Overlaying factors or other data (bubble plot)

The ability to display, on any ordination plot, external structure such as factors (e.g. for sites, times etc.) by **Graph>Sample labels & symbols** is a fundamental interpretational tool, as is the addition of time (or unidirectional space) trajectories, via **Graph>Special>Overlays**>✓Overlay trajectory, and supplying a numeric factor which determines the order in which points are joined. This, too, is greatly expanded in PRIMER 7 by allowing multiple trajectories, e.g. a common time course drawn in separate colours or line styles for different sites, using (✓Split trajectory) and then supplying the site factor. Also, there is the capacity to view the evolution of a trajectory (or multiple trajectories) dynamically, in an animation which can be recorded (as noted above) in an *.mp4 file.

Bubble plots (**Graph>Special>Main**>✓Bubble plot) overlay circles whose sizes reflect values of one of the variables (e.g. species) used in constructing the MDS, or of an external variable such as environmental information. Again, bubble plots have been greatly extended in PRIMER 7, from improvements in flexibility, such as the degree of user control over definition of the bubble key (**Key**>Key values), to several new features: drawing simple bubble plots with a user-defined image (**Key**>✓Use image) displayed at different sizes; the automatic availability of '3-d effect' bubbles on 3-d ordinations (justifying the term bubble plot rather than circle plot!); the display of bubbles for single variables in different colours dependent on the levels of a factor, by **Key**>(✓Use symbol colours) when **Sample labels & symbols**>(Symbols✓Plot)>(✓By factor) is selected; and, perhaps most significantly, *segmented bubble plots* are introduced. These display several variables on the same MDS plot as different-sized segments of a circle or sphere, in differing colours and segment positions for the differing variables (under ✓Bubble plot>**Change**, add more variables to Include).

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