4.10. Figures for Chapter 4

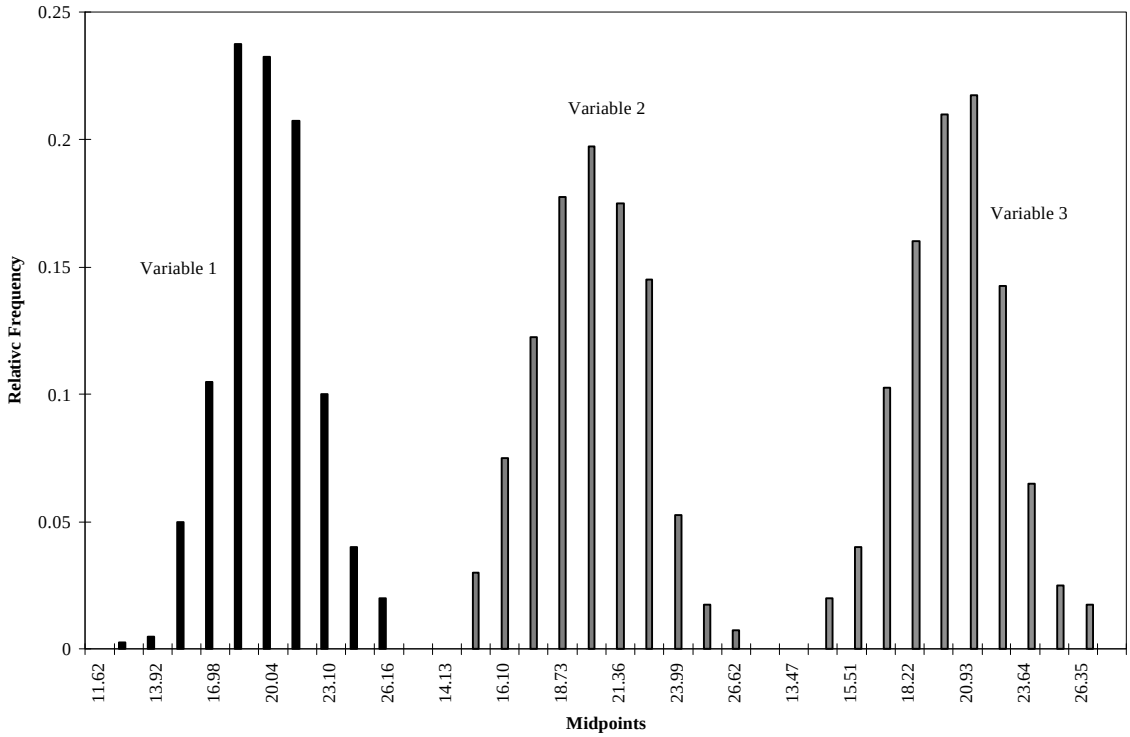


Figure 4.1: Frequency distributions of three variables generated by the new synthetic dataset generator. The variables have Moran Coefficients of -0.4, -0.2, and 0.0 respectively. The distributions are clearly mound-shaped, but are not normal.

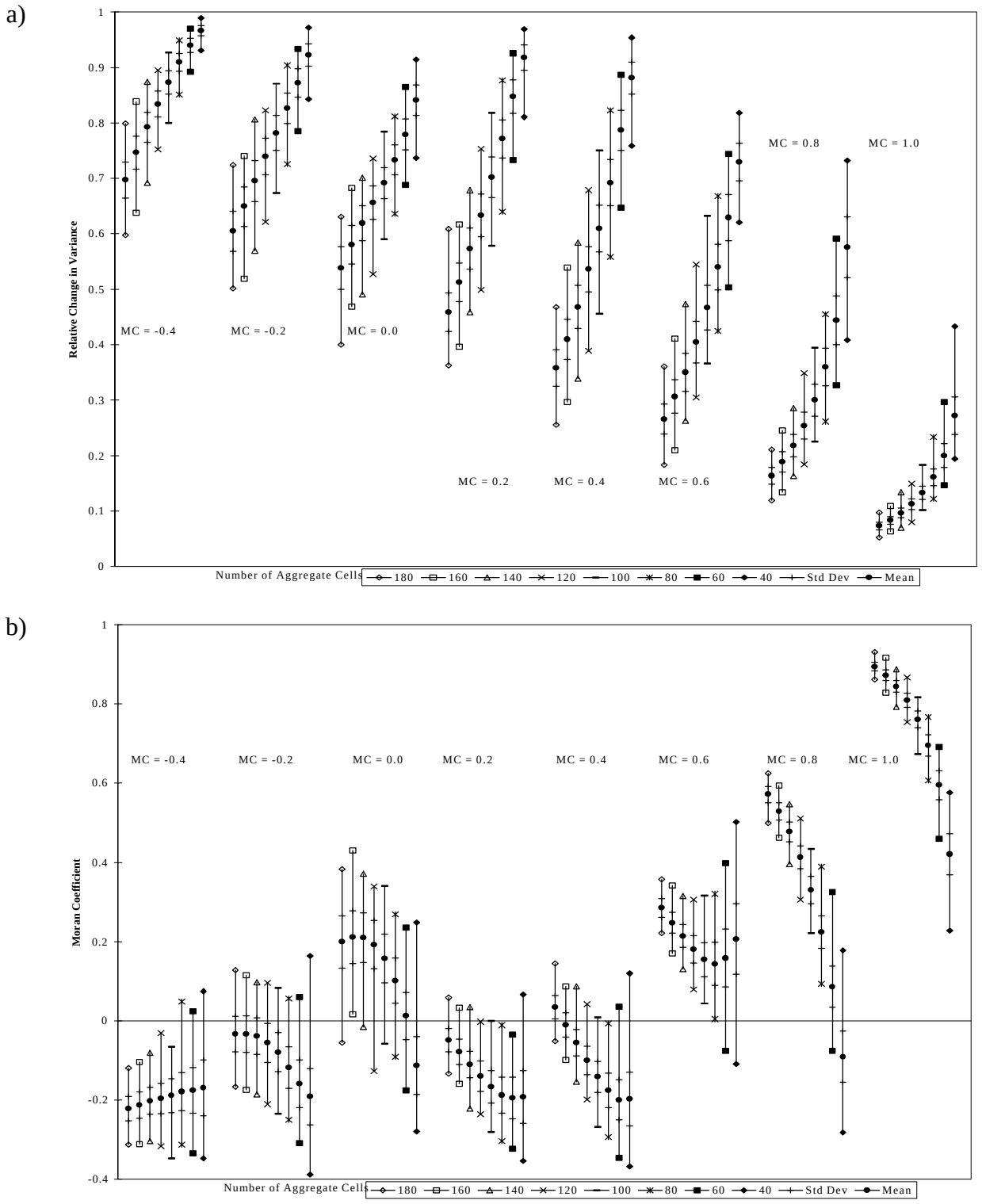


Figure 4.2: Variation of relative change in variance RCV (top) and MC with initial MC and aggregation. Note how the RCV has a well-defined variation with MC, but the aggregated MC does not.

