

Towards a definitive palaeoclimate record for deglacial New Zealand.

Results from the 2004 NZ-INTIMATE Workshop, 23-24 August, 2004

By Lionel Carter, on behalf of the 2004 INTIMATE workshop

A group of scientists, with a keen interest in palaeoclimatology, gathered at the GNS Rafter Laboratory to further the development of an event stratigraphy for New Zealand. The venue was symbolic. One of the classical studies of the marine environment, K. O. Emery's 1960 book, *The Sea off Southern California*, relied on radiocarbon dates provided by Athol Rafter, to help define past environmental changes on the continental shelf. Thus, even in that pioneering era, the Rafter Laboratory played a key role in palaeoenvironmental analysis.

The workshop had two goals;

1. to identify and rank key palaeoclimate records from terrestrial and marine settings, for the period 30 to ~ 10 ka, and
2. to develop detailed correlations between these key records, using improved dating techniques and procedures.

The meeting was held in air of marked collegiality, where open discussion and adherence to the workshop goals ensured success. It began with a series of presentations, outlined in Alloway (2004), that discussed palynological, glacial (including ice-core), loess and tephra records preserved in a suite of terrestrial settings ranging from Antarctic moraines to maars and lakes to limestone caves. The composite speleothem record was especially noteworthy because of the well controlled chronology and detail of the stable isotope curve, which appears to outline responses to major, climate-forcing events. A similarly robust marine record had a comparable, but not necessarily identical, event stratigraphy, which was an encouraging sign that the workshop goals were indeed achievable.

The second part of the workshop concentrated on the means of improving time control. While New Zealand is fortunate in having many widespread late Quaternary tephtras, both on and offshore, the point was made that some tephra ages should be refined with more definitive radiocarbon data, especially from wood carbonized at the time of tephra emplacement. Radiocarbon itself provoked lively discussion, especially in relation to calibration and local reservoir ages. The consensus was for INTIMATE to use a single calibration programme, probably INTCAL04, which is scheduled for release before the end of this year.



Nicola Litchfield discusses new loess ages to an attentive NZ-INTIMATE workshop.

To finalize proceedings, the last session was devoted to the selection of key onshore and offshore records for publication as an INTIMATE poster. The poster will be designed to reflect the current state of palaeoclimate knowledge in New Zealand, and to act as a catalyst for further research. It will also be a “living document” that will evolve as better environmental proxies and chronologies come to the fore. Not only will it be a document of national importance, but it will have international significance by virtue of New Zealand’s strategic position in the world ocean – the landmass and surrounding submarine micro-continent form the Pacific Gateway for the *Ocean Conveyor*, constricts the Antarctic Circumpolar Current, and intercepts water masses of subtropical to subpolar affinities as well as the *Roaring Forties* and associated weather systems. An exciting and fruitful future for NZ-INTIMATE and the palaeoclimate community is ensured.

Reference.

Alloway, B.V., 2004. 2004 NZ-INTIMATE Meeting, GNS Rafter laboratory, Wellington: 23-24 August 2004. Geological and Nuclear Sciences Science report 2004/22, 43pp.