

FIT3179 Data Visualisation

Week 07: Dot maps and proportional symbol maps



■ What?

- Geographic points or regions with quantitative attribute per region

1 dot = 1 restaurant



■ Why?

- Task: show spatial distribution, density.

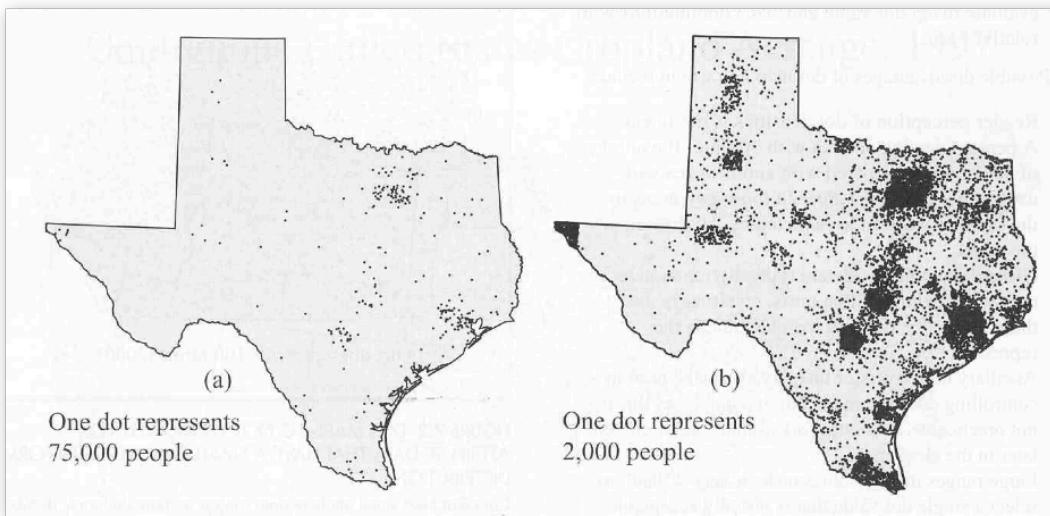
■ How?

- Marks: points
one point represents n observations
- Scalability: large number of points
- For large areas, an area preserving map projection is required

1 dot = 1000 cows



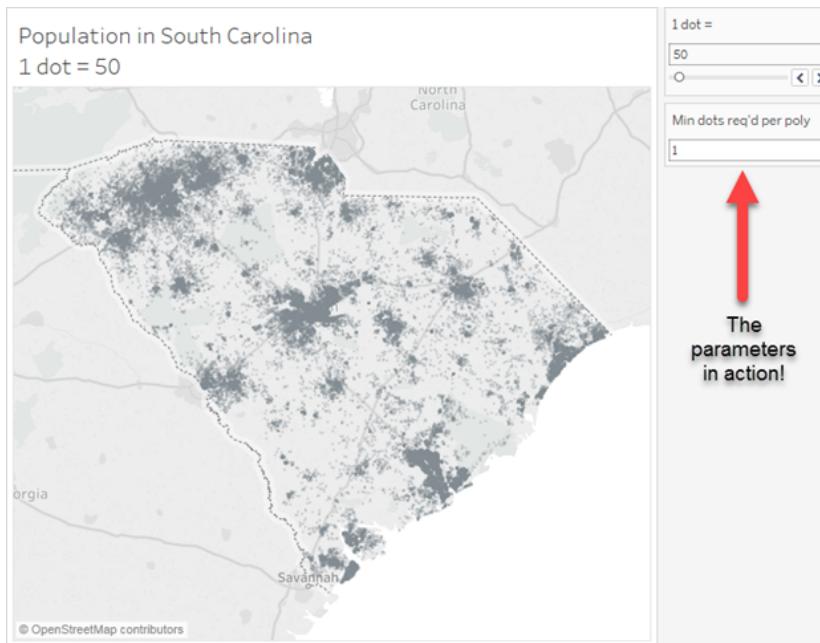
- Dot maps do not work well with strongly varying density
 - in map (a) dots are too sparse; no pattern in large areas of the map
 - in map (b) dots are too dense; dots form black areas



- Alternative to dot maps:
 - choropleth or bin map by counting points per area
 - convert to scalar field and use isocontours or colour mapping

