

Mapping Geodemographic Classification Uncertainty – an Exploration of Visual Techniques using Compositing Operations

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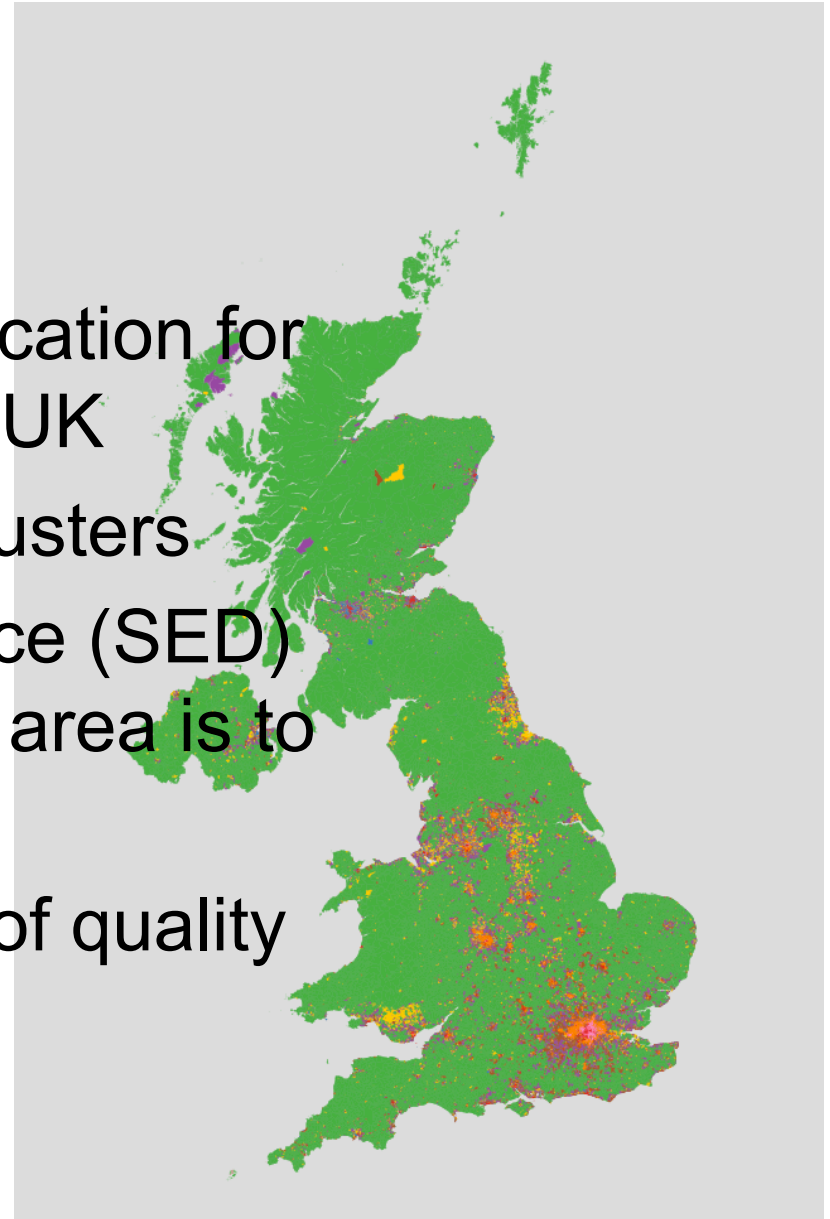
Uncertainty Workshop, GIScience 2014, Vienna

Contents

- OAC 2011 and SED
- Mapnik Compositing Operations
- Absolute SED using Textures
- Absolute SED using Hatching
- Relative SED using Hatching

OAC 2011 and SED

- A geodemographic classification for 230000 small areas in the UK
- 8 top level “supergroup” clusters
- Standard equalised distance (SED) measures how close each area is to the closest cluster centre.
- It is effectively a measure of quality of fit, or uncertainty of the classification for that area.



Mapnik Compositing Operations

- Mapnik is an excellent C++/Python toolkit for creating map images (mainly raster).
- Its compositing operations allow us to quickly and easily configure and generate maps at various scales, and easily add them in to “standard” Google-style web maps.
- They work by compositing effects on a map tile directly, so that we don’t need to simulate the effect by layering different tiles on top of each other and adjusting opacities.

