

Using SAS Maps

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Maps as we know them

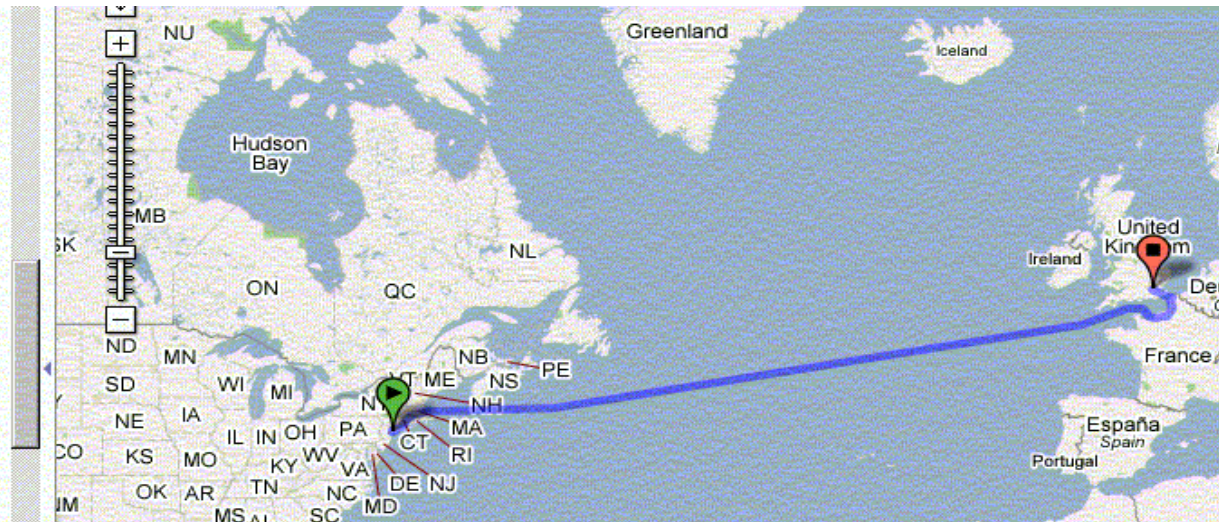
- ⌘ We have generally used maps to find a location, whether it be a street/town/province/country/region.
- ⌘ For example, I can use a Melways or whereis.com.au to find where I work.



Maps as we know them

- ⌘ We also use maps to show us where to go
- ⌘ With the advent of the internet, this task is much simpler with a map showing the route and telling us the directions. Google maps and whereis.com.au are example of web sites that give directions and the map of the route.

19. Turn right at Long Wharf	0.1 mi
20. Swim across the Atlantic Ocean Entering France	3,462 mi
21. Slight right at E05	0.5 mi
22. At the roundabout, take the 2nd exit onto E05/Pont Vauban	0.1 mi
23. Turn right at E05/Quai Colbert Continue to follow E05	5.7 mi
24. Take the exit onto A29/E44 toward Amiens Partial toll road	27.8 mi
25. Take the exit toward Dieppe/ Amiens/Calais/A151/Rouen Toll road	1.1 mi
26. Merge onto A29 Toll road	22.6 mi