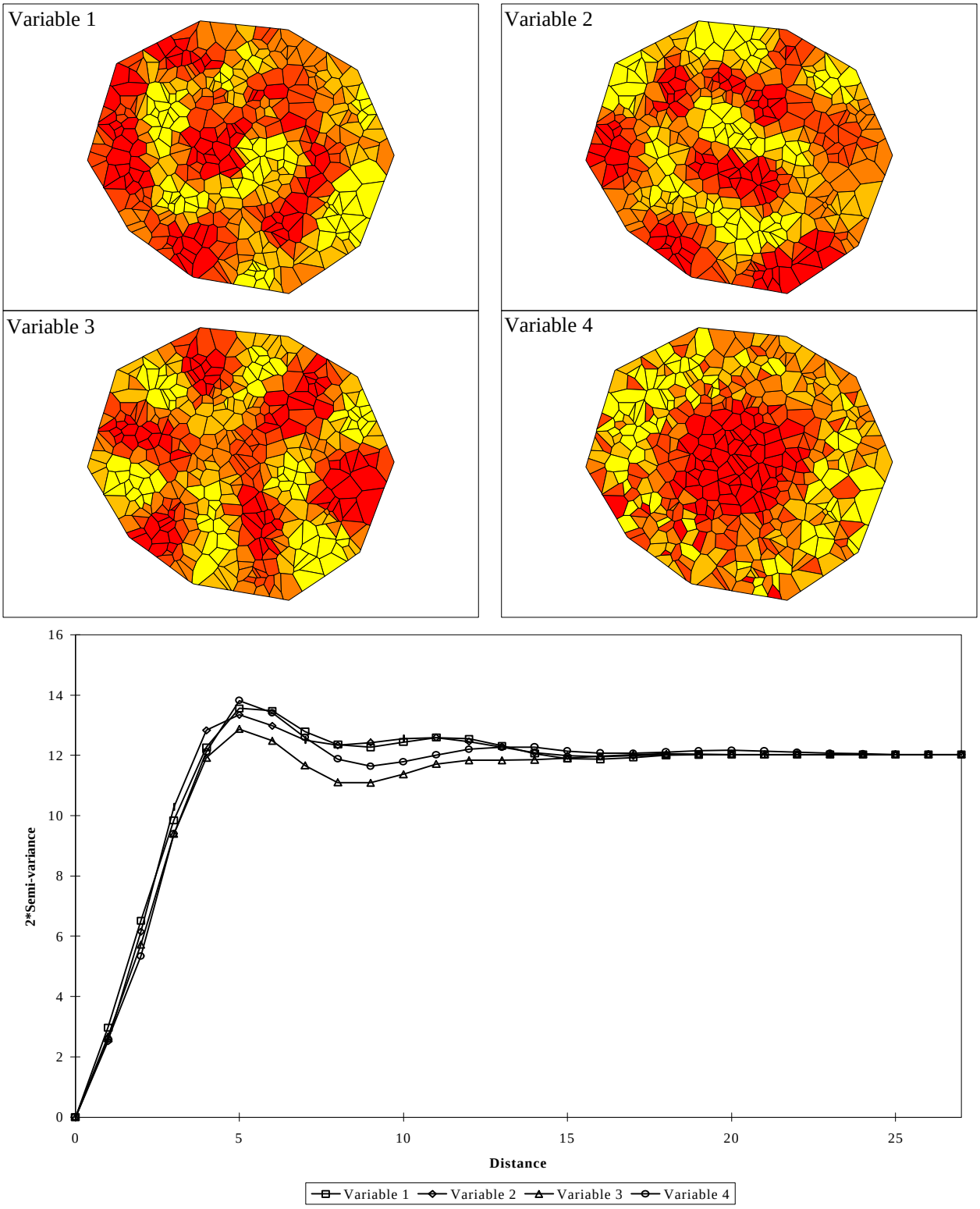


Figure 4.3a: Examples of variables with Moran Coefficients of 0.8 (top) and the variograms of the variables (bottom). These variables all have a large number of small clusters of high and low values, indicating short length scales and hence aggregation effects will be noticeable even for relatively small aggregated zones.

