



**PERMANOVA+ Online WORKSHOP**  
15<sup>th</sup>-19<sup>th</sup> February 2021  
New Zealand Daylight Time (UTC + 13 hrs)

**Presenters:** Distinguished Professor Marti J. Anderson *and* Dr Adam N. H. Smith  
**Dates:** 15<sup>th</sup> – 19<sup>th</sup> February 2021 (08:30 to 17:30 NZ Daylight Time, UTC + 13 hrs)

This **PERMANOVA+ for PRIMER 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 software<sup>1</sup> 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

- The workshop will focus on **PERMANOVA+**, an add-on package to PRIMER 7. PERMANOVA+ allows analysis of multivariate data in response to complex designs, partitioning variation in multivariate data on the basis of a resemblance measure of choice and with rigorous inferences *via* permutation methods. The tools in PERMANOVA+ provide formal models, tests and predictions for multivariate (or univariate) ecological (and other) systems that are over-parameterised (i.e., have too many variables) or that demonstrate substantial non-normality.
- Participants will explore: analysis and estimation of components of variation in complex experimental designs, including interactions, covariates, contrasts, fixed or random effects, crossed or nested models, unbalanced designs, environmental impact designs, randomised blocks or repeated measures (**PERMANOVA**); tests for homogeneity of multivariate dispersions and analyses of beta diversity (**PERMDISP**); multivariate regression and model selection procedures (**DISTLM**); unconstrained (**PCO**) or constrained ordinations using distance-based redundancy analysis (**dbRDA**) or canonical analysis of principal coordinates (**CAP**), leave-one-out allocation success for discriminant analysis or canonical correlation analyses based on resemblance matrices and the placement of new points into existing predictive canonical models.
- This workshop does not assume any formal background in statistics, and 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. However, some practical familiarity with the core methods in PRIMER 6 or 7 (e.g., by attending a previous PRIMER 7 workshop) *and/or* some prior knowledge of basic multivariate methods and experimental design is highly desirable.

#### Venue

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

---

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

## Registration fees

*\*New Zealand residents must add 15% GST*

	PERMANOVA+ Online Workshop Fees*	
	Full Registration:	Student Registration:
Rest of the world	USD \$ 880	USD \$ 580
New Zealand-based participants	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 have registered for either a **PRIMER 7** or an **Advanced PRIMER 7** workshop within the past 12 months, 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).

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 those based inside of New Zealand. If you are based in New Zealand, you may purchase software at the NZD prices shown below **in square brackets and in blue font** and you will also be charged an additional 15% for GST.

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

## Contact and Registration

**To register**, please fill out the **registration form** available for download from the PRIMER-e website ([www.primer-e.com/workshops](http://www.primer-e.com/workshops)) and return it directly to [primer@primer-e.com](mailto:primer@primer-e.com) to secure your place. Places are limited. The **Final Deadline** for registration and payment is **10 February 2021**. Late registrants will only be accepted if space permits.

## About the Lecturers

**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.

**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.