Summary of first lecture http://gis.unbc.ca

- **Most disciplines use maps /geomatics**
- **Maps help you see the world**
- **Mapping is a practical skill for jobs**
- **Map creation is ever increasing**
- **The Power of Maps (graphics)**
- **– see example next slide**

BOMB SIGHT

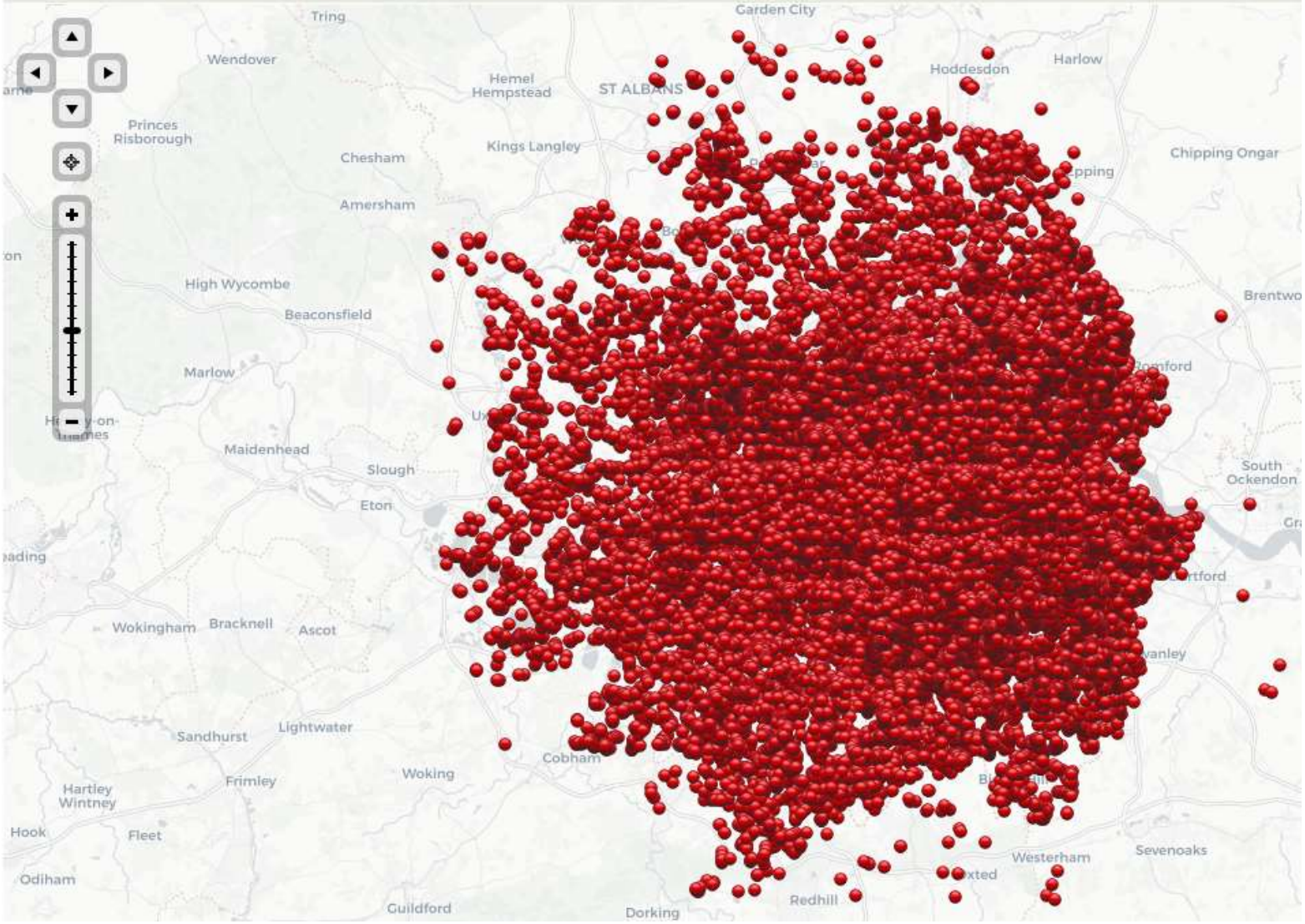
Mapping the WW2 bomb census

http://bombsight.org

Map | Explore London | About | FAQ | Data | Android App

EXPLORE THE LONDON BLITZ during 7th October 1940 to 6th June 1941

Type Street, Location ... | Aggregate Bomb Census | Information



Cartography and Geomatics

- **Cartography:** The art, science and technology of making maps

- **Geomatics:** An umbrella term for the mapping technologies

- **Map:** A (two-dimensional) scaled representation of a planetary surface ('traditional' definition)
  - includes printed maps, online displays, animations

Cartography versus GIS in the Geomatics umbrella

Cartography

Input -> **map design** -> Output

GIS

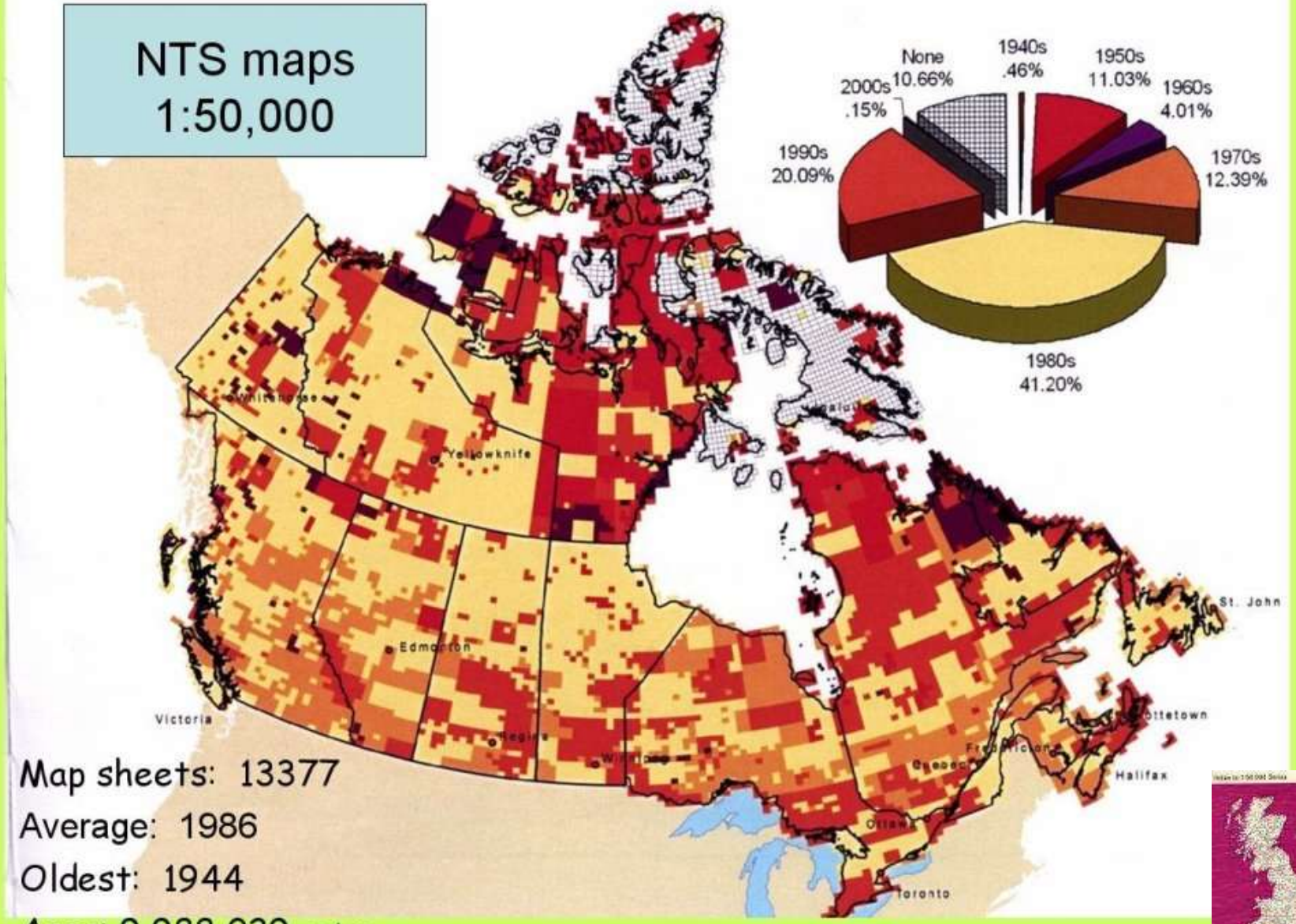
Input -> **Database -> Analysis** -> Output