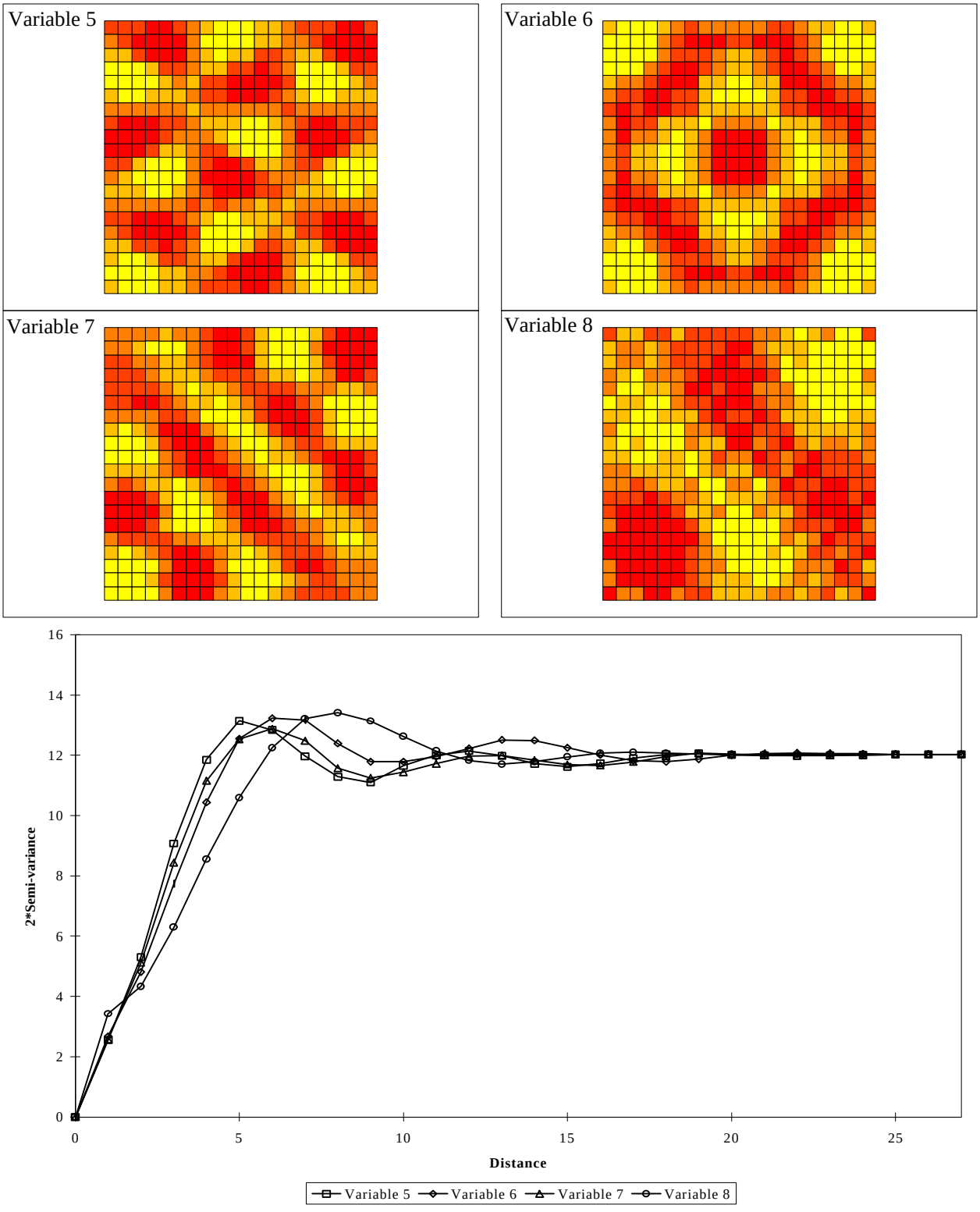


Figure 4.3b: Four more variables with MCs of 0.8 with length scales longer than those of Figure 3a. Note how the length scale is related to the number and positioning of clusters of similar values.

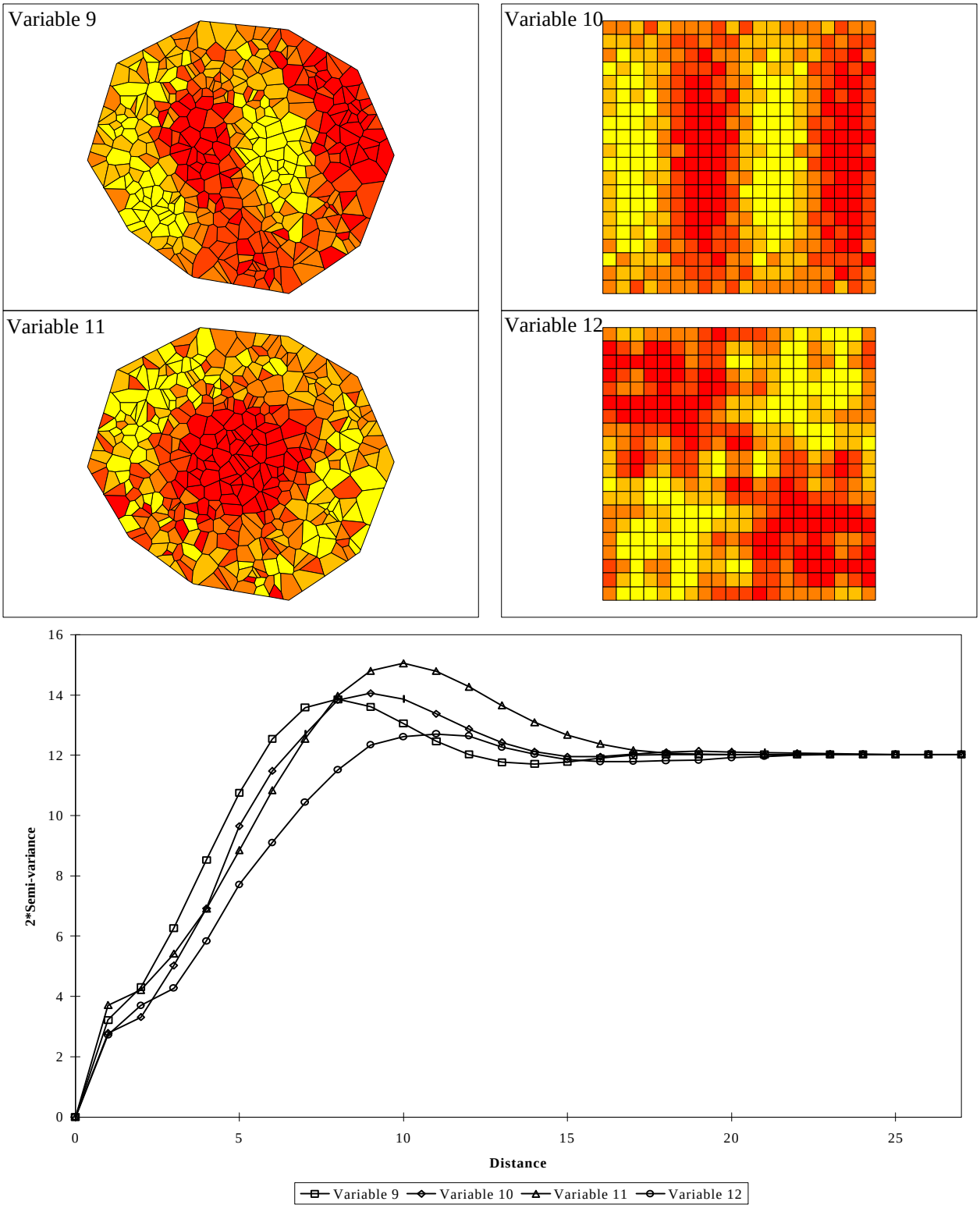


Figure 4.3c: Four more variables with MCs of 0.8, all with longer length scales. Note the lack of oscillation of the variograms after the peaks, compared to those of the previous figures.