Mapnik Compositing Operations

Lighten

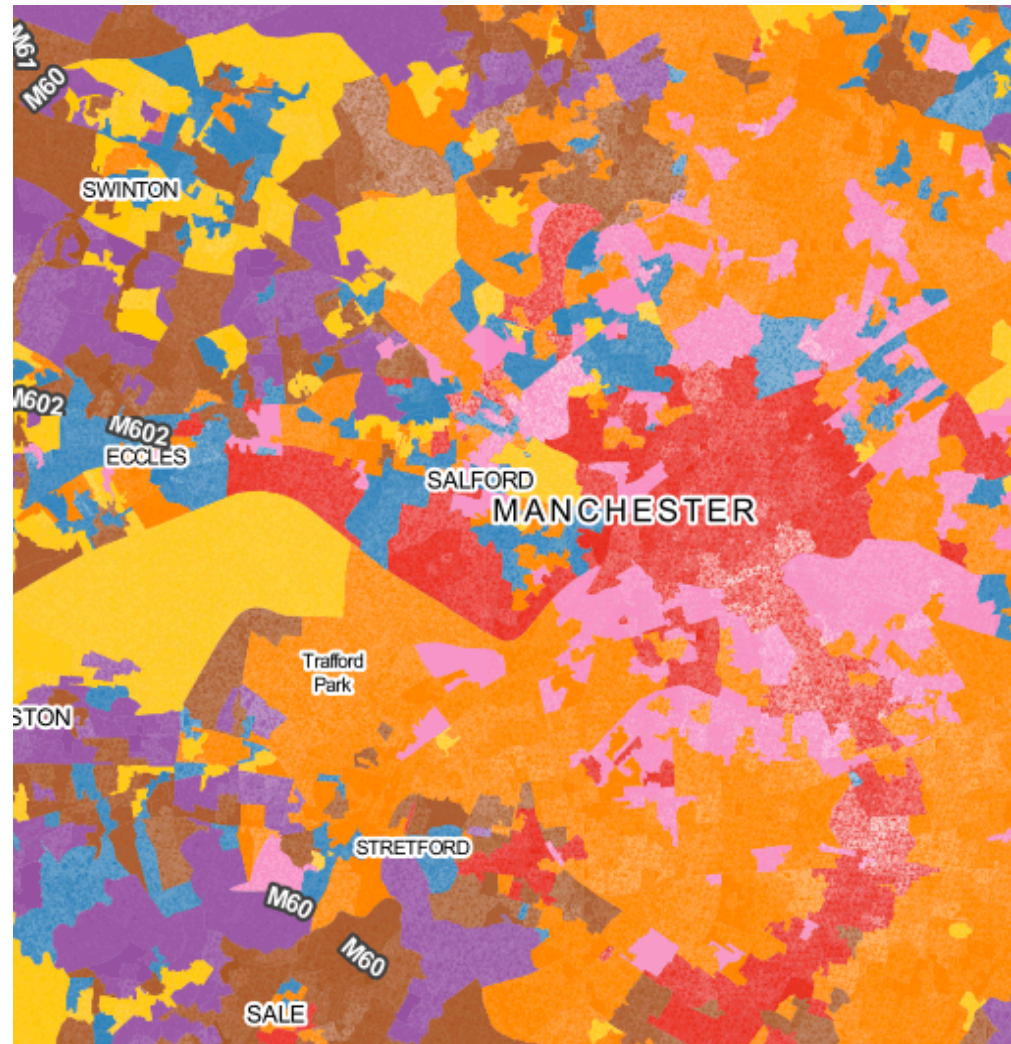


The `lighten` comp-op compares the individual red, green, and blue components of the source and destination and takes the higher of each.