Map Basics - summary

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

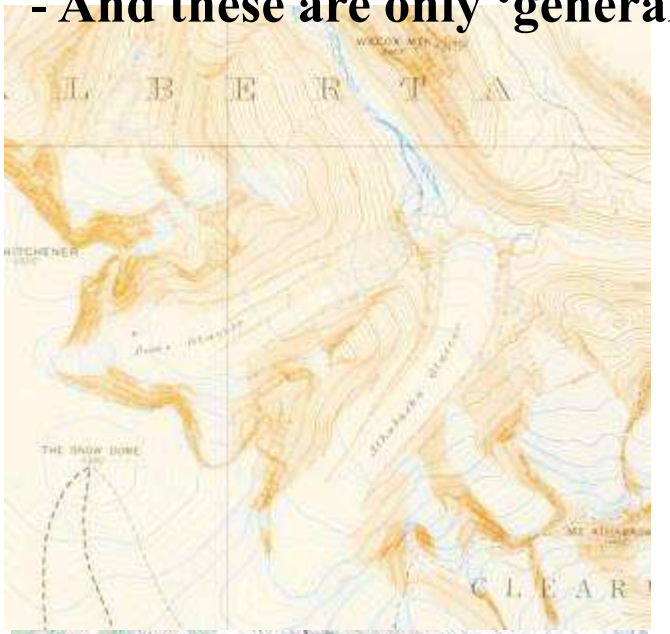
The nature of mapping:

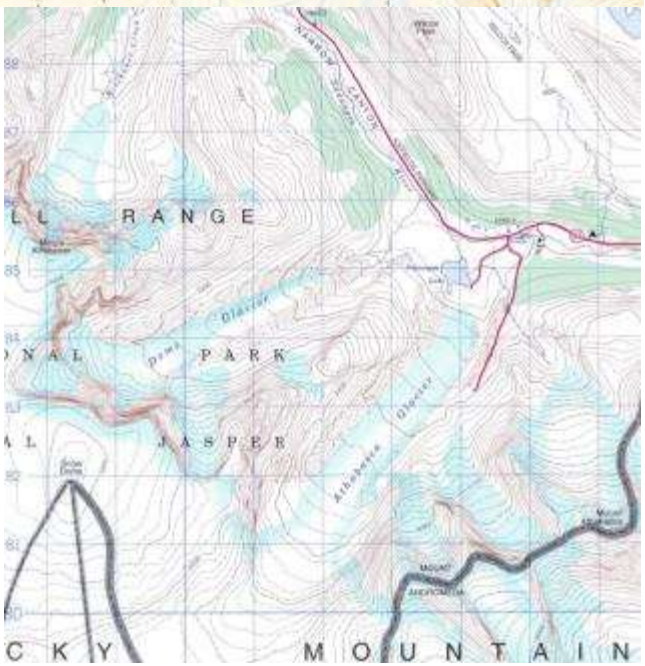
1a. Mapping is never finished (especially here)

