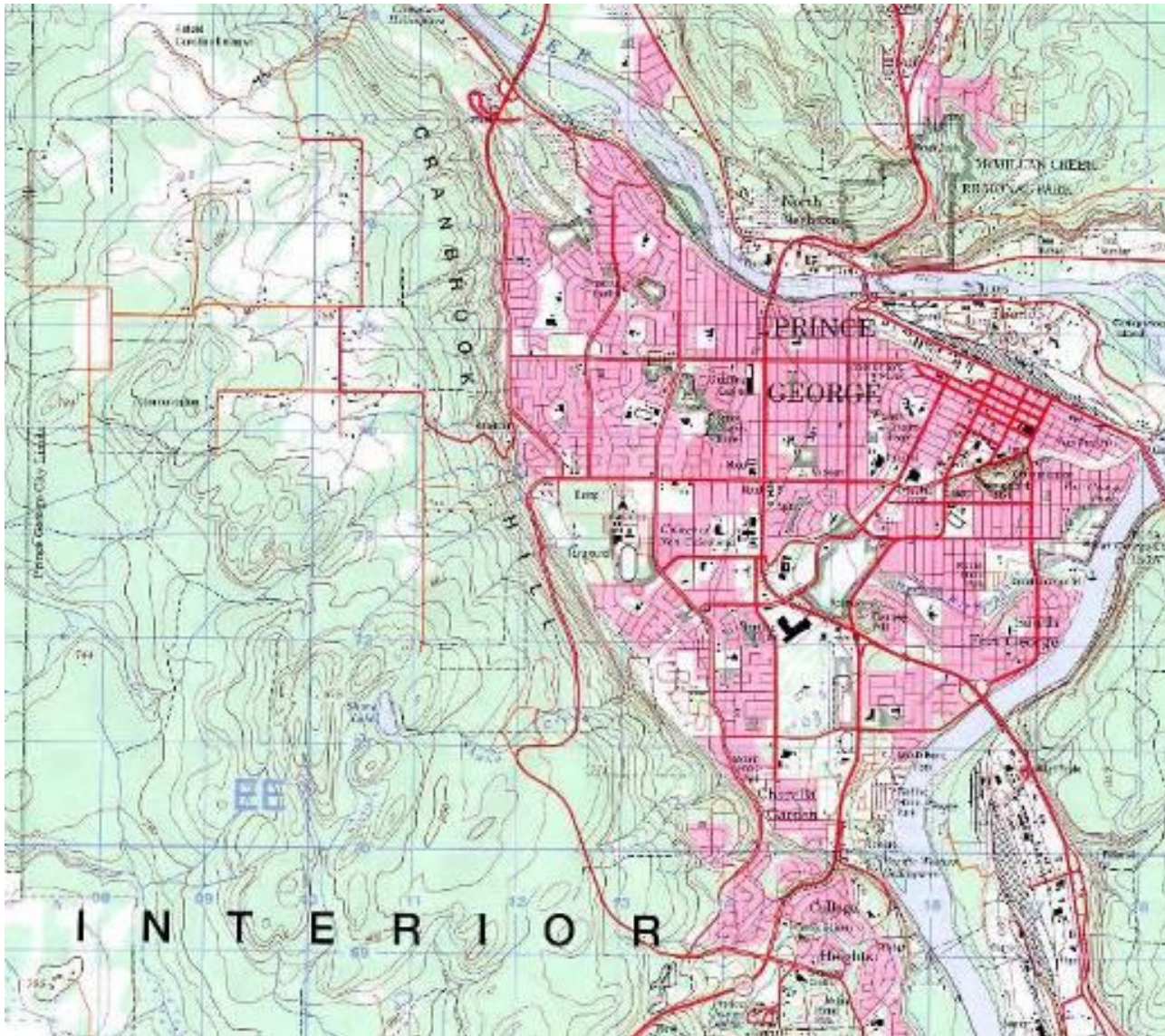


Figure 1. Geomatics (After Konecny, 2002)

a. General purpose (topographic) – ‘base layers’

