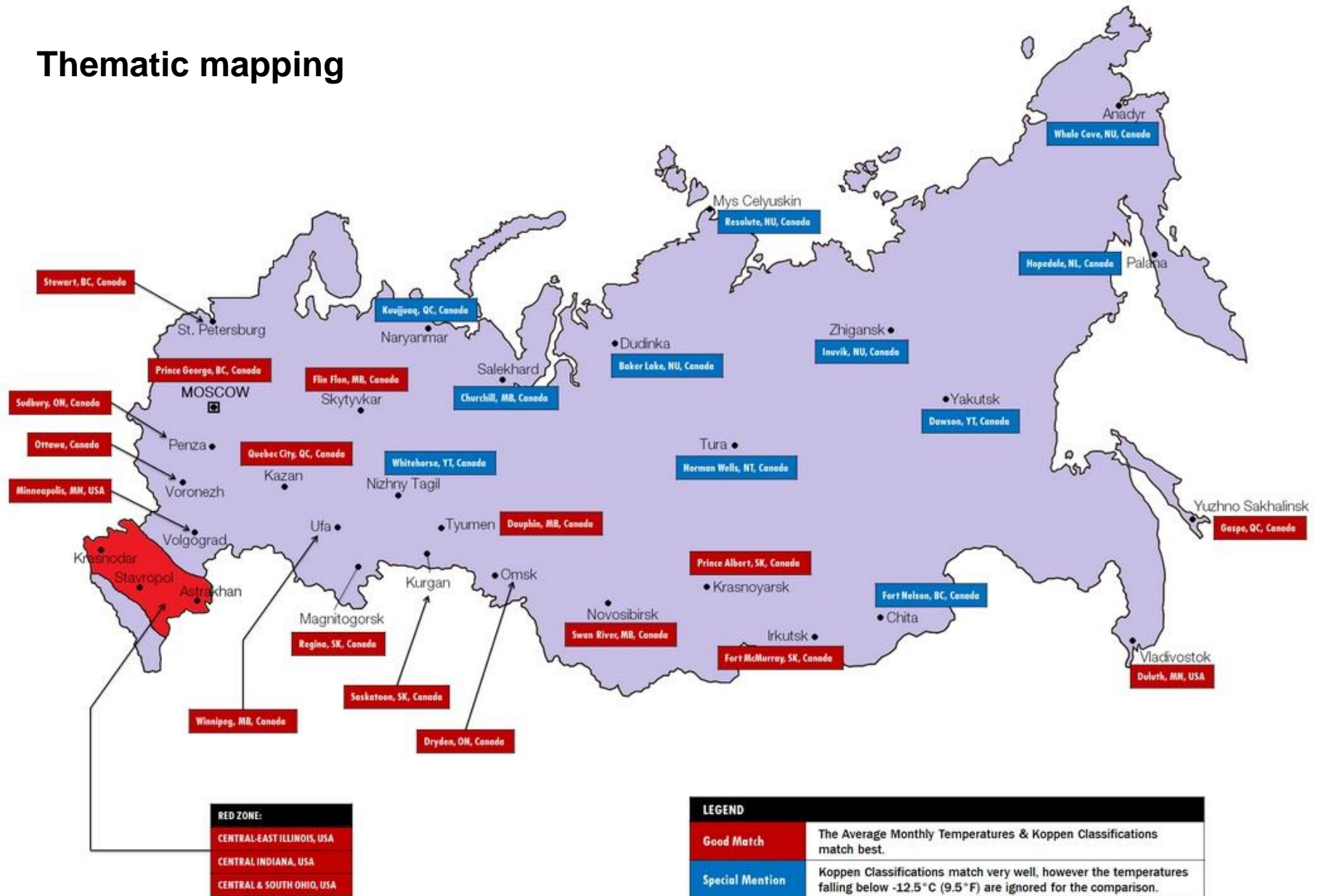


# Places in the World whose Climates match with places in RUSSIA

## Thematic mapping



# Thematic mapping:

'Qualitative point symbols' are similar to topographic (general) maps- Individual point locations are important



## A. point symbols

Quantitative thematic point maps  
Design focus: overall distribution



Base layers are background for thematic maps: Map themes are 'special purpose'

# 1. Dot maps

Dr. John Snow used a dot map to identify the Broad Street Pump in London responsible for the spread of cholera - previously thought to be wind-borne.



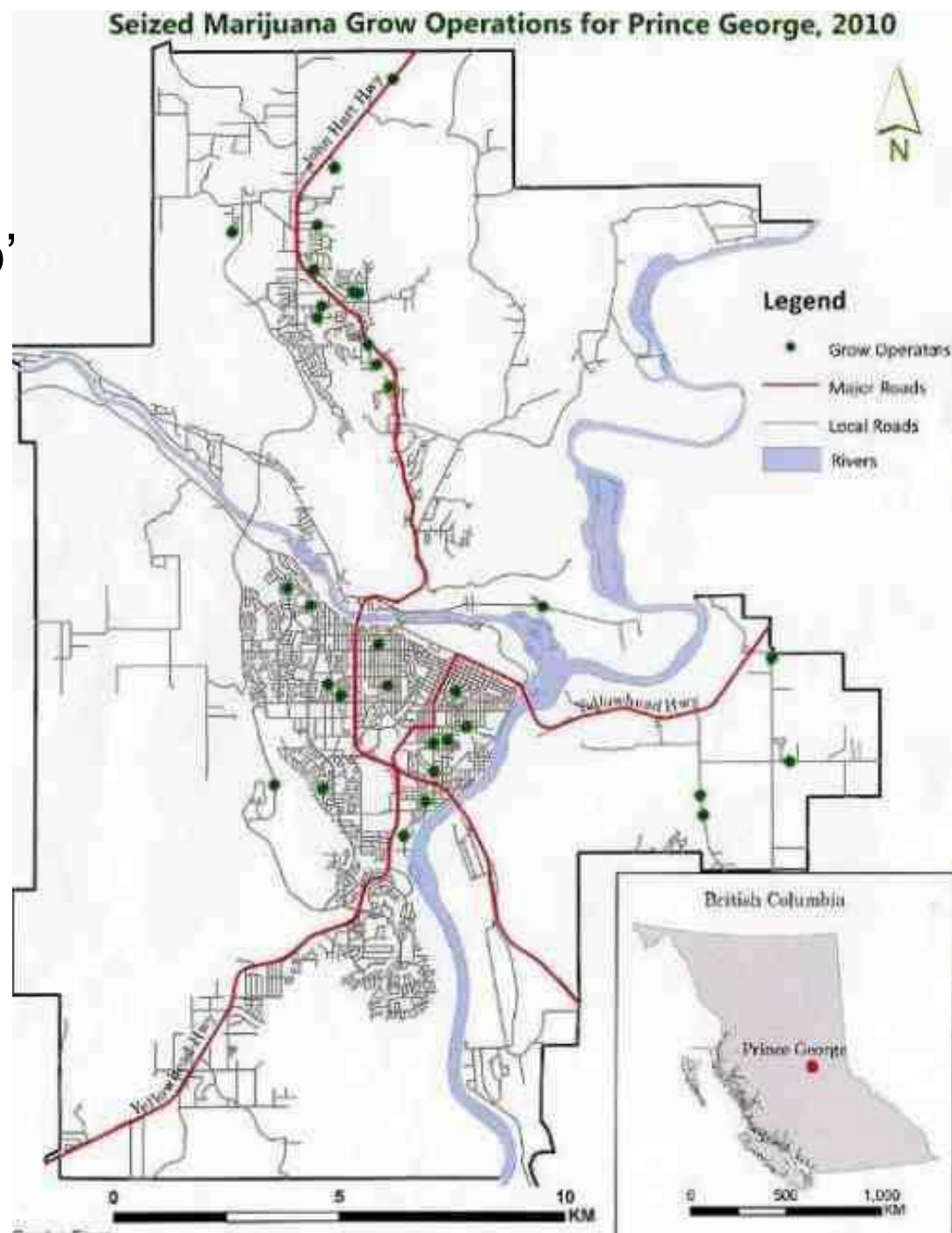
1 dot for each fatality



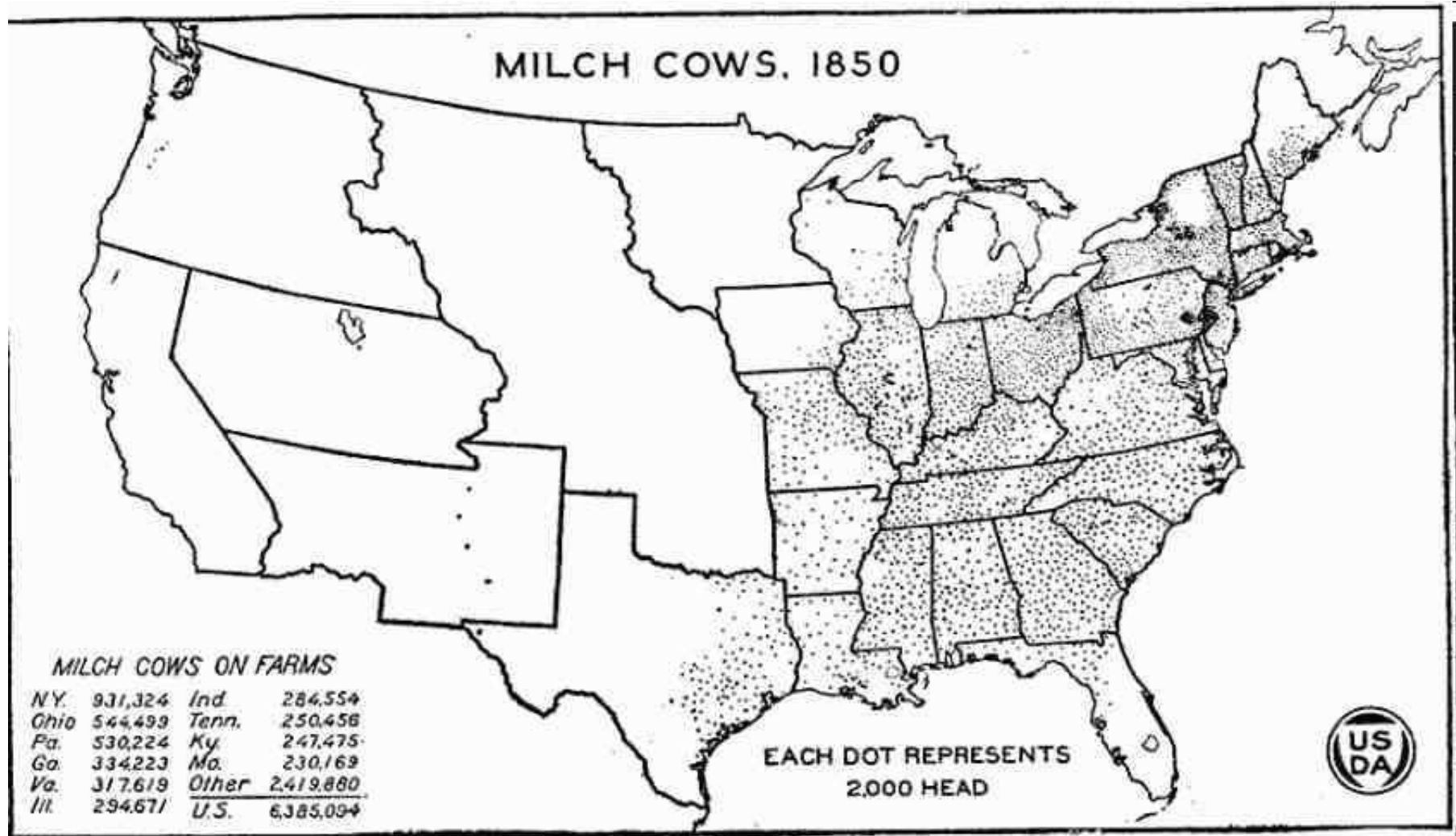


Example of a 'dot map'