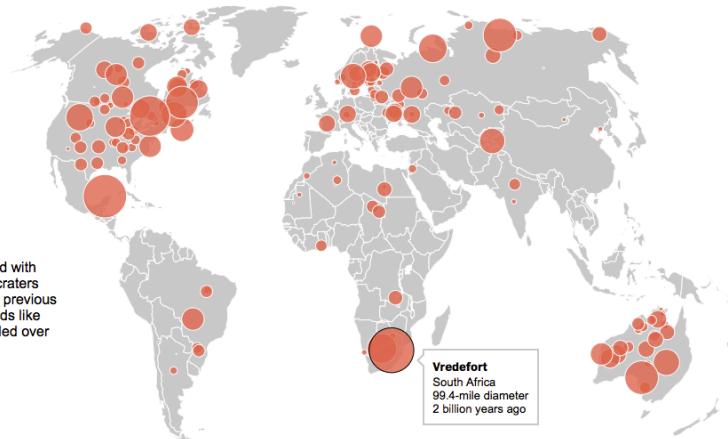
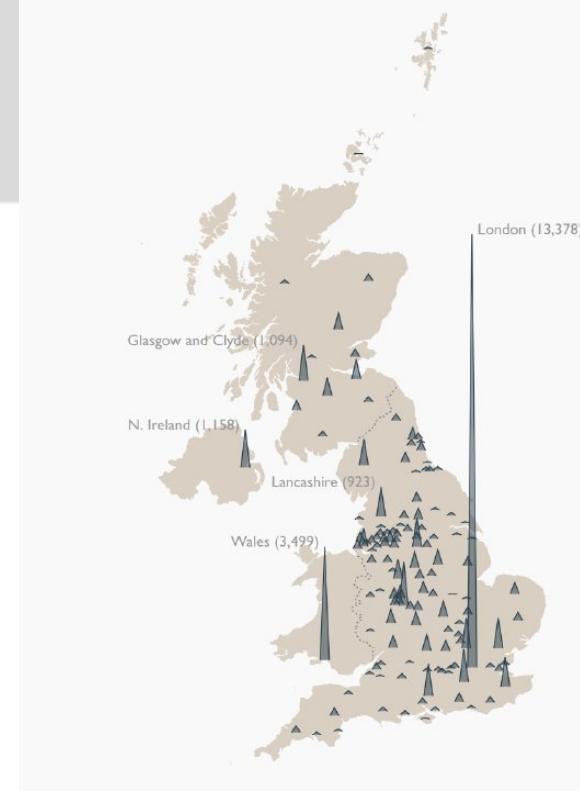
- Dot maps in Tableau:

<https://community.tableau.com/people/sarah.battersby.0/blog/2018/03/07/dot-density-maps-in-tableau-postgresql>



Proportional Symbol Map

- **What?**
 - Geographic positions with quantitative attribute
- **Why?**
 - Task: show spatial distribution.
- **How?**
 - Marks: lines or areas
 - Channel: size (length, area, volume) or angle (for pie charts)
 - Scalability: dozens of items

