

Presenters: Dr Adam N. H. Smith *and* Distinguished Professor Marti J. Anderson
Dates: 7 - 11 December 2020 (08:30 to 17:30 NZ Daylight Time, UTC + 13 hrs)

This **PRIMER 7 ONLINE WORKSHOP** will take place over 5 days (Monday – Friday, 08:30 to 17:30 New Zealand Daylight Time each day), with **4 scheduled online sessions per day** (2 in the morning and 2 in the afternoon) for Monday-Thursday, and a series of “own-data” consultation sessions on Friday. Within each scheduled session, there will (generally) be:

- a **live lecture** (typically ~45-60 minutes), including ample opportunity for participants to ask questions;
- a **computer lab** session (to be done by participants on their own, using 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 week. 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 or dual boot.

The last day of the workshop (Friday) will be devoted to participants analysing their **own data**. Each individual participant (or a small group of participants, if desired) will be scheduled into a separate one-on-one online consultation with the presenter(s) on the Friday (including data/document sharing, if desired) to discuss their own data or projects, obtain advice and assistance with data analysis, and/or to ask additional questions.

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.
- Methods are presented from a conceptual point of view for applied researchers, with an emphasis on interpretation of salient results in the context of particular ecological (and other) research studies of interest. Non-parametric (rank-based) approaches and permutation tests also make the methods intuitively simple to understand. **No prior background in statistics is assumed.**

Venue

This workshop will be offered **online**, so participants may attend from **anywhere they wish**.

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

Registration fees

**New Zealand residents must add 15% GST*

PRIMER 7 Online Workshop Fees*	Full Registration:	Student Registration:
Rest of the world	USD \$ 880	USD \$ 580
<i>*Participants based in countries using New Zealand Dollars as official currency</i>	NZD \$ 980	NZD \$ 720

- If you have registered for the [World Conference on Marine Biodiversity \(WCMB\)](#) you are eligible for a discount of **10% off** the workshop registration fee.
- If you are a **Massey University student or staff member** you are entitled to a discount of **25% off** the workshop registration fee (not to be used in conjunction with any other discount).
- **Note:** An **online PERMANOVA+ workshop** will be held **15th-19th February 2021**. Participants who register for this PRIMER 7 workshop will be eligible for a discount of **10% off** the registration fee for the online PERMANOVA+ workshop. If you wish to register to attend both workshops and pay for them on a single invoice, contact the PRIMER-e office directly at: primer@primer-e.com.

** Participants based in countries which utilise the NZ dollar as their currency are eligible for the NZD prices; specifically, New Zealand, the Cook Islands, Tokelau, Niue and the British overseas territory of Pitcairn Island.*

The registration fee **includes** all workshop materials and (if needed) a temporary (fully functional but time-limited) software licence key for PRIMER 7 with PERMANOVA+. All prices are in USD except for New Zealand-based participants, who will be invoiced in NZD and will be charged Goods and Services Tax (GST) at 15%.

Software – discount prices for workshop participants

Participants wishing to purchase PRIMER software at the discounted prices shown below should indicate this on their registration form. Software prices are in USD for all participants, except for participants based in countries which utilise the NZ dollar as their currency, who are eligible for the NZD prices shown below **in square brackets and in blue font**. If you are based in New Zealand you will also be charged an additional 15% for GST.

<i>*NZD Prices excl. GST</i>	New PRIMER 7 (USD) [NZD]	Upgrade PRIMER 6 to PRIMER 7 (USD) [NZD]	PERMANOVA+ add-on (USD) [NZD]
Private sector	\$ 800 [\$ 1,080]	\$ 400 [\$ 540]	\$ 400 [\$ 540]
Public sector	\$ 600 [\$ 810]	\$ 300 [\$ 405]	\$ 300 [\$ 405]
Academic	\$ 400 [\$ 540]	\$ 200 [\$ 270]	\$ 200 [\$ 270]
Full-time student	\$ 200 [\$ 270]	\$ 100 [\$ 135]	\$ 100 [\$ 135]

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 **2 December 2020**. Late registrants will only be accepted if space permits.

About the Lecturers

Dr Adam N. H. Smith (Massey University, Albany, Auckland, New Zealand) is a highly sought-after ecological statistician who specialises in the application of modern statistical methods to ecology and management, including fisheries and marine reserve assessment. Adam obtained his PhD from Massey University and has a wealth of multi-disciplinary experience across multiple sectors. He lectures across a wide range of areas, including both univariate and multivariate statistics, data mining, quantitative ecology and biostatistics. He has been a key consultant to industry and government, having worked as an in-house statistician for the Department of Conservation (DoC) and the National Institute for Water and Atmospheric Sciences (NIWA) in New Zealand. Adam is an enthusiastic and engaging lecturer with a passion for natural environments and for teaching and learning.

Distinguished Professor Marti J. Anderson (Massey University and PRIMER-e, *FRSNZ*, Auckland, New Zealand) is an ecological statistician whose work spans several disciplines, from ecology to mathematical statistics. A Fellow of the Royal Society of New Zealand, she holds a Chair in Statistics in the NZ Institute for Advanced Study at Massey University and her core research is in community ecology, biodiversity, multivariate analysis, experimental design and resampling methods, with a special focus on developing novel statistical methods for ecology. Marti developed all the methods in PERMANOVA+ and loves engaging in the dynamic interactions with students, academics and professionals that have become a trademark of the PRIMER and PERMANOVA+ international workshops.