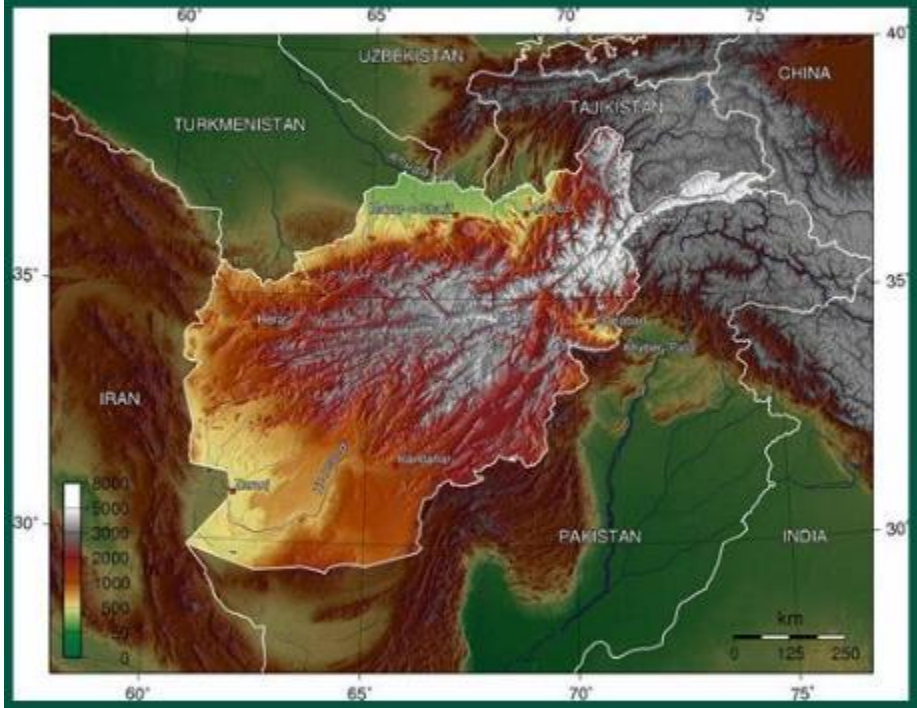
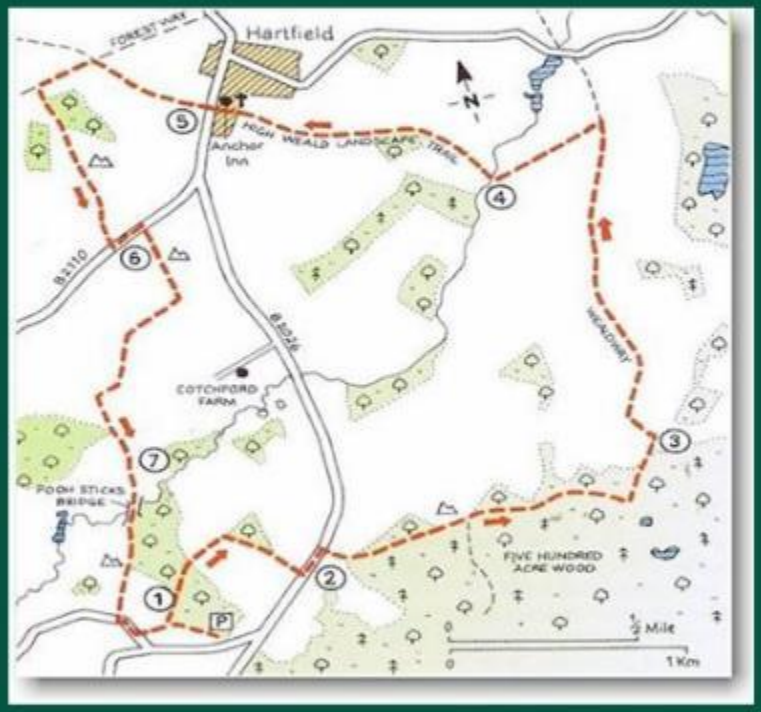
UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Geography, Earth & Environmental Sciences

GEOG 205-3 Cartography & Geomatics

The principles of projections, mapping, and symbolization using topographic and thematic data in GIS software.





Lectures: Tuesday/Thursday 10:30 - 11:20 am

Lab: one 3-hour per week

Instructor: Dr. Roger Wheate

email: Roger.Wheate@unbc.ca

GEOG205 Winter 2023:

Cartography & Geomatics

Lectures Tues / Thur 10.30-11.20 7-150

Roger Wheate *wheate@unbc.ca* (8-307)

Course notes: http://gis.unbc.ca

GEOG 205 Labs Winter 2023
Starting **next** week **…**

Software: ArcGIS Pro (Esri)
connected to our ‘Osmotar’ server ->

SLI: Matt.McLean@unbc.ca

Lab TA: Emily.Bornestig@unbc.ca

Mon 11.30-14.20 (20)
Friday 8.00-10.50 (24)

Lab periods – 3 hours (Monday / Friday)

Lab itself takes ~1- 2 hours

Recommended you do most of the assignment in the remaining time, when help is available; Don't leave it to the last day *

Labs due – before your next week lab starts

Labs and quizzes submitted via Moodle

Labs – 5% Assignment each week, labs 2-8

Quizzes on 3 topics: a. Map coordinates, b. Thematic mapping and c. map projections – available after the Thursday lecture (by midnight), due the next Wednesday (midnight)

*Students only fail this course if they stop doing the labs / project

GEOG205, Student majors - Winter 2023

11 Computer Science
7 Forest ecology & management
5 Geography
3 Civil Engineering
2 Anthropology, Wildlife & Fisheries, Wildland conservation, Environmental/sustainable Studies; Northern-Rural Community planning, Biology, Undeclared
1 Physics, Environmental Engineering, First Nations Planning

Why are you taking it: required / elective course ?
- Useful skill, love maps, course reputation, other ?

