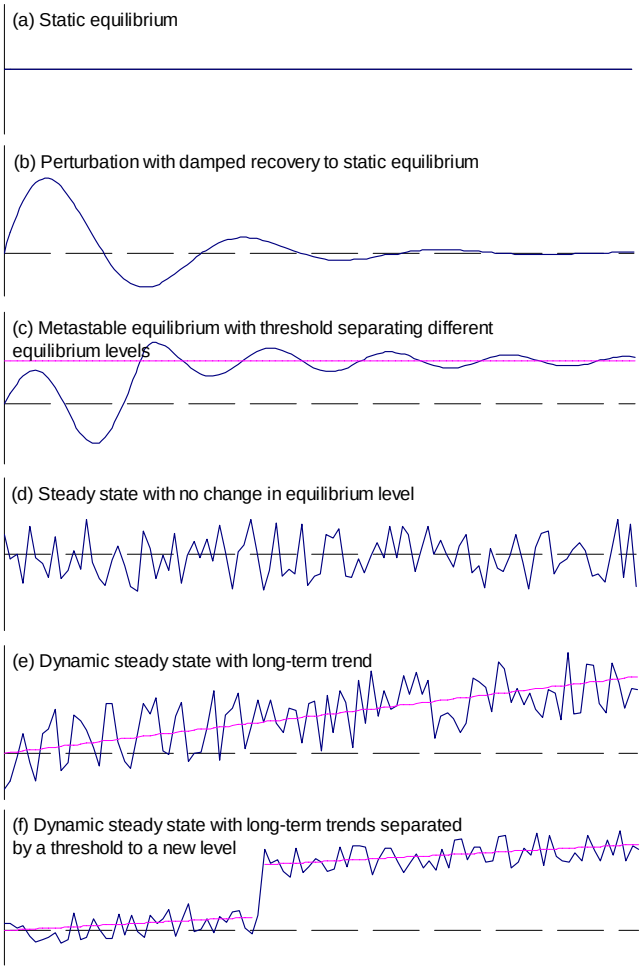
STATISTICAL, SPATIAL AND TIME SERIES ANALYSIS TECHNIQUES



The statistical analysis of data is a huge subject, which is covered extensively by a wide range of standard texts in the literature (Benjamin & Cornell, 1970; Coolican, 1996; Gumbel, 1958; Leadbetter *et al.* 1982). In addition, many statistical software packages now include their own handbooks or supporting explanatory notes (MATLAB, NAG, SAS, SPSS, StatSoft and many others: see Statistical Software).

The need for studies of estuaries often relates to the analysis of time series data, the manipulation of geographic information, or a combination of the two. Again time series analysis is an extensive subject that is well covered in the literature (Williams, 1997; Young, 1999) and on the web (e.g. Time Series Analysis). The development of spatial analysis is less well developed but with the rapid proliferation of GIS for environmental studies there is now a growing literature (Burrough & McDonnell, 1998; Raper, 2001).

In carrying out this type of analysis one is invariably seeking to identify, underlying trends or cycles (in time or space), associations between different parameters, or the probability distribution of the data (statistically or in time or space). In any such analysis, the recognition of uncertainty and use of error analysis is an essential component of helping to avoid spurious conclusions and once again this is well covered in the literature (Mayo, 1996; Taylor, 1997; Bevington & Robinson, 2002).

Emery and Thomson (2001) cover all these topics in relation to physical oceanography in their book on data analysis methods.

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