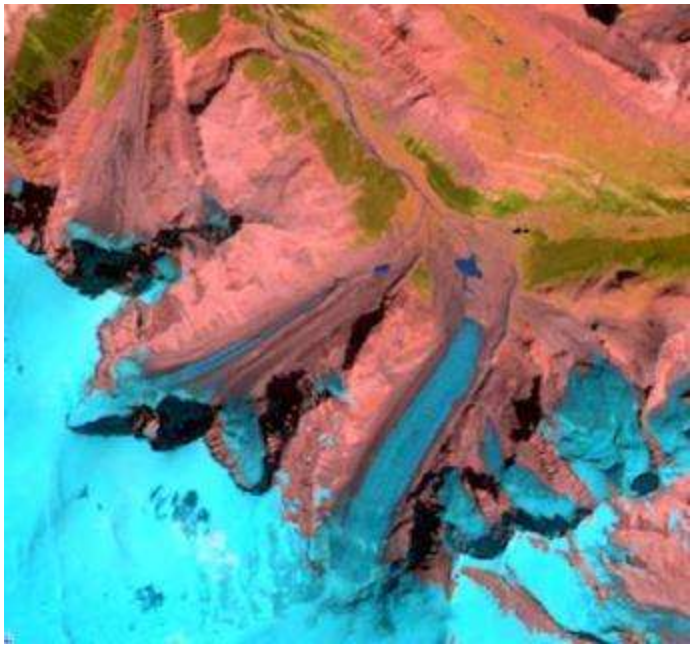


1b. There are multiple map products for the same area

- And these are only ‘general’ examples







2. Types of Maps and data

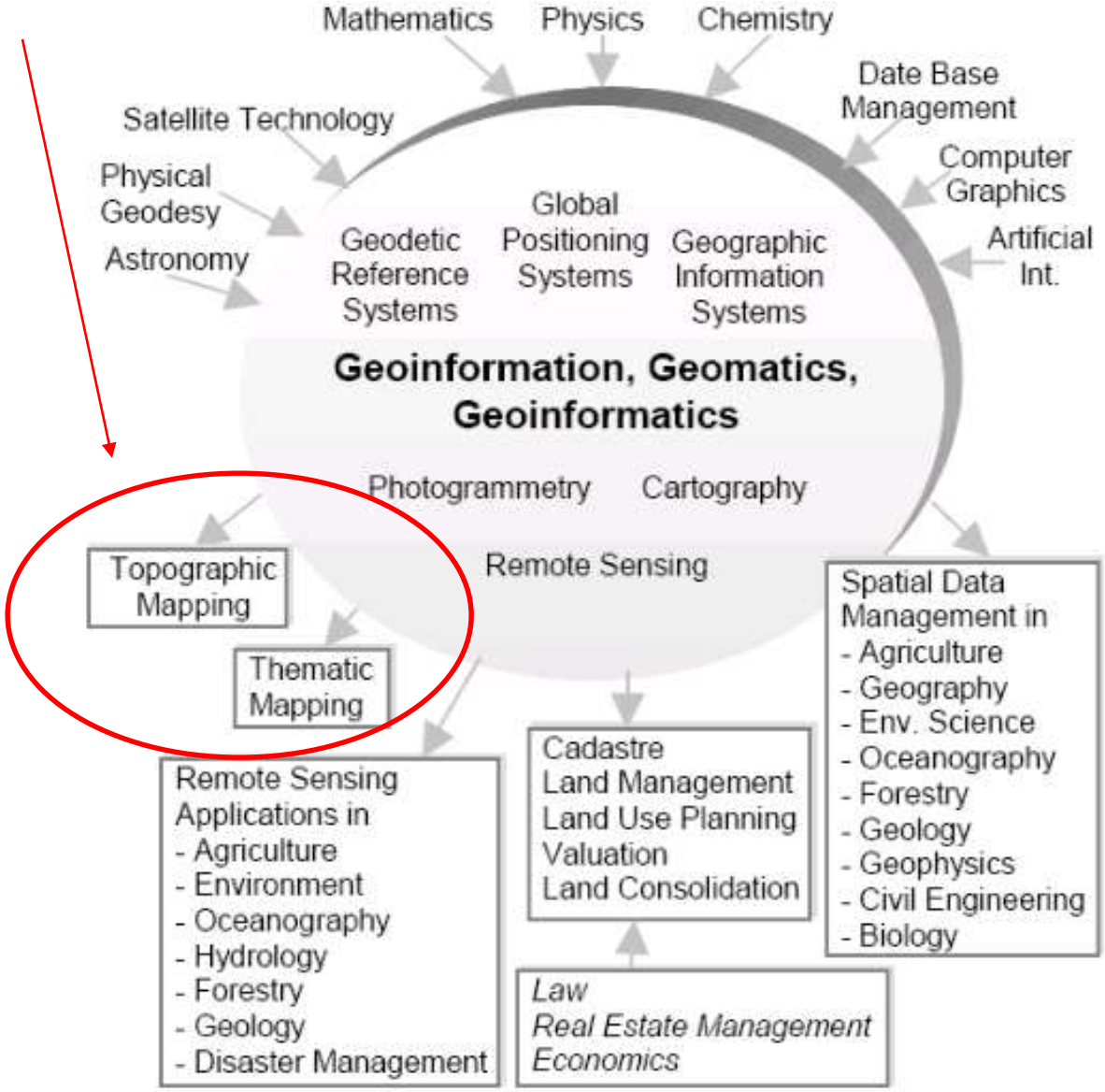
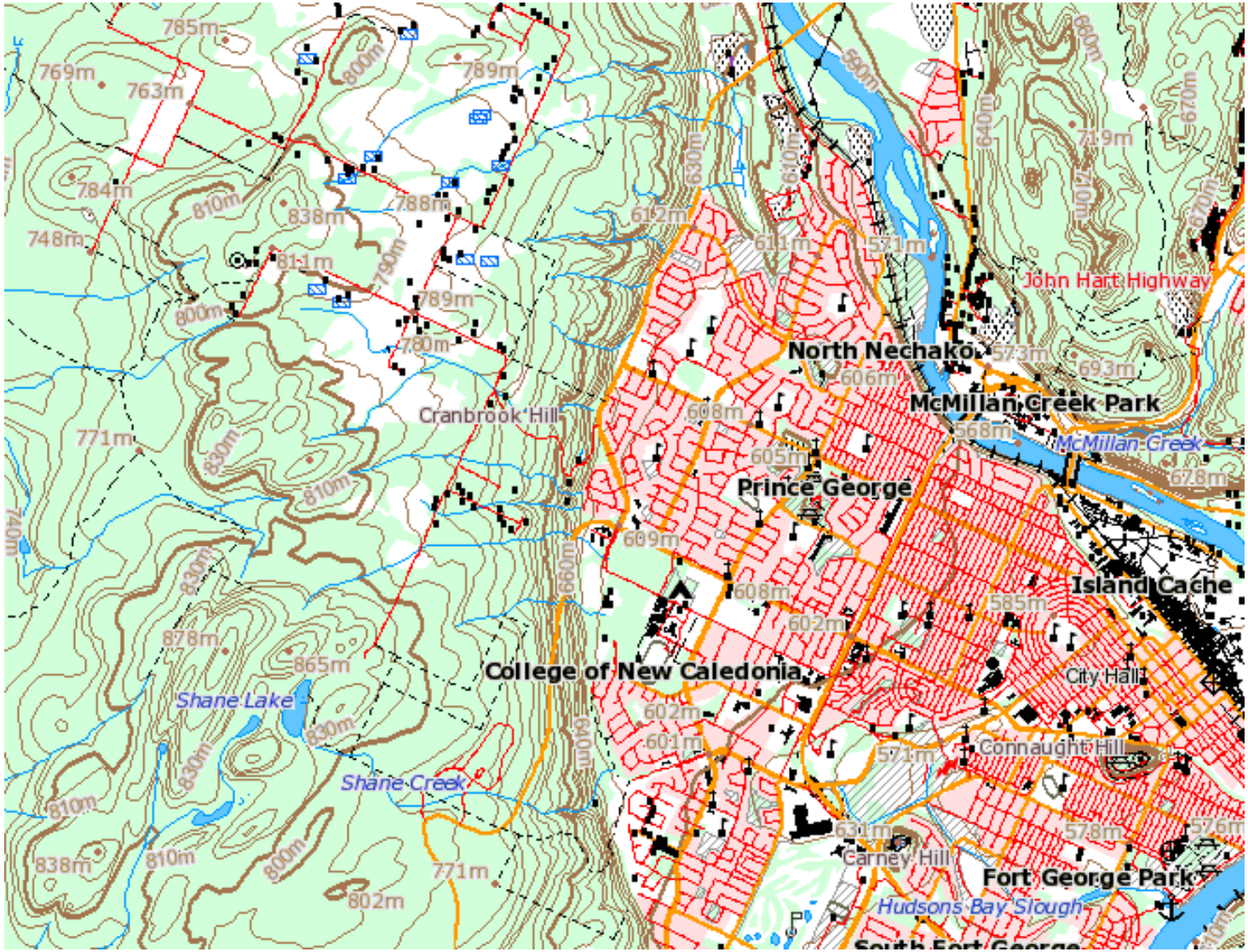


Figure 1. Geomatics (After Konecny, 2002)