What is 'Cartography and Geomatics' ?

Cartography

"The art, science and technology of making maps"

Canadian Cartographic Association (CCA) 1975

- **Map:** A scaled representation of a planetary surface
  - includes printed maps, online displays, animations

Geomatics (geomatique)

"An umbrella term for the mapping technologies"

"the discipline of gathering, storing, processing, displaying geographic information"
(geographic = has a spatial location)

Canadian Institute of Geomatics (1992) *[Can. Inst of Surveying and Mapping 1882]*

Geomatics

"an umbrella term for the mapping technologies"

Cartography: art, science and technology of making maps

Geographic Information Systems (GIS)

"The management, analysis, input and output of spatial data"

Remote sensing (satellite and aerial imagery)

"Acquisition of planetary information from a distance"

Global Positioning Systems (GPS)

"determination of ground locations using measurements from satellites"

Surveying and Photogrammetry

"derivation of 2D or 3D locations from aerial photography"

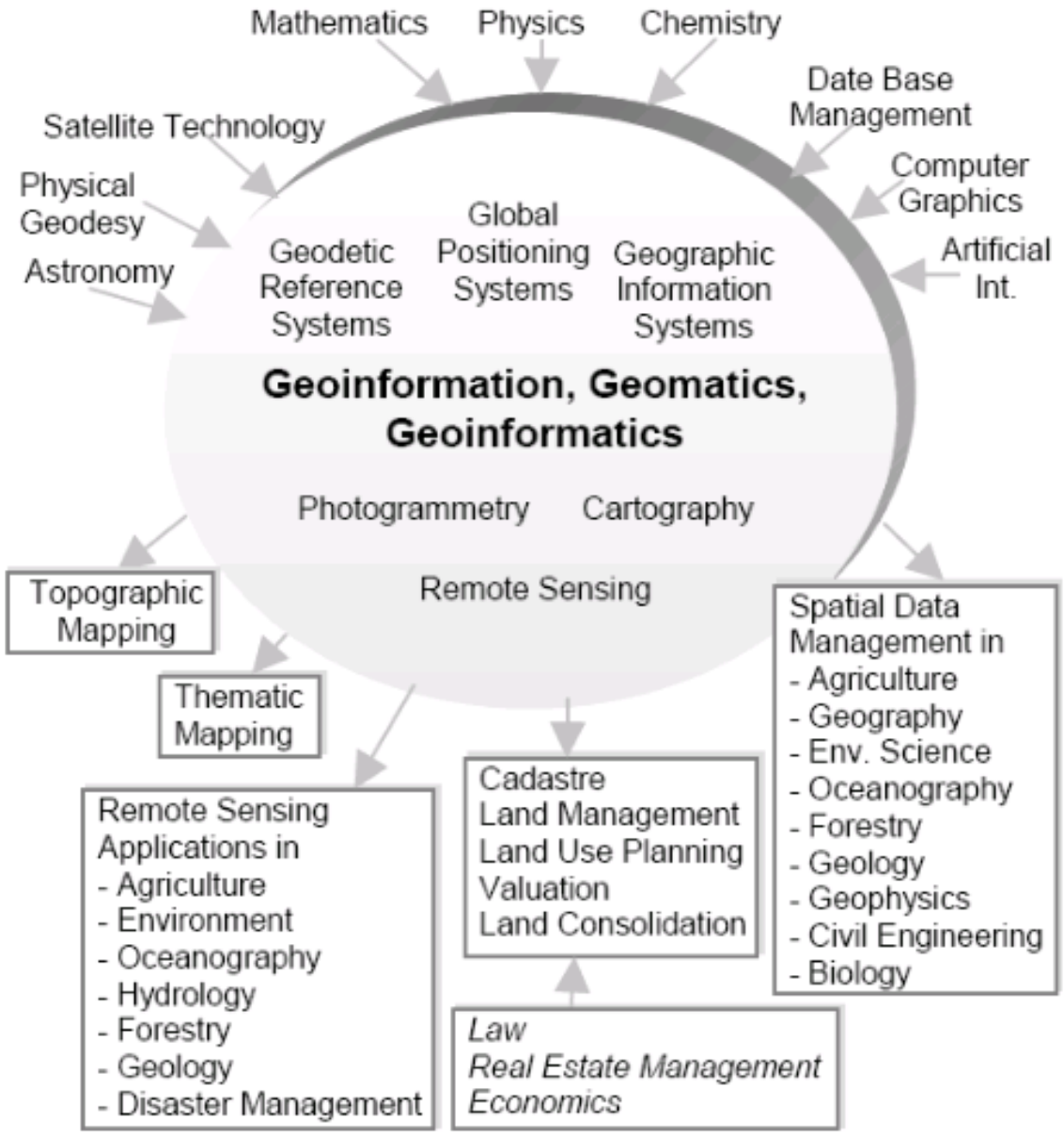


Figure 1. Geomatics (After Konecny, 2002)

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

400 level independent study to map trails below campus 2003 (pre-Google Earth / maps)

‘Geovisualisation’

GEOG205 and related ‘Geomatics’ courses

GEOG204: Intro to GIS applications – datasets, analysis

GEOG205: Focus on display / mapping

GEOG300: (Intermediate GIS) Focus on spatial analysis

Some unavoidable overlap e.g. data input, elevation models

Software

204: QGIS (Quantum) – freely downloadable

205 / 300: ArcGIS Pro .. “industry standard”

Evolution of Esri software

Esri: Environmental Systems Research Institute

1981: Arc/Info

1992: Arcview

2000: ArcMap (ArcGIS)

2019: ArcGIS Pro

Why are Cartography and Geomatics important?