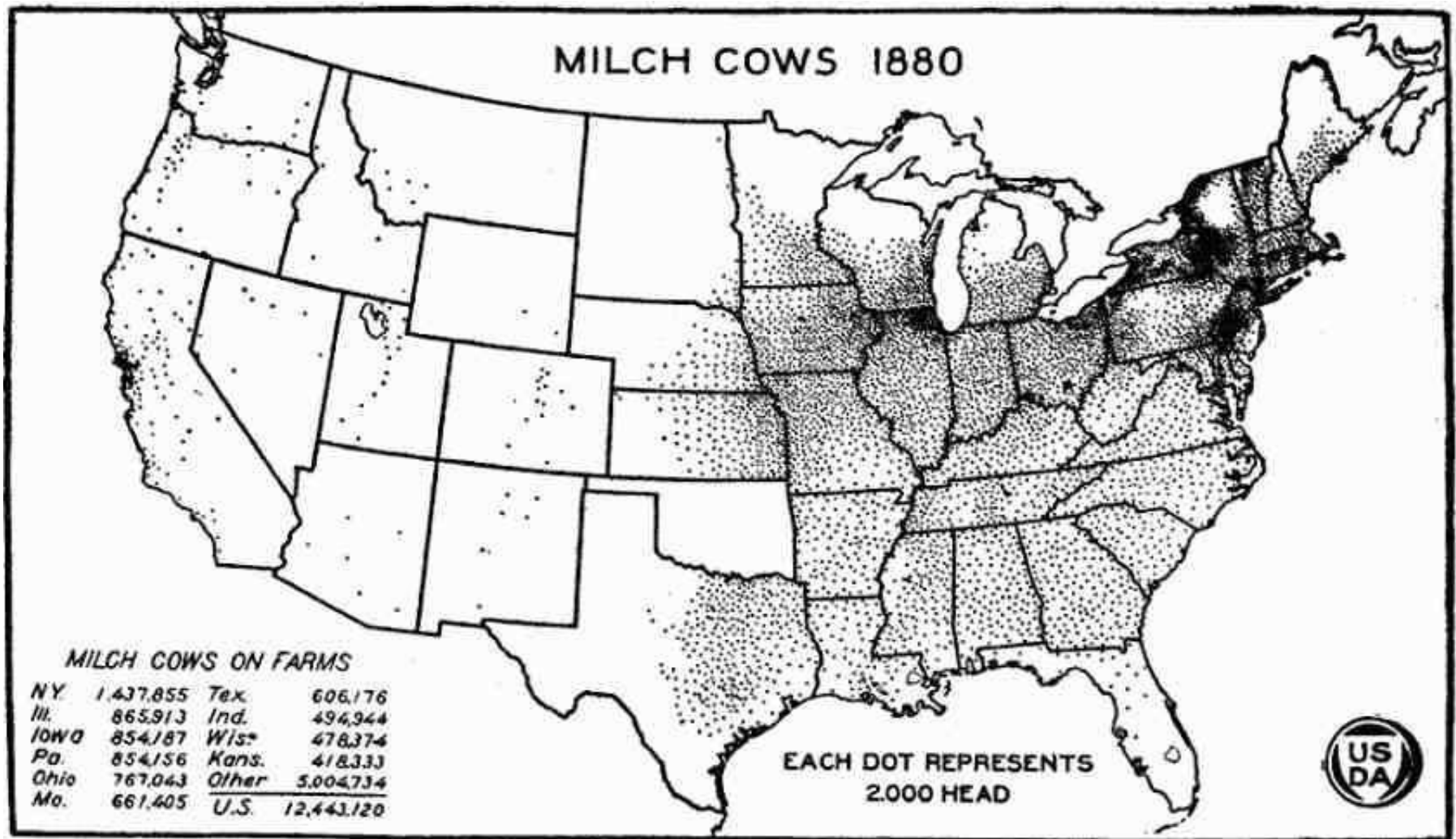
1 dot for each event



Using a 'thematic' scale (1 dot = 2000 cows)

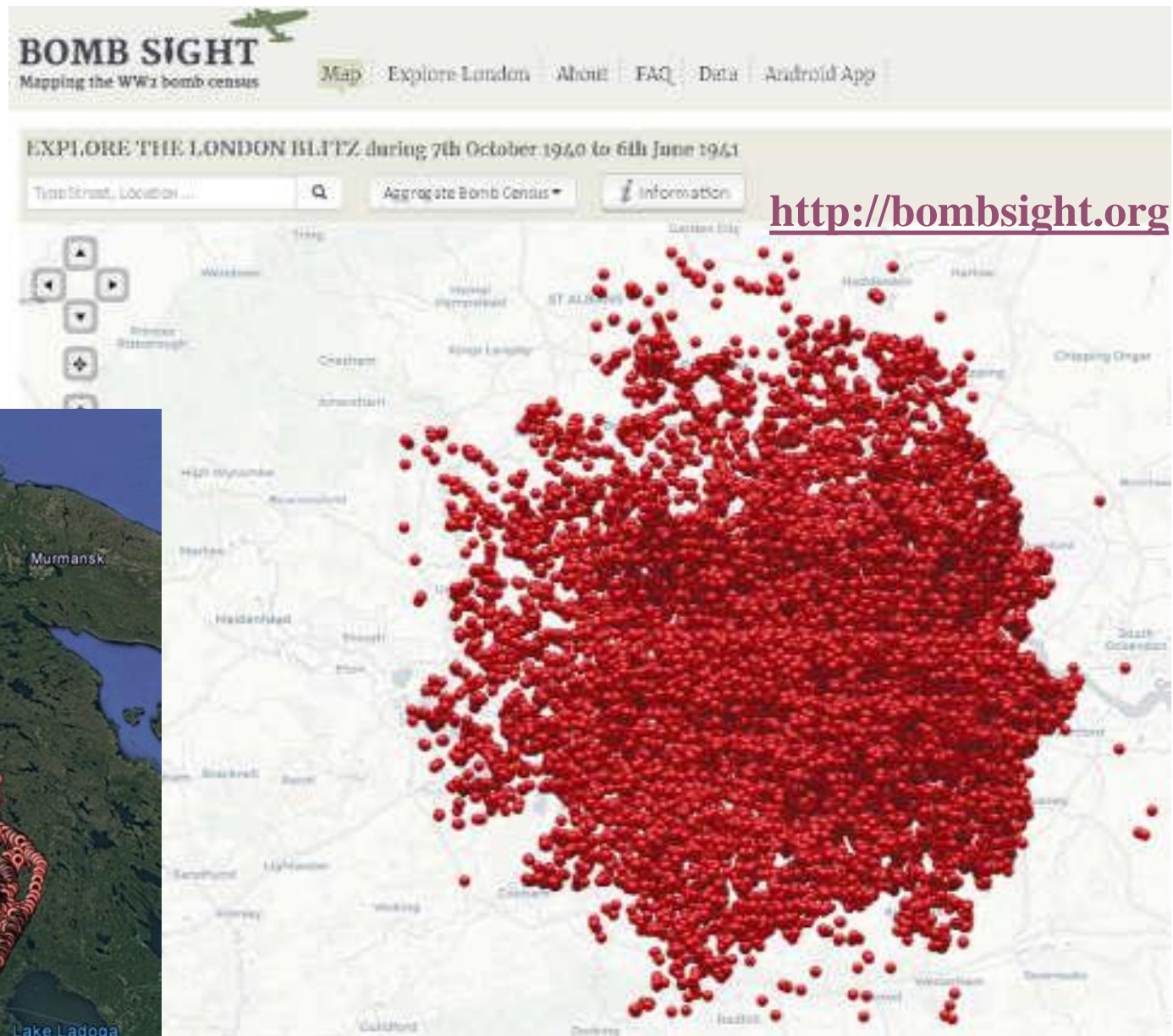


Dot maps – easy to draw, simple to understand



It gives a quick visual impression, but a poor estimate of actual numbers.





<http://bombsight.org>

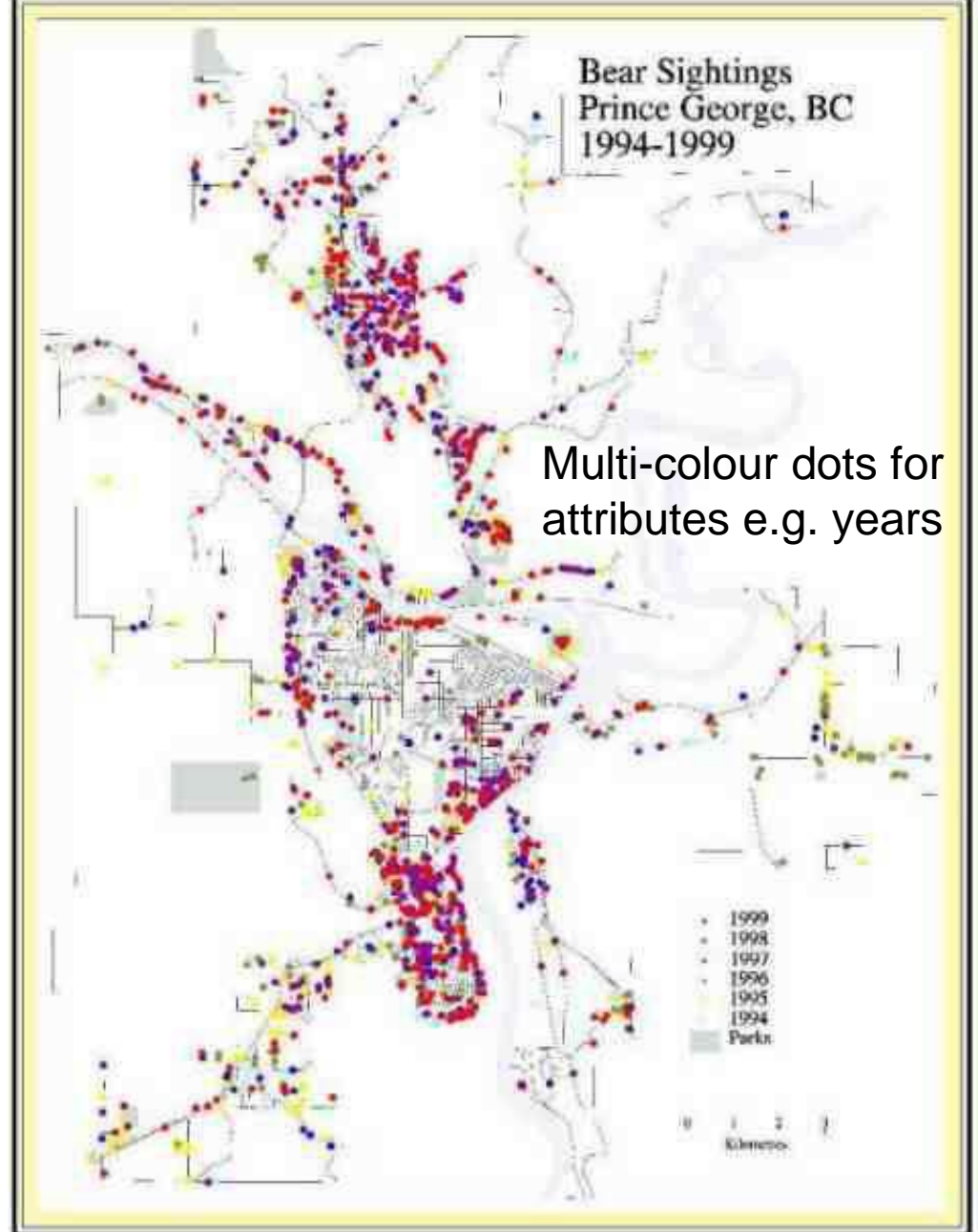
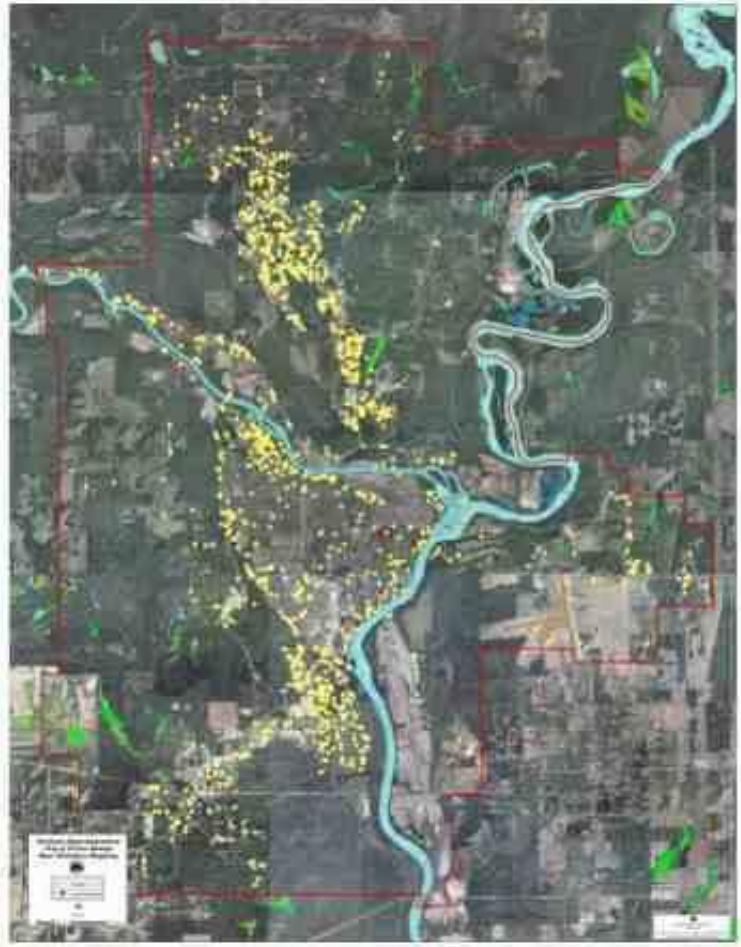
Saunas in Finland



# Black bear sightings, 2010

Yellow = sighting

Red = destroyed



Multi-colour dots for attributes e.g. years

It breaks down when: exact locations are not feasible OR there are too many locations  
Then instead we use a variable size symbol, where size = number of occurrences

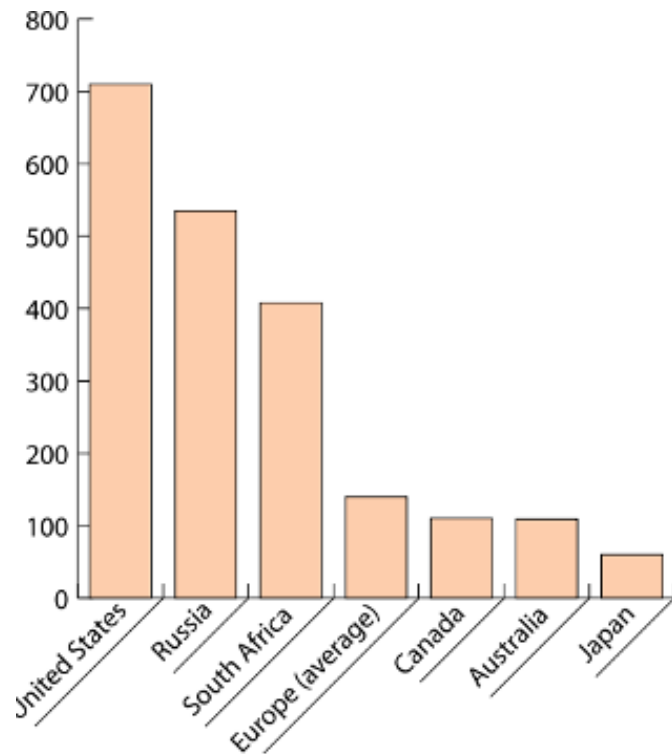


## 2. Proportional Symbols - bars

These indicate values at a point, or in an area. The simplest is a bar.