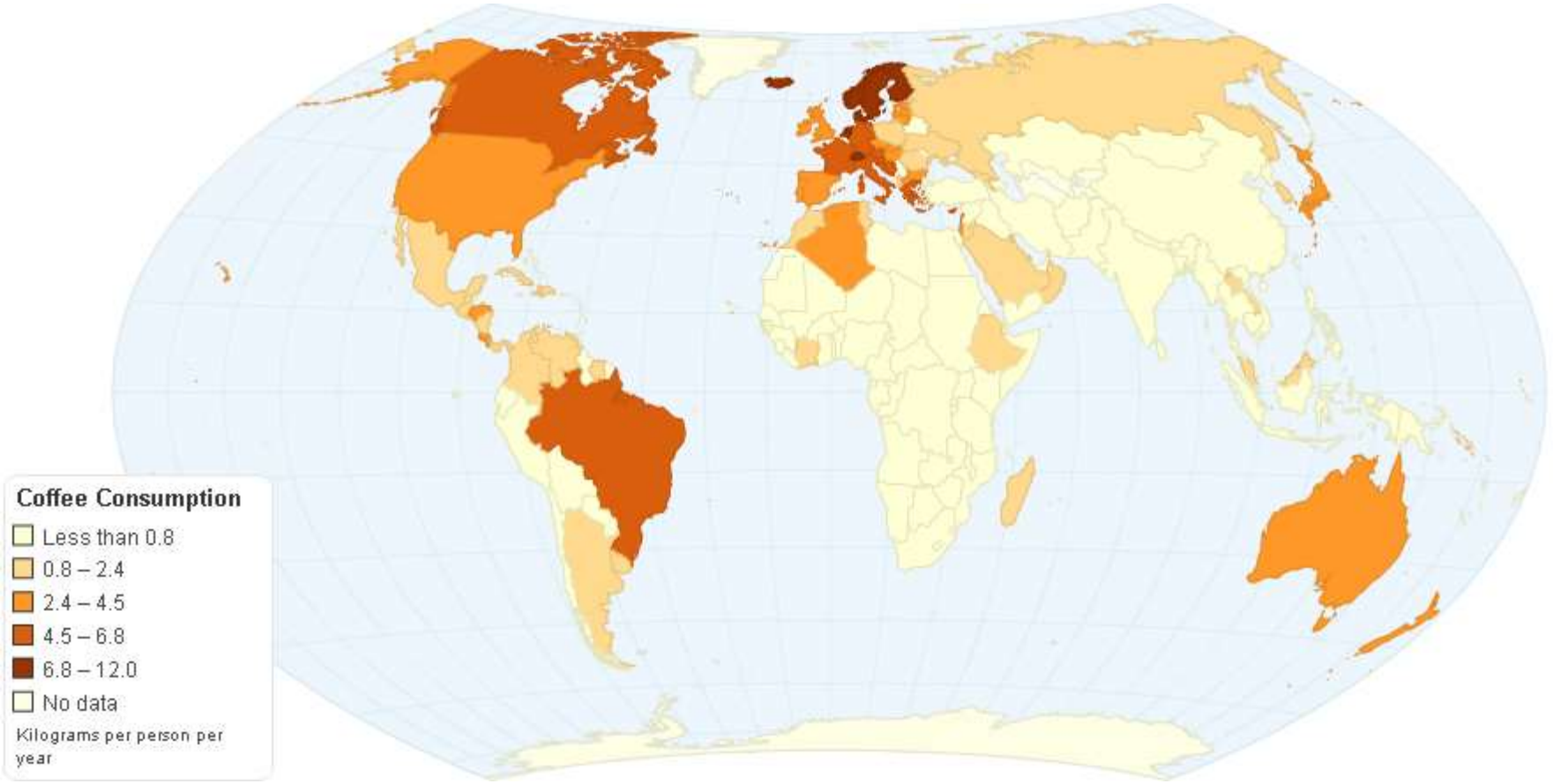
KONECNY, G. (2002). Recent Global Changes in Geomatics Education, Proceedings of 22nd FIG Congress 2002, Washington, D.C.

a. General purpose (topographic) – 'base layers'

These show the **visible features of the landscape** e.g. relief, water, and roads - 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.



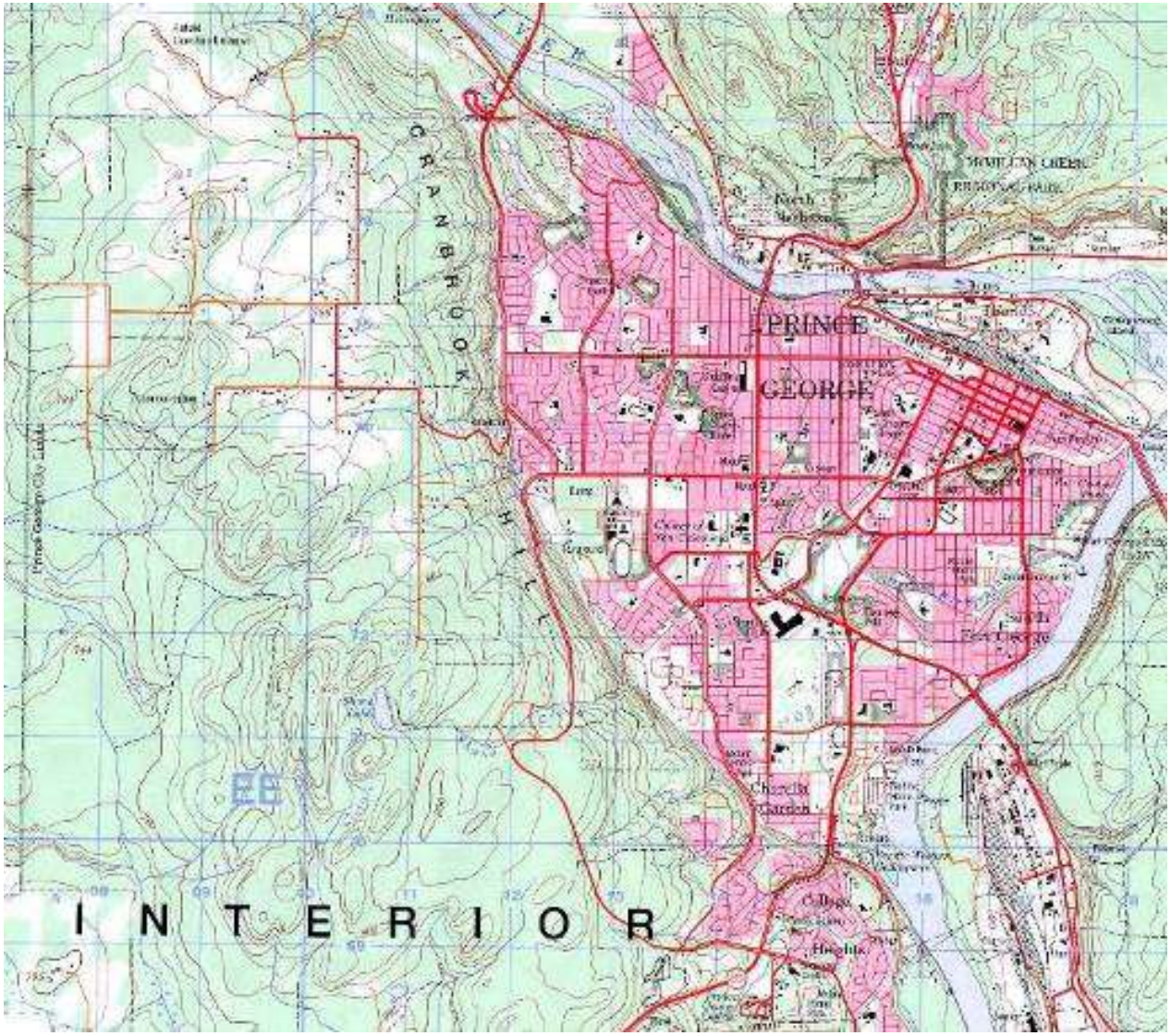
Global coffee consumption

Canada: #12

http://www.theguardian.com/news/datablog/interactive/2011/dec/01/world-corruption-index-transparency-international-map