*"The **eye** will learn more in one hour from a **mappe** than the eare will learn from discourse"*

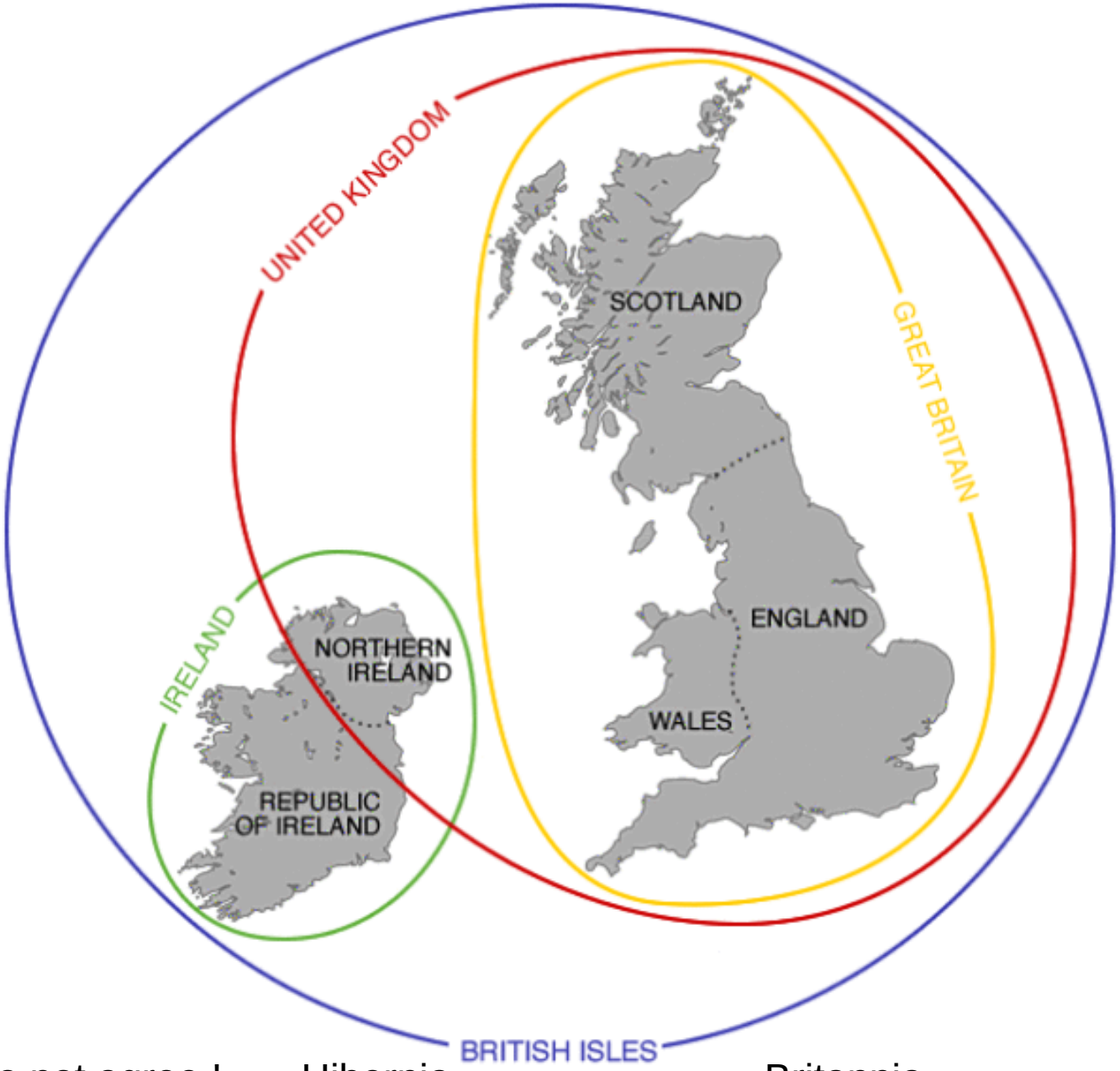
(Thomas Fuller, 1690)

'(geo)spatial data' display:

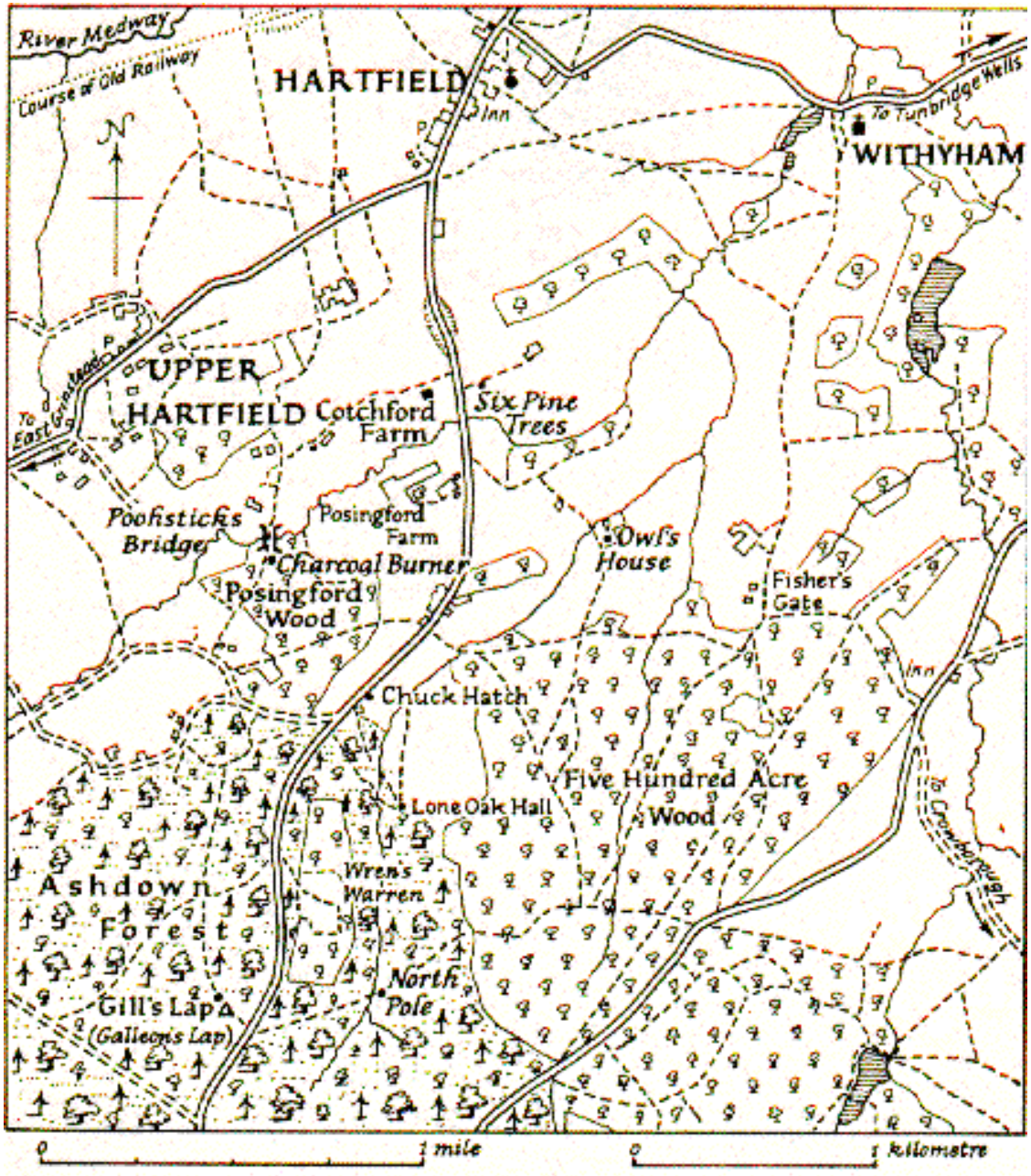
a picture says 1000 words

Some educators believe that

…. *'gRaphicacy' should be the 4th 'R'*



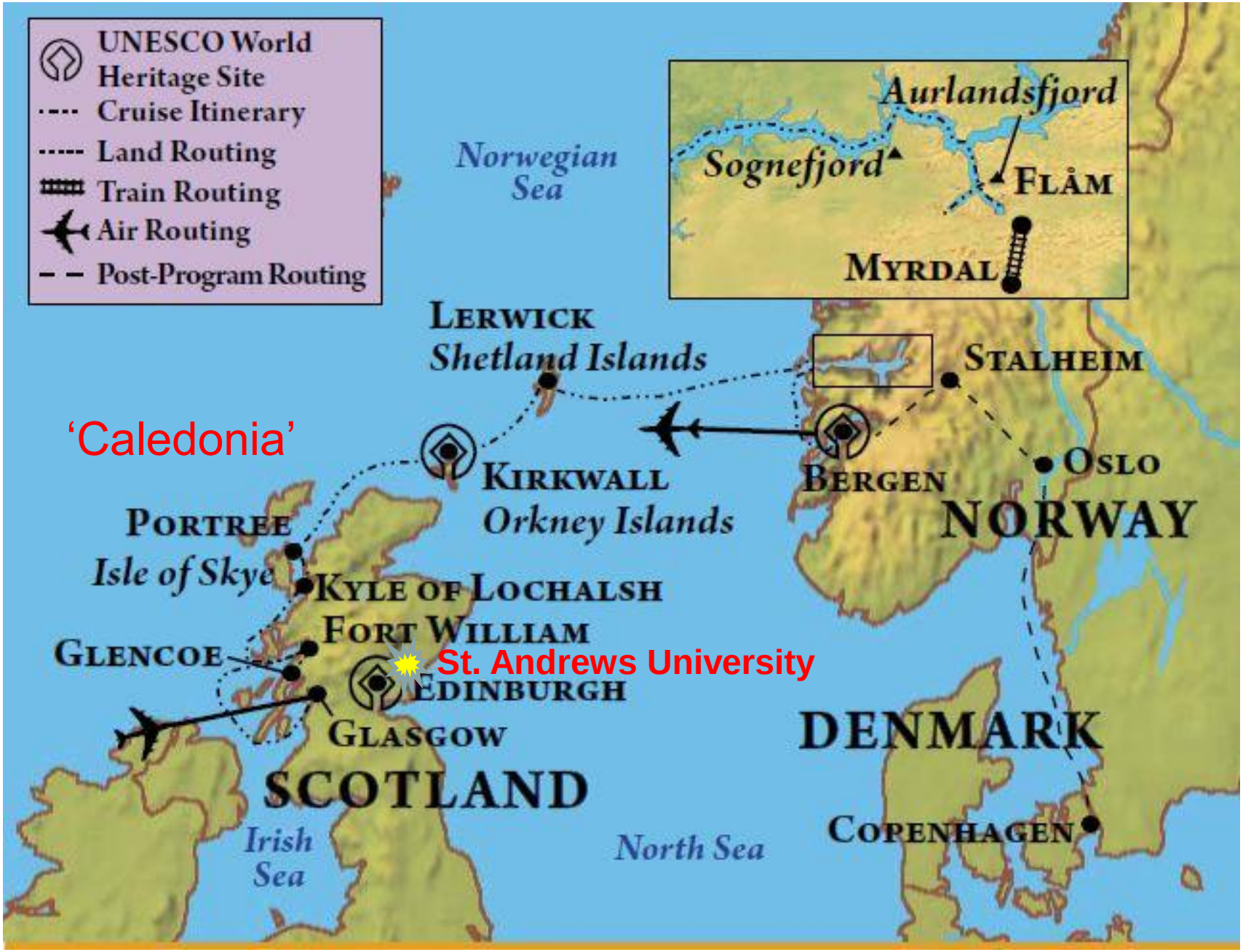
The Irish do not agree ! Hibernia Britannia