- <https://www.mapbox.com/tilemill/docs/guides/comp-op/>

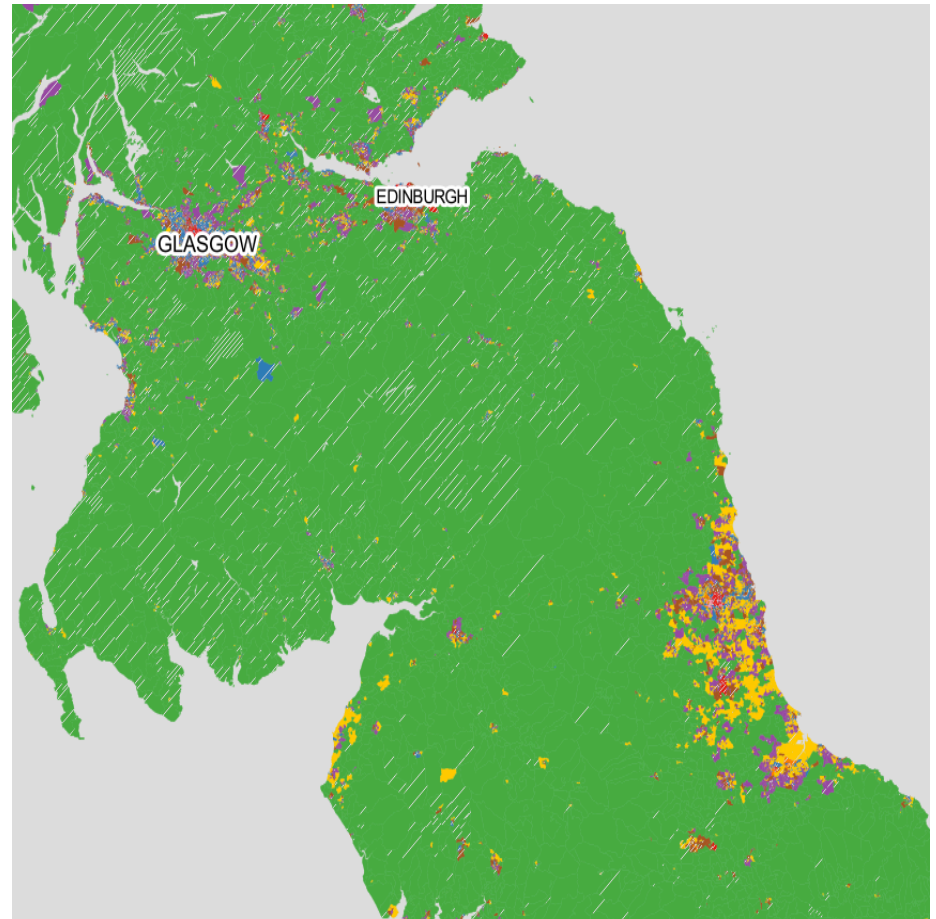
Absolute SED using Textures

- Using a “grain” texture
- Areas with high SED have more grain applied
- Idea is to decrease attention to poor area transitions
- Some areas show abrupt changes in colour – physical barriers (W)
- Other areas fade out near transition areas (N and S)