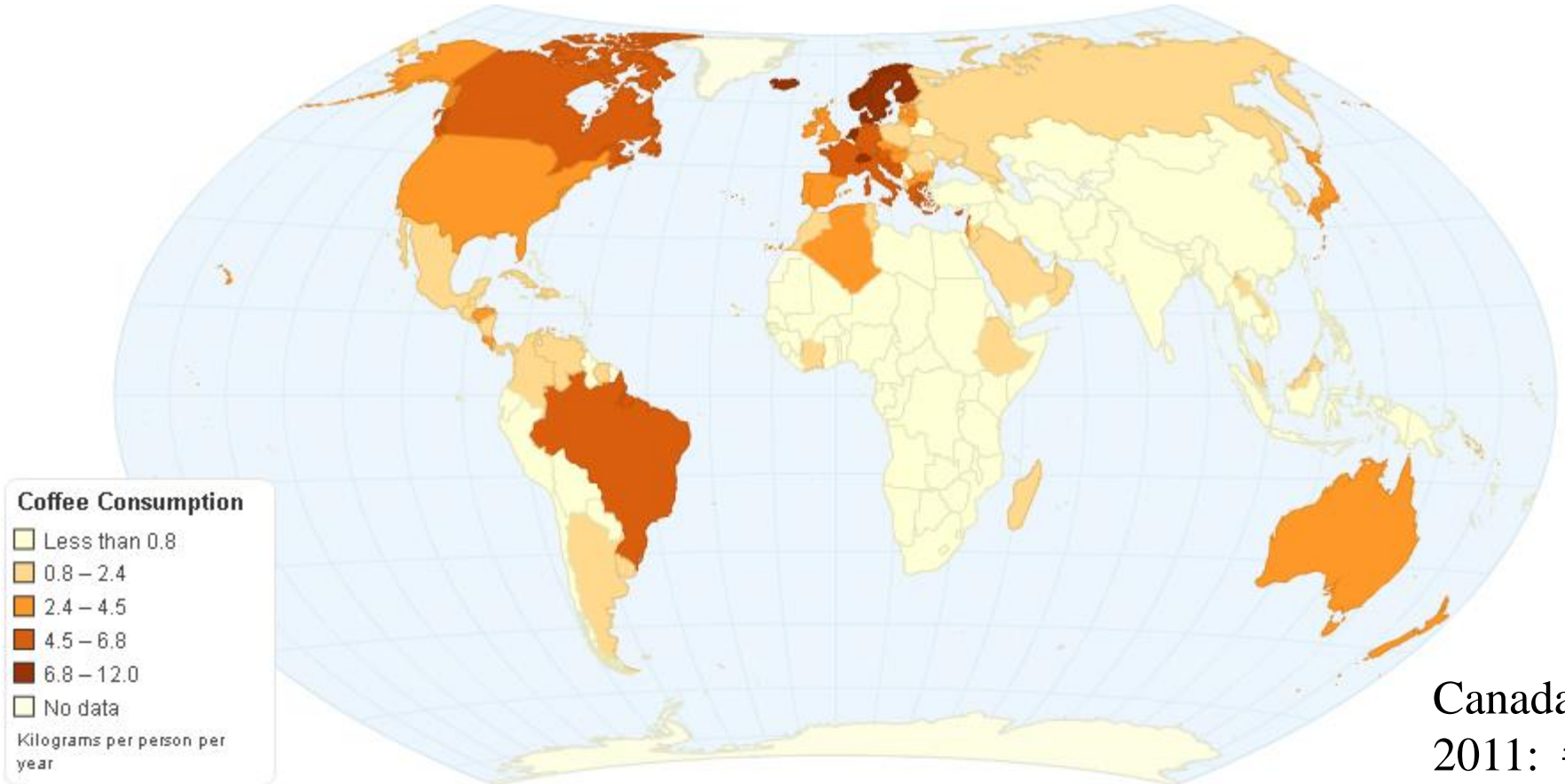
These show the **visible features of the landscape** e.g. relief, water, roads
- also base maps, relief maps, city maps (and nautical charts)



b. Special purpose (thematic)

Emphasis is placed on a particular element

e.g. climate, geology, population density, industry.