But this is not what SAS maps are for



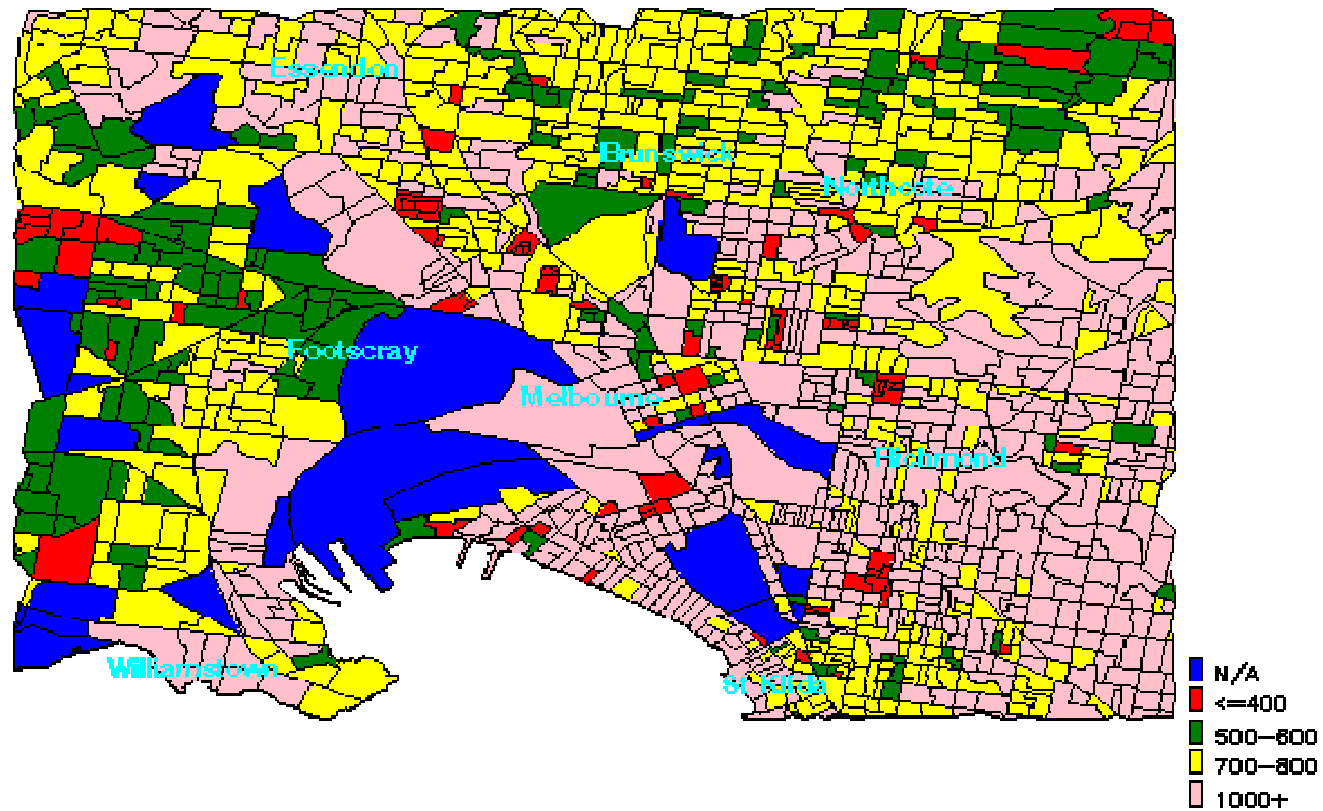
- ⌘ What if we are not interested in getting from Sandringham to Melbourne, but interested instead in information (such as population density) about the suburbs in between Sandringham and Melbourne.
- ⌘ ABS geodemographic maps and crime statistic maps are examples of maps that convey information, but don't necessarily show us directions. These are examples where pictures can paint 1000 words.
- ⌘ You might instead be interested in geographical exposure, or market share by region.

What is easier to comprehend a table or ...

CCD	Median Income
2010101	1000
2010102	700
2010103	600
2010104	700
2010105	800
2010106	500
2010107	800
2010108	700
2010109	600
2010110	700
2010111	500
2010201	700
2010202	600
2010203	700
2010204	700
2010205	700
2010206	600
2010207	700
2010208	800
2010209	600
2010210	1200

... a map?

