

Presenter: **Dr Paul J. Somerfield** (*Plymouth Marine Laboratory*)
Venue: **ONLINE**
Dates: **6 - 10 December 2021**
(09:00 - 18:00 U.K. time (GMT/UTC + 0 hrs))

This **PRIMER version 7 ONLINE WORKSHOP** will take place over **5 days**, 09:00 - 18:00 U.K. time (GMT/UTC + 0 hrs), on each day, with **4 scheduled online sessions per day** (2 in the morning and 2 in the afternoon) Monday-Friday. Much of the final day will be dedicated to Masterclass sessions to allow participants to analyse their own data, connect with one another, and consult one-on-one with the presenter. Within each scheduled session, there will (generally) be:

- a **live lecture** (typically ~45-60 minutes), with ample opportunities for questions;
- a **computer lab** session (done by participants on their own machines); and
- a **live wrap-up/summary**, in which the presenter will go through the computer lab, summarising salient points of interpretation, and also fielding any further questions.

Participants are expected to use their own laptop or desktop computer, which must be equipped with secure and reliable internet access, a microphone and a camera, enabling direct communication with the lecturer (and potentially other workshop participants) *via* appropriate video-conferencing software¹ for the duration of the workshop. All lectures will also be recorded and made available to participants for the duration of the workshop. Software may be purchased (at a discounted price – see below) *or* a free fully functional (but time-limited) version will be made available to registered participants for trial use during the workshop. Note that PRIMER is a Windows-only product, so Macs need to run in Windows emulation. If you would like to, or are able to, it would be great to arrange to share a space and participate in the workshop alongside other participants in your area.

Content

- This workshop will provide an intensive and extensive overview of statistical methods in non-parametric analysis of multivariate data, encapsulated in the software: **PRIMER version 7**. It will cater to both those who are **new to PRIMER** and to those who are “**old hands**”, but have not yet had a chance to get up to speed with the latest developments in version 7. Important new tools include: **shade plots** with flexible ordering & clustering of axes; **coherence plots** to show species displaying statistically distinguishable response patterns; **unconstrained binary or divisive flat clustering** (as in *k*-means) along with **SIMPROF** tests; **metric, threshold metric, non-metric or combined MDS** in any dimensions; **bootstrap averages** to show variation among averages in metric MDS space; **2-way versions** of BEST and RELATE; **new plot types** (bar, box, means, line, histogram, scatter, surface, shade) in 2-d or 3-d; **animations** of ordinations captured to video files; multi-factor and multi-variable **segmented bubble plots** in 2-d and 3-d; ANOSIM extended for **ordered factors** and **3-factor** designs and much more...
- As well as covering new methods in PRIMER 7, the core basic multivariate routines will all be fully discussed, e.g. pre-treatment of data; definitions of similarity; clustering; ordination by principal components (**PCA**), non-metric (and metric) multi-dimensional scaling (**MDS**); permutation tests on similarity matrices for structured (**ANOSIM, RELATE**) and unstructured (**SIMPROF**) cases; emphasis on species analyses; linking community to abiotic data (**BEST**); biodiversity indices; means plots (with approximate region estimates), and the many graphical tools available for effective presentation of results. Non-parametric statistics and permutation tests make the methods intuitively simple to understand so **no prior background in statistics is assumed**.

¹ PRIMER-e will facilitate access to a secure video-conferencing platform for workshop participants only.

Registration fees (GBP)***New Zealand residents must add 15% GST*

WORKSHOP FEES	
Full Registration:	Student Registration:
GBP £ 540	GBP £ 370

The registration fee **includes** workshop materials, and (if needed) a temporary (fully functional but time-limited) software licence key for PRIMER 7 with PERMANOVA+. The registration fee **does not include** the separate (discounted) costs of time-unlimited software.

Software – discount prices for workshop participants

Participants wishing to purchase software at the discounted prices shown below should indicate this on the registration form. All prices are in GBP. New Zealand residents must add 15% GST.

	New PRIMER 7 (GBP)	Upgrade PRIMER 6 to PRIMER 7 (GBP)	PERMANOVA+ add-on (GBP)
Private sector	£ 600	£ 300	£ 300
Public sector	£ 450	£ 225	£ 225
Academic	£ 300	£ 150	£ 150
Full-time student	£ 150	£ 75	£ 75

Contact and Registration

To register, please fill out the **registration form** available for download from the PRIMER-e website (www.primer-e.com/workshops) and return it directly to primer@primer-e.com to secure your place. Places are limited. The **Final Deadline** for registration and payment is **26 November 2021**. Late registrants will only be accepted if space permits.

About the Presenter

Dr Paul J. Somerfield (Plymouth Marine Laboratory) is a highly-cited and sought-after numerical ecologist who has been instrumental in developing and using the methods in PRIMER across many fields, having led and lectured PRIMER workshops across the globe for over two decades. With knowledge and broad experience in analysing multivariate datasets of all kinds, Paul has mentored and published with hundreds of scientists and professionals from a wide range of disciplines: marine, freshwater and terrestrial ecology, oceanography, soil science, forestry, environmental science, microbial ecology, genetics, remote sensing and modelling.