Maps are portals to new worlds

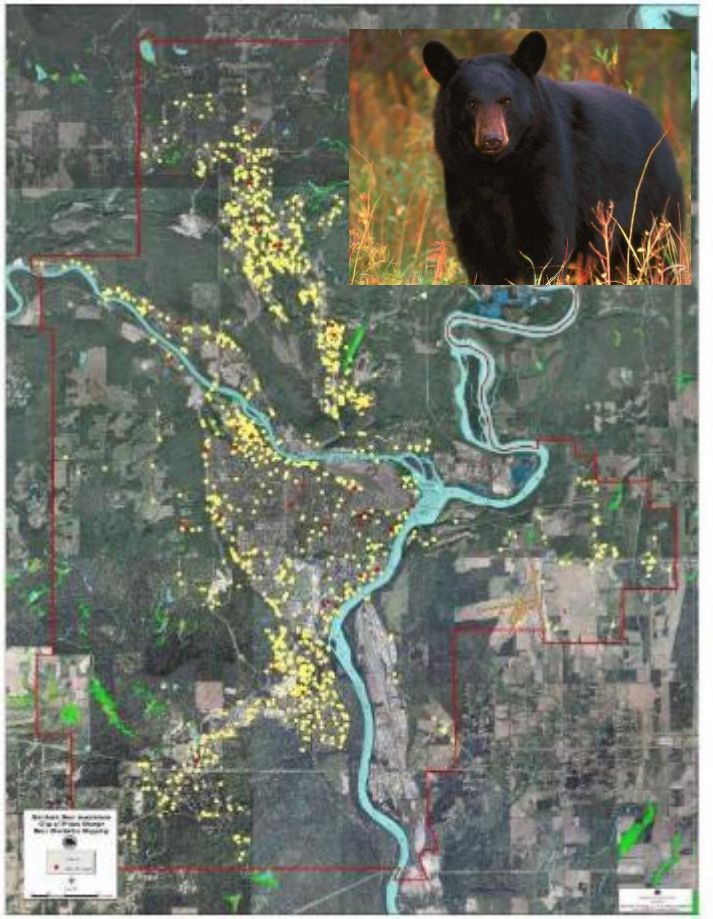
A bit about me … my ‘most important’ early map


Chief Lake
Salmon Valley
ESKERS PROV. PK.
Nukko Lake
Willow River
Newlands
Upper Fraser
Hansard
Giscome
Aleza Lake
Sinclair Mills
Reid Lake
Shelley
Hutton
Prince George
Purden Lake
PURDEN LAKE PROV. PK.
Longworth
Mud River
WEST LAKE PROV. PK.
Penny
YELLOWHEAD
Baldy Hughes
Red Rock
Dome Creek
Woodpecker
Narrow Lake
Hixon
Stony Lake
Strathnaver
CARIBOO
Crescent Spur
Cinema
Ahbau Lake
WHITEHORN MT. EL. 3395 m
COTTONWOOD RIVER PROV. PK.
TWO SISTERS MTN. EL. 2105 m
Indianpoint Lake
Lamming Mills
McBride
Bouchie Lake
TEN MILE LAKE PROV. PK.
Cottonwood
Wells
Bowron Lake Prov. Park
MOUNTAINS
Quesnel
Wingdam
Barkerville
BARKERVILLE HISTORIC TOWN
PINNACLES PROV. PK.
Dunster
Croydon Sta.
Kersley
Mitchell Lake
ROBERTS PK. EL. 2700 m
Narcosli Creek
Keithley Creek
CARIBOO RIVER PROV. PK.
MT. SPRANGER EL. 3024 m
Niagara
Tête Jaune Cache
MOUNTAINS
Kakwa Rec. Area
MT. HANINGTON EL. 2515 m
MT. SIR ALEXANDER EL. 3274 m
MT. BUCHANAN EL. 2735 m
MT. MAY EL. 2450 m
INTERSECTION MTN. EL. 2461 m
MT. DE VERBER EL. 2577 m
RESTHAVEN MTN. EL. 3098 m
Resthaven Icefield
Narraway
Muddywater
Morkill River
Holmes R.
Goat R.
Fraser R.
Willow River
Swift River
Quesnel
HIGHEST POINT IN CANADIAN ROC
97
49
16
160
64
38
26
85
48
63
HWY.
CARIBOO


UNESCO World Heritage Site
Cruise Itinerary
Land Routing
Train Routing
Air Routing
Post-Program Routing
Norwegian Sea
Aurlandsfjord
Sognefjord
FLÅM
MYRDAL
LERWICK
Shetland Islands
STALHEIM
'Caledonia'
KIRKWALL
Orkney Islands
BERGEN
OSLO
NORWAY
PORTREE
Isle of Skye
KYLE OF LOCHALSH
FORT WILLIAM
GLENCOE
St. Andrews University
EDINBURGH
GLASGOW
SCOTLAND
DENMARK
COPENHAGEN
Irish Sea
North Sea


My jobs in Canada
1994
1981
1978
1979
1975
Cape Columbia
Arctic Ocean
Ellesmere Island
GREENLAND
(DENMARK)
ICELAND
Beaufort Sea
Queen Elizabeth
Islands
ALASKA
(US)
Banks Island
Baffin Bay
Victoria Island
Baffin Island
Davis Strait
MacKenzie Range
MacKenzie
Whitehorse
Yukon
Great Bear L.
Foxe
Basin
Iqaluit
Labrador Sea
Hudson Strait
Yellowknife
Ungava
Peninsula
Great Slave L.
CANADA
Hudson Bay
L. Athabasca
Coast Mts.
Rocky Mts.
Reindeer L.
Labrador
New Foundland
St. John's
Edmonton
Gulf of St Lawrence
Saskatchewan
Lake Winnipeg
Vancouver
Victoria
Calgary
Saskatoon
Regina
Charlottetown
Fredericton
Québec
Halifax
Saint John
Winnipeg
Thunder Bay
Montréal
Great Lakes
Atlantic Ocean
Toronto
Hamilton
Windsor
UNITED STATES
WWW.FREEWORLDMAPS.NET