### Proportional bars:

The height of the bar is proportional to the value represented  
e.g. as in a bar chart



# NHL PLAYERS BY PROVINCE

Where the Canadian-born players for the 2013-14 season hailed from, and their average number of career points. New Brunswick, it's time to get in the game.

**Brad Richards,**  
Murray Harbour, P.E.I.

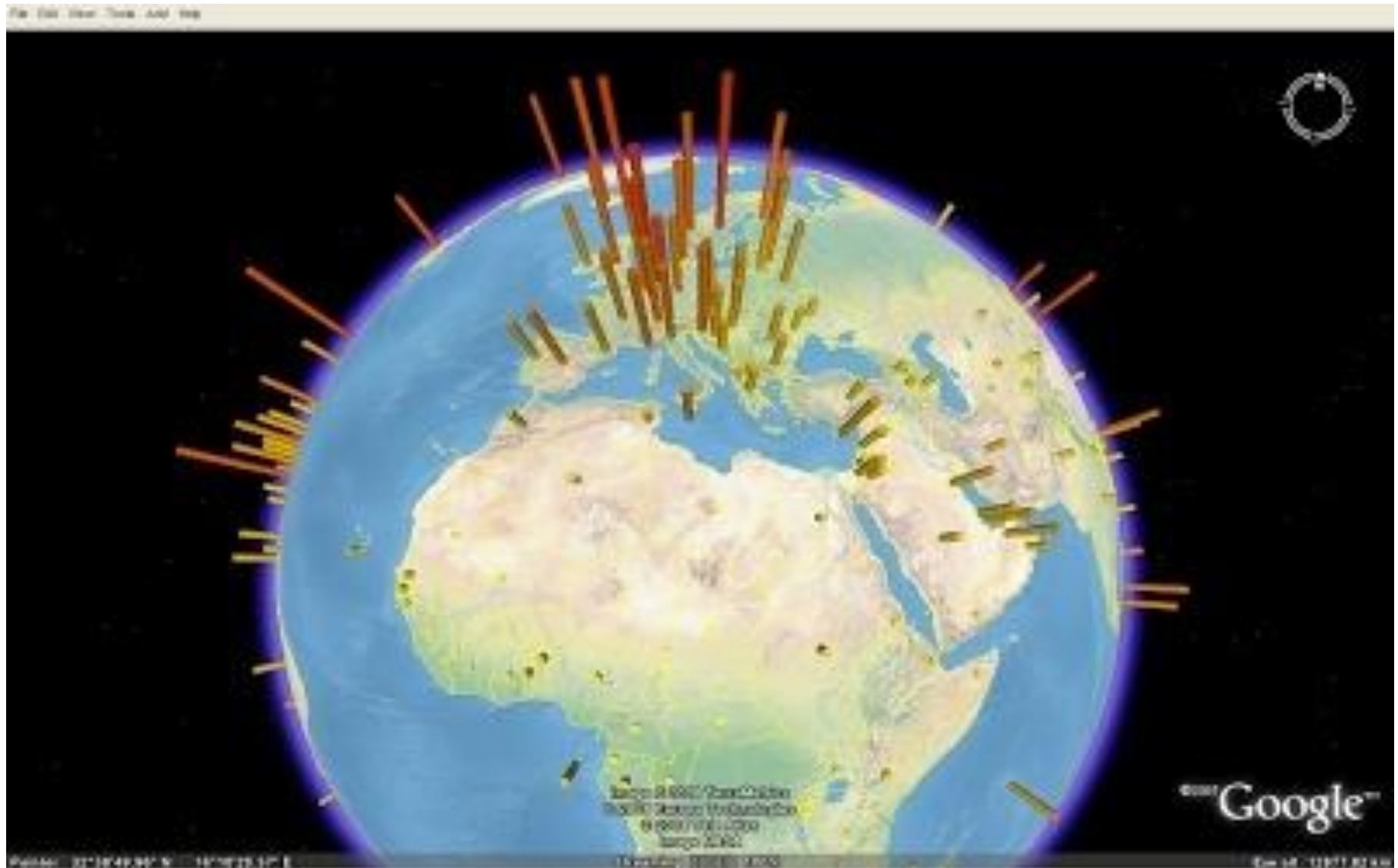


Source: QuantHockey.com;  
Maclean's 2014

**MACLEAN'S**

<http://thematicmapping.org>

Making thematic maps with google earth « *Internet users per 100 population* »





### 3. Proportional (formerly 'Graduated') circles ....

#### **Britain comes first for Movember donations**

Funds raised by the Movember campaign in 2013 (in £ million)



# The advantage of circles over bars: (2D v 1D)

Value	Square root
1	1
4	2
16	4
25	5
50	7.1
100	10
400	20

'Thematic scale'

1

4

1

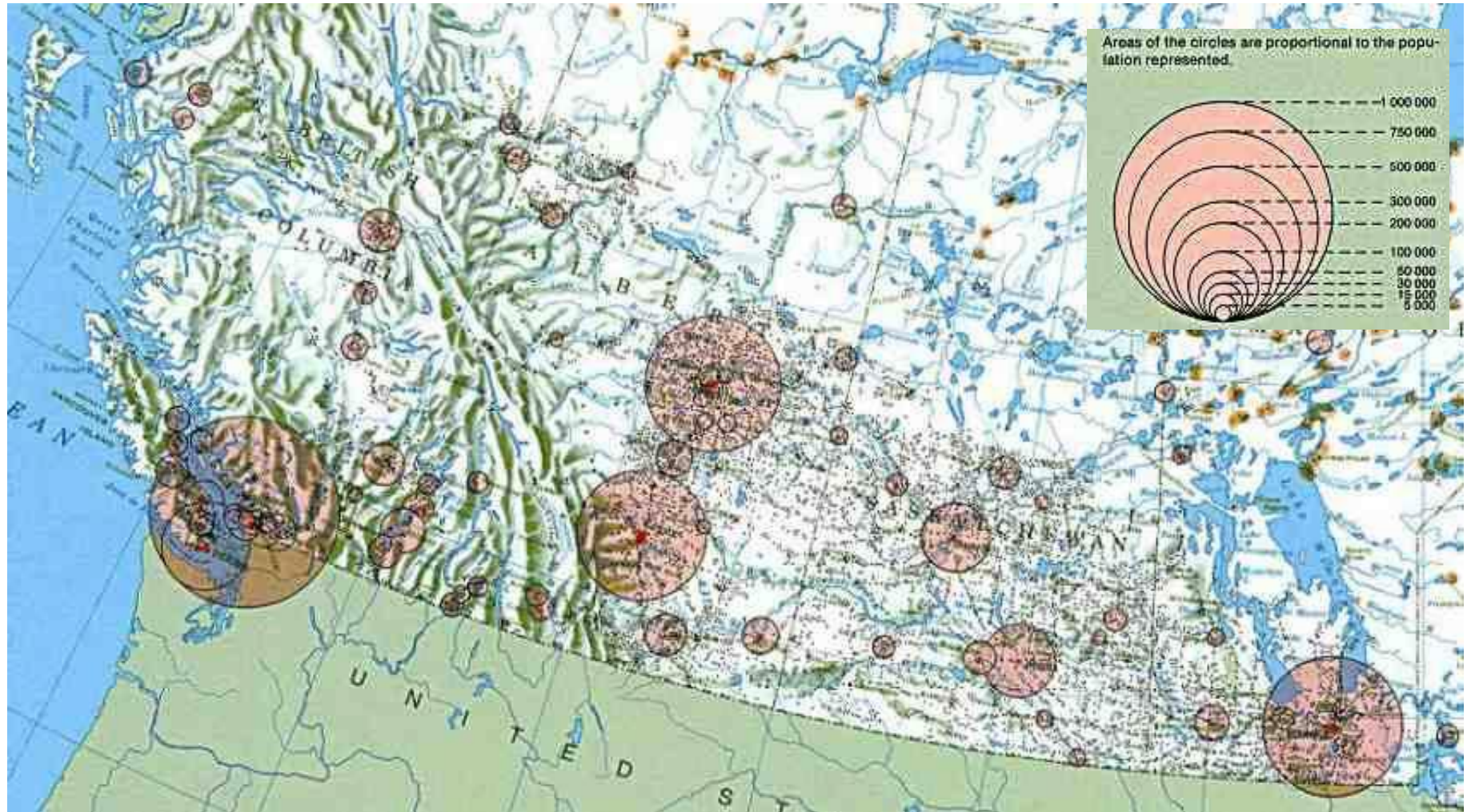
4

Bars are **proportional in height to the value**

Circle **areas** are proportional to the value -  
...the radius is proportional to **square root of the value**

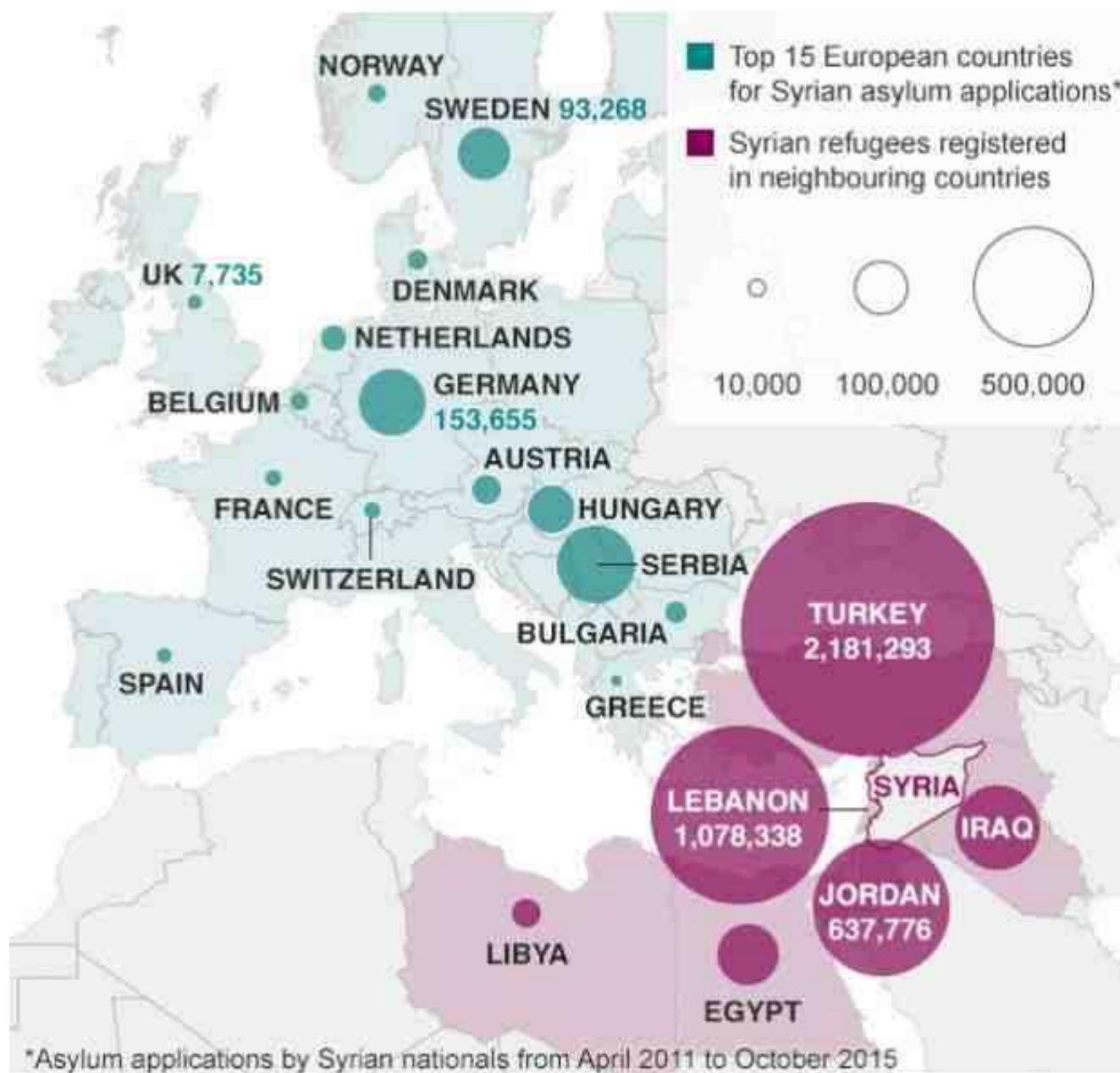
Thus it can handle greater data ranges than the bar, and has been used more than any other point symbol in thematic mapping

