PRIMER-e
empowering research

WORKSHOP on PRIMER version 7,
Universiti Putra Malaysia (UPM)
Multivariate Analysis in Ecology (& other Sciences)

Presenter: Dr Paul Somerfield (Plymouth Marine Laboratory, UK)
Venue: The Laboratory of Marine Biotechnology, Institute of Bioscience (IBS),
Universiti Putra Malaysia (UPM)
Date: 3rd – 7th December 2018

This **PRIMER version 7** workshop takes place over 5 days (Monday – Friday, 08:30 to 17:30 on each day). Participants will engage in a mixture of informative lectures on key topics and computer lab sessions on literature data sets. Participants can also discuss and analyse their own data sets in consultation with the lecturer, with dedicated time for this provided on the Friday. Participants are expected to **bring their own laptop**. Software either 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 over the period of the workshop. Note that PRIMER is a Windows-only product, so Macs need to run a Windows emulation.

Content

- This workshop will provide an intensive and extensive overview of statistical methods in non-parametric analysis of multivariate data, using **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 the new methods in PRIMER 7, the core basic multivariate routines will also 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 designs (**ANOSIM**, **RELATE**) and unstructured cases (**SIMPROF**); emphasis on species analyses; linking community to abiotic data (**BEST**); biodiversity indices; bootstrap average 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**.

Venue

The workshop will be hosted by The Laboratory of Marine Biotechnology, Institute of Bioscience (IBS), Universiti Putra Malaysia. All sessions will be held at the following address: Tongkat Ali Emas Seminar Room, 4th floor, Institute of Bioscience (IBS), Universiti Putra Malaysia (UPM), 43400 UPM Serdang, Selangor, Malaysia. There is free parking within the IBS main complex and nearby accommodation options are shown below:

- RHR Hotel at UNITEN, http://www.rhrhotel.com/, Tel: +603 8922 2088
- Le Meridien Putrajaya, http://www.lemeridienputrajaya.com/, Tel: +603 8689 6888
- Putrajaya Marriott Hotel, http://www.marriott.com/hotels/travel/kulpg-putrajaya-marriott-hotel/, Tel: +603 8949 8888
- Palm Garden Hotel, http://palmgarden.com.my/cms/, Tel: +603-8943 2233
- Sun Inns D'Mind Seri Kembangan (budget hotel), http://www.suninnshotel.com.my/hotels/d-mind-2-seri-kembangan, Tel: +603 8943 1678

- Place2Stay @ The Mines, http://www.place2stay.com.my/hotel_themines.html, Tel: +603 8957 2961

For further information, including directions to the venue etc., please contact the local workshop organiser, *Ms. Fadzillah Abdul Razak* (fadzillah@upm.edu.my ; fadzillah.upm@gmail.com), tel: +603-8947-2224. Please note that it is the participant's responsibility to arrange and pay for their own accommodation - this is not included within the course fee.

Registration Costs

	COURSE FEES (USD)	
	Full Registration:	**Student Registration:**
EARLY BIRD* *By 30ᵗʰ September 2018*	USD $950	USD $670
After 30ᵗʰ September 2018	USD $1,020	USD $740

The course fee **includes** lunch, coffee/tea during breaks, all course materials, wi-fi, and (if needed) a temporary software licence key for the duration of the workshop, **but not** accommodation or the separate (discounted) costs of purchasing software. All prices are in United States Dollars (USD).

Contact and Registration

To express interest in attending, please send an email directly to the PRIMER-e office: primer@primer-e.com. You will be sent a **registration form** and a detailed **programme**. To register, please complete the **registration form** and return it directly to primer@primer-e.com to secure your place. Places are limited. The **Early Bird** registration deadline is **30ᵗʰ September 2018**. The **Final Deadline** for registration and payment is **16ᵗʰ November 2018**. Late registrants will only be accepted if space permits.

Software – discount prices for workshop participants

All prices in the table below are in United States Dollars (USD); New Zealand residents must add GST[*].

	New PRIMER 7 (**USD**)	Upgrade PRIMER 6 to PRIMER 7 (**USD**)	PERMANOVA+ add-on (**USD**)
Private sector	$800	$400	$400
Public sector	$600	$300	$300
Academic	$400	$200	$200
Full-time student	$200	$100	$100

About the Lecturer

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.

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[*]New Zealand residents will not be charged Goods and Services Tax (GST) on workshop registration, as this service will be delivered in Malaysia, but GST will be charged to New Zealand residents for any software purchases, as software will be repatriated with the workshop participant on re-entry into New Zealand.