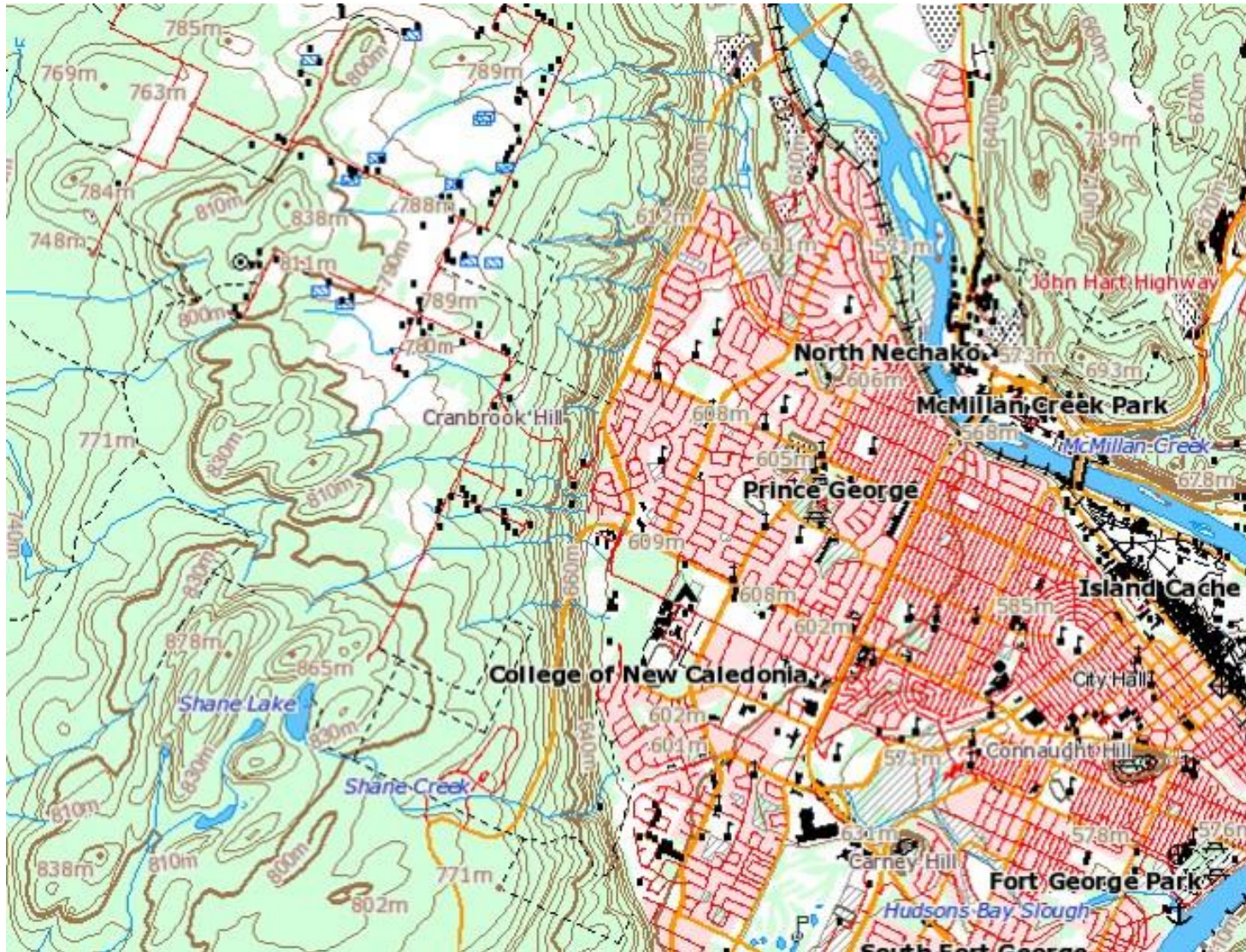


Canada:
2011: #12
2025: #11

Global coffee consumption

4. Purpose of Maps / spatial data

A. Display and store of spatial information



B. Historical record of spatial features (time)

[though old maps may show change / techniques / knowledge]



Europe: Map series 1800-> <https://maps.nls.uk/geo>
Canada does not have many multi-date map sets and only displays the most recent

Purpose of Maps & Spatial data

A. Display and store of spatial information

B. Historical record of spatial features



Kakwa Park, BC 1920
Adjacent to BC-AB border



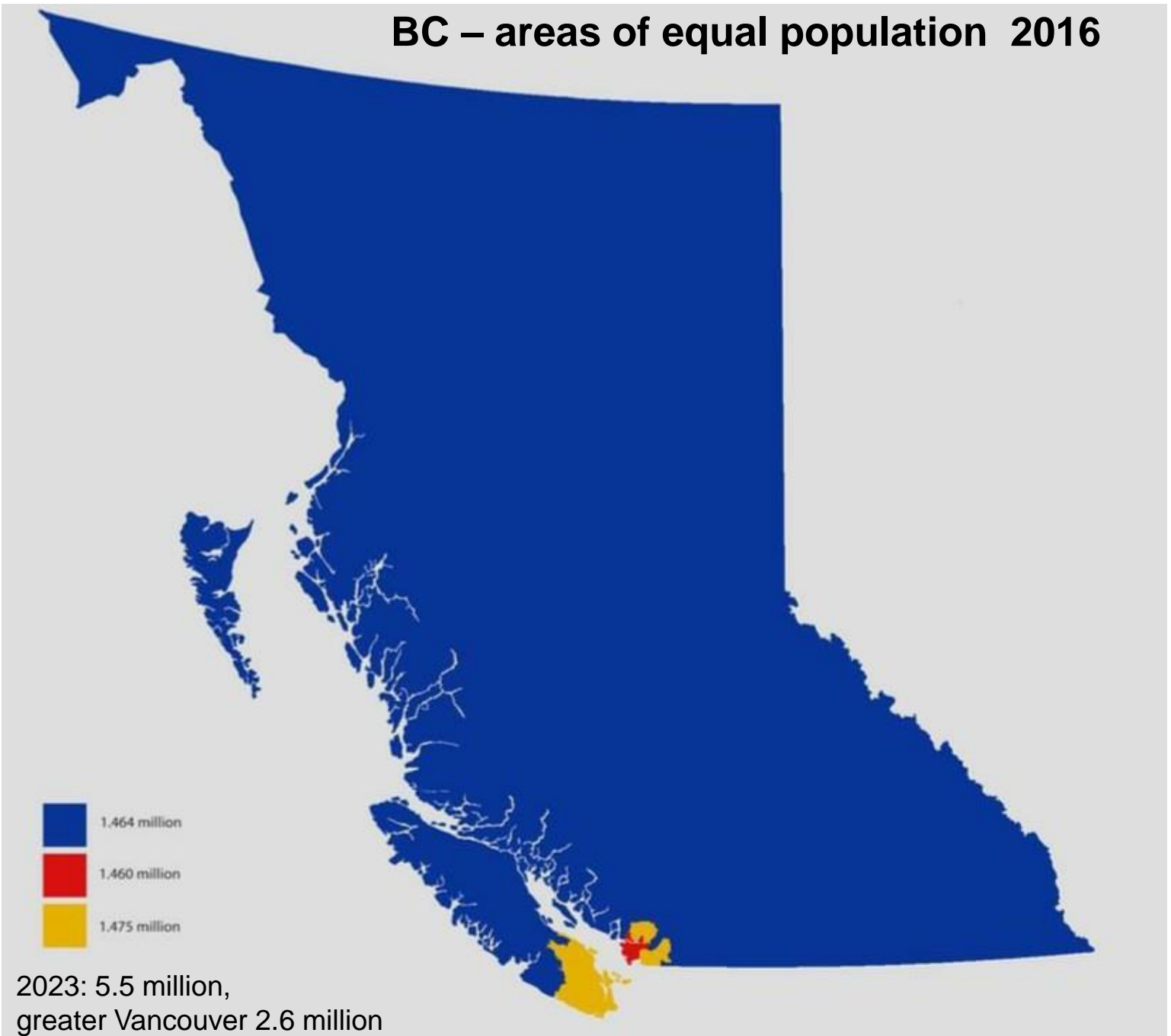
2010 (Google maps)

