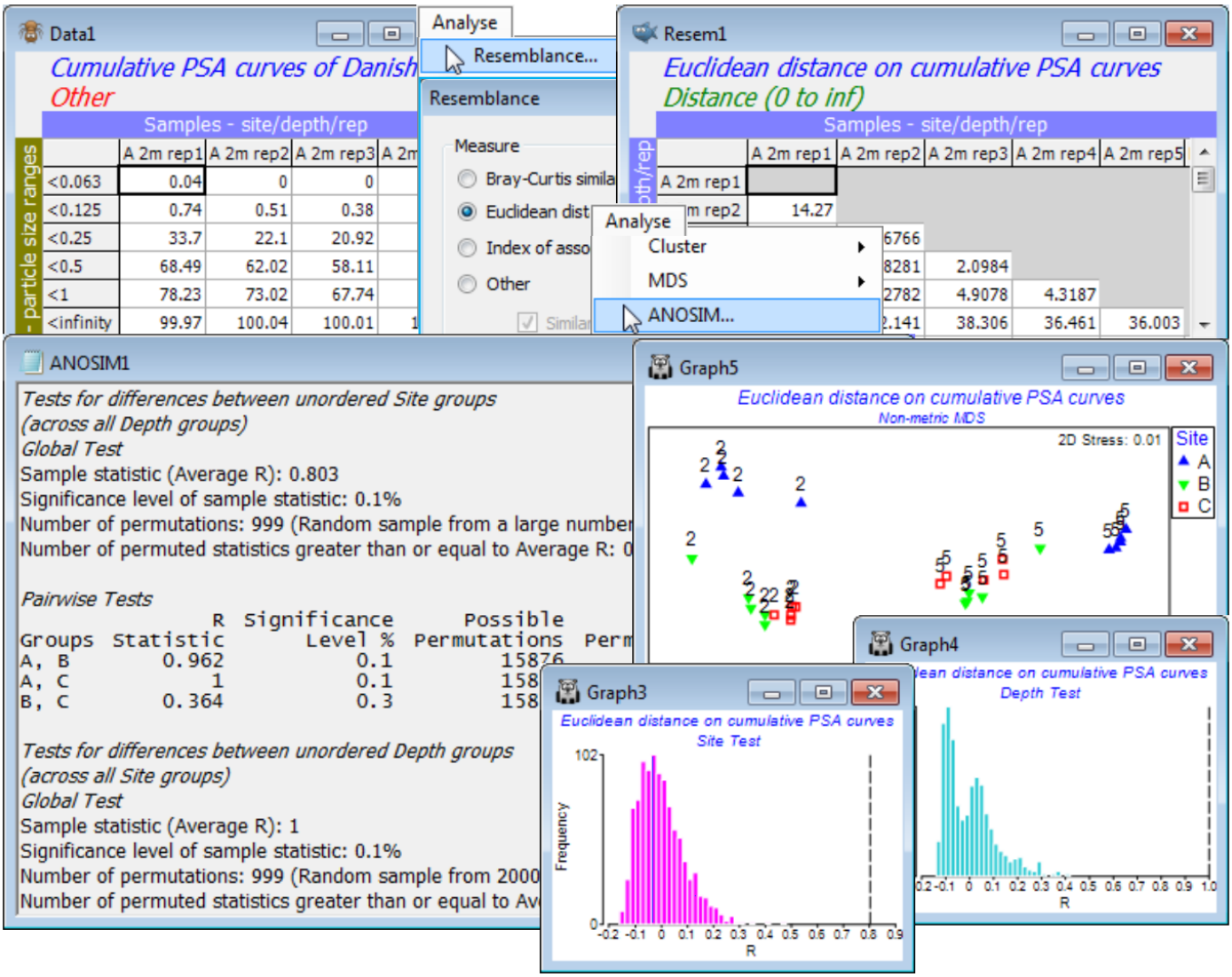
2-way crossed ANOSIM (Danish sediment data; Phuket coral reefs)

For an example of a 2-way crossed ANOSIM test in a very different context, save and close the above workspace and return to the particle size distributions from Danish sediments introduced at the very end of Section 4 – the workspace Denmark ws in C:\Examples v7\Denmark PSA, with particle size frequency data (over 6 size-categories) in Denmark PSA histogram, for 3 sites (A, B, C) crossed with 2 depths (2m and 5m), and 5 replicate samples from each combination of site and depth. A distance measure such as Euclidean (or Manhattan or Maximum distance, see Section 5) is appropriate for defining the resemblance between two distribution curves.

As suggested earlier, apply this to the (smoother) cumulative frequencies from **Pre-treatment> Cumulate Samples**>(Variable Order•As worksheet), and on the resulting resemblance matrix run **Analyse>ANOSIM**, with the 2-way crossed option for factors Site and Depth (in some cases, the latter might be considered ordered, but we have only 2 depths here so the distinction is irrelevant; Site is clearly unordered). The results show perfect separation of the depths (global average R = 1, p<0.1%) and strong separation of the sites (global average R = 0.80, p<0.1%). The large number of possible permutations means that these p values could be made almost arbitrarily small, as is clear from the null distribution histograms. Pairwise site tests show, however, that B and C are not well separated (average R = 0.36, though still larger than all but 2 of the 999 permutations considered from the full set of 15876, thus p<0.3%), as is also seen in an *n*MDS plot on the Euclidean distance matrix (or a PCA, see Section 12). Close this workspace – it will not be needed again.



The study of coral reef assemblages at Cape Panwa, Phuket, Thailand – introduced near the end of Section 8 – measured area cover of corals on twelve 10m line samples taken perpendicularly to an onshore to offshore transect (A), over a time series of years. The previous workspace, Phuket ws, contained the data only for 1983-87, and 1983 was selected to visualise community change along the A transect, seen in an *n*MDS. Here, you should open into that workspace (or a clear one) data from the 7 middle years, Phuket coral cover 88-97 in C:\Examples v7\Phuket corals. Factors Year (88, 91, 92, 93, 94, 95, 97) and Position on the A transect (1-12) form a 2-way crossed design, because each position is examined (*plotless line sample*) in each year, but there is no replication

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