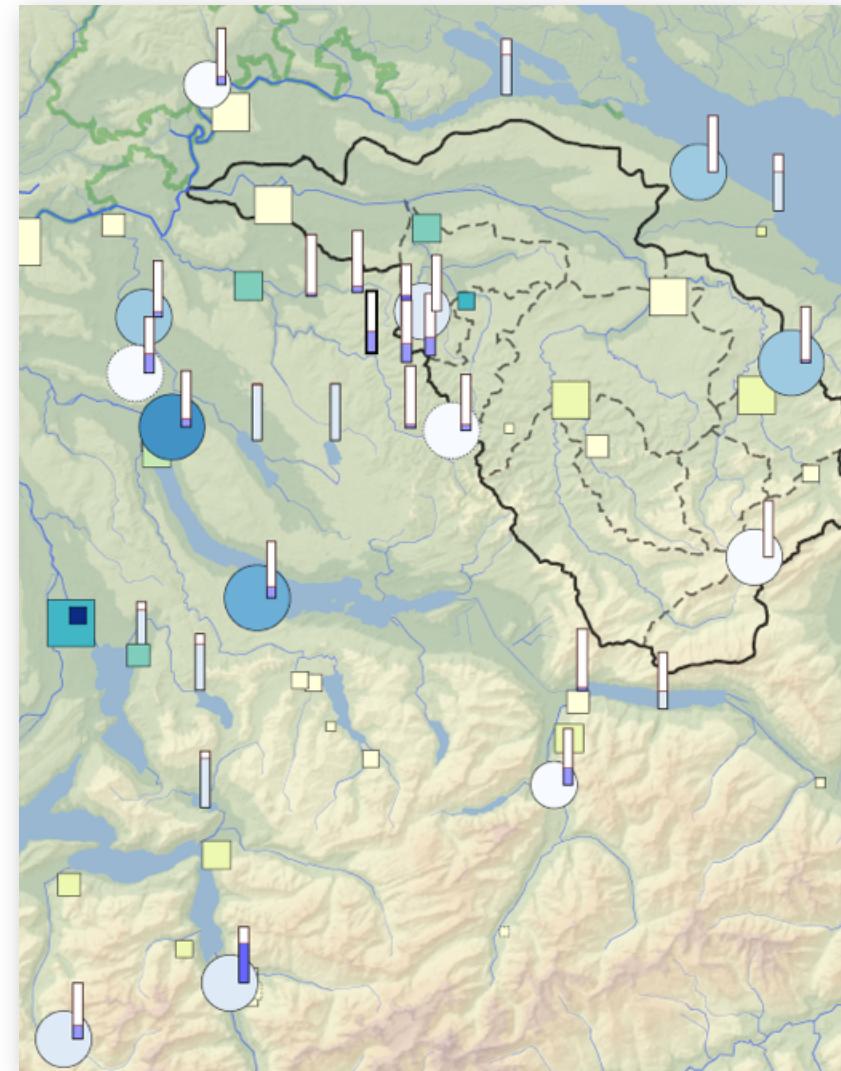


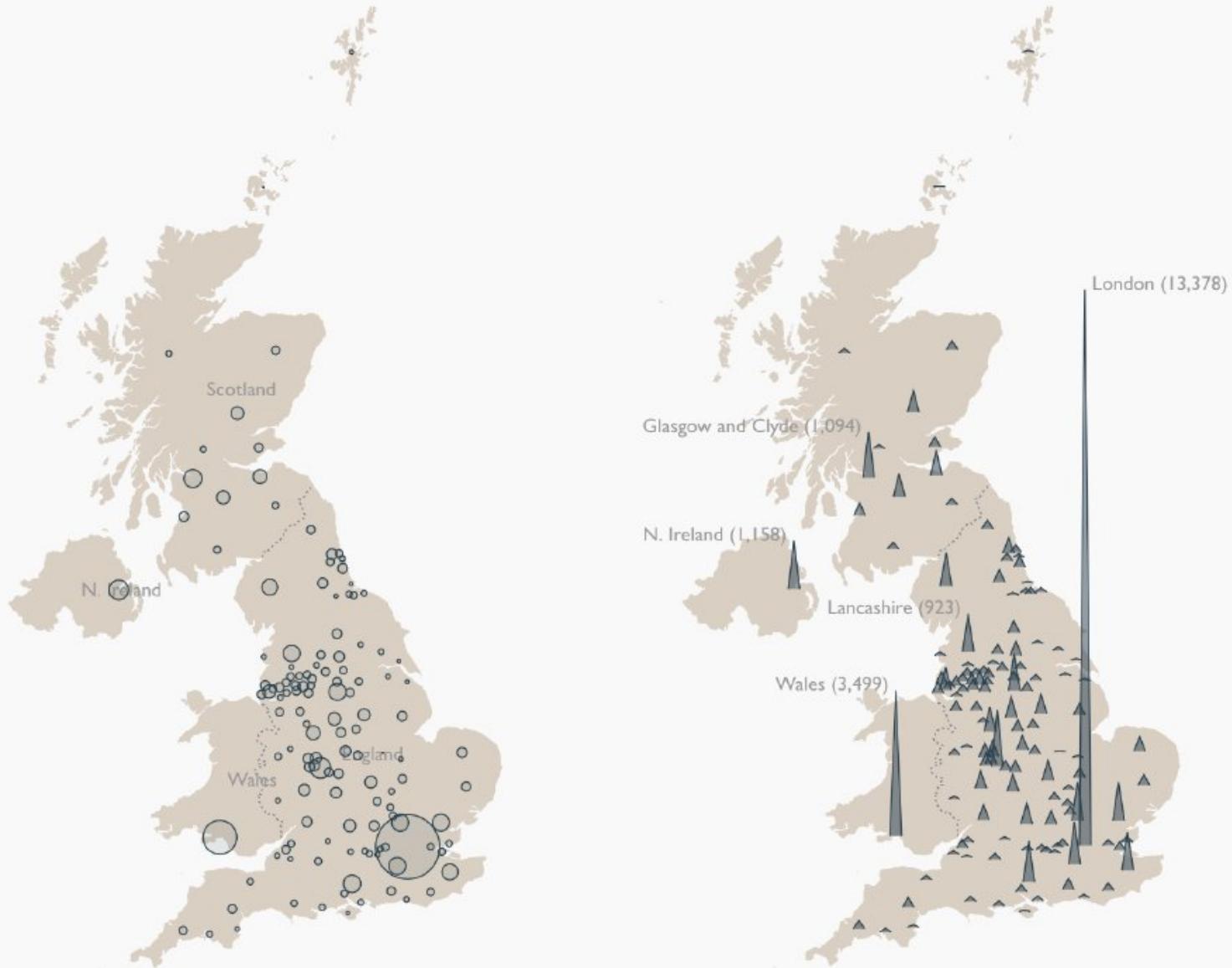
Source: The Washington Post,

<http://www.washingtonpost.com/wp-srv/special/world/russia-meteor/index.html>

Proportional Symbol Map

- Framed bar charts