Purpose of maps: C. Communication tool

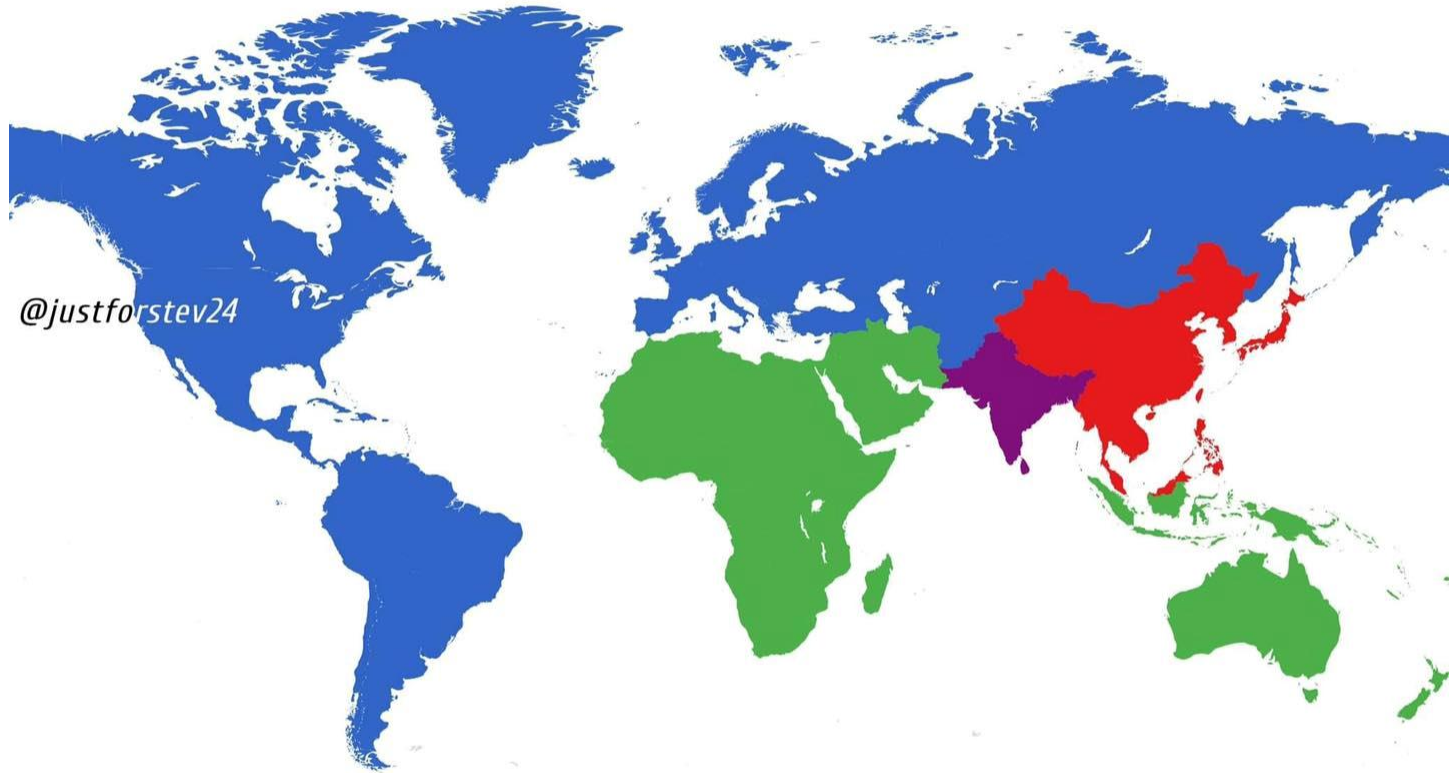


What is the red line at $\sim 46^\circ\text{N}$?