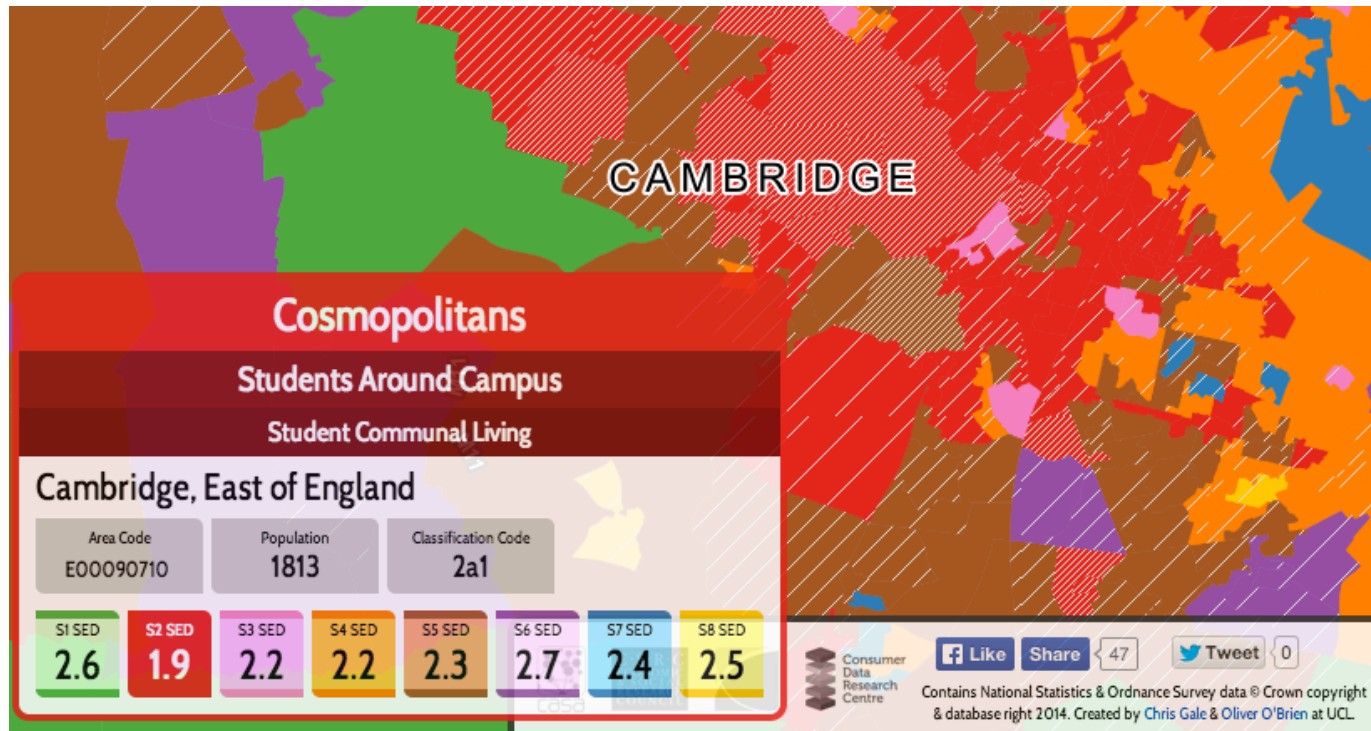


Absolute SED using Hatching

- Using four densities of diagonal hatching (1/4-1/32 white strokes)
- Scotland (N) has much higher amount of hatching for the rural supergroup
 - Indicating relatively poor fit compared with England (S)

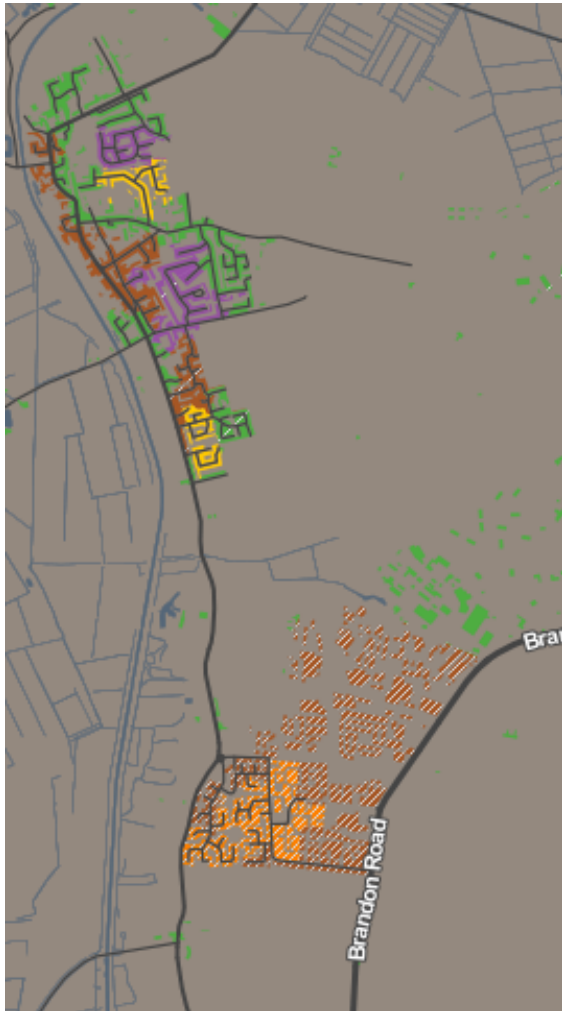


Absolute SED using Hatching



- University student areas (W) have fallen into the red supergroup “Cosmopolitans” but high level of hatching reveals that they have high SED so that they fit only weakly.

