**Spatial Data visualisation with R: Response to Reviews**

We are extremely grateful for the detailed comments and edits provided for our chapter. We take each comment below in turn and explain how they have been addressed and hope that the resulting improvements are sufficient to meet the high standards required of the book.

Many thanks for the chapter, this is an important one. Although there is merit in the chapter as presented there are a few mainly stylistic problems. Most critical is that chapter has more of a tutorial feel (structure and language) which will place it out of balance with the other chapters in the book. These have typically provided some introductory material to an area, and then presented this in the context of a research application. Supporting materials (such as code) are available externally, but not within the text itself, or if they are, these are more limited than presented here. This chapter is however a little different, so on balance we think some aspect of this can be retained - however, as detailed in the list of comments that follow, we think it best if you collapse these code blocks as much as possible.

Thanks for this. Given the suggested topic of the chapter it was challenging to get the right balance between code and prose. On reflection we agree that there was too much of the former and not enough of the latter. In essence we were seeking to provide a solid introduction to R given the applied nature of the text in the hope that it equips readers with the skills needed to tackle the undoubtedly more challenging concepts discussed later in the book. We think we have preserved this whilst tightening up the code, offering more context and reducing the figure count from 14 to 10.

More generally, we did wonder if it might be better to have a chapter that also includes some of those other methods of visualising spatial data - for example, considering ggplot versus base, or just base for simplicity?

This is something we thought a lot about before starting the chapter and still feel that ggplot is the best approach for this. Had a chapter been requested about spatial analysis rather than visualisation with R then the simplicity of base graphics would save space for other elements. We believe, however, that one of the biggest barriers to the widespread use of R graphics is the lack of sensible built-in defaults encouraging best practice in terms of visualisation. Another advantage of ggplot2 for beginners is that the code associated with layering and recolouring the plots etc. is more intuitive than with base graphics. We also feel the final example – which is designed to enthuse students about the power of R to produce innovative publication-ready graphics – would not be straightforwardly possible with base and nor would the use of ggmap functions. For these reasons we would prefer to continue to use ggplot2. Based on the comment we have expanded the discussion of the pros and cons of each (see the third paragraph of the section “Why R for spatial data visualisation?”) and encouraged users to try both.

Some significant edits have been completed on the chapter being returned, in consideration of those further changes detailed, we would also request that the amendments we have made to the .tex be checked.

Many thanks, we have reviewed these changes and edited the .tex accordingly. We have also added a supporting materials section at the end. One change that we noticed and changed back to the original was an alteration to the opening quote by Gary Sherman: we cannot change a quote from a printed textbook.

General comments…

1) Can we link the Introduction to Visualising Spatial Data in R from the book website?

Yes – this has be done in the references.

2) Are there any web links to material for visualising raster data?

We would recommend this vignette: <http://cran.r-project.org/web/packages/raster/vignettes/Raster.pdf>

Here is a useful tutorial for ggplot2: <http://nrelscience.org/2013/05/30/this-is-how-i-did-it-mapping-in-r-with-ggplot2/>

Both have been added to supporting materials.

3) Are there any pedagogic materials which could be cited up-front about the benefits of GUI versus terminal - perhaps from the human-computer-interaction literature?

Yes, Gary Sherman’s “Desktop GIS: Mapping the Planet with Open Source Tools” is an excellent resource that has been cited to introduce readers to the GUI vs code debate. We have not delved into the human-interaction literature in an attempt to stay on topic (GIS/Geocompuation).

4) Is the sp package the only way in which spatial data can be imported into “spatial classes” in R? [line 213]

Regarding the specific “Spatial\*” (e.g. SpatialPolygonsDataFrame) we believe sp is a prerequisite. Indeed in Bivand et al (2013), sp is described as a prerequisite of many other packages because it allows other packages to use the “Spatial\*” classes. There are a number of ways of loading external data into these “Spatial\*” S4 classes, not least maptools, but many of these depend on sp (e.g. sp is the only dependency for maptools: http://cran.r-project.org/web/packages/maptools/index.html). There are other classes for spatial data such as the “pp\*” classes of spatstat. sp is the recommended package however because it is most mature, integrates with most other spatial packages and handles the widest range of spatial data. At no point, as far as we are aware, do we state that sp is the *only* way of importing data into spatial classes in R, simply the one we’d recommend to beginners.

5) In places the chapter drops into a “tutorial” style which would ideally be moved into supporting materials online, but referenced in the text. Some of this content has been moved to footnotes, but other has been removed.

We have worked to address this throughout. The latest edition reads more like a textbook chapter.

6) In general there has been a sweep on the language which was in places a little informal in style relative to the other chapters in the book.

Many thanks – we have accepted these changes to the style.

7) Could you add in some supporting material (links?) for the website on projections?

Yes, we have added the following to the list of supporting materials and referred to them in the text.

<http://spatial.ly/2011/03/flattening-the-earth/>

http://en.wikipedia.org/wiki/Map\_projection

8) Can figure 3 be a side by side comparison between the mercator and robinson projection.

Yes- fixed \*ROBIN\*

9) I am not a big ggplot2 user, but can you confirm that the merge function works after fortify - if you use merge with a spatial (points/lines/polygons) data frame this often fails to merge correctly; instead you are better using the match functions.

Yes, merge is fine. The resulting object from the fortify operation is a straightforward data frame.

10) Can the world population be converted so that this doesn’t appear as scientific notation in the R code or maps?

Yes, done. \*ROBIN\*

11) Figures need to be referred to from within the text - e.g. Figure X etc

This has now been done in most cases, thank you.

12) Can figure 8 either have the whitespace around the images removed, or, be manually created from four images - at present it is very difficult to see the details that have been set by the line colour and width adjustment.

Yes, done. \***ROBIN\***

13) As a general point, can the code blocks be consolidated so that the paragraphs of text are not broken up. For example, describe what is happening in the code block, and then present it. Any specific annotation could be in the R comments within the code - this was especially evident in the final bit on basemaps.

Yes, done.

14) In the presented code, can the errors / warnings be removed to keep tidy

Yes, good comment. We have removed all the error and warning messages that could be found and agree these were an unnecessary distraction.

15) Could you provide some suggested reading - say not more than 5 - but if these could be accompanied with a brief exposition about why they are important would be useful.

Yes, this has been added to the supporting materials section.

## Notes to the editor

There are a couple of changes we would like the editor to implement that depend on factors outside our control: the page width and margins of the book and the reference provided for Chris Brunsden’s book. We have indicated these issues with the word “TODO”, which has been commented out to avoid disrupting the flow or readability of the pdf document.

To be clear, the latest version of the .tex file can be found here: https://github.com/geocomPP/sdv/blob/master/finalChap.tex

There latest version of the pdf document can be found here: <https://github.com/geocomPP/sdv/raw/master/finalChap.pdf>

Also, we are aware that the figures are low resolution and have a large amount of whitespace. We kept the figures small for portability of the early documents and will provide higher resolution images as/when they are needed.

We have made an effort to be consistent with the highlighting/emphasis given to different elements of R (in previous draft editions, some package names were presented in monospace, others were not): packages are presented in normal text. Inline code is presented in monotype, whilst blocks of code are colour highlighted to make the code more readable. An alteration the editor may want to make is to embolden package names (see <http://vita.had.co.nz/papers/tidy-data.pdf> for a recent example of this) although this is a matter of style so best left to the editing/typesetting team.