UNBC Trails Cranbrook Hill



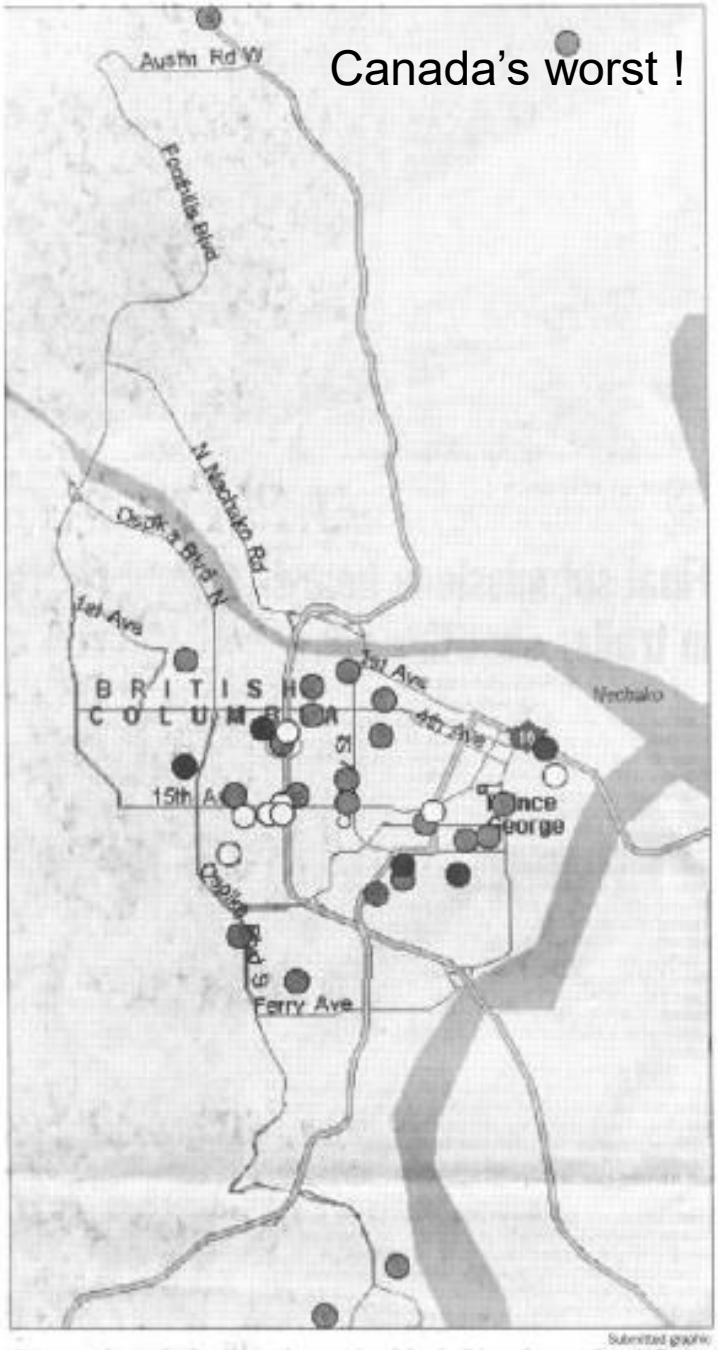
Mountain cartography [Pre-digital map]: Canada's best !

Columbia Icefield, 1981 Athabasca Glacier / Icefields Parkway

Maximising communication and 'geovisualisation' … not just a 'pretty map'

The world's 2nd worst map (1978)
It wasn't easy for all to create maps before computers

Canada's worst !