3. Purpose of Maps / spatial data

A. Display and store of spatial information (space)



3. Purpose of Maps & Spatial data

B. Historical record of spatial features (time)

Purpose of Maps & Spatial data

A. Display and store of spatial information

B. Historical record of spatial features

Kakwa Park, BC 1920 2010 (Google maps)

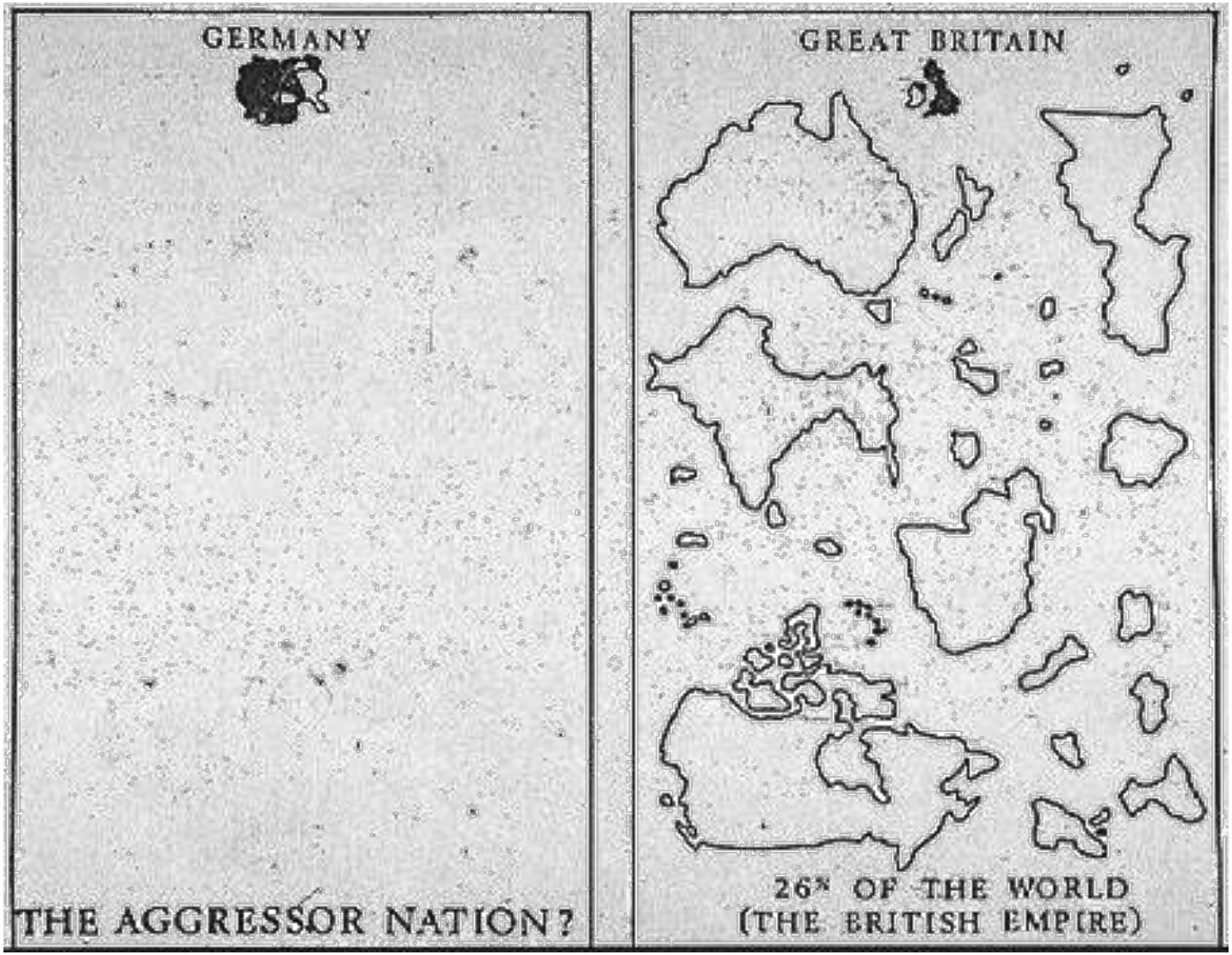
Long term history: https://www.old-maps.co.uk

Purpose of maps: C. Communication tool

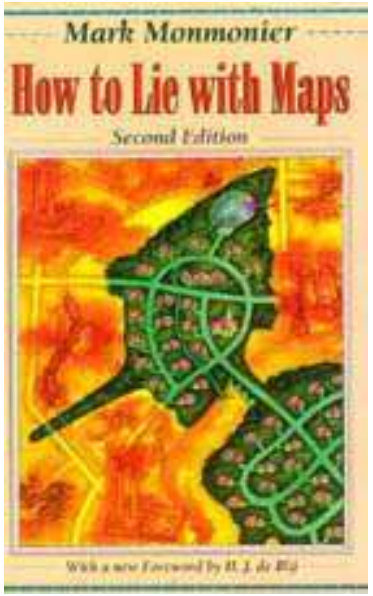
What is the red line at ~ 46°N ?