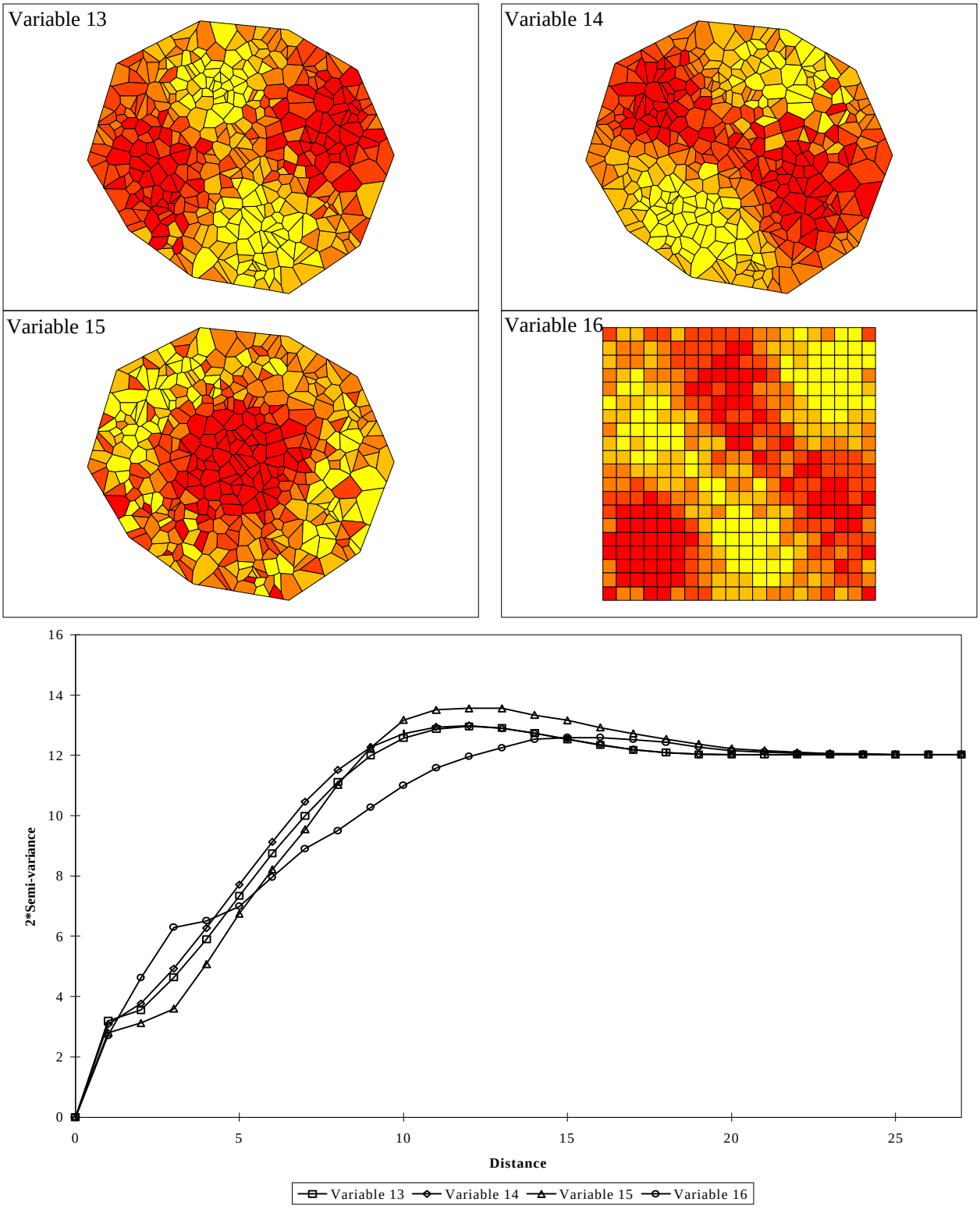


Figure 4.3d: The final four variables with MCs of 0.8, all with long length scales. On average, aggregation effects manifest themselves more slowly for these variables than for those with shorter length scales.

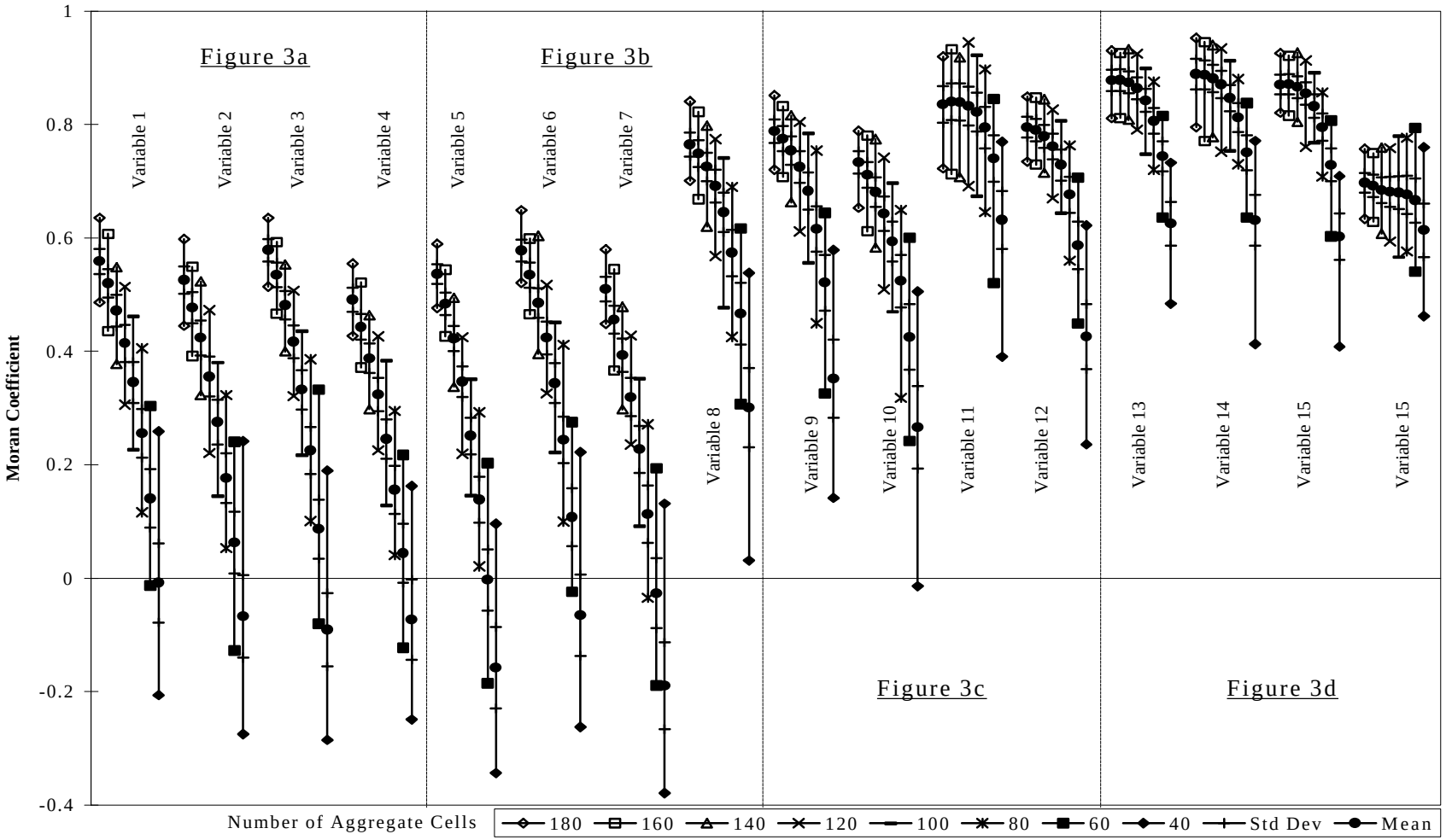


Figure 4.4a: Variation of the MCs of the variables in Figures 3a to 3d. It can be seen that the longer the length scale, the larger the region must be before aggregation effects become severe and the slower the rate at which the aggregated MC decreases. Each group of lines is labeled with the variable number; each set of four groups is labeled with the figure in which they appear.