BC – areas of equal population 2016



THE WORLD DIVIDED IN 4 EQUAL PARTS



@justforstev24

 2 BILLION PEOPLE

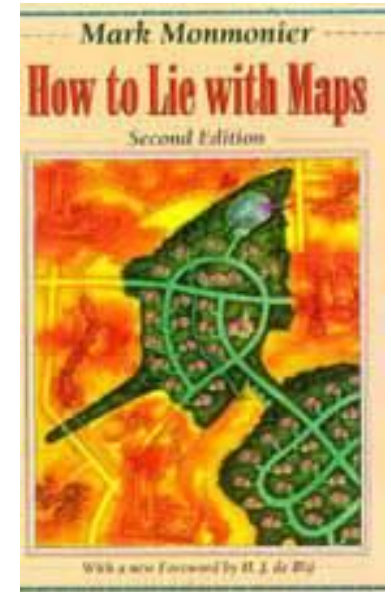
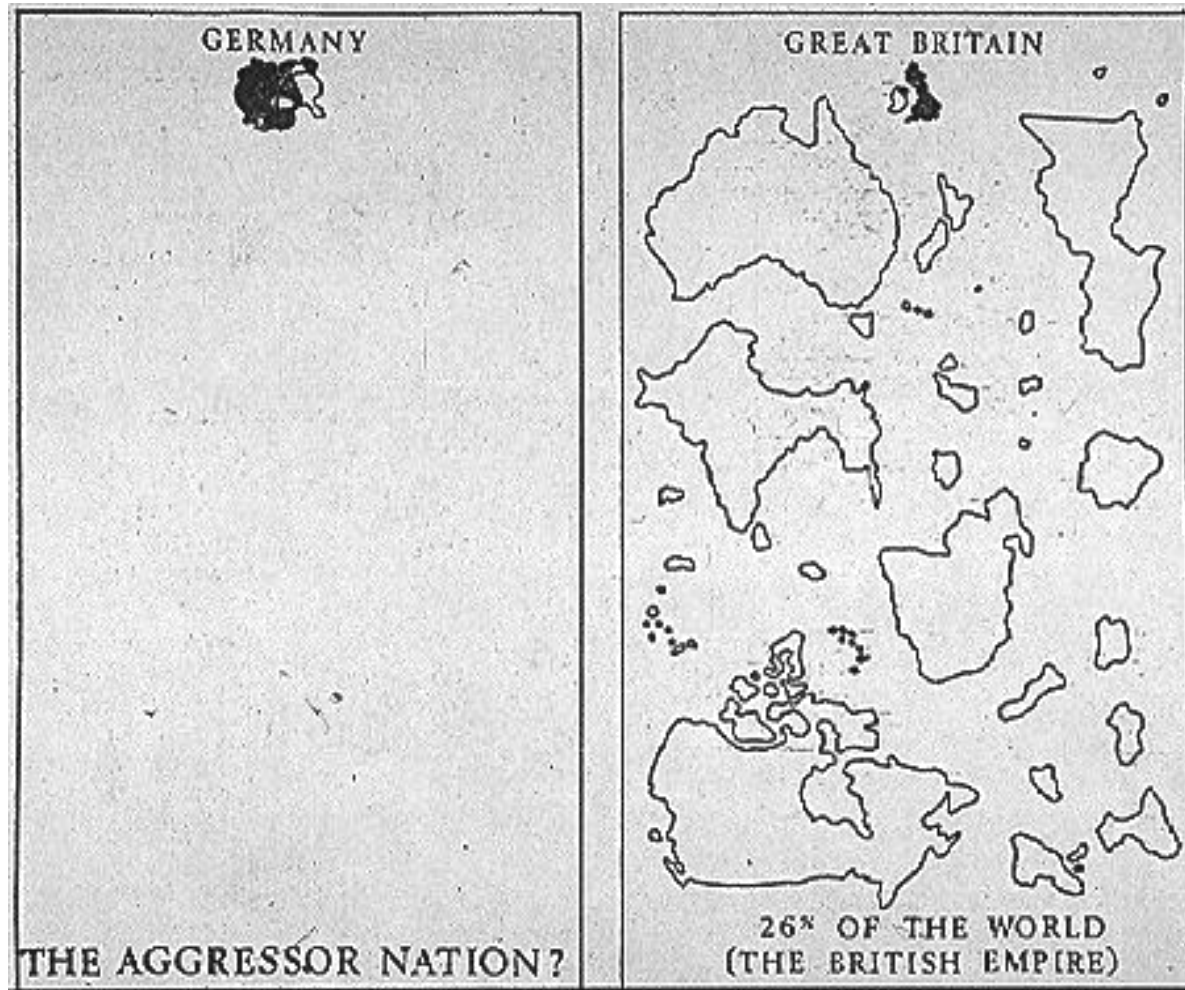
 2 BILLION PEOPLE

 2 BILLION PEOPLE

 2 BILLION PEOPLE

General Uses of Maps & Spatial data

Communication tool e.g. propaganda



German propaganda, world war II

Modern propaganda ?

Map image implies supertanker safety (by omitting islands) accidentally or not

Image screen captured from Route Flyover Ad at duration point 0:39:



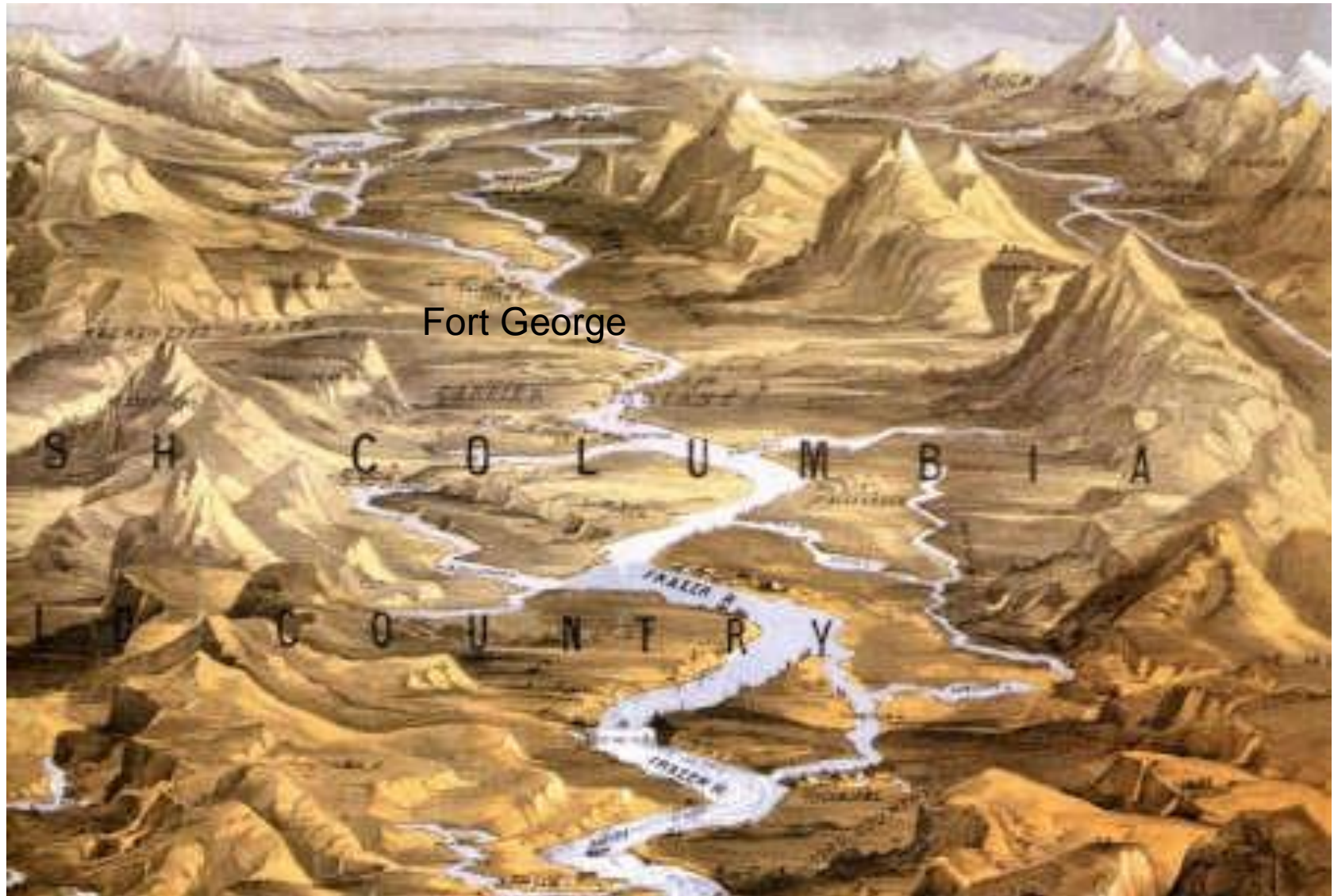
Image above adjusted to include representations of the islands that lie within the waterway (islands added by Lori Waters)



