Chapter 8

Multivariate methods

Aim: In many circumstances, climate studies involve more than just two time series. Sometimes, spatial maps of a parameter, such as the SLP, are used instead of just one station value. The geographically distributed climate quantities are often stored in *gridded* data files, consisting of $n_x \times n_y$ grid boxes (or points), each which represent the mean value for that particular region.

An example of multivariate analysis is the map of correlation scores between the SLP and Bergen temperature. Such maps can be used to identify teleconnections, and lagged-correlation maps can be used in the study of propagating signals.

8.1 The geographical distribution of correlation

By computing the correlation coefficients between the time series from each grid box and the Bergen temperature, it is possible to study the geographical dependence of the Bergen temperature (60°N,5°E) on the SLP. Hints of a wave train pattern running from the Gulf of Mexico to Fennoscandia can be seen.

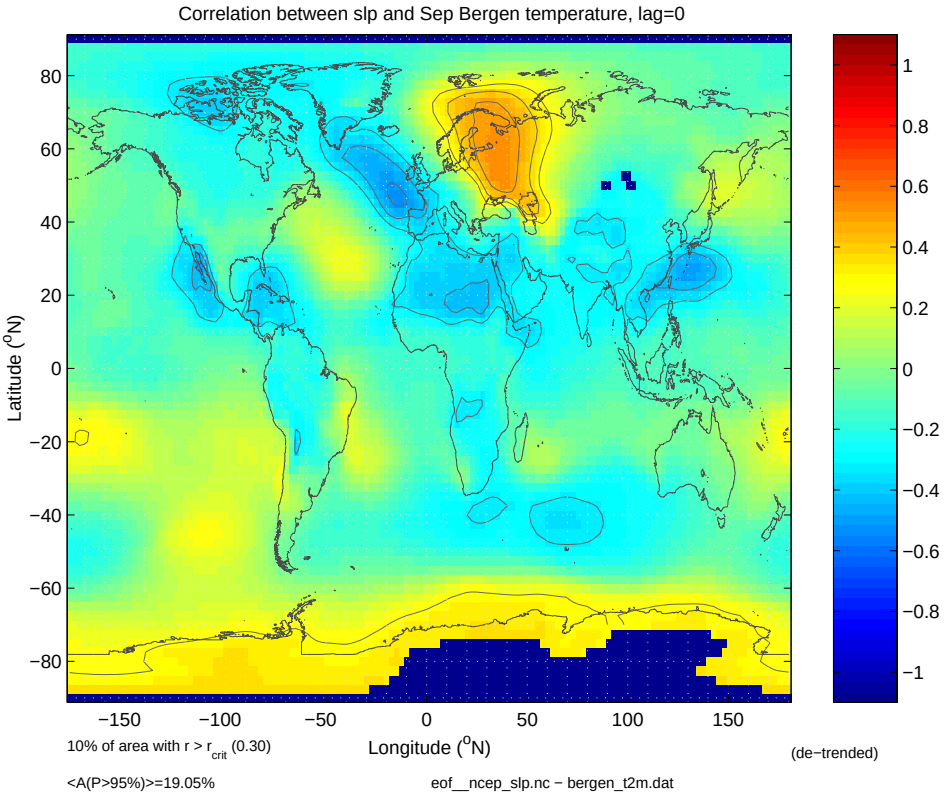

Figure 8.1: *The correlation between the Bergen September temperature and the global SLP. The confidence limit was estimated by applying a MC-test to the times series from the location of maximum correlation, assuming that this estimate is valid for all locations. [stats_uib_8_1.m]*