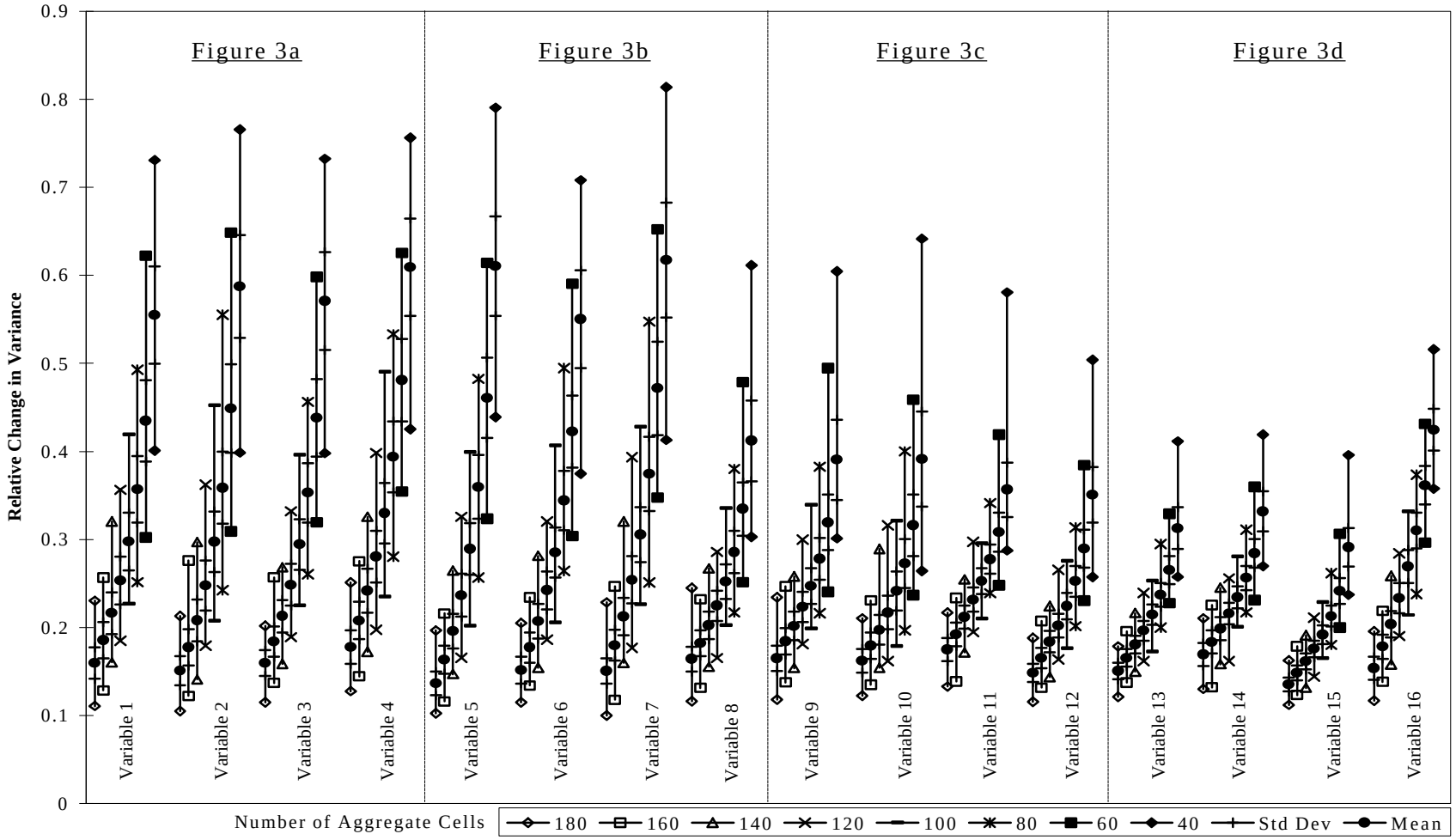
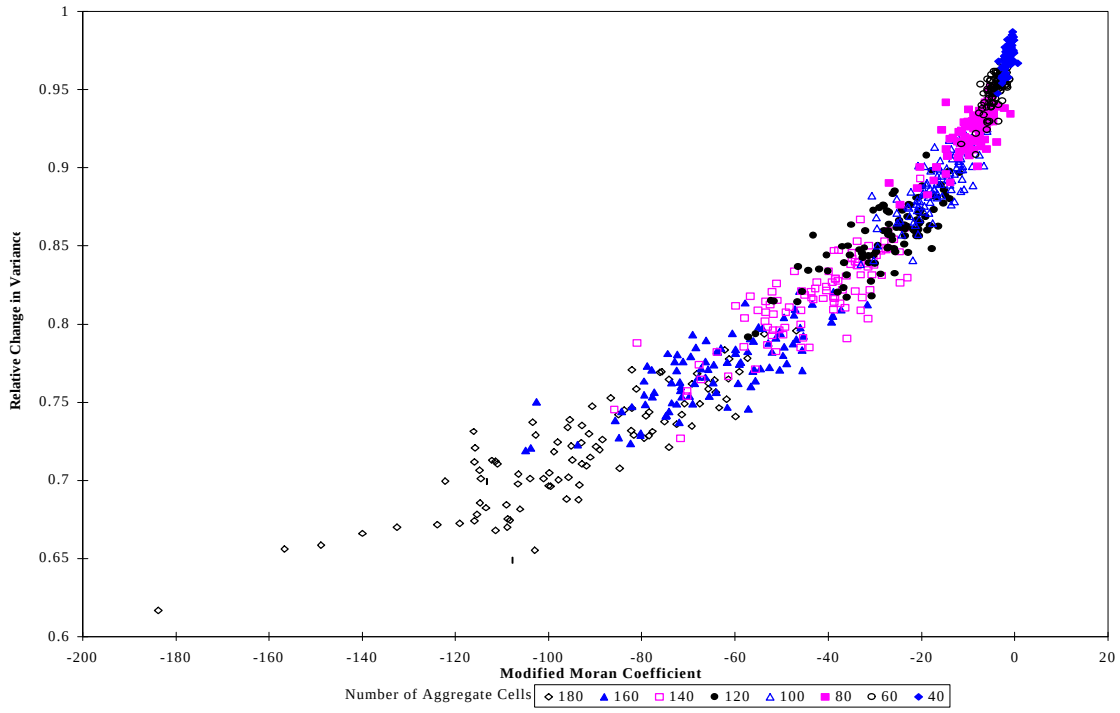