Inner Melbourne



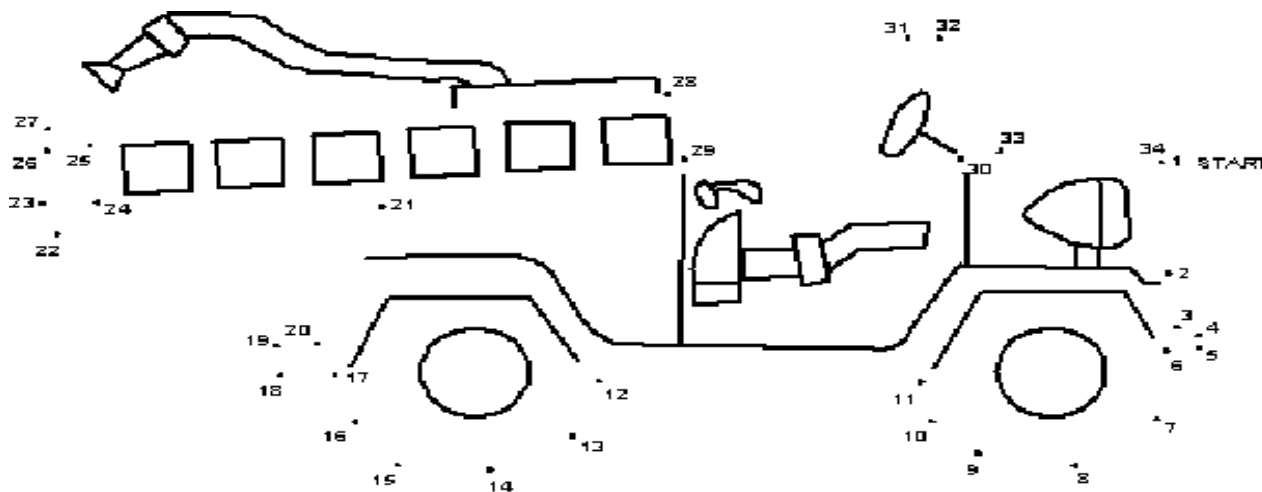
How do SAS maps work?



- ⌘ SAS as part of its SAS/GRAPH install has a maps library already defined. These files have the latitude and longitude of states/provinces in various countries.
- ⌘ For Australia, we have two files:
 - ☑ AUSTRAL has latitude and longitude for each of the eight states and territories as well as an id variable
 - ☑ AUSTRAL2 has the state name as well as the id variable
 - ☑ We will use these files soon

How do SAS maps work?

- ⌘ SAS maps will plot points in the latitude/longitude file a bit like you do a dot-to-dot puzzle. It will plot by the id variable.
- ⌘ The second file is a reference file, but you will merge it with a file with your measures so you can plot something useful.

