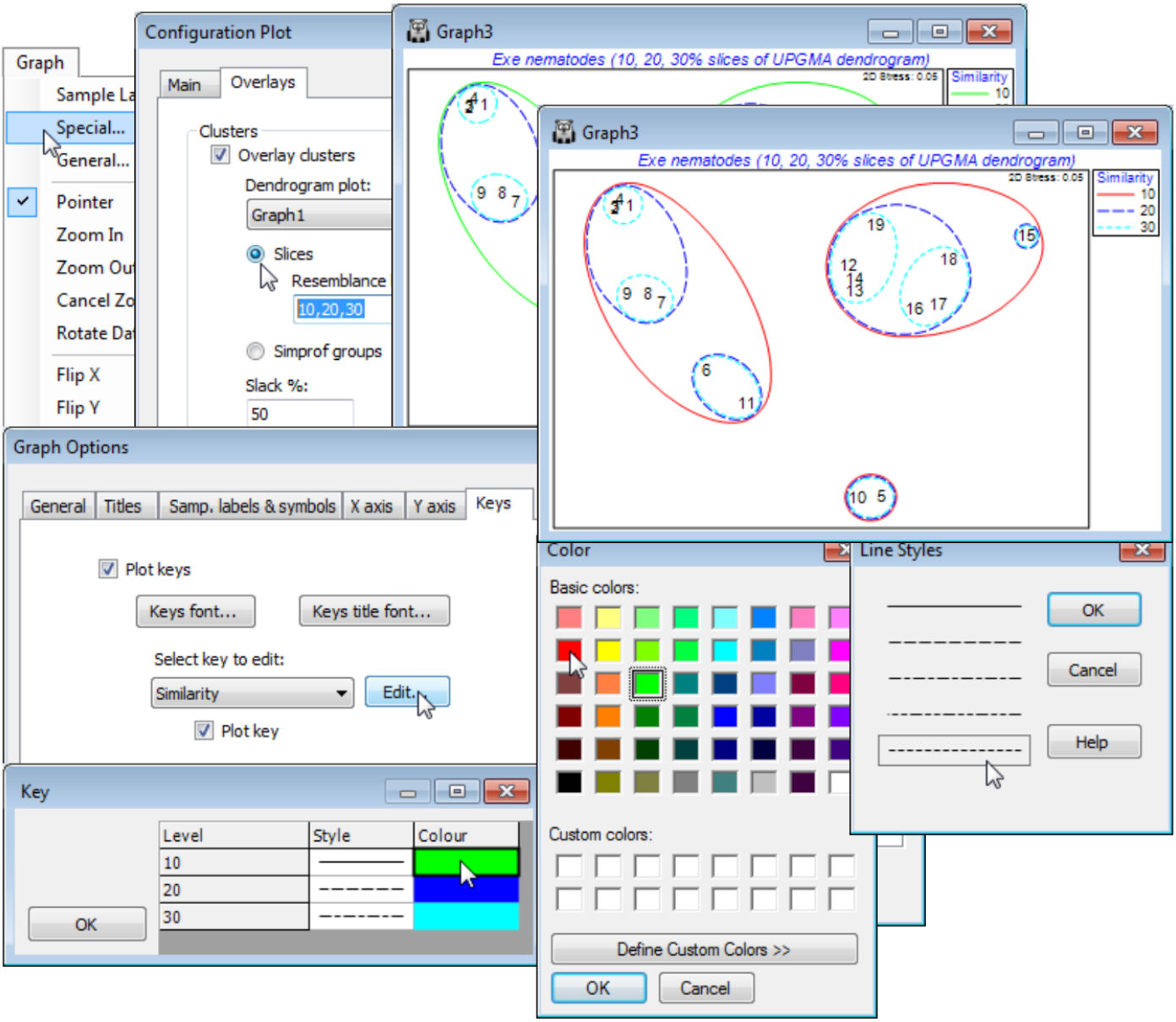
Cluster overlays on MDS plots

The second way in which a cluster analysis can be displayed on a 2-d MDS plot, to aid assessment of the level of agreement, is to draw smoothed envelopes around each of the cluster groups, either for one or more slices at arbitrarily chosen similarity levels (drawn with different line colours and line types) or, as a new option in PRIMER 7, with a previously-defined SIMPROF grouping from a hierarchical dendrogram. The envelopes are smoothed *convex hulls* of the points they enclose and a *slackness* parameter determines the smoothness of the enclosing line (how loosely it is drawn round the points in that group). The default of (Slack %: 100) results in a high degree of smoothing, and thus larger envelopes, with (Slack %: 0) giving the tightest enclosing polygon (the convex hull).

For the Exe nematode MDS (Graph3), remove the symbols that are displayed with the 30% slice by **Graph>Sample Labels & Symbols**, unchecking the (Symbols: ✓Plot box) to leave only the site labels. Take **Graph>Special>Overlays**>(Clusters✓Overlay clusters)>(Dendrogram plot: Graph1) & (•Slices>Resemblance levels: 10, 20, 30) & (Slack %: 50). Experiment with the slack parameter and change the colours and line types with the Keys tab in the Graph Options dialog, i.e. **Sample Labels & Symbols>Keys**>(Select key to edit: Similarity)>**Edit** and double-click on a colour or line style box to get the same options as for factor Keys, seen previously. You might also like to add envelopes for the SIMPROF groups created by the cluster run you chose on the previous page – by taking (Clusters•Simprof groups) rather than (Clusters•Slices) on the Overlays tab.



Attractive though such envelopes are, in guiding the eye to cluster groupings, there can be a lack of clarity as to which points fall in which envelopes when boundaries overlap, sometimes exacerbated by too high a slack parameter (chosen in the interests of producing very smoothed curves). This is also the reason why the envelope overlay operation is not offered for a general *a priori* factor, defining a one-way layout of samples, for which there is quite likely to be substantial overlap of some groups. At least with SIMPROF groups or dendrogram slices, if the MDS and cluster analysis are substantially in agreement, the likelihood is that most cluster groups will occupy a discrete region of the MDS space and lightly smoothed convex hulls will tend not to overlap too often. And *a priori* factors can always be simply and unambiguously displayed using different symbols.

Revision #2
Created 2 July 2024 01:45:58 by Arden
Updated 22 January 2025 04:23:30 by Abby Miller