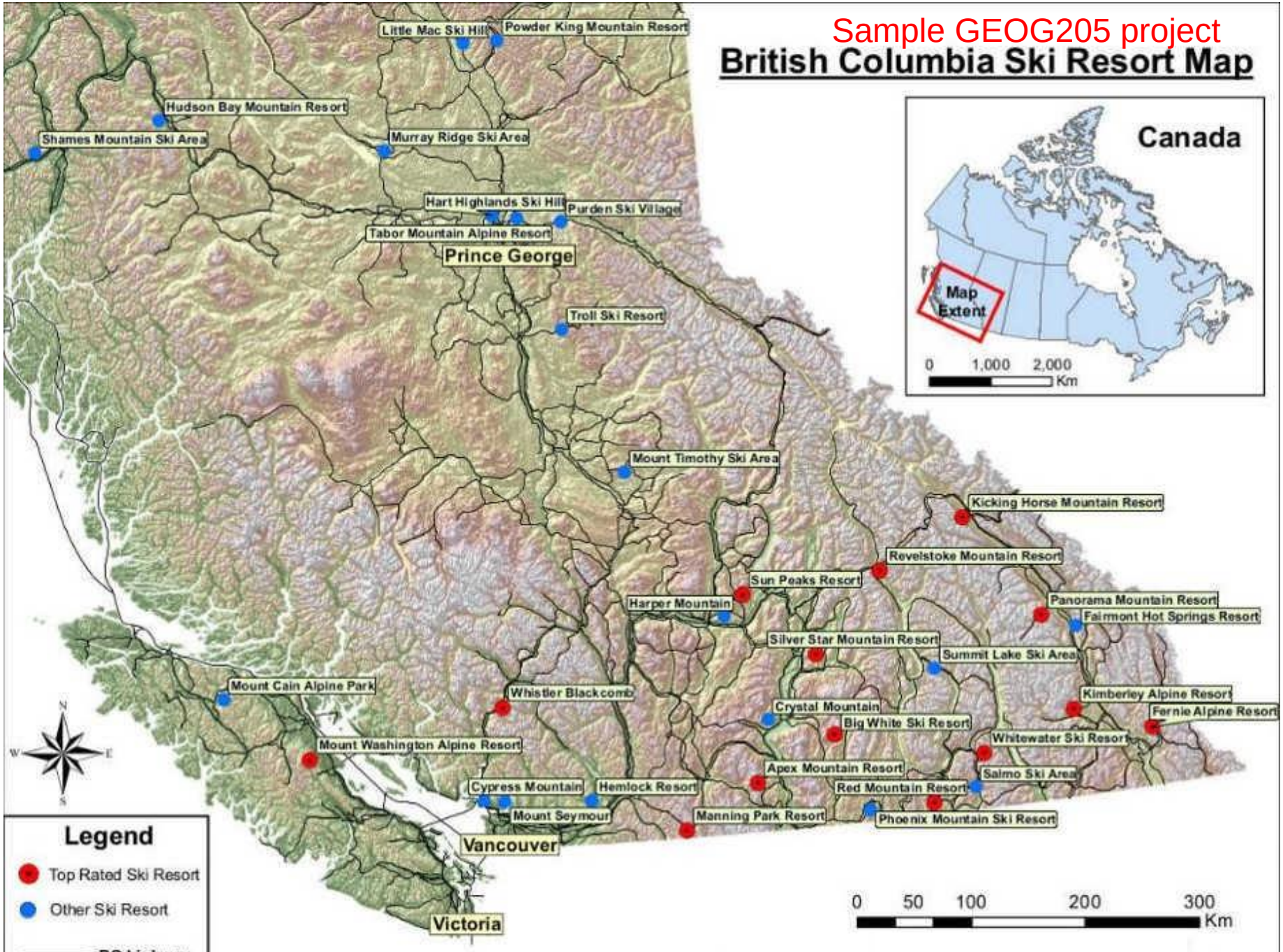


Submitted graphic

This map shows the locations of recent break-ins in Prince George. Grey indicates residential break-ins; white is business and black is other. A residential break-in past the Prince George Airport is not shown.

Sample GEOG205 project

British Columbia Ski Resort Map



Data Source: http://theprovince.com/feature/snow-scene-your-2017-guide-to-b-c-ski-resorts

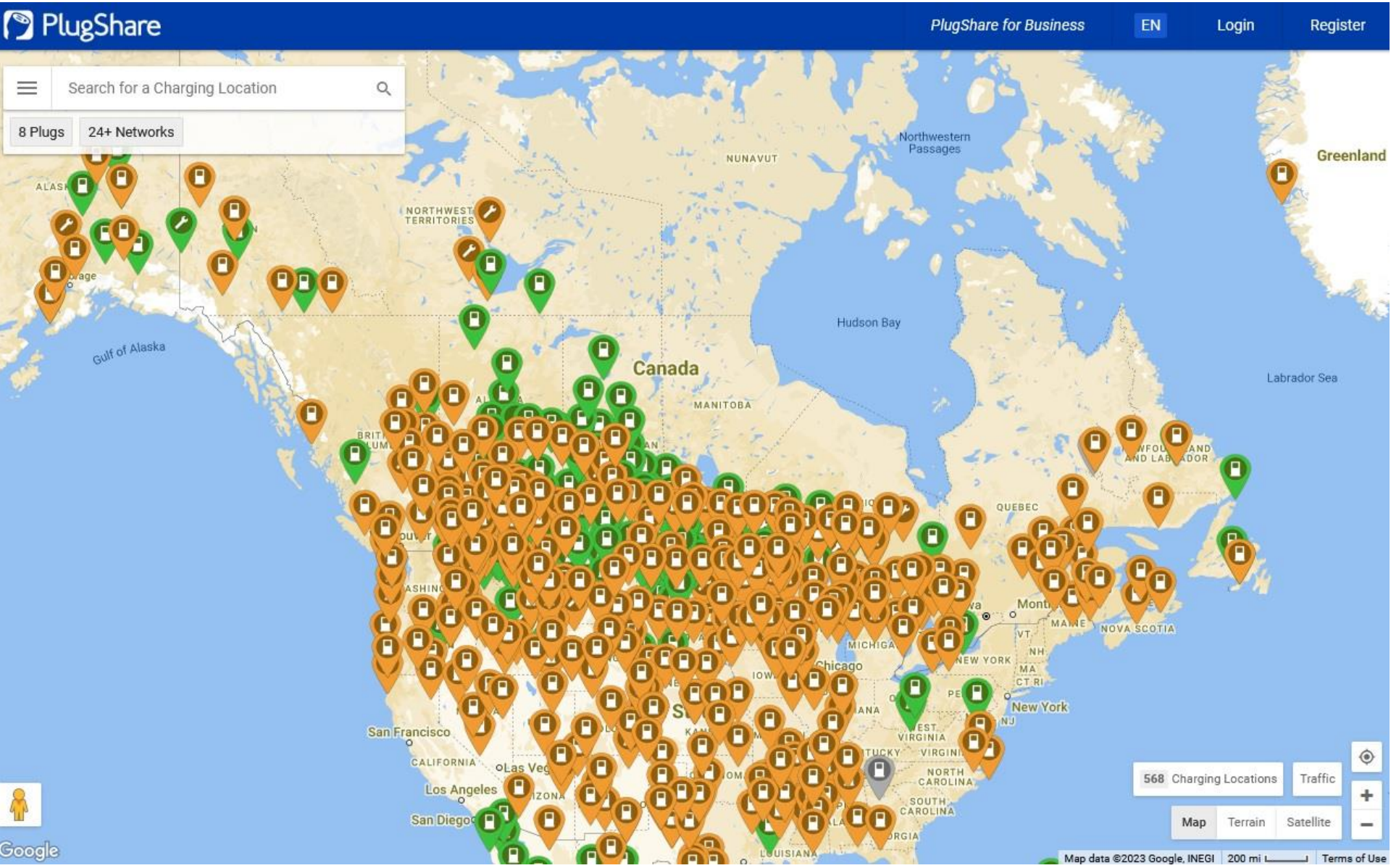
The impact of computers, data and software:

The 'democratisation' of cartography

In parallel with arts and social media

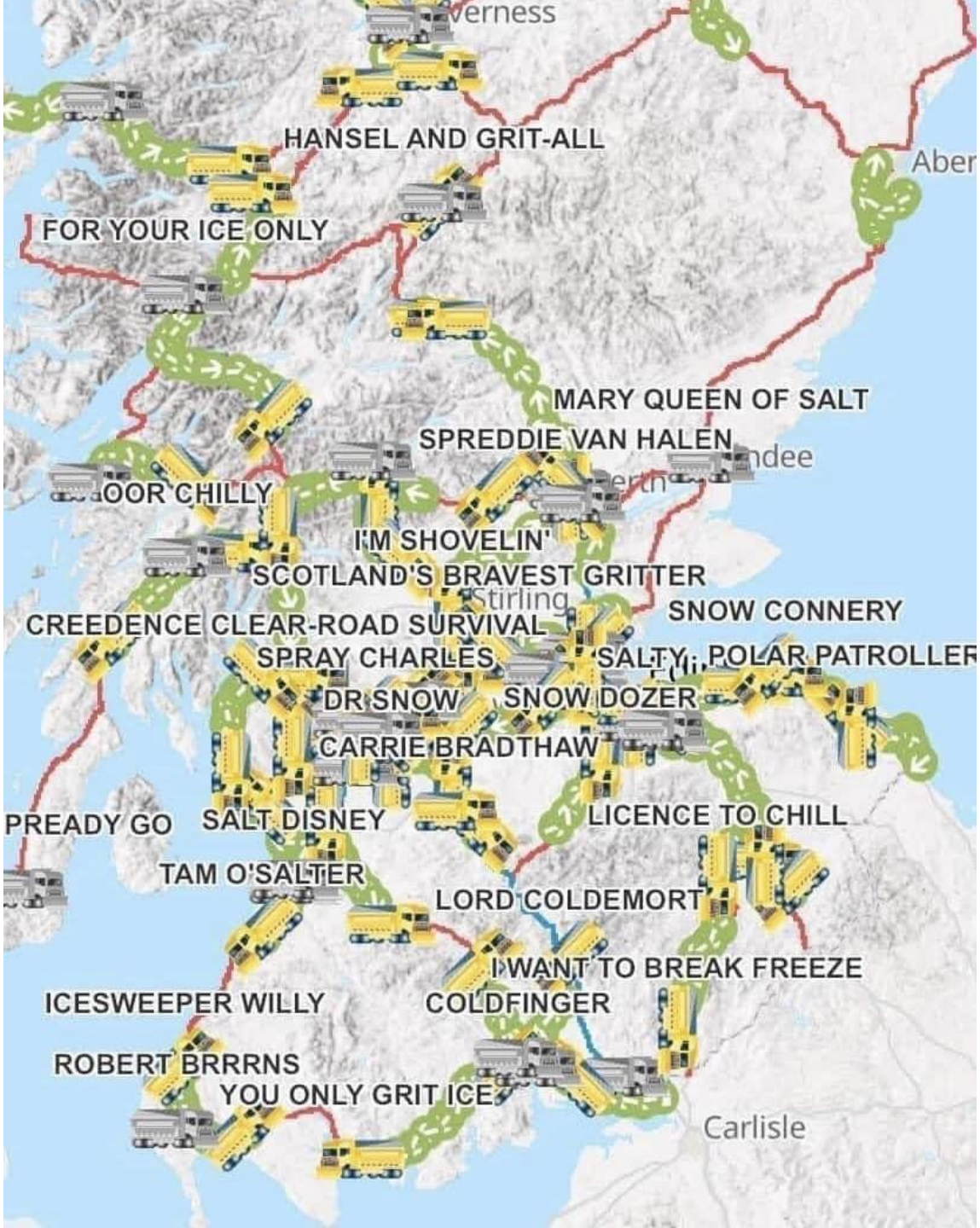
= anyone can make maps – good and bad

… and also new types of maps



https://www.plugshare.com/map

https://www.dangerousroads.org



Winter gritter and salt trucks in Scotland

- named by the public

https://trunk-road-gritter-tracker-scotgov.hub.arcgis.com/

Ontario snowplows

- Anita Shovel.
- Gordie Plow.
- Blizzard of Oz.
- Darth Blader.
- Pillsbury Plowboy.
- Sled Zepplin.
- Buzz Ice-Clear.
- Qunuk (Inuit word for snow
- Flurrious George.
- School's Not Cancelled.
- Snobi One Kenobi.
- Sleetwood Mac.

New (animated) cartography: ‘Cartography is not dead, it is reborn’
‘Geovisualisation’

Air Traffic around the World

http://www.youtube.com/watch?v=NNzTPfARdwQ&feature=related

No required textbook: library books on cartography (GA105.3)

Selected online map viewer sites

World: http://maps.google.com

Canada: http://atlas.nrcan.gc.ca

iMap BC: https://maps.gov.bc.ca/ess/hm/imap4m/

PG map: http://pgmappub.princegeorge.ca/Html5Viewer/?viewer=PGMapMobile

Today's Intro class: https://tmackinnon.com/cartography

Other references: web links given with lectures

COURSE EVALUATION

Lab exercises	35%
Exams (in class Feb 16, April 04)	25%
Take home quiz (Feb 3,Feb 17, Mar 17)	15%
Map project (due April 6)	25%

syllabus: http://gis.unbc.ca