Figure 4.4b: Variation of the variances of the variables in figures 3a to 3d. Results here correspond with those in Figure 4a: the longer the length scale, the less the variable is affected by aggregation.

a)



b)

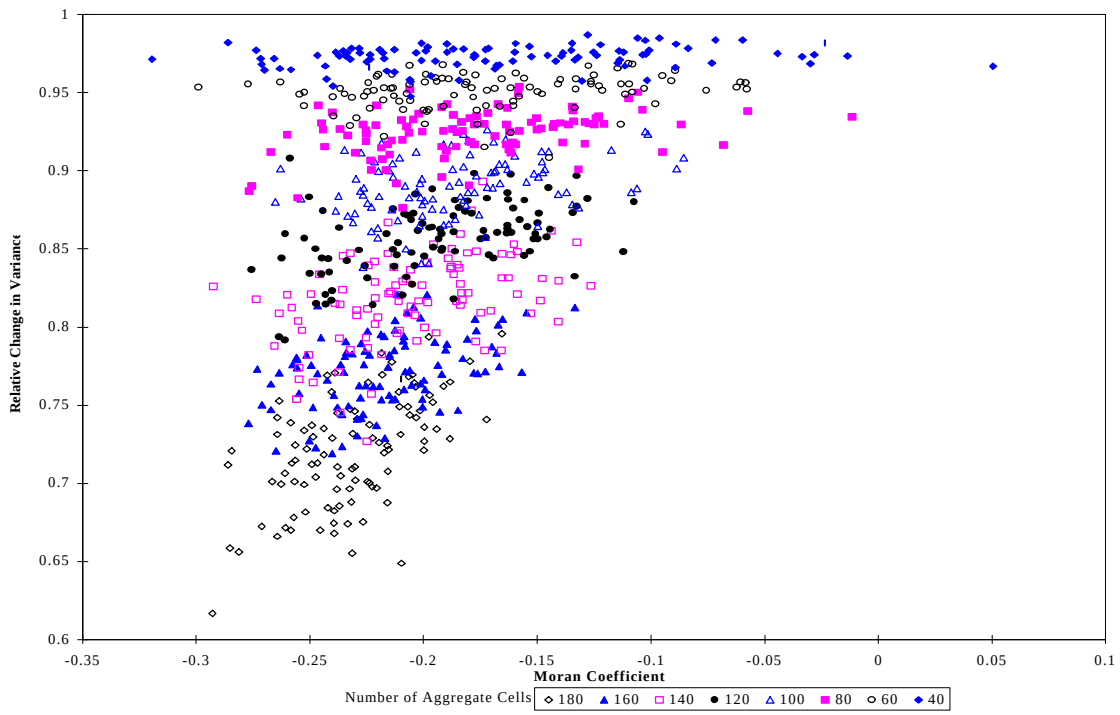
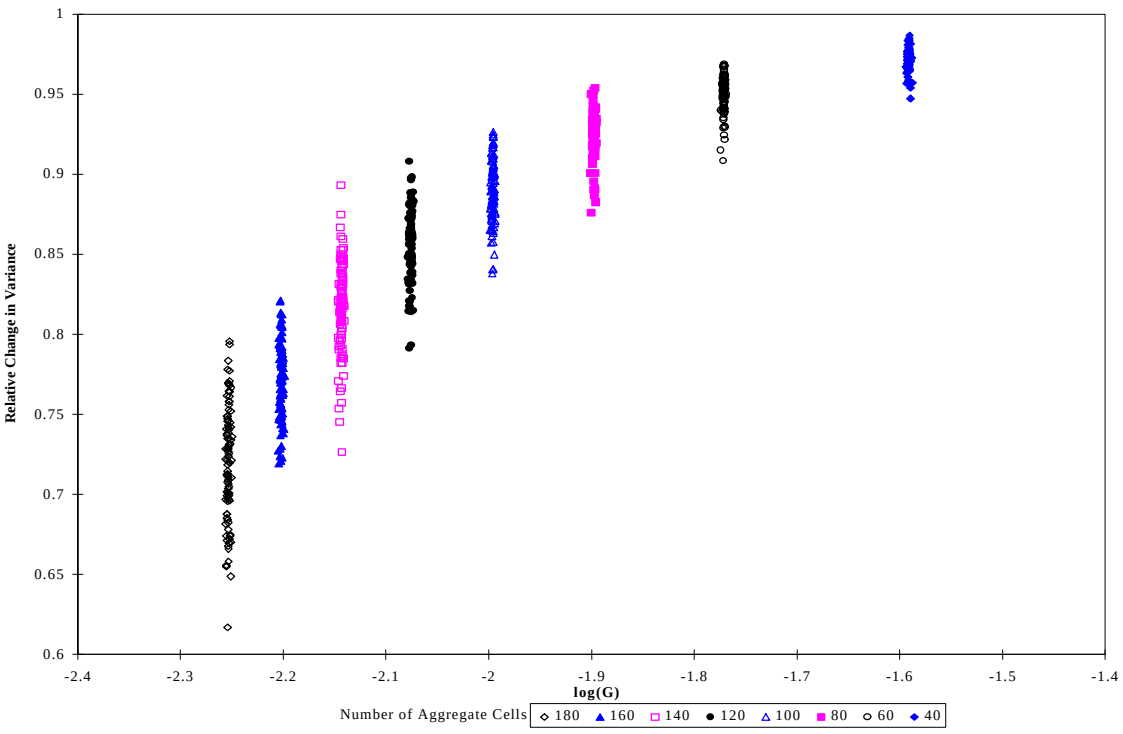


Figure 4.5: Relative change in variance (RCV) as a function of the aggregated MC without the sum of squares of deviations term (top) and of regular aggregated MC (bottom), for variable with initial MC of -0.4. Note how adding the term significantly worsens the relationship.

a)



b)