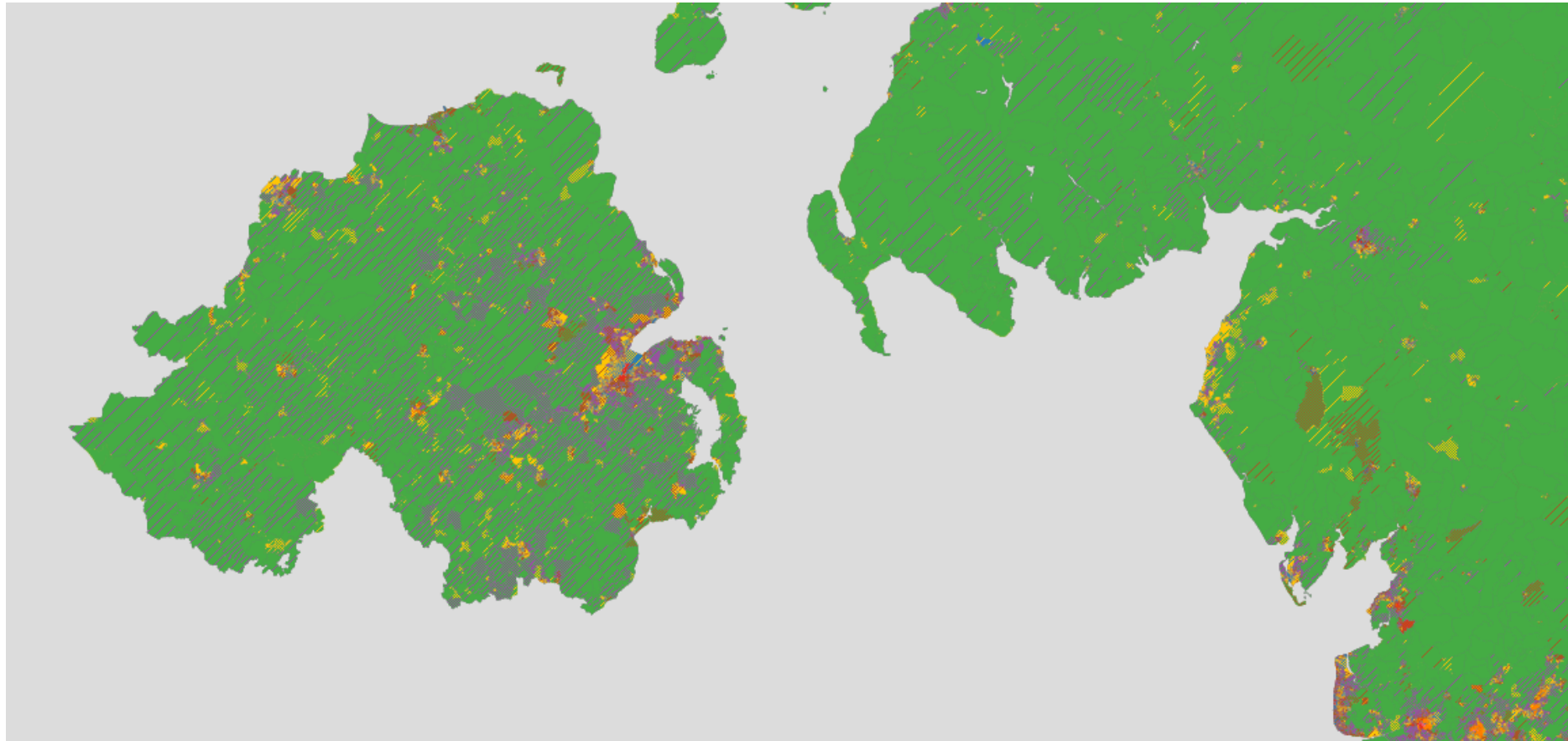
Absolute SED using Hatching



- Another anomaly: Intense hatching draws the eye to these “Urbanites” & “Multicultural Metropolitans” areas (S, esp. compared with village to N)
- USAF 48th Fighter Wing, pop. 7000.

