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MAKING SPATIAL DECISIONS USING GIS AND LIDAR: A WORKBOOK, by Kathryn Keranen and Robert Kolvoord, Esri Press, Redlands, 2016, 200 pp., ISBN 9781589484290, \$79.99 (approximately £65.00) (paperback)

I was very happy when I was asked to review this book. Having written many guides to using ArcGIS over the years, it is always interesting to see how others do it, what scenarios they use and how the instructions are written. Readers may already be aware that Lidar data is gathered by scanning an area using laser sensors. The raw data is in the form of point clouds, with each point having a very accurate three dimensional location, which allows precise mapping to be carried out in two and three dimensions.

What do you get for your money if you buy this book? Firstly, you get access to a 180 day trial of ArcGIS. This might not be much for many, but it will be a big attraction for others who may be trying to improve their skill base without having access to the software at their workplace or place of study.

The book itself is a glossy softback book. Each section is colour-coded, with some nice illustrations and screen shots scattered included at important places. I would have liked to see a few more images, as I was sometimes uncertain whether I was seeing what I was supposed to be seeing. A higher quantity of illustration would also make it easier to read through and follow each process, without the need to carry out the exercises yourself each time.

The book is divided into ten modules, each dealing with a different scenario and using a selection of functions, ranging from simply viewing the data in different ways to calculating vegetation height, or shoreline change after a storm. Each module is in three parts. The first comprises a step-by-step walk-through using a dataset which can be downloaded from the Esri website. The instructions assume that the user is familiar with ArcGIS but not with the tools that are being explored in the module. This tends to work well, although it can sometimes feel jarring when the tone changes from one of gentle nurturing to 'Create a layout using appropriate cartographic principles.'

The second part of each module repeats the steps carried out in the first but using a different data set, also available as a download from the Esri website. The instructions are less detailed, forcing the user to think more and possibly refer back to the first part from time to time. This repetition is an essential part of the learning process and it is great to see it incorporated here.

The third section is the same for each module and encourages the user to try the exercise again, but using their own choice of dataset and relying on their newly-acquired skills to complete the work. I initially found the repetition of this section a little frustrating, but in a classroom situation this would be more suitable, allowing the tutor to instruct the class to work on a selected module, knowing that this will lead them through three levels of learning, from closely-guided to full independence.

One small issue that I have is that, being scenario-driven, it is not easy to look up an example of a specific function being used. This could be easily resolved by the inclusion of

an index, or perhaps the functions used in each module could be added to the table of contents. Either of these would cut down on the amount of time spent thumbing through the book trying to find how to use a particular function.

Overall, this is a rather good book for those who are familiar with ArcGIS and want to dip their toes into the world of Lidar data, while also providing some good exercises that could be used in class, for which there are tutor's notes available too. I look forward to seeing more in this series of books.

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