Legend: sample circles, nested or strung out, use round numbers

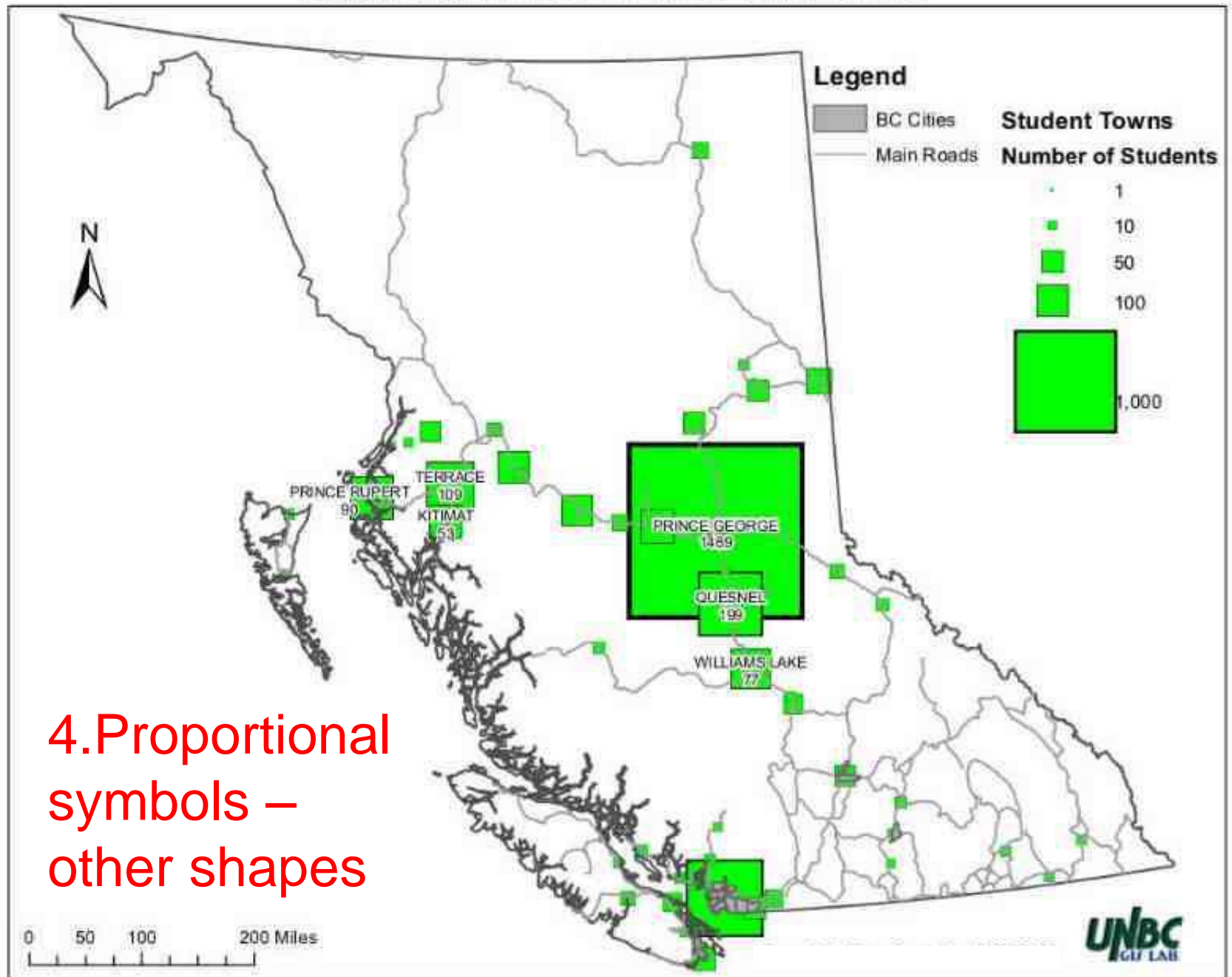




## Syrians in neighbouring countries and Europe

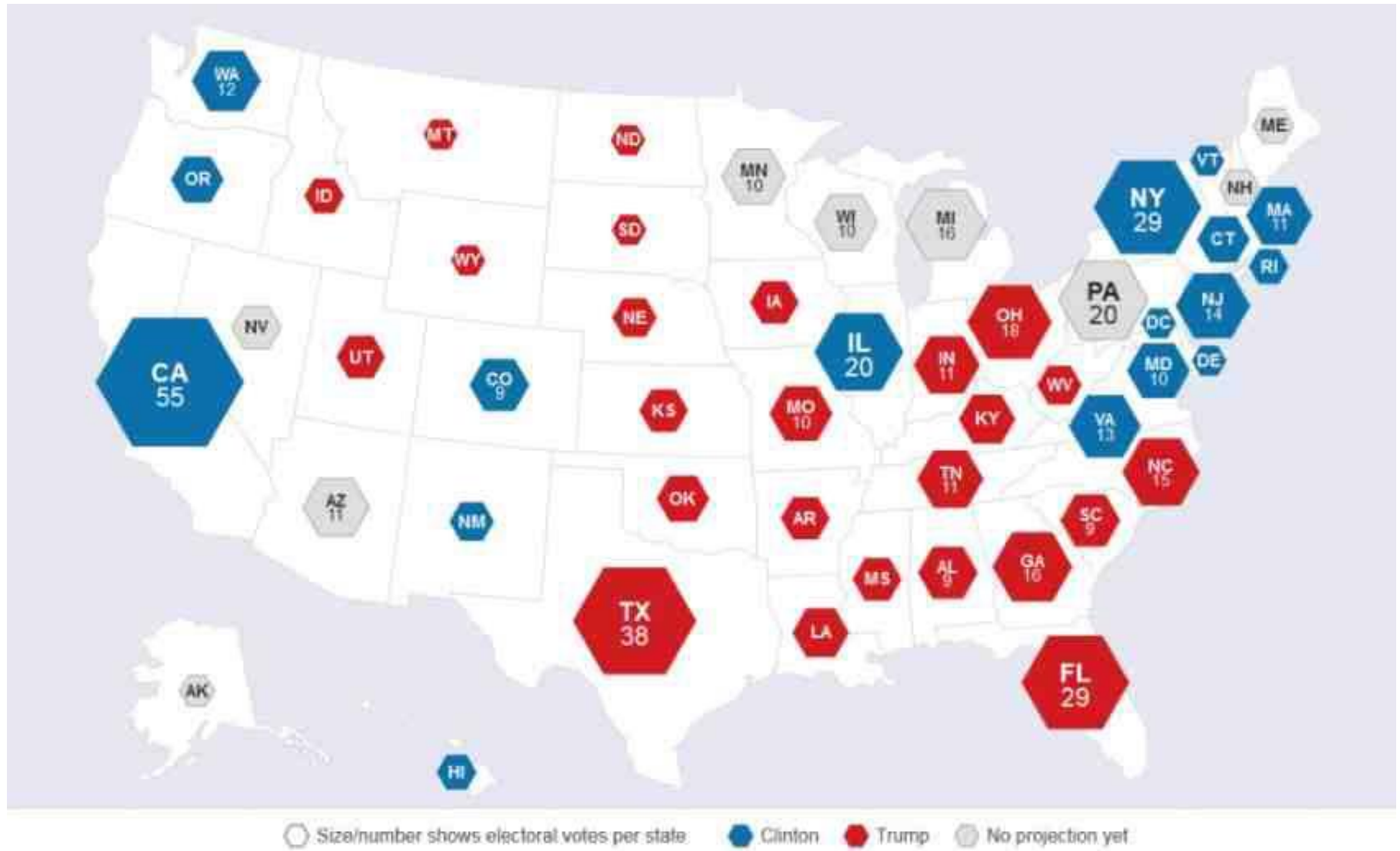


# Distribution of UNBC Students



4. Proportional  
symbols –  
other shapes

# USA election results 2016 (hexagons)





# Facing the Presidential Election 2004



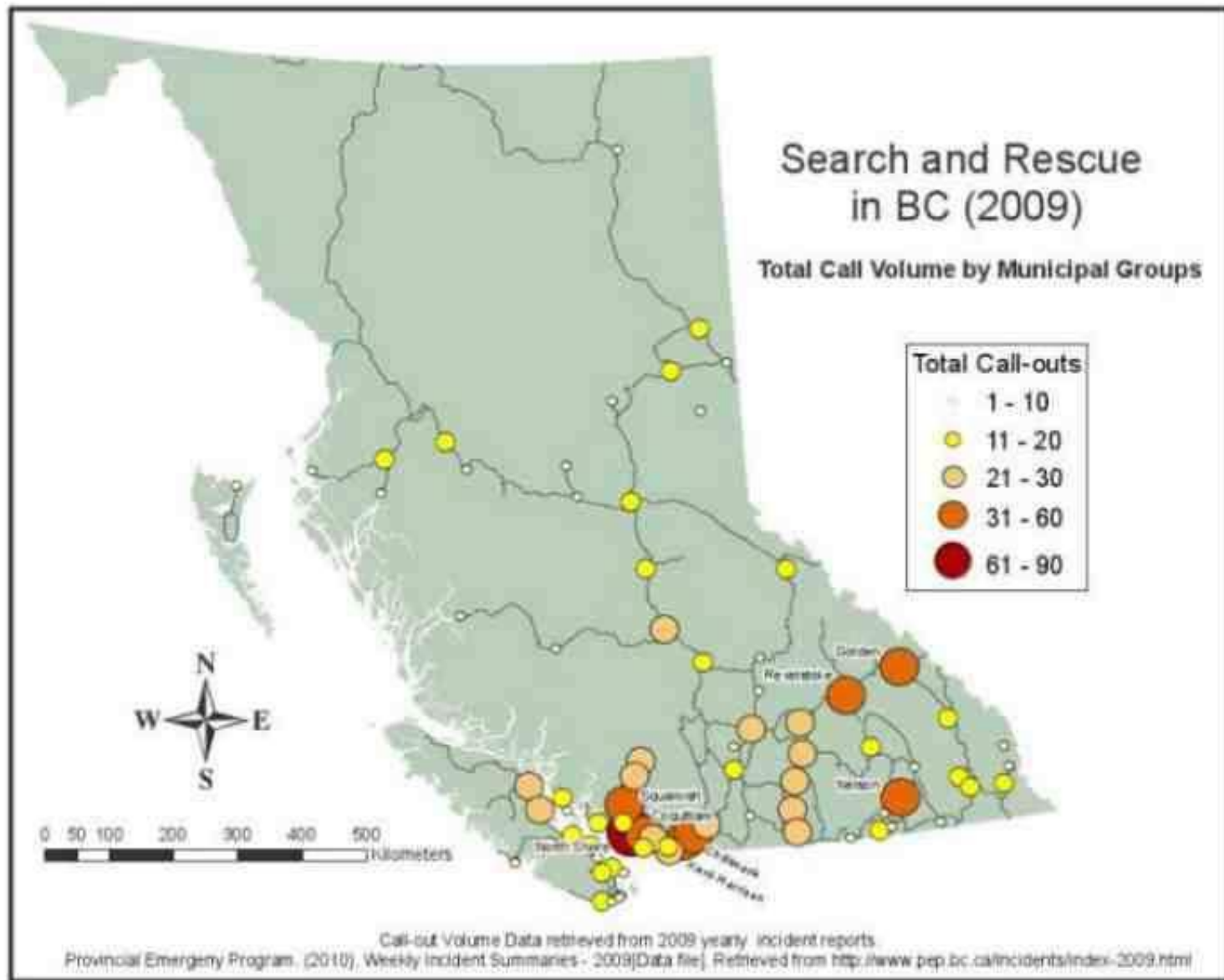
© sara i. feibrkant, 2004

<http://www.geog.ucsb.edu/~sara/html/mapping/election/election04/election.html>

data source: ESRI, New York Times

\* resemblance with a Hollywood actor is pure conspiracy theory

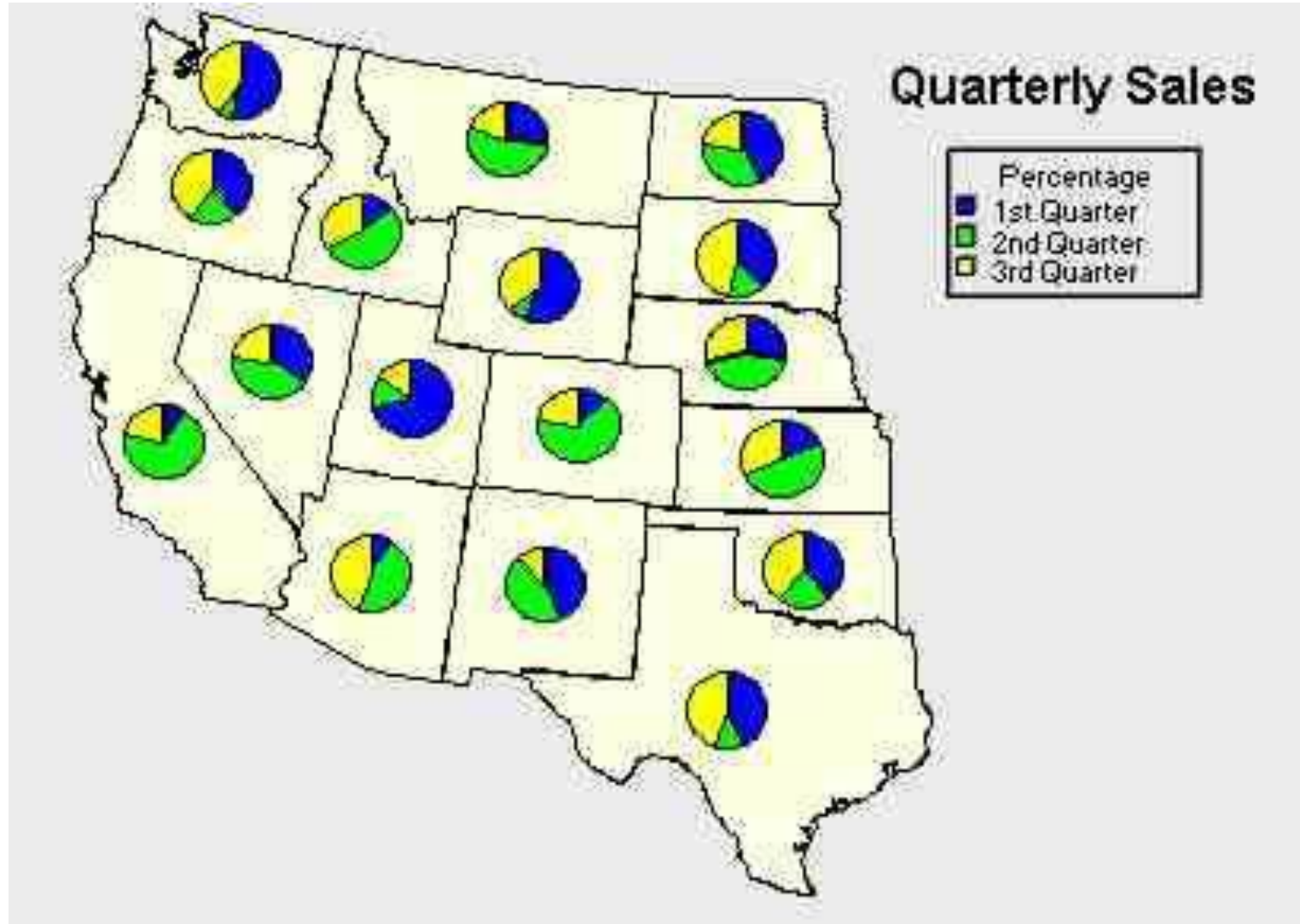
## 5. Graduated ('Range Graded') Symbols: grouped in classes



Where it is not feasible to keep all symbols individually proportional to their values, they can be grouped into classes and shown by a symbol size ~proportional to the class range central value. The design of these classes should be based on grouping similar values.

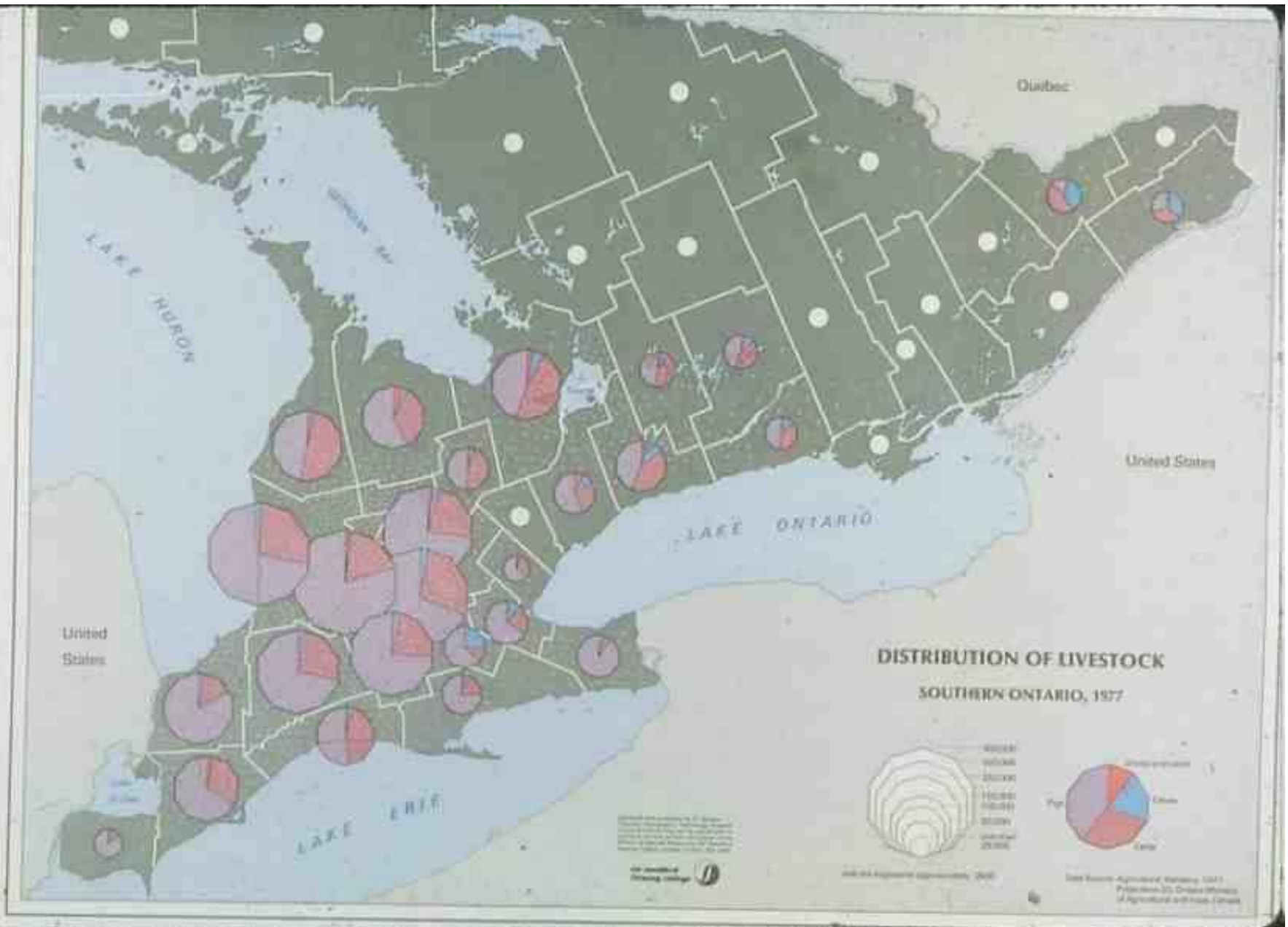
## 6. Segmented Proportional Symbols

Circles are divided into 'pie' sections, starting at the '12 o'clock' position and progressing clockwise round, always in the same sequence for the subdivisions.