Critical Cartography
.. differs from academic **cartography** in that it links geographic knowledge with political power.

General Uses of Maps & Spatial data

Communication propaganda: Promoting BC during the Gold Rush, 1858



D. Maps as works of art (and often functional)

Maps of Whistler Blackcomb, Grouse Mountain and Sun Peaks among James Niehues many paintings.

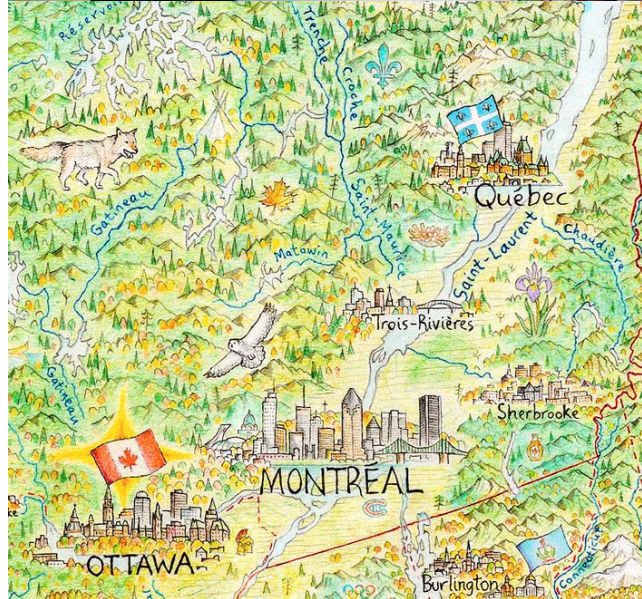
CBC News · Posted: Mar 31, 2019 6:00 PM PT | Last Updated: March 31, 2019