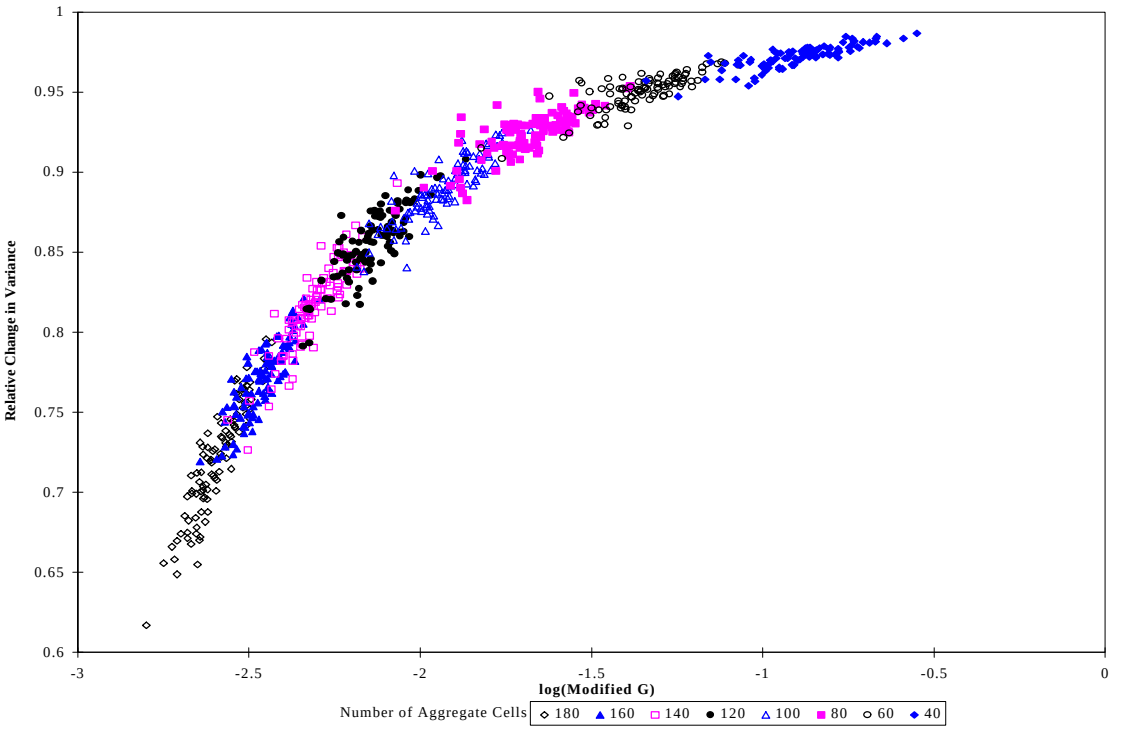
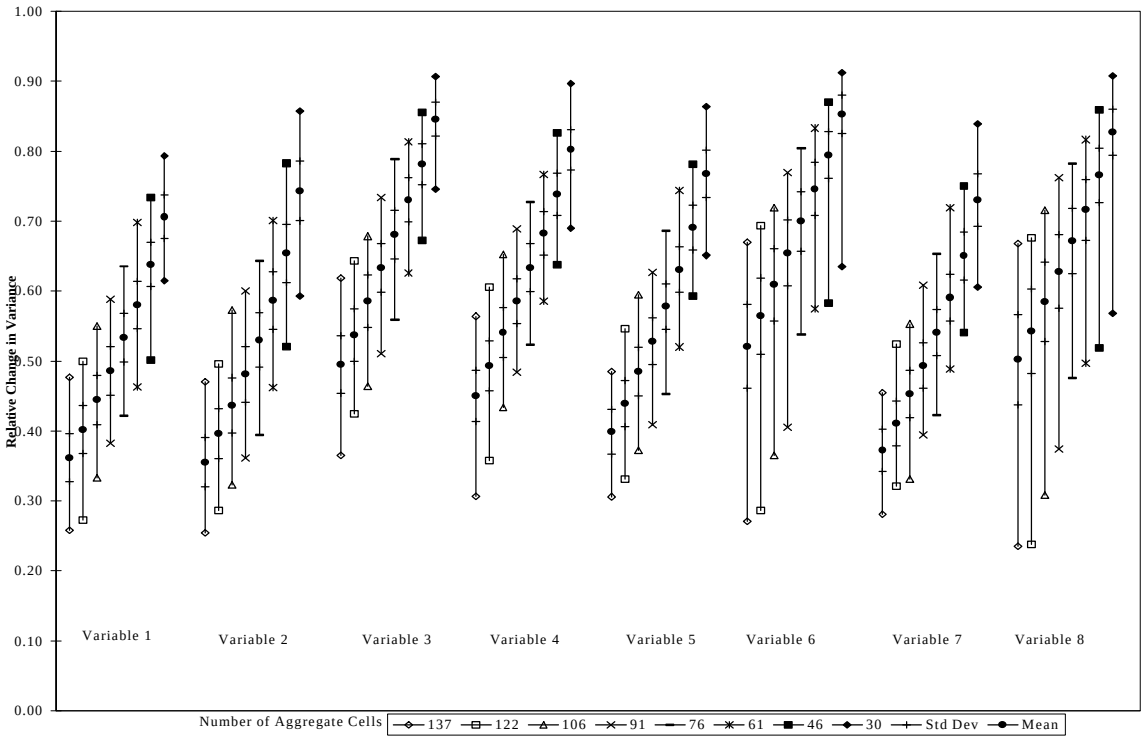


Figure 4.6: Relative change in variance (RCV) as a function of $\log_{10}$(G) (top) and $\log_{10}$(modified G) (bottom). Notice how, unlike Figure 5, adding the variance (sum of squares of deviations divided by M, the number of cells) improves the relationship.

a)



b)