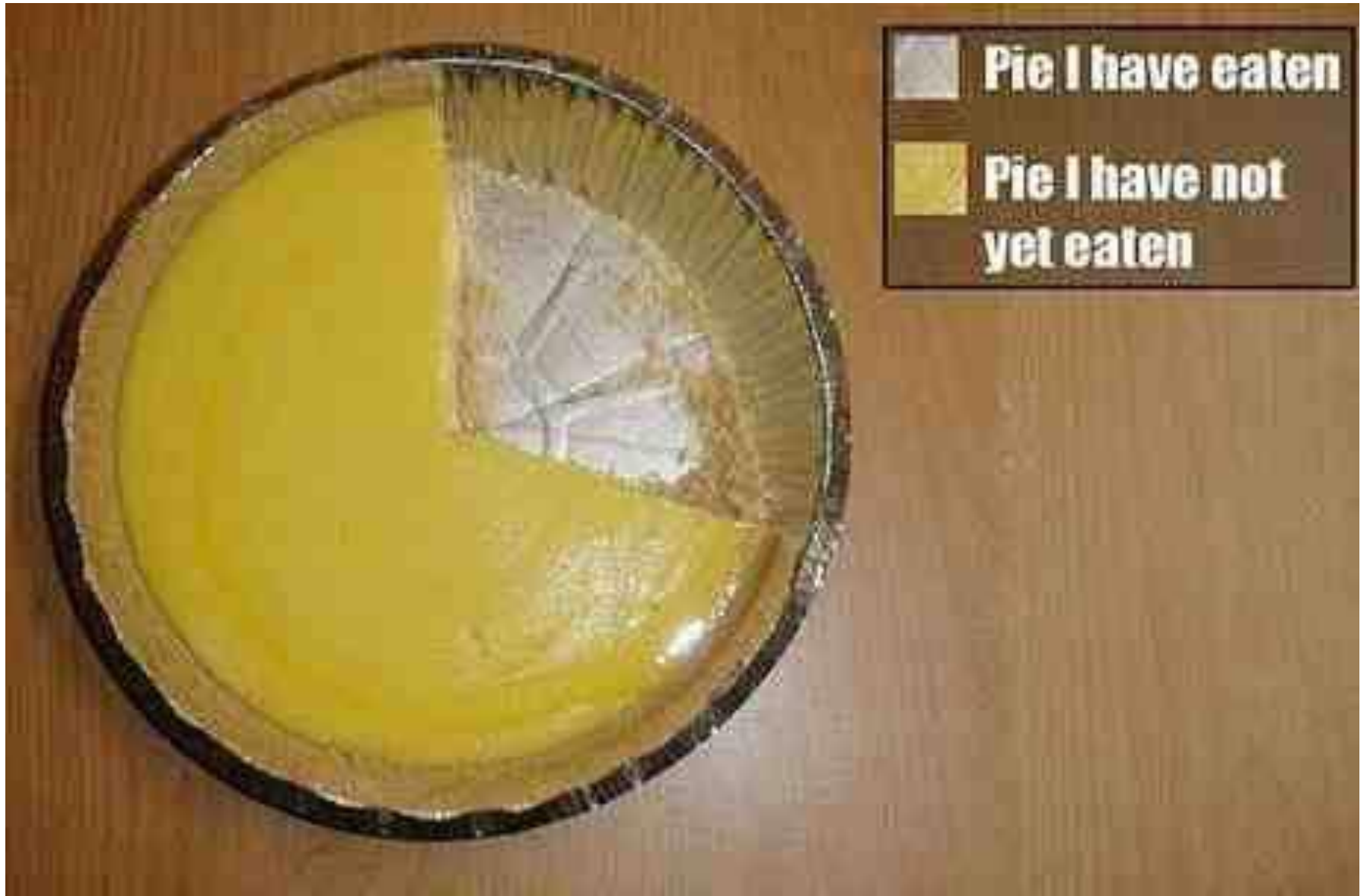




# Segmented proportional symbols - decagons (loonies?)



## Segmented symbols / Pie chart humour

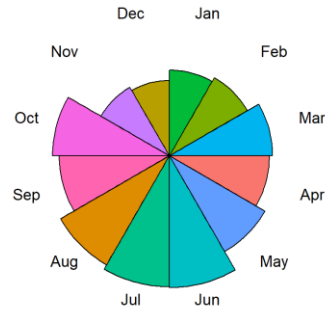


# Alternative segmented circles

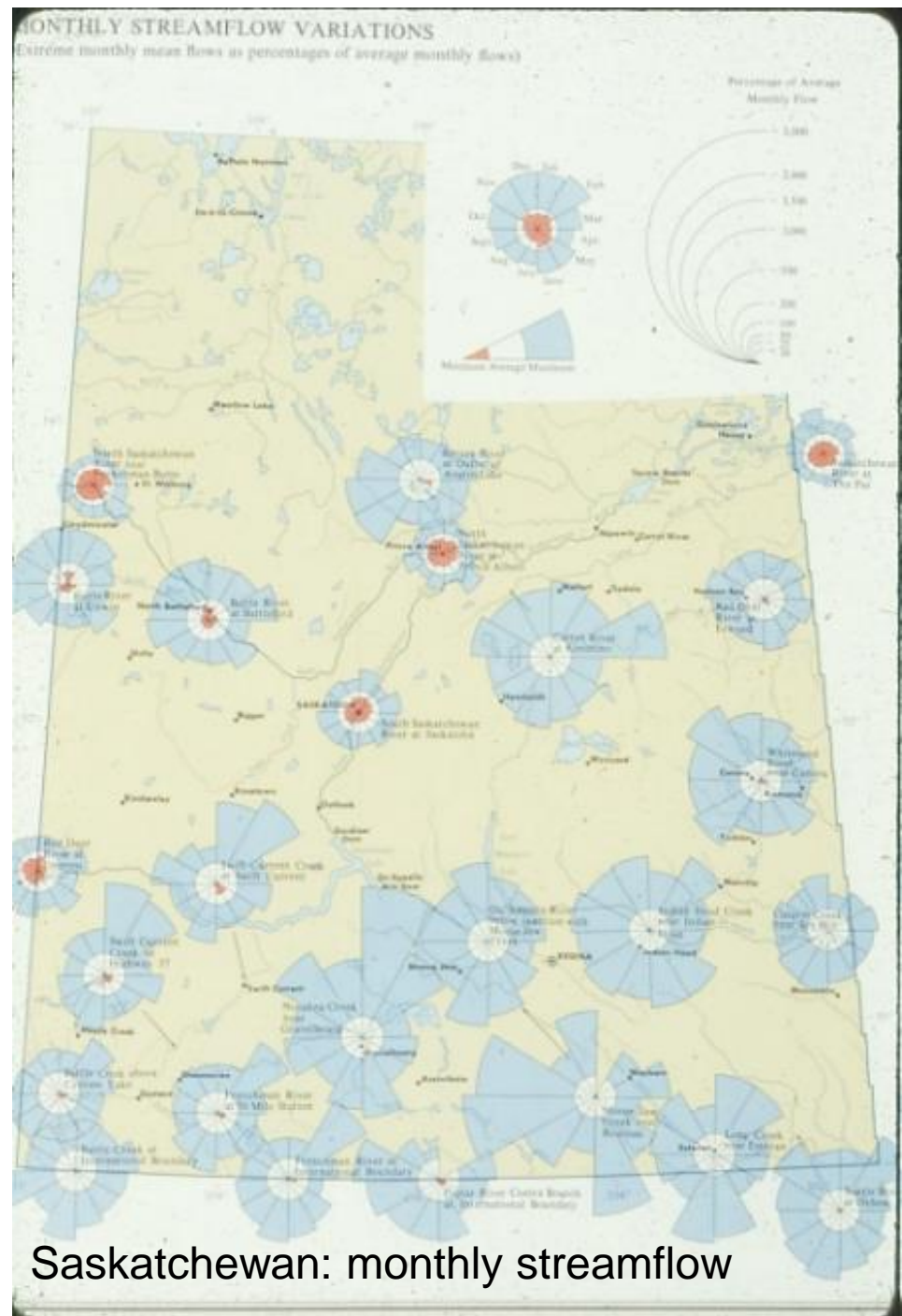
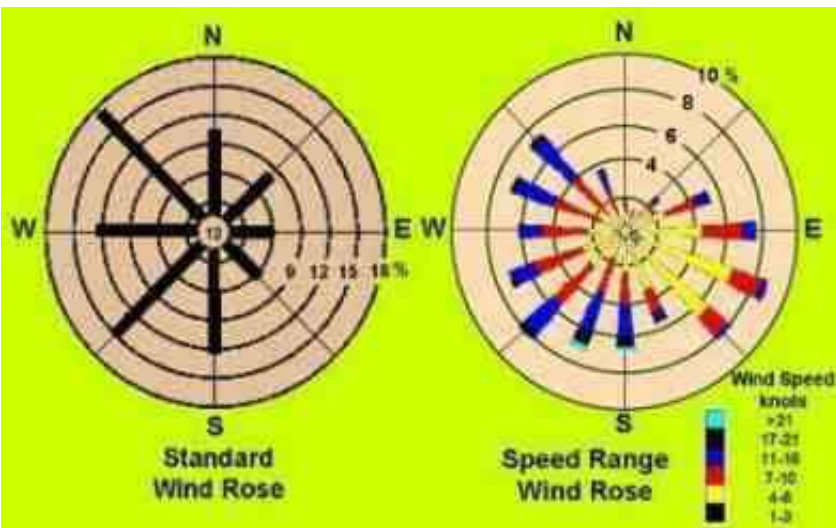
## 'polar diagrams'

'pie sections' are equal in number of degrees, but vary in radius, according to the value.

Number of FIA plot measurements in each month  
Minimum of 12,796 in Dec; maximum of 22,836 in June



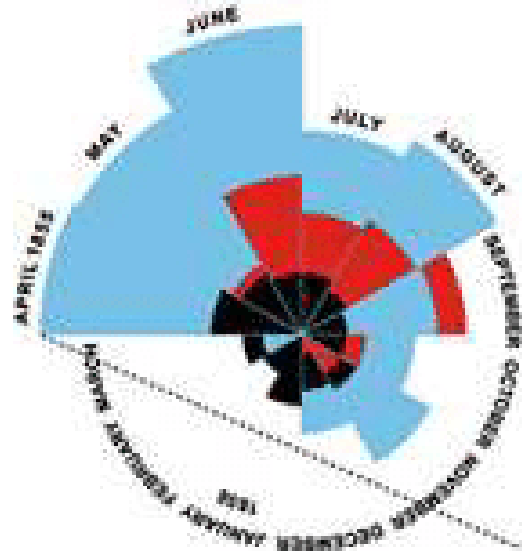
This is used where it is important to directly compare the constituent values, e.g. [river flow](#) over 12 months, or wind speeds from the 8 cardinal directions (a 'wind rose').



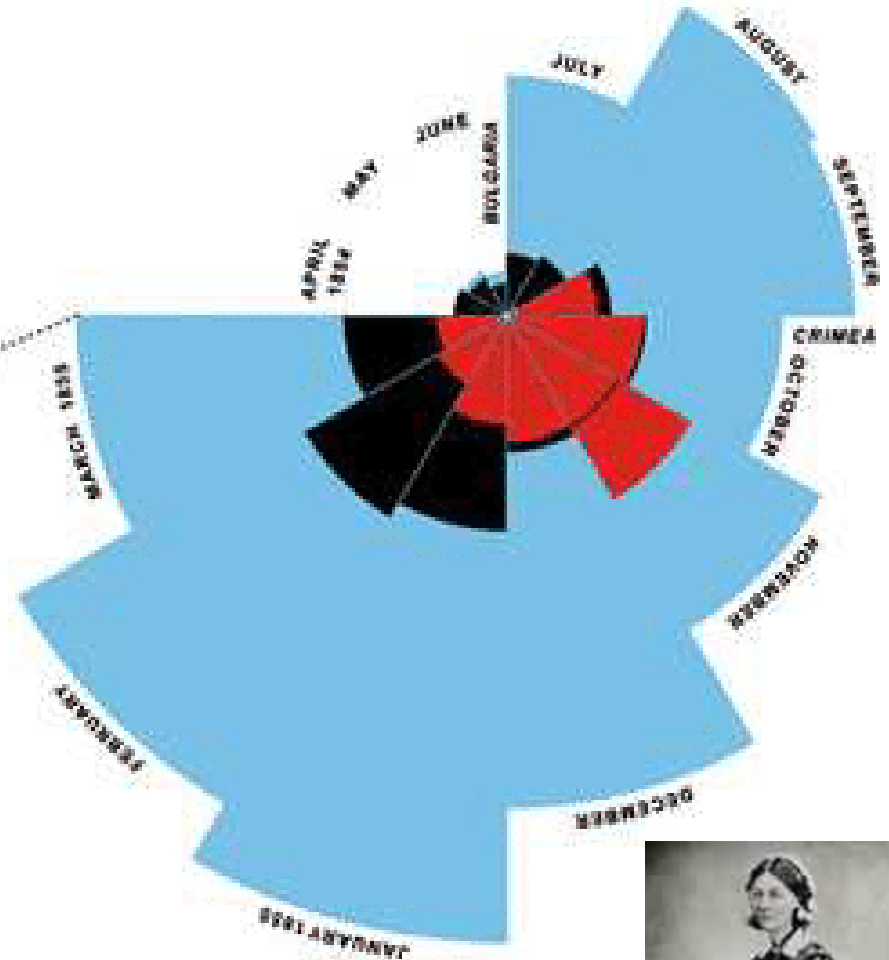


# DIAGRAM OF THE CAUSES OF MORTALITY IN THE ARMY IN THE EAST.

2.  
