6.5 ANOSIM for two-way layouts

Three types of field and laboratory designs are considered here:

a) the *2-way nested* case can arise where two levels of spatial replication are involved, e.g. sites are grouped *a priori* to be representative of two ‘treatment’ categories (control and polluted, say) but there are also replicate samples taken within sites;

b) the *2-way crossed* case can arise from studying a fixed set of sites at several times (with replicates at each site/time combination), or from an experimental study in which the same set of ‘treatments’ (e.g. control and impact) are applied at a number of locations (‘blocks’), for example in the different mesocosm basins of a laboratory experiment, or of course many other combinations of two factors;

c) a 2-way crossed case *with no replication* of each treatment/block combination can also be catered for, to a limited extent, by a different style of permutation test.

The following examples of cases a) and b) are drawn from Clarke (1993) and the two examples of case c) are from Clarke & Warwick (1994) .

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