- Area-proportional circles and squares





Covid-19 cases, thetimes.co.uk, 9. April 2020, <https://twitter.com/samjoiner/status/1248168495696809984>

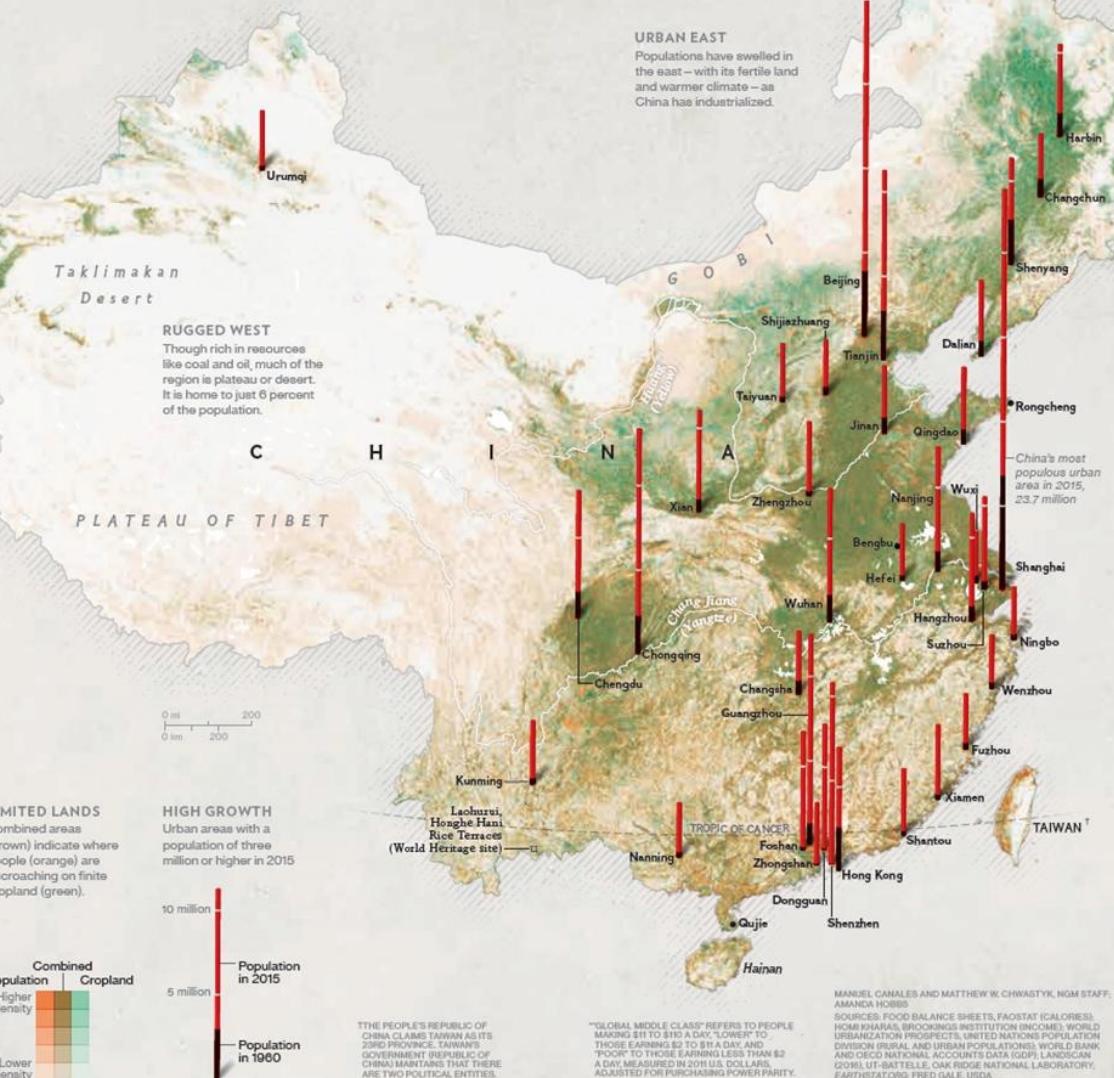
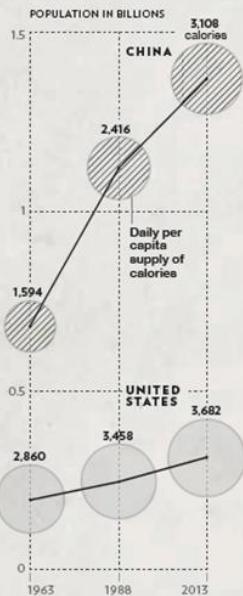
AN APPETITE FOR MORE