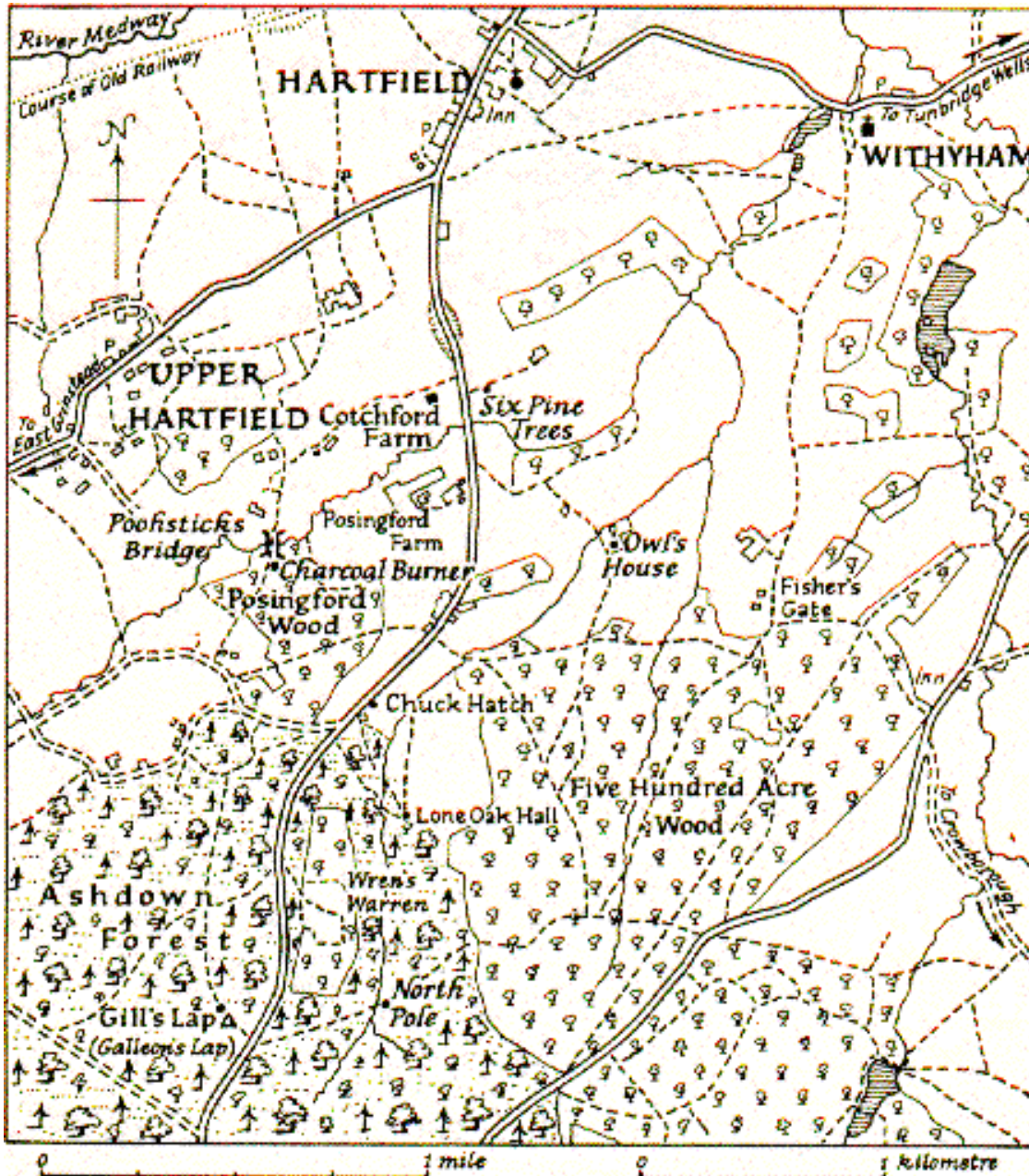
<https://www.outsideonline.com/2376261/man-behind-ski-maps>

Maps as works of art

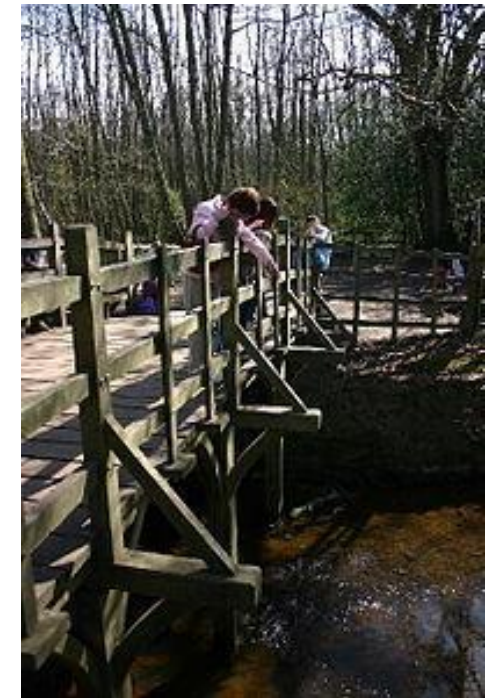
<http://www.antonthomasart.com>



E. 'Vicarious' travel = experienced in the imagination



Maps are portals to new worlds



One hot day in Saskatoon, 1978



5. Map Scales

The concept of scale is fundamental to mapping ...

Scale represents the reduction compared to the distances on the earth's surface.

Without a scale, it is more a 'diagram', (not a map)

Scale can be given in 3 ways:

a. Verbal statement

- For example, 1 cm to 10 km, 1 inch to 1 mile
- Verbal statements are simple to understand
- They are 'unit-dependent'

b. Ratio or 'representative fraction (RF)'

- This states the reduction as a ratio of fraction
e.g. 1:100,000 or 1/100,000
- It is free of specific units (metric or imperial)
- It can describe map series and datasets e.g. 1:50,000
... a default digital display
- 1:20,000 is a larger scale than 1:50,000 (reduced less)
(1/20,000 IS a bigger fraction than 1/50,000)

common world scales / map series / data

1:1,000,000 (world)

Small

1:500,000

1:250,000 (federal/provincial)

Medium

(1:100,000 and 1:125,000)

1:50,000 (federal)

Large

1:20,000 (provincial)

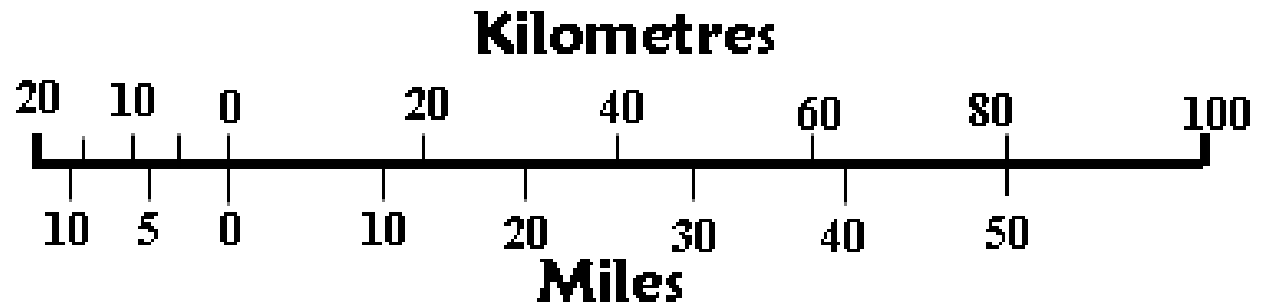
>1:10,000 (municipal)