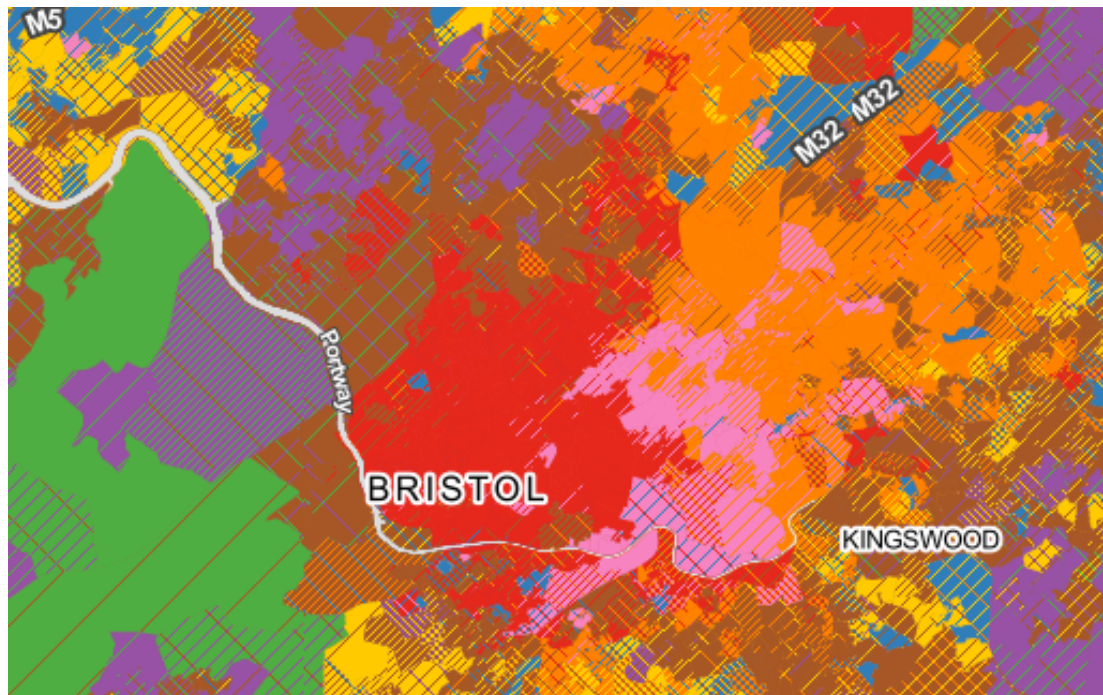


Relative SED using Hatching



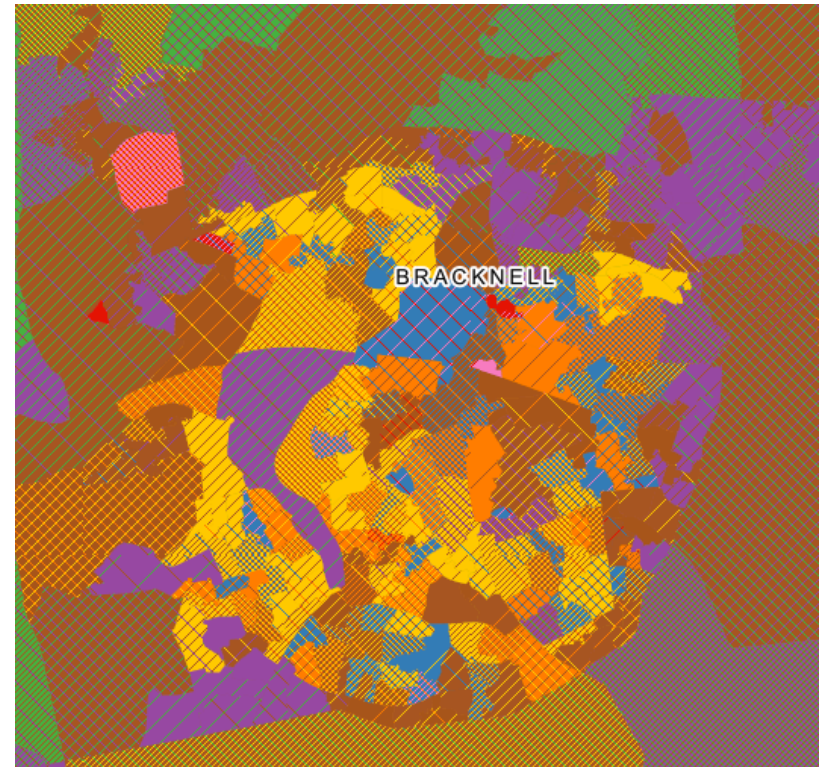
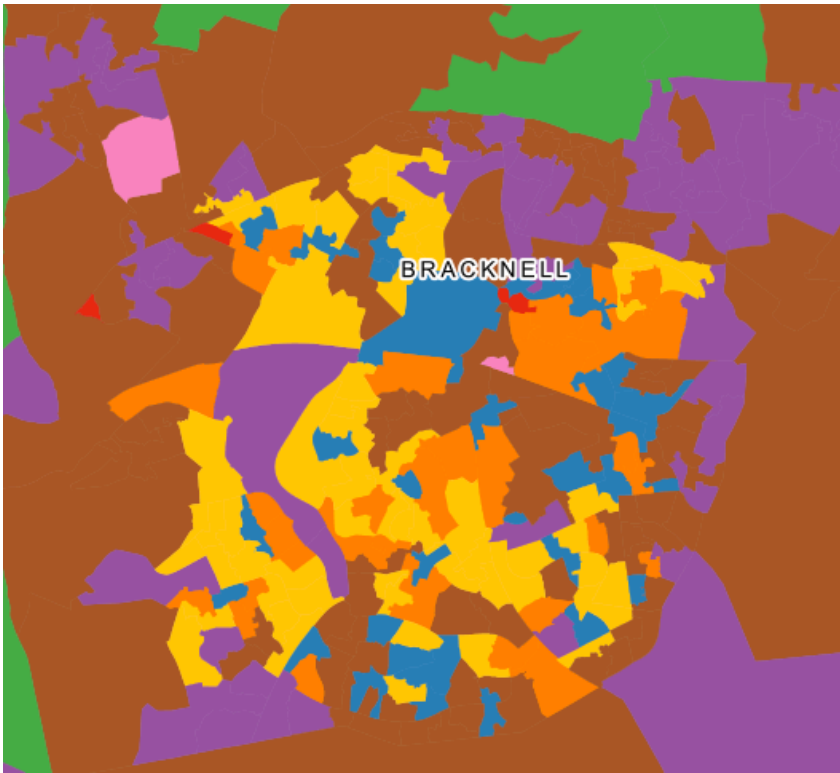
Relative SED using Hatching