APRIL 1855 TO MARCH 1856.



1.  
APRIL 1854 TO MARCH 1855.



The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.  
The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic Diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.  
The black line across the red triangle in Nov. 1854 marks the boundary of the deaths from all other causes during the month.  
In October 1854, & April 1855, the black area coincides with the red, in January & February 1856, the blue coincides with the black.  
The entire areas may be compared by following the blue, the red & the black lines enclosing them. *Cough - small mark*

## Polar diagrams

Florence Nightingale



## 7. Volumetric graduated symbols:

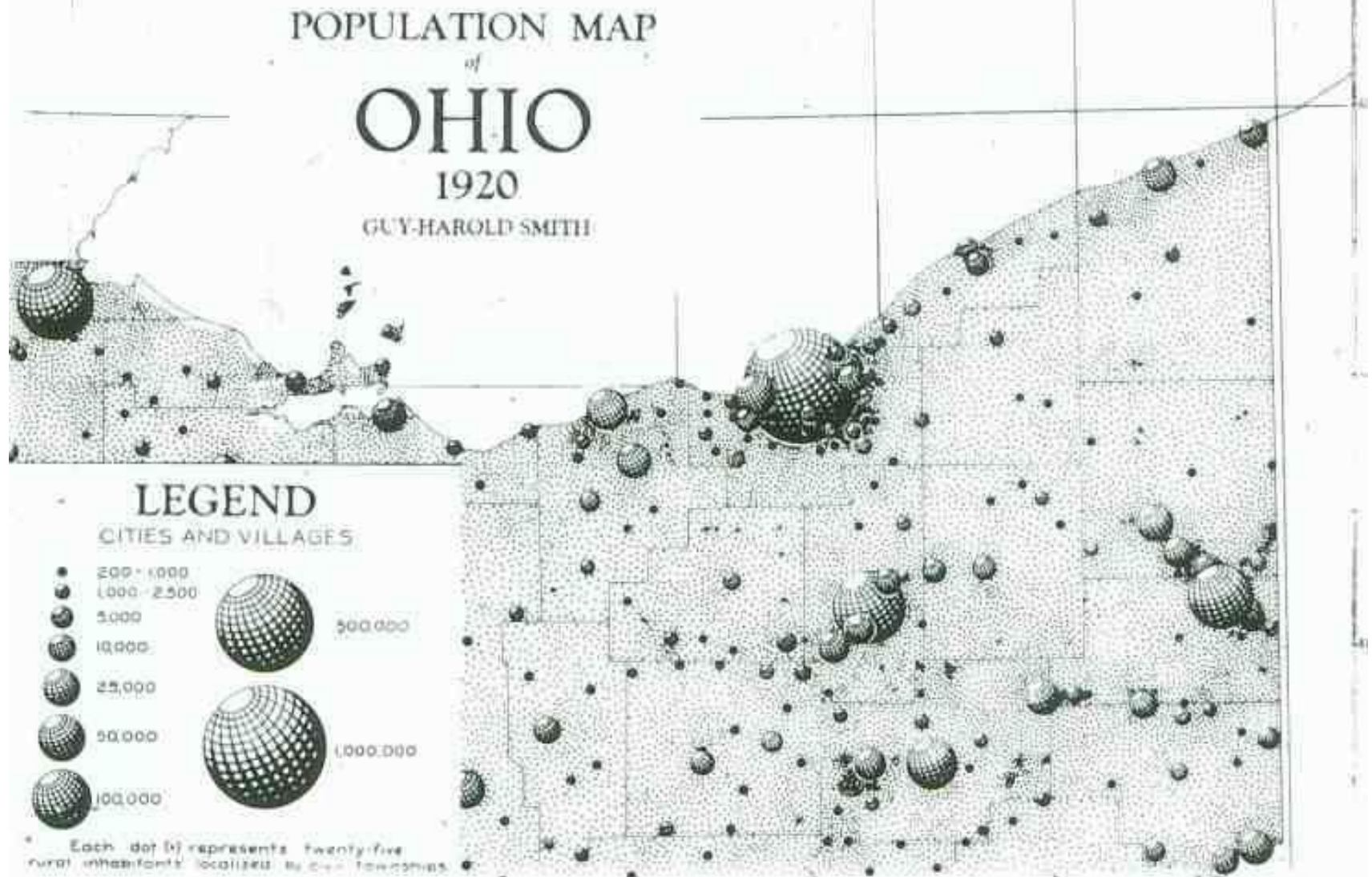
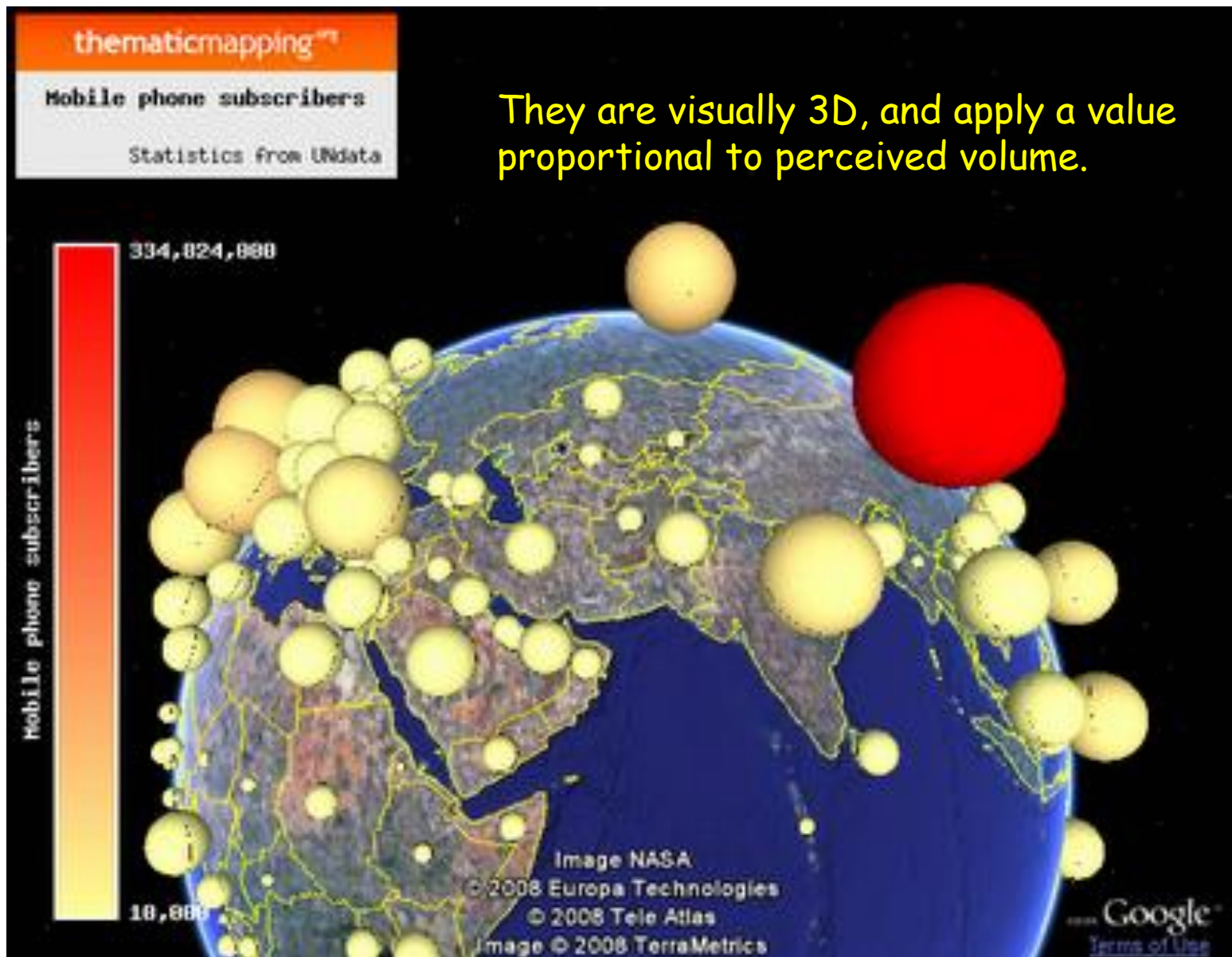