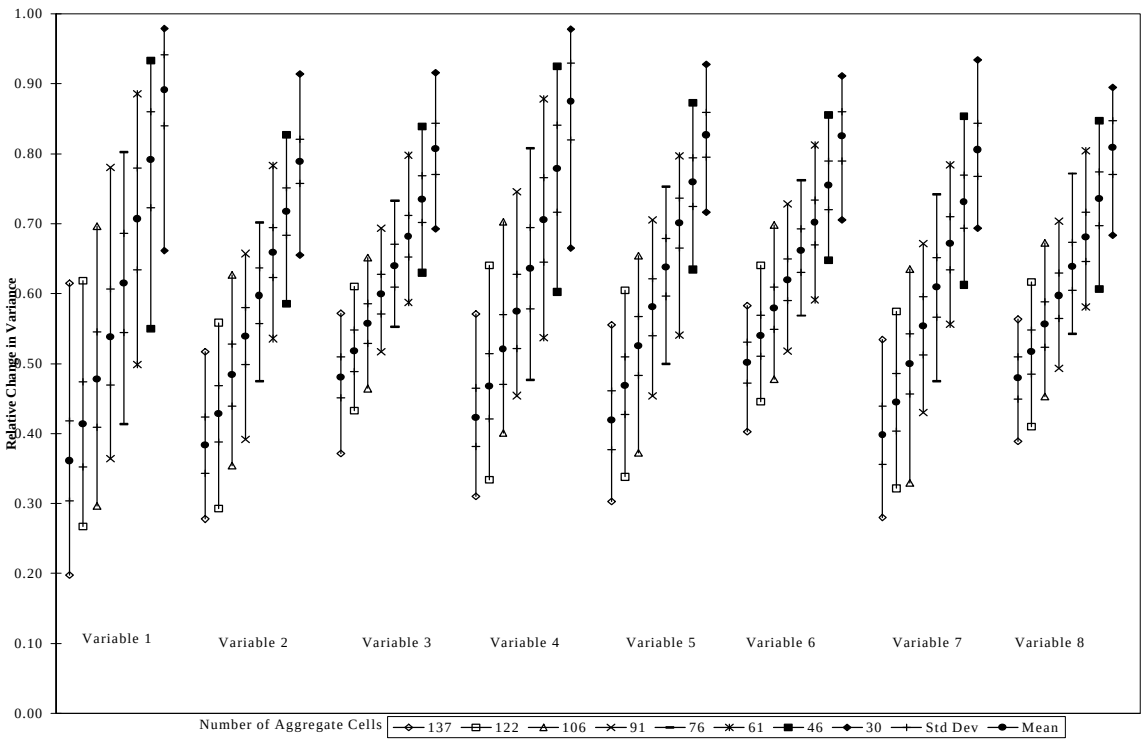
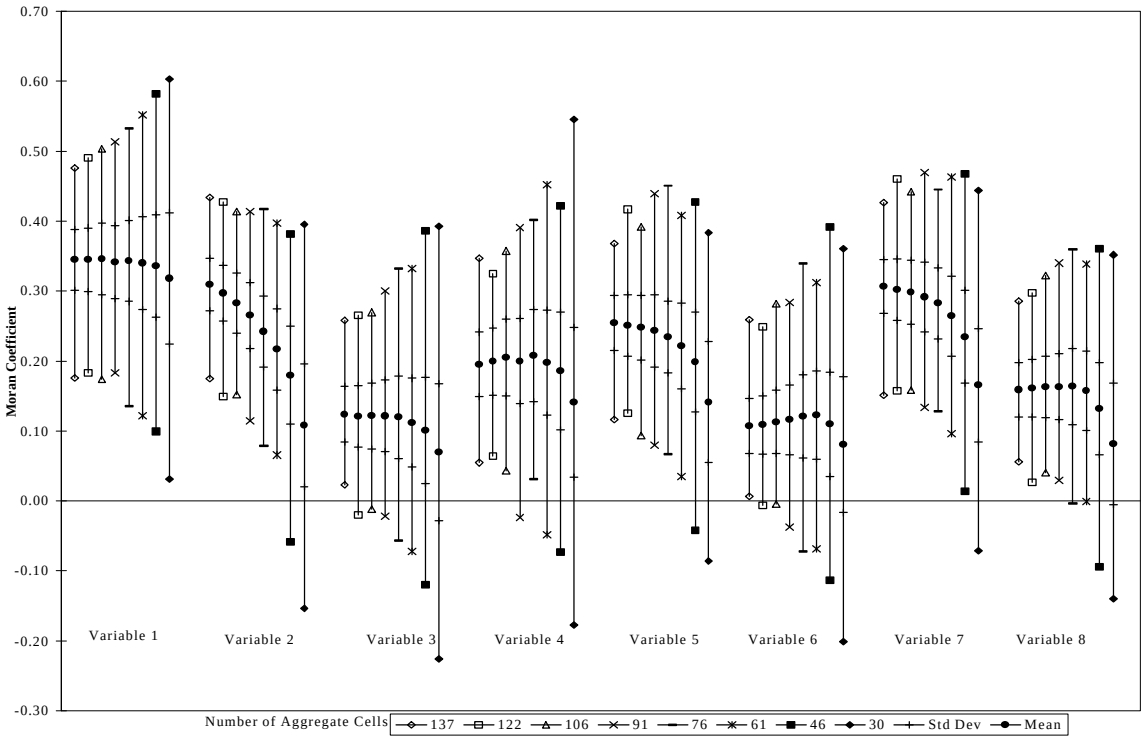


Figure 4.7: Behaviour of the Relative Change in Variance with aggregation for the actual Lancashire dataset (top) and a synthetic Lancashire dataset (bottom). Differences exist, but the general patterns of behaviour are quite similar.

a)



b)

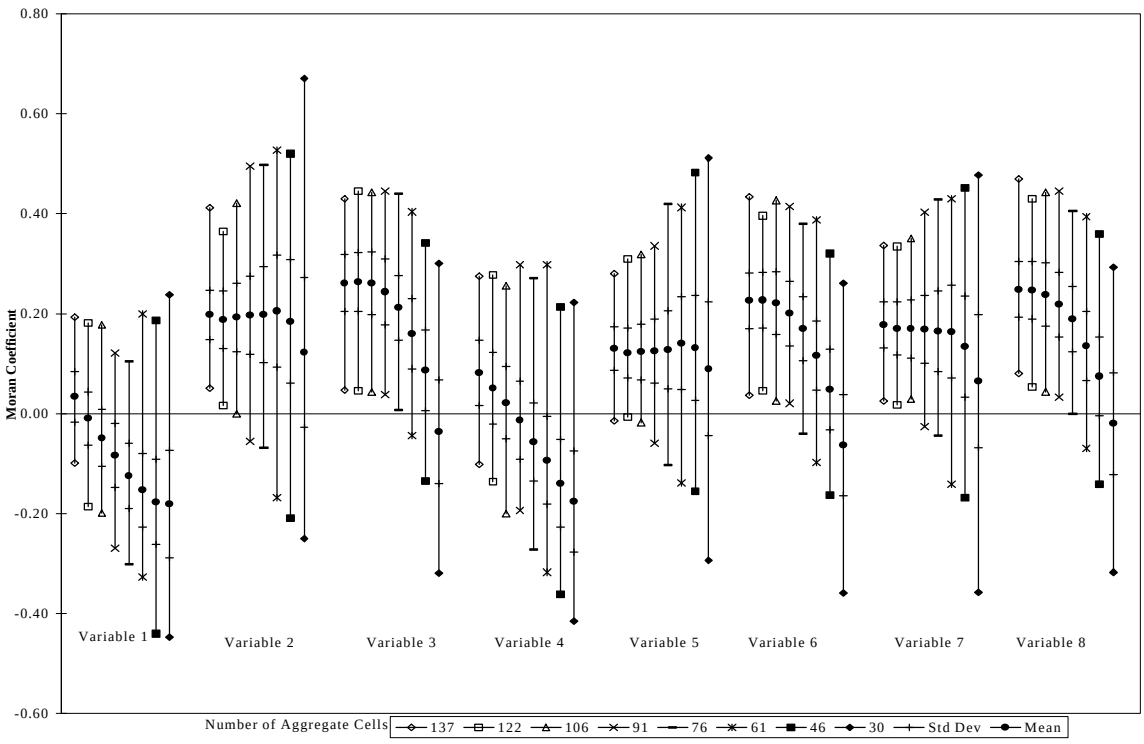


Figure 4.8: Behaviour of the aggregated Moran Coefficients for the actual Lancashire dataset (top) and a synthetic Lancashire dataset (bottom). The differences in behaviour are most likely due to the different spatial configurations of the values, as shown in Figure 4.9.