- Bristol is well classified – even when introducing hatching showing secondary & tertiary classifications (where SED difference is small) Bristol retains distinct demographic areas.



Relative SED using Hatching

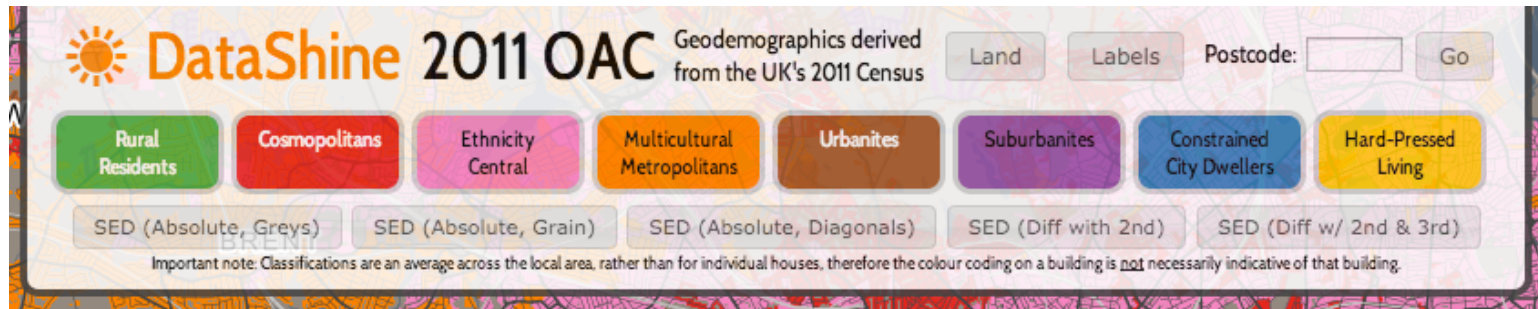
- Bracknell is poorly classified in OAC – secondary and tertiary supergroups have SEDs close to the primary:



Commentary

- Shortcomings of this method mainly relate to the use of colour hue variations and texture/hatchings to try and show quantitatively show uncertainty
 - Human perceive certain colour hues more strongly
 - For ranking or numeric differences, lightness & value are generally better (although less eye-catching)
 - Difficult to “measure” differences in hatching
- At best, our visualisations allow the viewer to detect anomalous/interesting results, for closer, more quantitative examination.

Live Version & Contact Details



- http://oac.datashine.org.uk/index_dev.php
 - To examine our SED visualisation effects on a “pure” choropleth map, click the Land and Labels button to hide these additional layers.
- More about DataShine maps:, including other DataShine maps, at <http://blog.datashine.org.uk/>
- We’re on Twitter: @oobr, @spatialanalysis