Sweeping reforms starting in the late 1970s have transformed China from an isolated, centrally controlled economy into an increasingly market-oriented juggernaut. Agricultural and industrial modernization has fueled continuing migration to cities, rising incomes, and a growing appetite for a more westernized diet among China's 1.4 billion people.



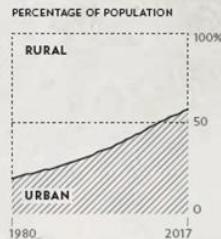
More people and food

Economic and food-production reforms have helped China's growing population double its supply of daily calories.



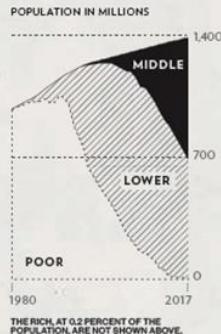
Urban migration

China's cities have grown by roughly 600 million people since 1980. Most are seeking better jobs and wages in the industrial sector.



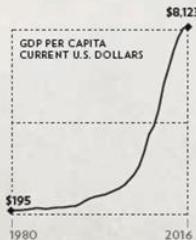
Rising incomes

Half of China's population has now joined the global middle class, and hundreds of millions have moved out of poverty.*



Economic boom

China has been counted among the world's fastest growing economies for nearly four decades.



MANUEL CANALES AND MATTHEW W. CHWASTYK, NGM STAFF;
AMANDA HOBBIS
SOURCES: FOOD BALANCE SHEETS, FAOSTAT (CALORIES);
HOMI KARAS, BROOKINGS INSTITUTION (INCOME); WORLD
ORGANIZATION FOR TRADE DEVELOPMENT; UNITED NATIONS,
DIVISION OF POPULATION AND URBANIZATION; WORLD BANK,
AND OECD NATIONAL ACCOUNTS DATA (GDP); LANDSCAN
(2010); UT-BATTELLE, OAK RIDGE NATIONAL LABORATORY;
EARTHSTAT.ORG; FRED, GALE, USDA