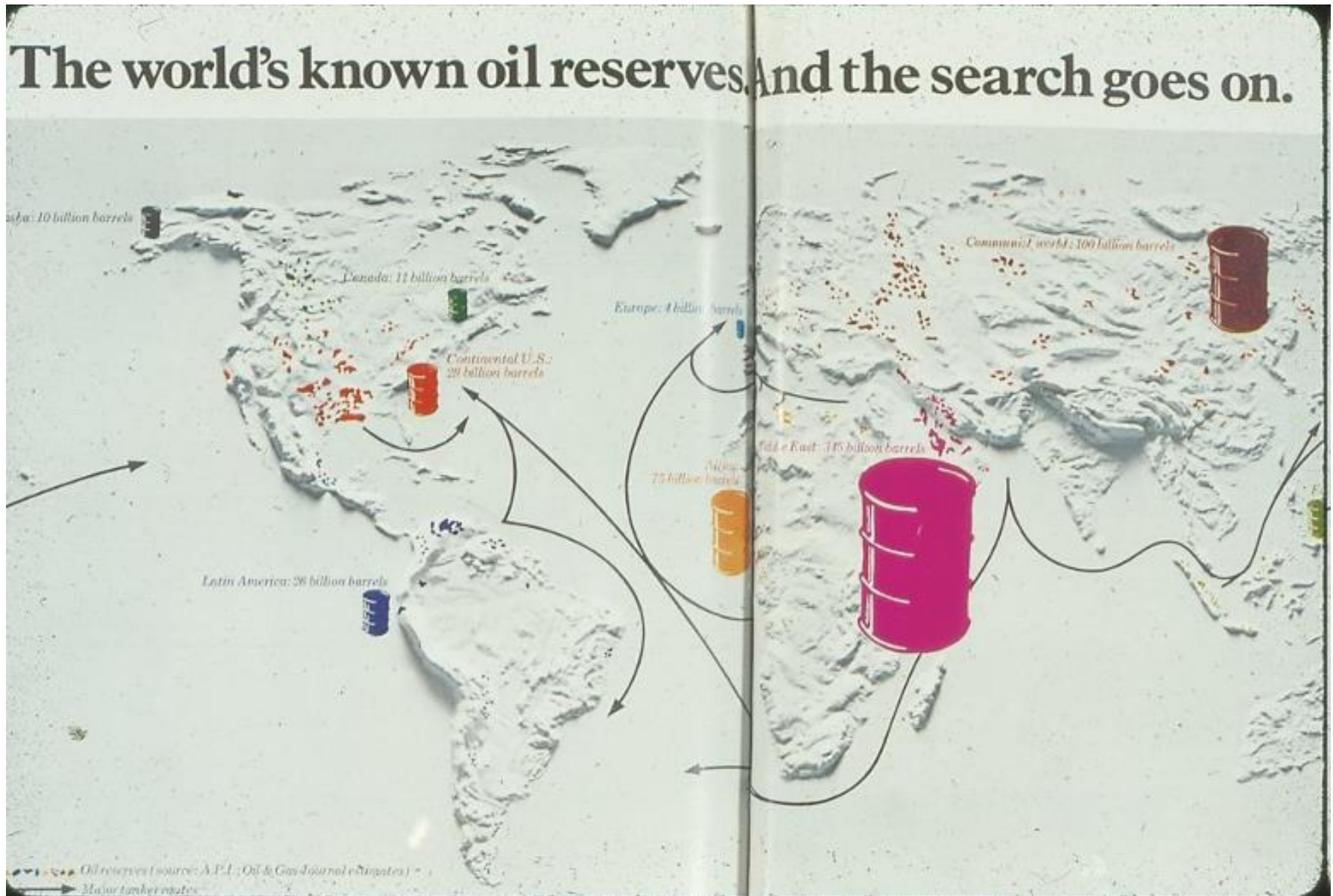
Figure 6.13 A portion of a population map of Ohio (1920) drawn by Guy-Harold Smith. Compare with Fig. 6.8. (Courtesy of the author and *The Geographical Review*, published by the American Geographical Society of New York.)



These can handle even greater data range than circles, -> a sphere radius is proportional to the cubed root of values e.g. 1:1000 becomes 1:10.



# Infographic: Other shapes are possible: cubes, any 3D shape



Not easily segmented

# Infographic

Tun  
216 gallons

## English Wine Cask Units

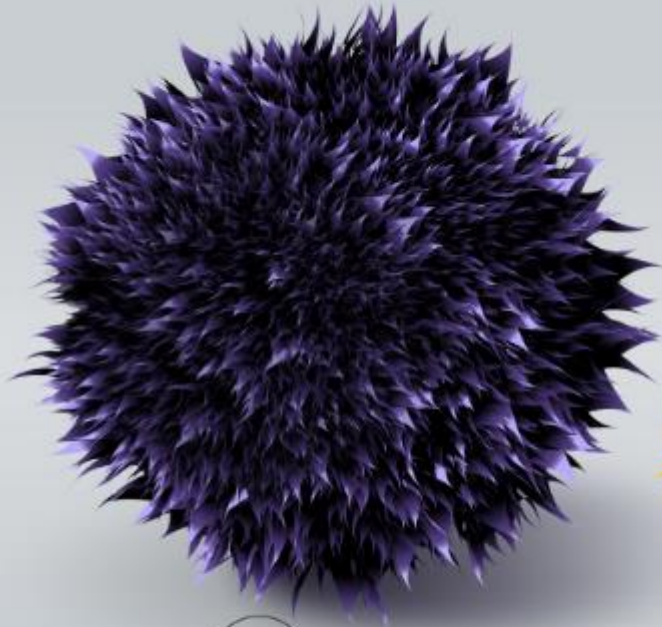




# World's deadliest pandemics

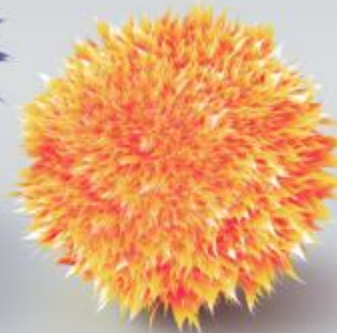
**200M**

**Black Death (Bubonic Plague)**  
1347-1351



**56M**

**Smallpox**  
1520



**40-50M**

**Spanish Flu**  
1918-1919



**30-50M**

**Plague of Justinian**  
541-542



'Thematic  
← Scale'



The plague originated in rats and spread to humans via infected fleas.

The outbreak wiped out 30-50% of Europe's population. It took more than 200 years for the continent's population to recover.

**Smallpox** killed an estimated 90% of Native Americans. In Europe during the 1800s, an estimated 400,000 people were being killed by smallpox annually. The first ever vaccine was created to ward off smallpox.

The death toll of this plague is still under debate as new evidence is uncovered, but many think it may have helped hasten the fall of the Roman Empire.



**25-35M**

**HIV/AIDS**

1981-PRESENT



**12M**

**The Third Plague**

1855



**5M**

**Antonine Plague**

165-180



**3M**

**17th Century Great Plagues**

1600



**2.2M\***

**COVID-19**

2019-9:22AM PT,  
FEB 01, 2021  
**[ONGOING]**

6.8m: 2023



**1.1M**

**Asian Flu**

1957-1958



**1M**

**Russian Flu**

1889-1890



**1M**

**Hong Kong Flu**

1968-1970



# Summary – thematic point techniques

- Dot maps (and other same-size shapes)

## Graduated symbols

Bar – linear (1D) proportional symbol

Circle – 2D proportional symbol (and other shapes)

- Range graded (graduated) symbols – classed by size
- Segmented symbols – subdivided by subcategories

Spheres – 3D proportional (volumetric) symbol

# Line techniques: 1. Graduated line symbols:

are used to indicate movement or FLOW (line width = amount)