Cadastral (civic)

c. Scale bar

- **Graphic**, units are stated e.g. kilometres or miles
- Scale bar adapts in size with zoom to match display

Topographic



Thematic



‘Classic’ traditional scale bars

Conversion between a ratio and a statement

To convert **1:250,000** to be a statement:

$$1 \text{ cm to } 250,000 \text{ cm} = 2500\text{m} = 2.5 \text{ km}$$

Scale is 1 cm to 2.5 km

In reverse: Get each side of the scale into the same units, e.g.:

To convert **1 cm to 1 km** into a ratio:

$$1 \text{ km} = 1000\text{m} = 100,000 \text{ cm}$$

So 1cm to 1km is the same as 1:100,000

common world scales / imperial series

Canada converted to metric post world war II

1: 506,880 1" = 8 miles -> 1:500,000 = 1cm:5km

1: 253,440 1" = 4 miles -> 1:250,000 = 1cm:2.5km

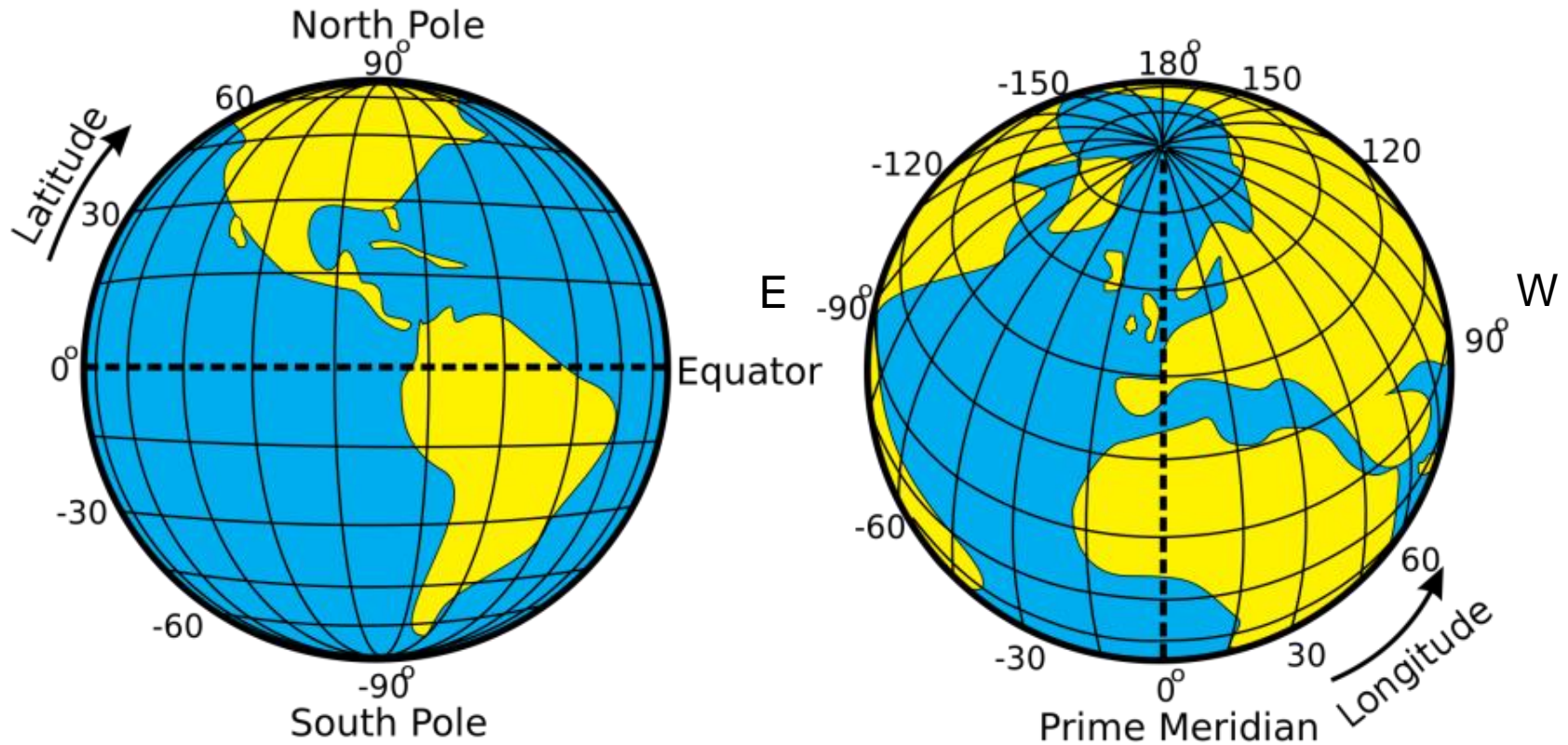
1: 63,360 1" = 1 mile -> 1:50,000 = 1cm:0.5km

1 mile = 1760 yards = 5280 feet = 63,360 inches

The world is metric except for Liberia, Myanmar and USA

6. Coordinates: e.g. N-S relative to the equator; E-W relative to Greenwich, UK

- The graticule is the imaginary grid of lines east-west lines of latitude (parallels) and north-south lines of longitude (meridians)



Tuesday's lecture and the following Moodle quiz