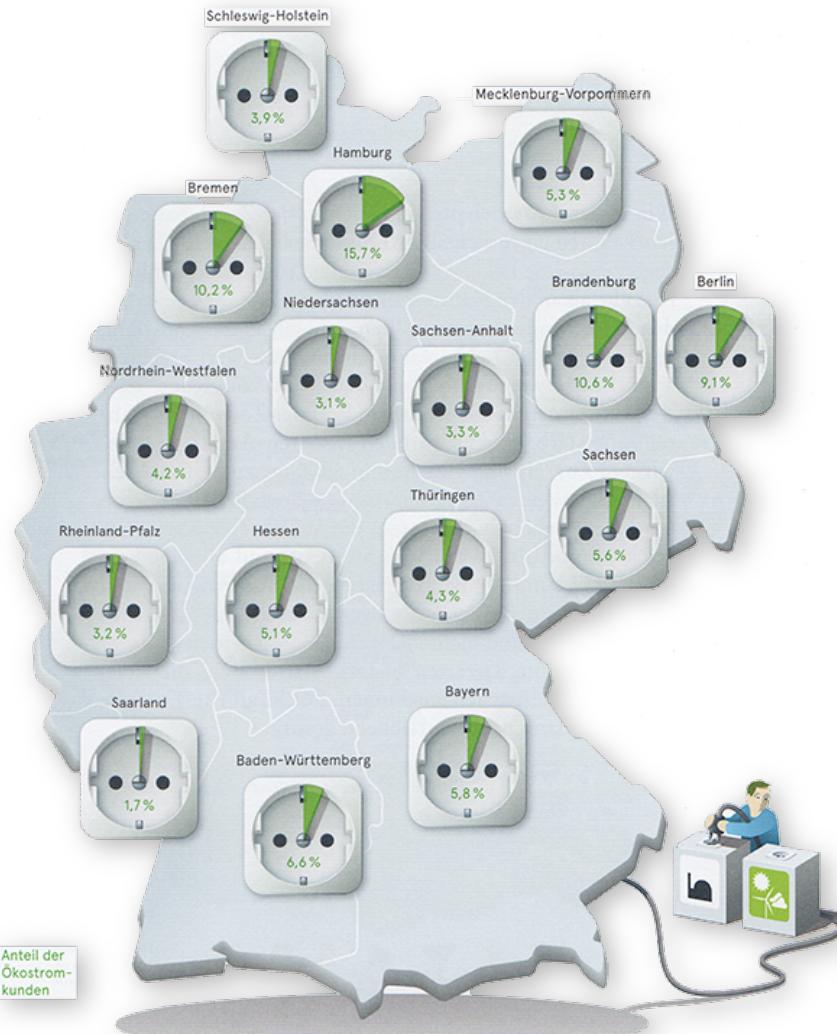


Proportional Symbol Map

- Pie charts

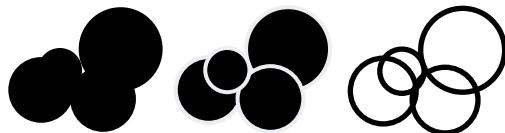
Percentage of alternative energy customers

Source: Stoltz, M. & Block, J., Deutschlandkarte, 2012, Zeit Magazin



Design Principles for Proportional Symbol Maps

Reduce clutter with stroke and transparency

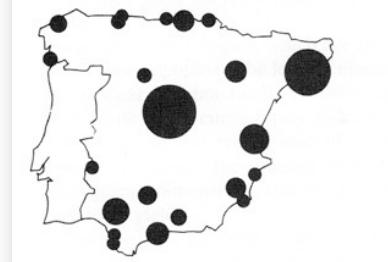


Symbol size

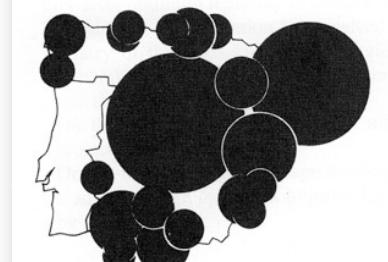
Too small



Good



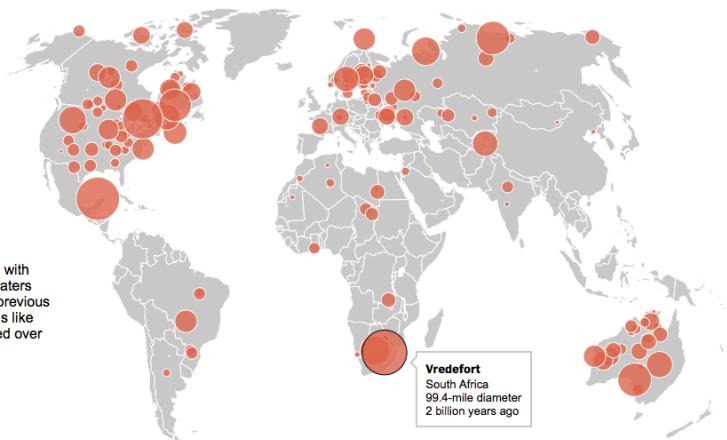
Too large



Craters
The earth is marked with about 180 named craters that are scars from previous run-ins with asteroids like the one that exploded over Russia on Friday.

Crater diameter

99 miles
20 miles



Can vary colour with same attribute or with a second attribute