36 Chapter Six

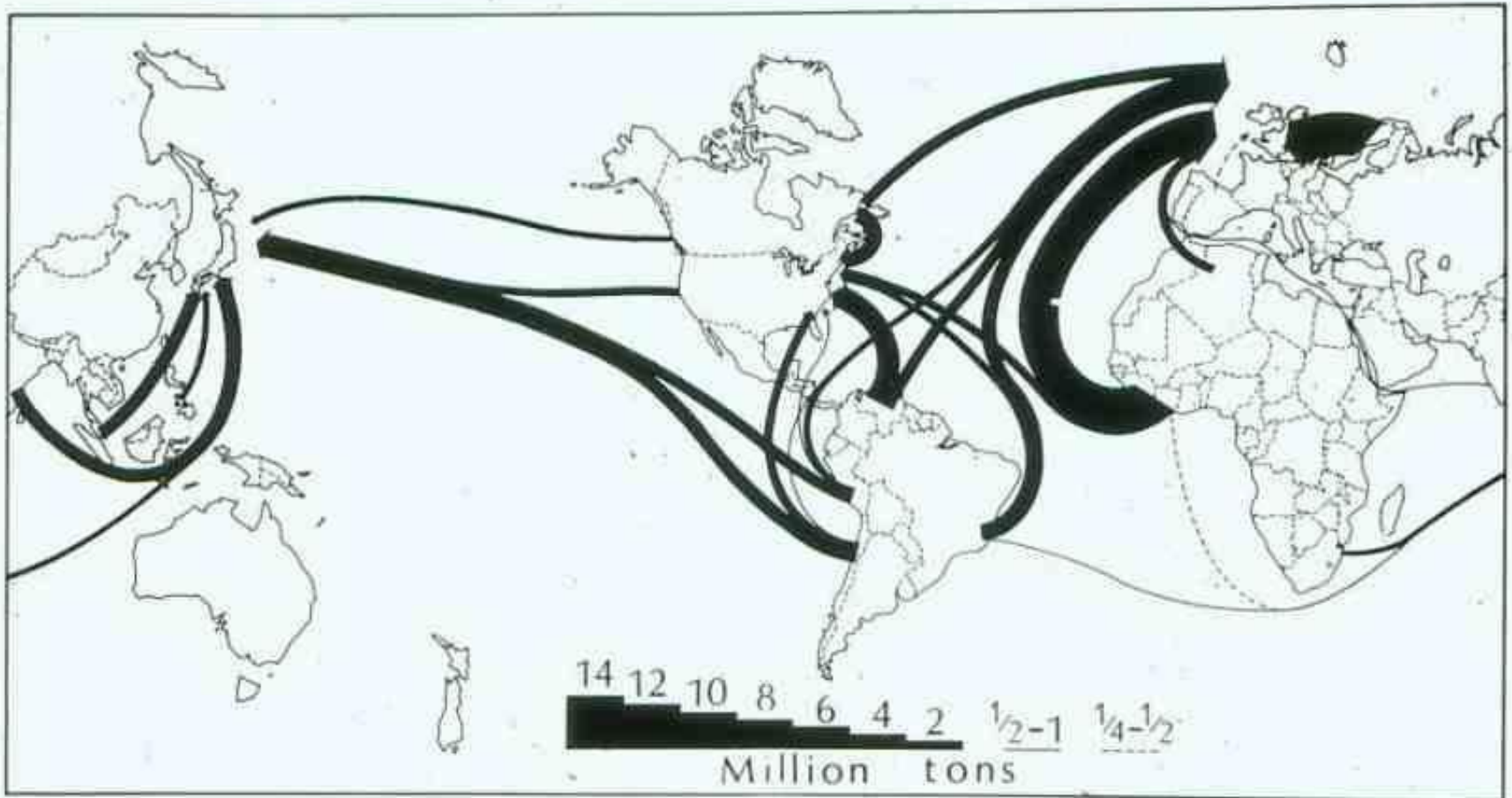
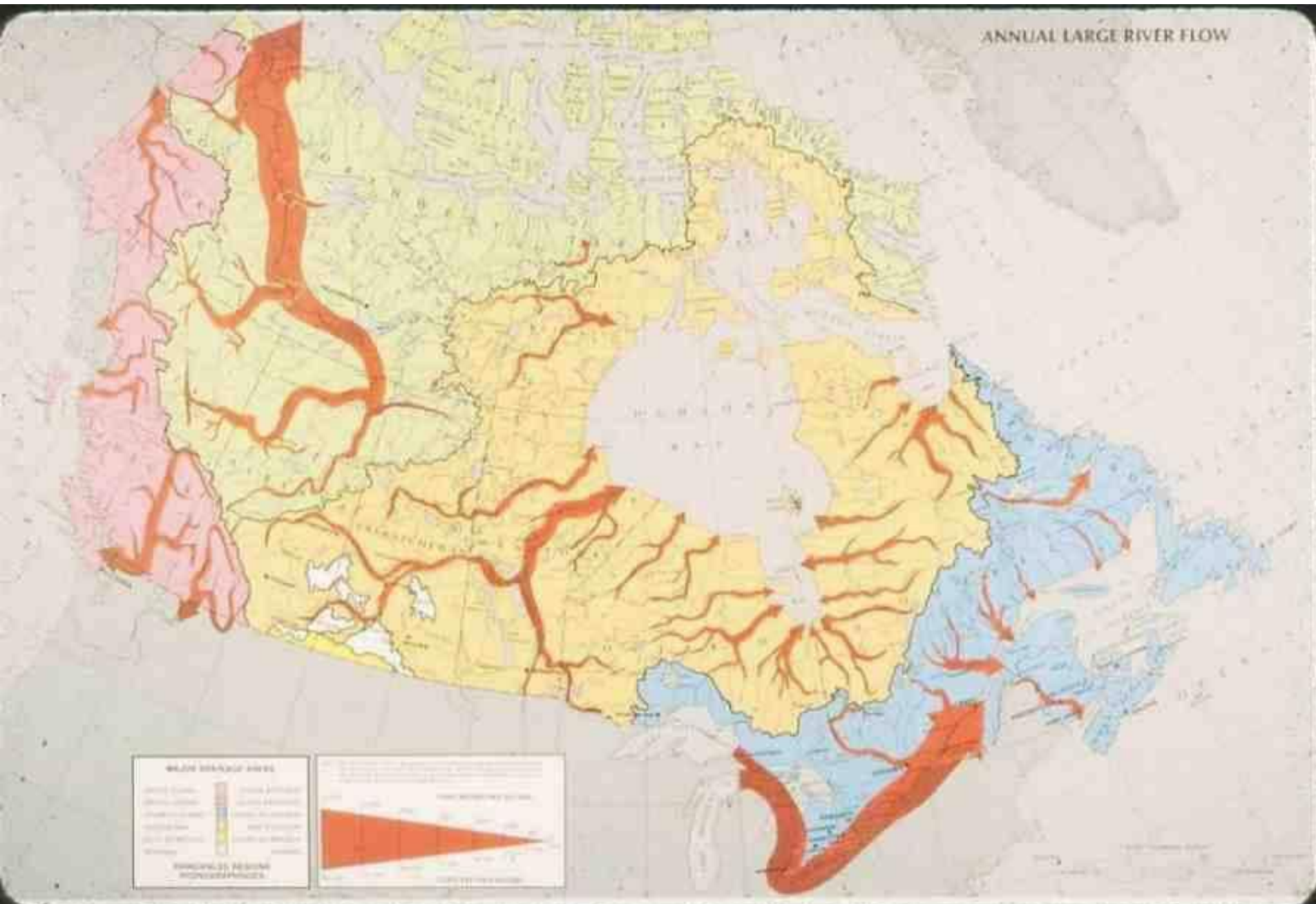


Figure 6.21 A portion of a flow-line map showing the movement of iron ore. Map by G. B. Lewis. (From G. Manners, "Transport Costs, Freight Rates, and the Changing Economic Geography of Iron Ore", *Geography*, 52 (1967), 260-279.)

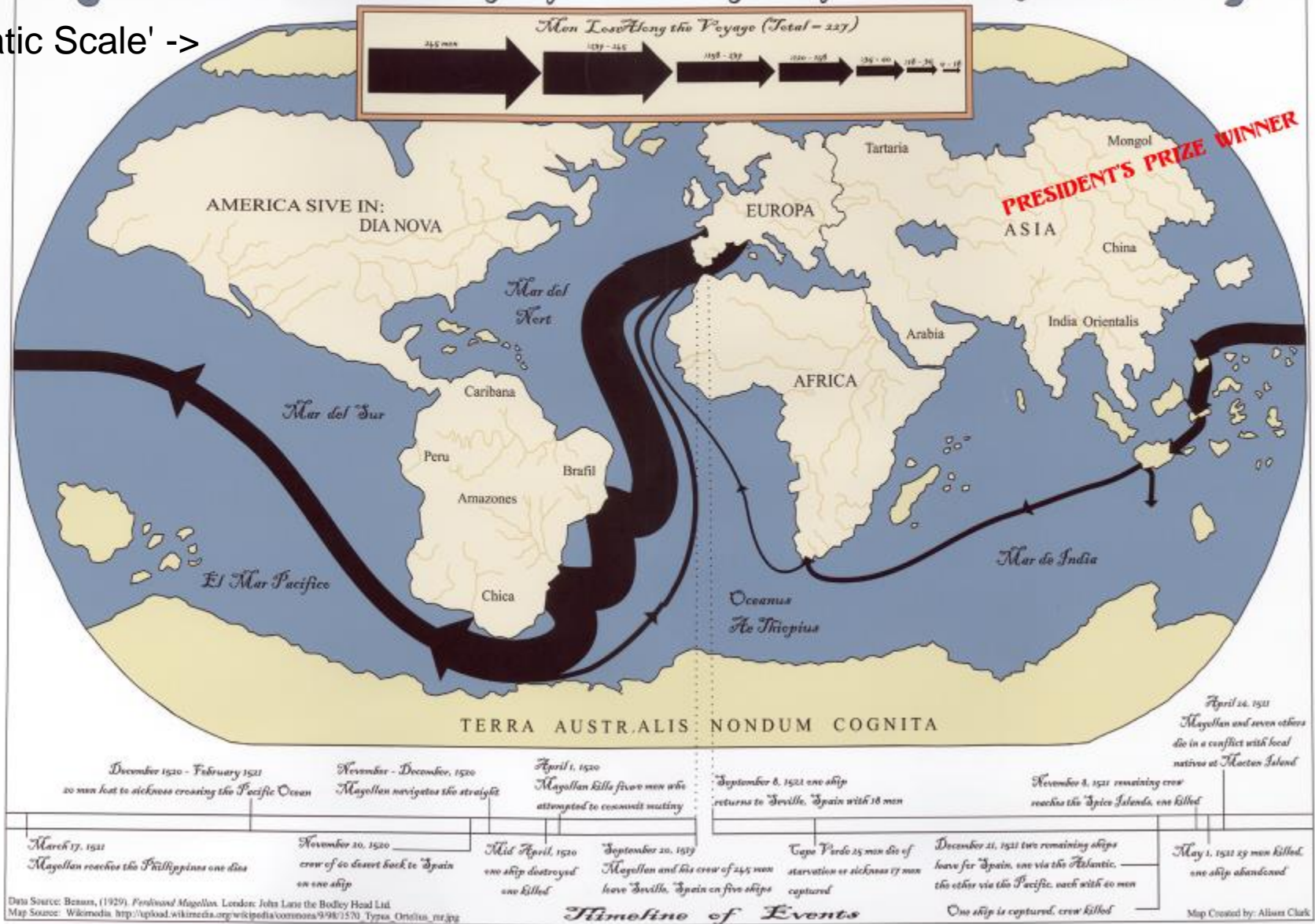
# River volume – Canada 'flow'

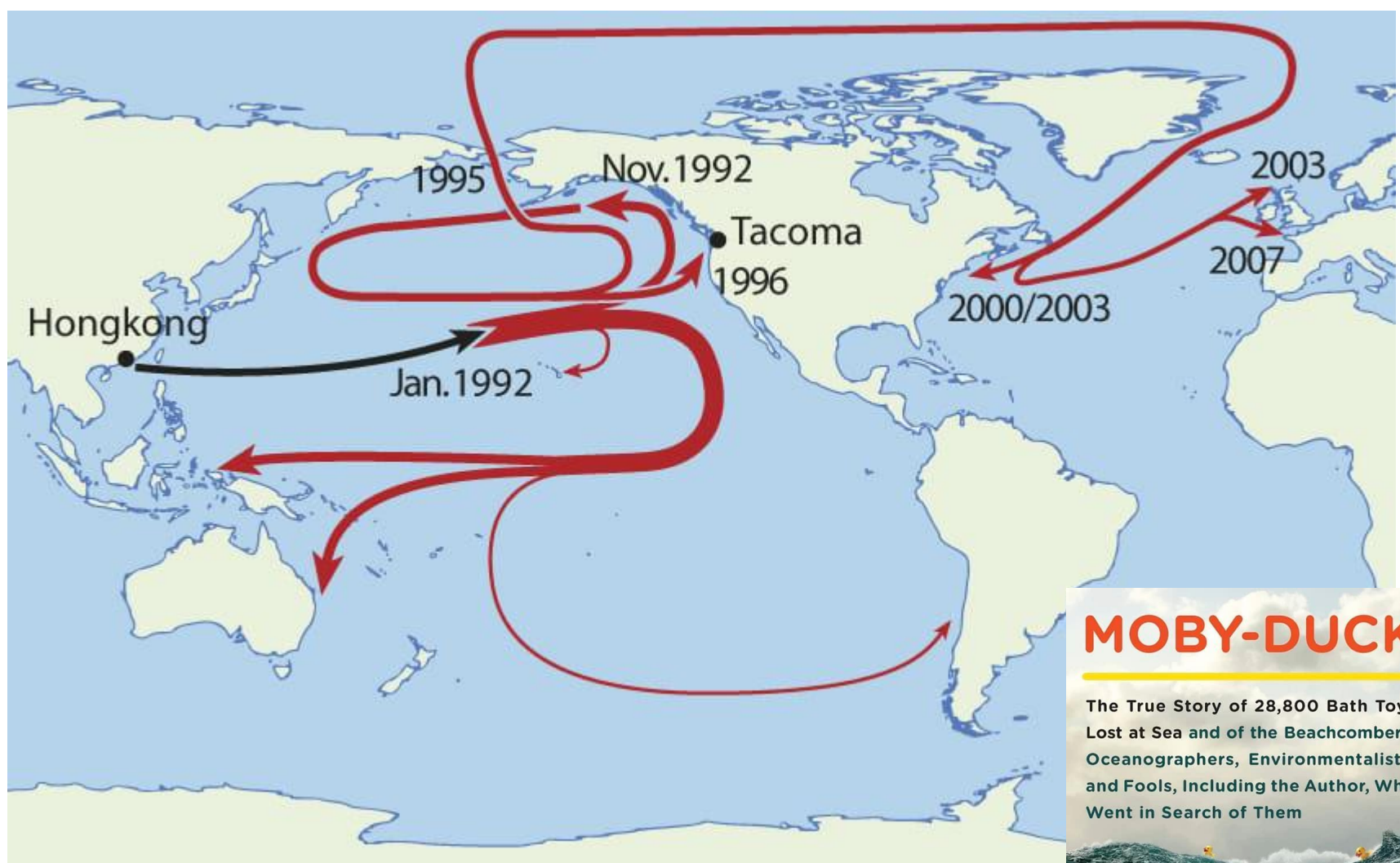




# Peril at Sea: The men lost during the first circumnavigation of the world, Magellan 1519 - 1522

'Thematic Scale' ->





28.800 Rubber ducks were washed overboard from a container ship in the Pacific Ocean on 10 January 1992 and have subsequently been found on beaches around the world and used by oceanographers to trace ocean currents. \* No thematic scale except by inference of start line

**Note- first 'take-home' lecture quiz at end of week – Thematic maps**