General Uses of Maps & Spatial data

C: Communication tool e.g. propaganda



German map, world war II



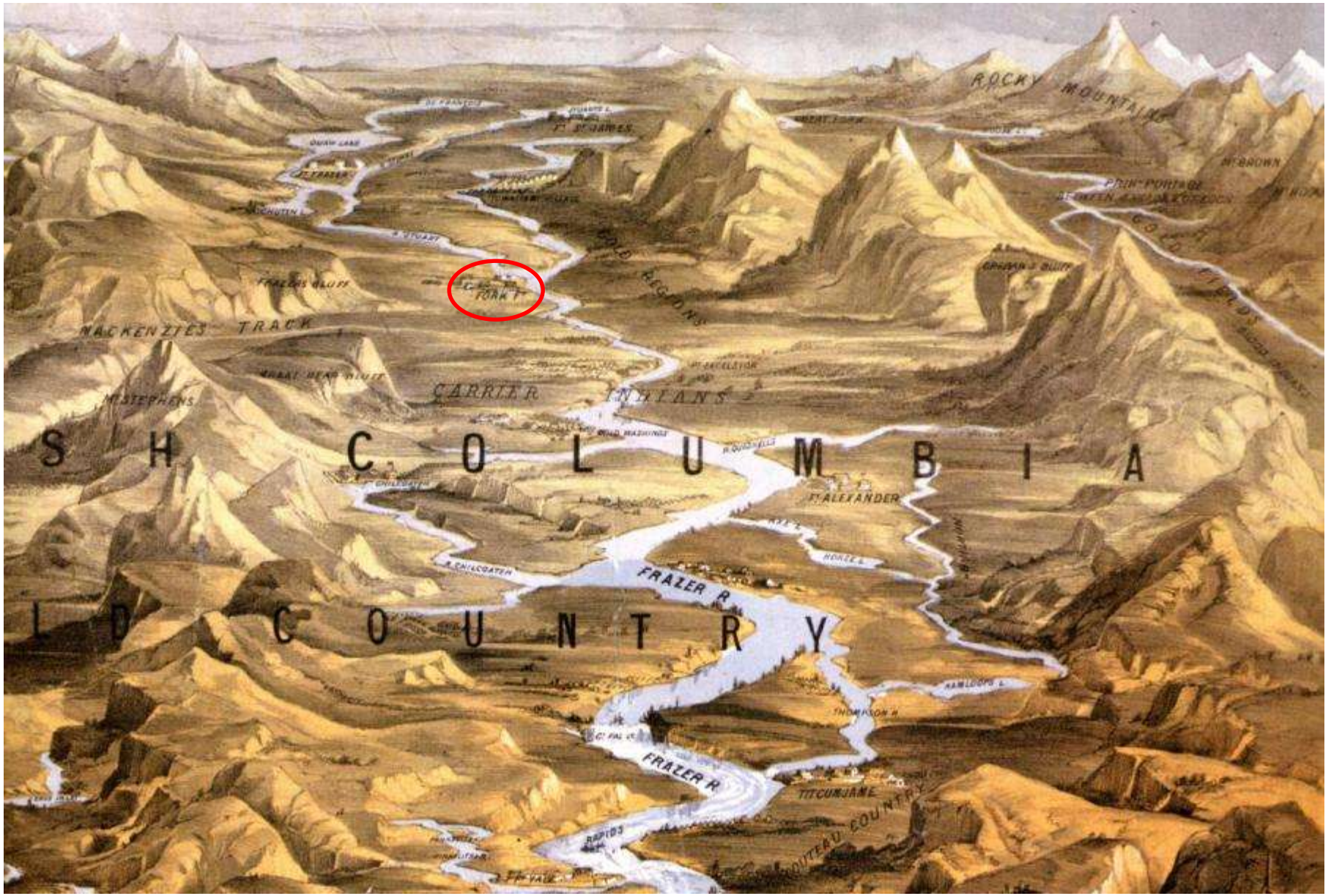
Enbridge image to show supertanker safety by omitting islands

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

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)

nunication propaganda: Promoting BC during the Gold Rush, 1858



Communication (humour): How Donald sees the world

D. Maps as works of art

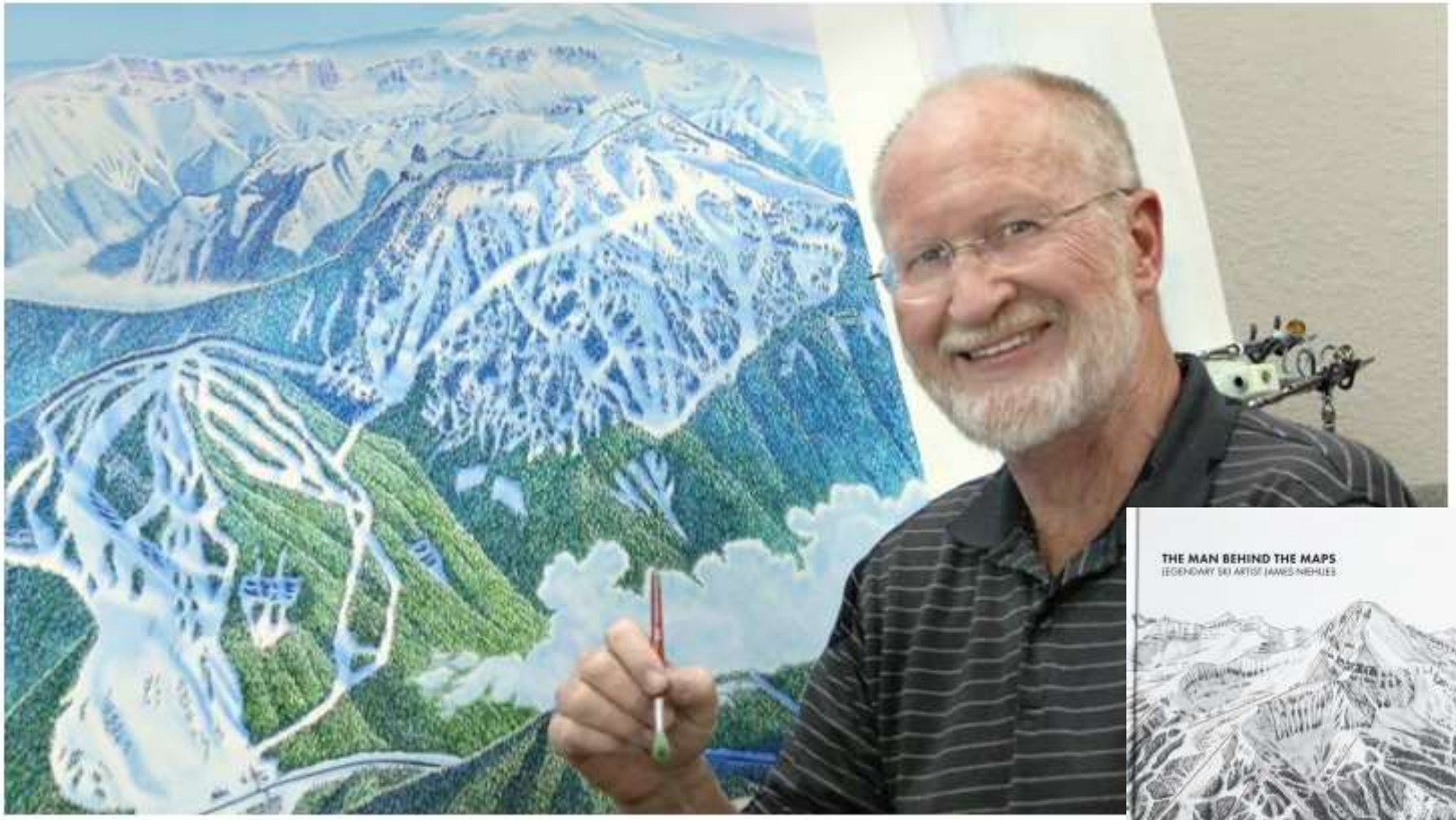
http://www.antonthomasart.co

https://www.youtube.com/watch?v=B20WKWnDmRQ
https://www.youtube.com/watch?v=4HpmWkBCFOE