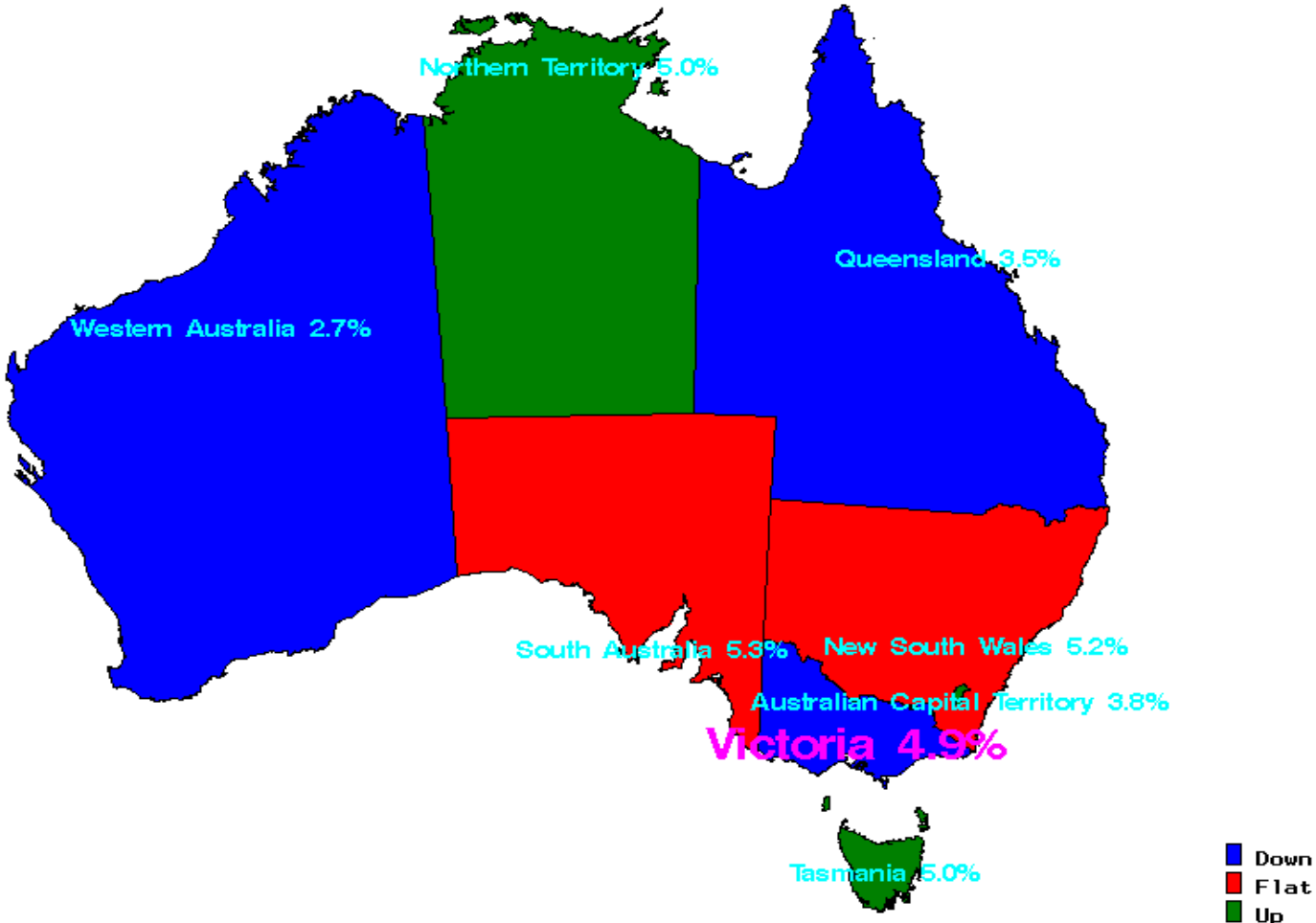


Example 1 – Static map of Australia



- ⌘ Here, we will look at the unemployment rate in Australia. We will show the state name and rate. We will colour the state indicating whether this rate has changed.
- ⌘ We will also change the colour of the wording of Australia's best state.
- ⌘ Let's see how it works

Example 1 – Static map of Australia



SAS Functions Used



- ⌘ PROC GRPROJECT changes the map projection, do we want a flat map or a curved map and what latitude and longitudes do we want to include (define the map area).
- ⌘ GOPTIONS defines graphic options, such as if we want a GIF image, size of plots etc. This is a topic for another day.
- ⌘ PROC GMAP is the procedure that produces the map. DATA is the dataset that we wish to map, ie state unemployment, MAP is the dataset with latitude and longitude. CHORO specifies the variable that we wish to use to colour in the map. ANNOTATE has the dataset which has the dataset that is used to draw the state names on the map.

Creating a HTML image map



- ⌘ For those of you who are familiar with HTML (Hypertext markup language), you will understand the concept of an image map. For those of you who aren't, you will be familiar with the weather site, you can click on a state and look at the weather for that state.
- ⌘ SAS allows us to do exactly the same thing with PROC GMAP. We have to define a file with what the HTML links/anchors should be. In the GMAP statement, we have to specify that we are making an image map (IMAGEMAP=imap) and what the HTML links will be HTML=htmlref.
- ⌘ For those of you familiar with Javascript, you can put Javascript in the HREFs or you can use base SAS to interrogate the HTML file and put in ONCLICK, ONMOUSEOUT functions.

Active X



- ⌘ SAS now allows Active X graphs. Since GMAP is part of SAS/GRAPH, you can produce active X maps.
- ⌘ This allows you to change where you put the legend of the map, you can highlight a state and save the image as a static JPEG file.
- ⌘ Let's look at an example.

Further Applications



- ⌘ We can map our sales, claims, products etc. at the CCD, postcode and suburb level.
- ⌘ Depending on your latitude and longitude data, you can even map local government areas/ electoral boundaries.
- ⌘ The SAS FTP site has examples of SAS mapping code. This code is more for annotating the graphs, but some show some further capabilities of PROC GMAP.



Thank you for attending

References



⌘ Dot to dot from:

<http://www.kidprintables.com/puzzles/dot-todot/2.shtml>

⌘ www.whereis.com.au

⌘ www.bom.gov.au

⌘ www.maps.google.com

⌘ <http://ftp.sas.com/techsup/download/sample/graph/>