Reviewer’s report

Title: Building spatial composite indicators to analyse environmental health inequalities on a regional scale

Version: 2 Date: 19 January 2015

Reviewer: Pierre Goovaerts

Reviewer’s report:

Major compulsory revisions
The main goal of this paper is to introduce new ways to combine existing environmental, social and health indicators that account for relationships among these indicators and their autocorrelation. This paper seems technically sound; however since it is mainly a methodological paper the description of the theory and its implementation is too terse to allow the reader to replicate these results:

1. The term “locally weighted PCA” indicates that some weighting is being used. What are these weights? How are they computed? How do we define a local region in the attribute space? Which measure of proximity is used, Mahalanobis distance? Are the local regions overlapping? How many observations are included in each region? Is there a minimum number required for stable estimates of the correlation matrix? Which software was used for the analysis?

2. Similarly for geographically-weighted PCA, what is the size of the local windows? How many observations are located on average within each window? How was the bandwidth selected? Which software was used?

3. The authors mentioned that these techniques rely on an assumption of multivariate normality. Was this assumption tested? Were the indicators transformed?

Minor essential revisions
The authors need to carefully proofread their paper to correct for typos and make sure that the terminology is consistent throughout the manuscript. The figure captions need also to be improved in order for the reader to be able to understand the figure without having to look at the text. See comments inserted in the PDF of the manuscript.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests:

I declare that I have no competing interests