Maps as works of art

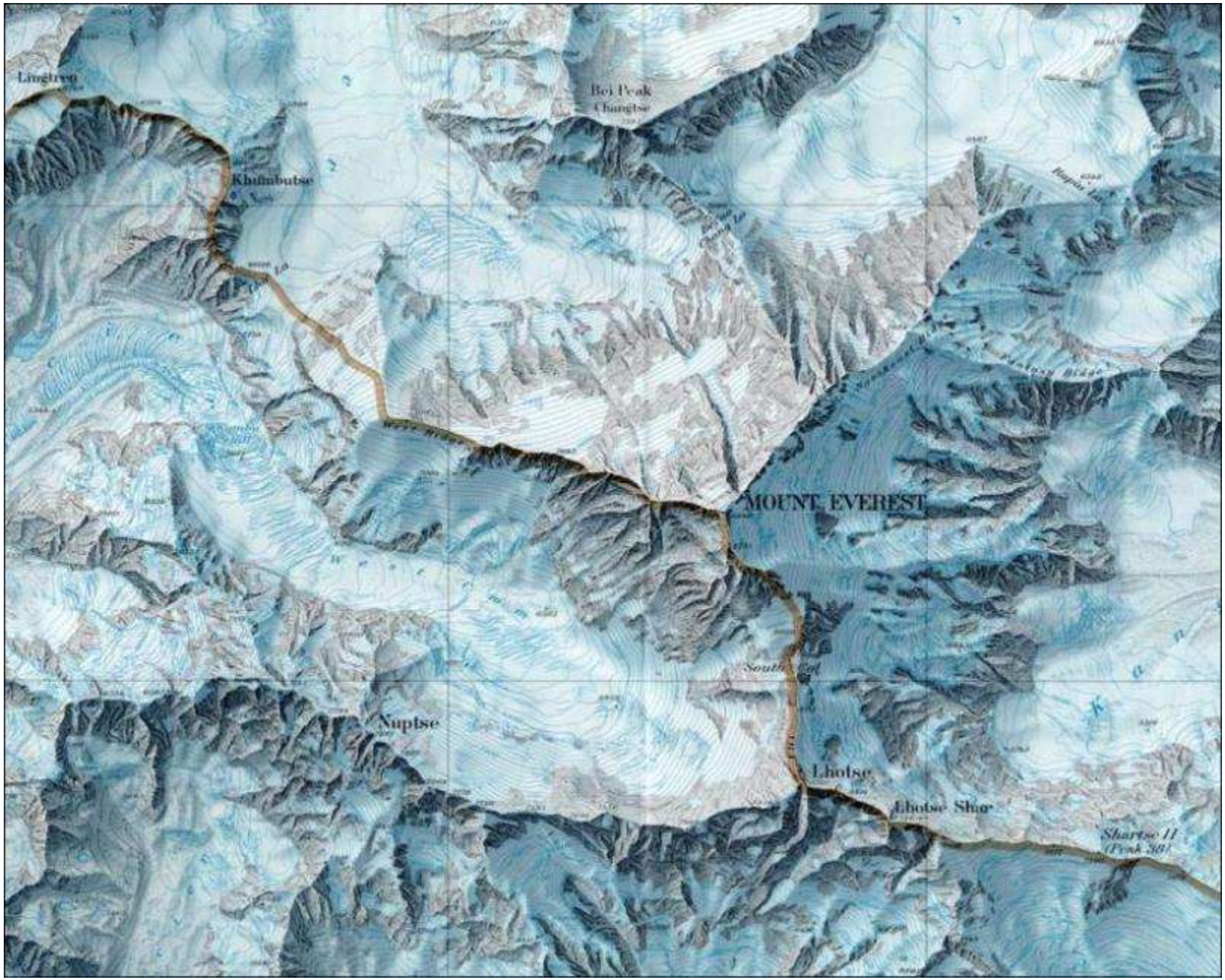
Maps of Whistler Blackcomb, Grouse Mountain and Sun Peaks among James Niehues many paintings.

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



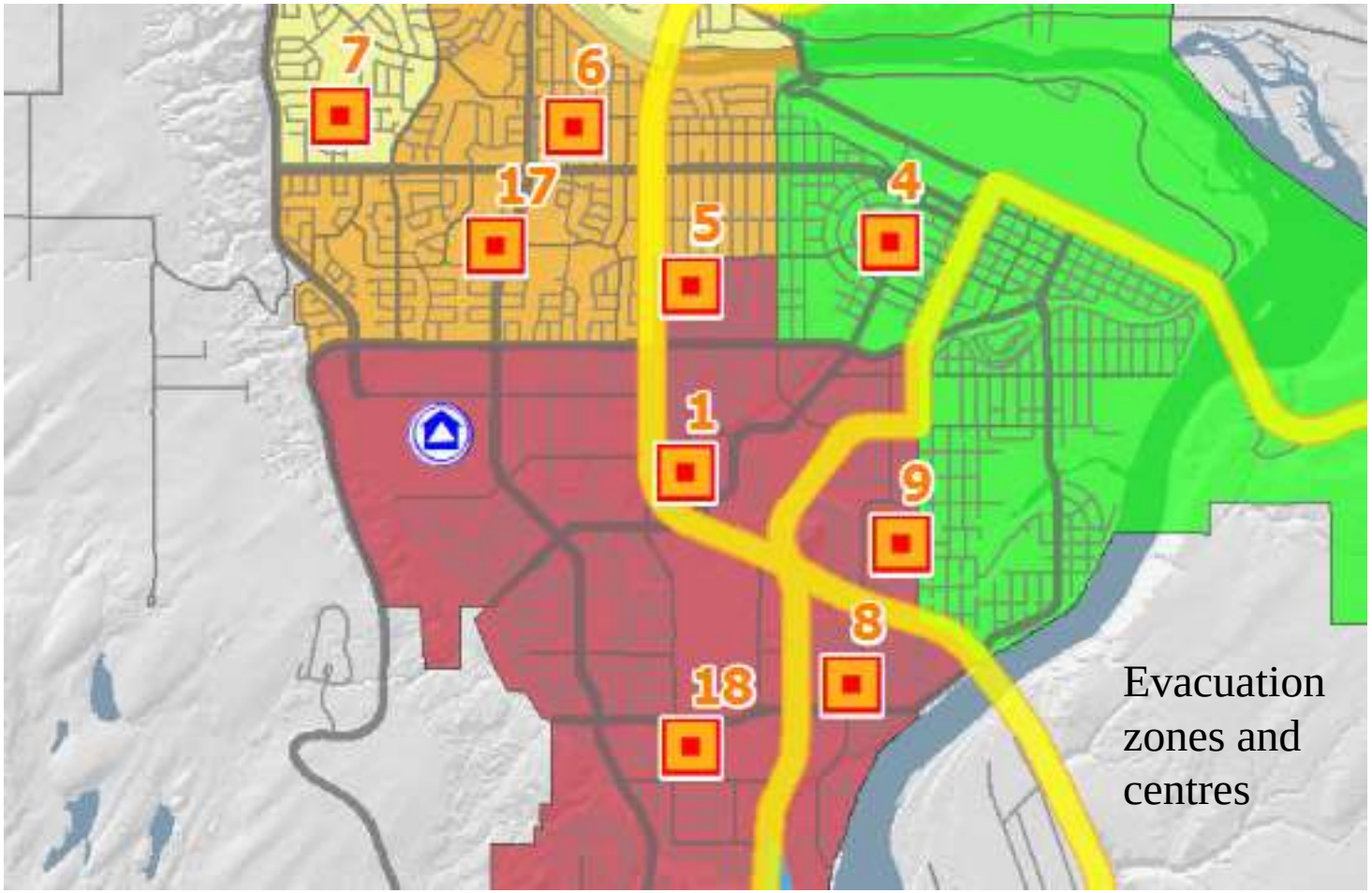
https://www.outsideonline.com/2376261/man-behind-ski-maps

