Automatic creation of multi-plots

The concept of a *Multi-plot* is a new feature in PRIMER 7. This construction has already been met in Section 4 where histograms of all selected environmental variables, using frequencies calculated over the samples, were presented in a single multi-plot window with component graphs consisting of the individual histograms for each variable (using **Plots>Histogram Plot**). You may have noted it again in the Explorer tree for the above Bristol Channel zooplankton analyses – see the PRIMER desktop in the first screen shot of this section – where a direct SIMPROF run (on one of the groups of samples identified by the cluster analysis) generated two plots: the similarity profiles, with their 'expected' limits under permutation, and the resulting histogram for the null distribution of the test statistic. Though these two plots are not of the same type (unlike the previous example of multiple histograms) it is natural to hold these related graphs together in a single construction, the multi-plot *MultiPlot2*. Another similar example is seen in this Bristol Channel ws workspace (*MultiPlot3*), of the dendrogram (*Graph6*) under flexible beta clustering, together with its associated line plot of the cophenetic correlation against the range of beta values (*Graph7*). PRIMER 7 now automatically packages such naturally related plot windows into a single multi-plot construction, essentially to neaten and simplify the 'house-keeping' of the Explorer tree rather than as a primary presentational tool – a multi-plot is often best thought of as a collection of thumb-nail graphs, each of which can (and should) always be viewed and manipulated individually by clicking anywhere over the space they occupy in the multi-plot window. In the Explorer tree the individual plot names are therefore all listed under the multi-plot name, e.g. *Graph 4* and *Graph5* under *Multiplot2*, and *Graph6* and *Graph7* under *Multiplot3*, etc., and it is often convenient to roll-up the individual plots by clicking on the rolled-out icon Image not found or type unknown in front of the multi-plot name, which is then replaced by Image n, the rolled-up icon, with the individual plot names now hidden (but not, of course, deleted). This is particularly useful when large numbers of component plots are automatically created, as in the **Histogram Plot** on large numbers of variables, or in the next section, the new availability in PRIMER 7 of MDS plots in higher numbers of dimensions, with a run of **Analyse>MDS>Non-metric MDS (nMDS)**> (Min. dimension: 2) & (Max. dimension: 10) generating 9 ordination plots with their 9 associated Shepard diagrams, all automatically combined into an 18-component multi-plot (or 19 plots if the option is also taken to show the *scree plot* of stress vs. dimensionality). Of course, configurations in more than 3-dimensions can only be displayed by showing 3 axes at a time, but viewing the change in Shepard diagrams as dimensionality increases, in a single multi-plot, can be instructive.

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