E. 'Vicarious' travel - and work of art



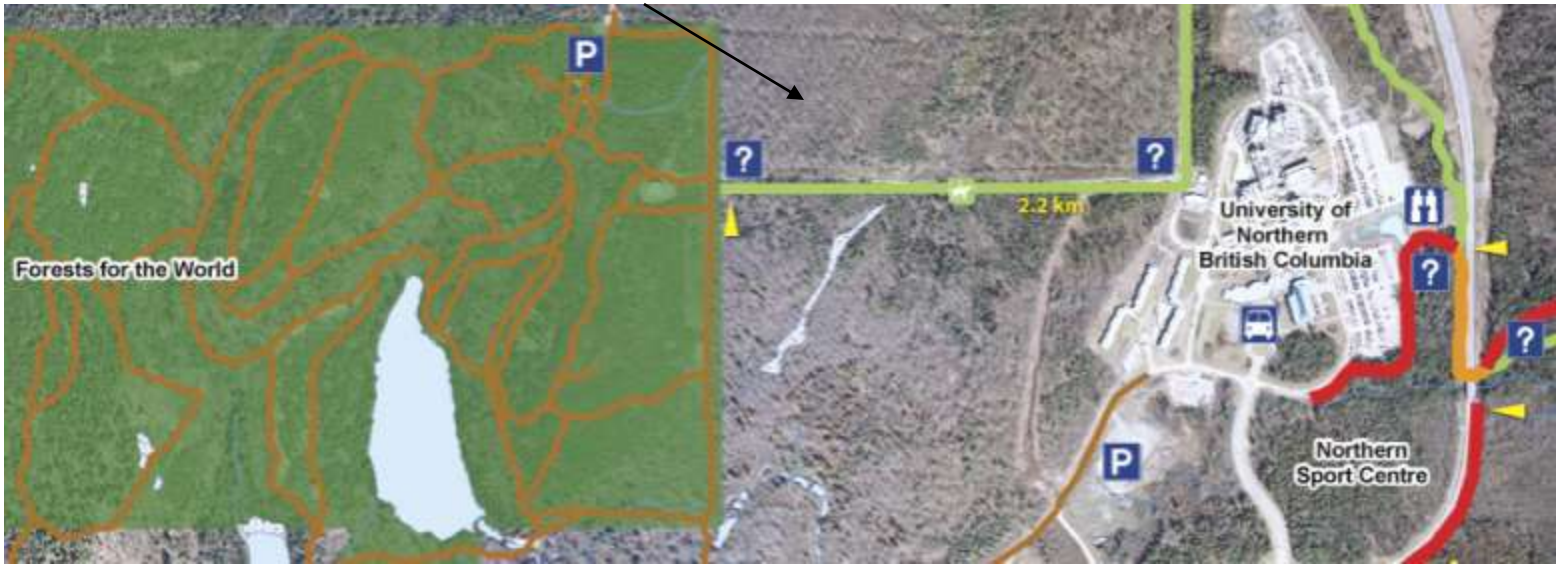
4. Map and data layers

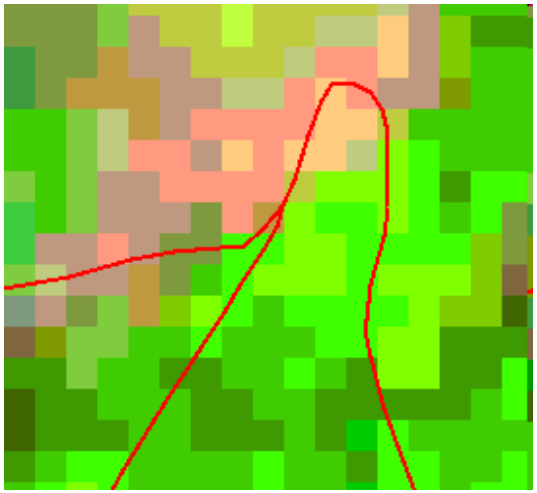
Maps and datasets are composed of layers or themes –
'feature' types are organised in **layers** e.g. roads, rivers etc..
There are three (vector) types: points, lines and **areas** (polygons-GIS)



Raster (grid) layers

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





pixels

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 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 fraction or ratio
  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

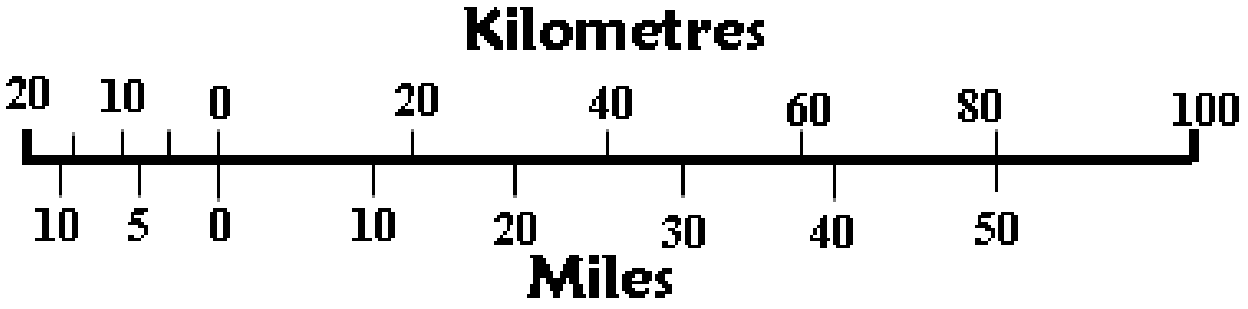
- 1:20,000 is a larger scale than 1:50,000 (reduced less)

  (1/20,000 IS bigger than 1/50,000)

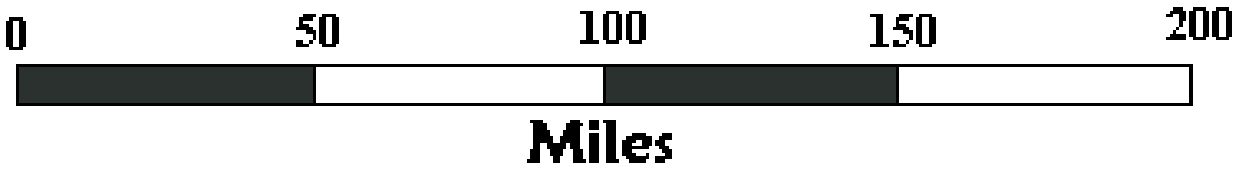
c. Scale bar

- **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

common world scales / map series / data

1:1,000,000 (world)	Small
1:500,000	

1:250,000	Medium
(1:125,000)	

1:50,000 (federal)	Large
1:20,000 (provincial)	

>1:10,000 (municipal)	Cadastral

common world scales / imperial series

Canada converted to metric post world war II

1: 506,880 1” = 8 miles -> 1:500,000

1: 253,440 1” = 4 miles -> 1:250,000

1: 126,720 1” = 2 miles -> 1:125,000

1: 63,360 1” = 1 mile -> 1:50,000

The world is metric except for Liberia, Myanmar and USA

Conversion between a ratio and a statement

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

1 cm to 250,000 cm = 2500m = 2.5 km

Scale is <u>1 cm to 2.5 km</u>

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

for example:

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

1 km = 1000m = 100,000 cm

So 1cm to 1km is the same as <u>1:100,000</u>