



NEW ZEALAND  
ARCHAEOLOGICAL  
ASSOCIATION

## ARCHAEOLOGY IN NEW ZEALAND



This document is made available by The New Zealand Archaeological Association under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

To view a copy of this license, visit  
<http://creativecommons.org/licenses/by-nc-sa/4.0/>.

NEW ZEALAND  
ARCHAEOLOGICAL ASSOCIATION  
ARCHAEOLOGY IN NEW ZEALAND

---



This document is made available by The New Zealand  
Archaeological Association under the Creative Commons  
Attribution-NonCommercial-ShareAlike 3.0 Unported License.

To view a copy of this license, visit  
<http://creativecommons.org/licenses/by-nc-sa/3.0/>.



# NEW ZEALAND RADIOCARBON DATABASE FOR ARCHAEOLOGY

Bruce McFadgen<sup>1</sup>, Tom Higham<sup>2</sup>, Rodger Sparks<sup>3</sup>

<sup>1</sup>Department of Conservation, Wellington

<sup>2</sup>Waikato University Radiocarbon Dating Laboratory, Hamilton

<sup>3</sup>Rafter Radiocarbon Laboratory, Lower Hutt

The first radiocarbon determinations from New Zealand archaeological sites were obtained about 50 years ago. Since that time, many hundreds of samples have been dated, and for the archaeologist interested in synthesising these various data into coherent regional and national chronologies, the problem of compiling results is a difficult one to overcome. Adequately assessing important radiocarbon-related variables such as the material dated, the context of the sample, the age, standard error, correction factors and a host of other variables, depends upon a time consuming effort to compile and decipher past sample record forms at IGNS and Waikato Laboratories. Changes in radiocarbon calculation practices, including the use of different standards and recommendations for reservoir correction, estimation of sample fractionation, the use of different fractions for dating—often without clear reference or description, amongst other factors, mean it is extremely time consuming and difficult to compile radiocarbon determinations and make sense of what they mean archaeologically.

To enable more effective access to radiocarbon information, a database of radiocarbon determinations from New Zealand archaeological contexts, and associated palaeoenvironmental contexts has been compiled by the Department of Conservation under the direction of Bruce McFadgen (see acknowledgements). The database is Internet based and fully searchable, and can be accessed at:

<http://www.waikato.ac.nz/waikato/nzcd/>

## **Purpose**

*The purpose of the database is to provide a list of dates primarily for:*

- reference – to check details of dates when the laboratory number is known;
- finding out what if any dates relate to a specific site, or area of land;
- extracting all dates determined on a particular material;
- finding all dates that fall within a defined time period;
- listing the most up-to-date calculations of dates in accordance with modern standards.

*Included in the database are:*

- dates which relate to archaeological sites;
- dates less than about 1000 years old which relate to forest burning whether from culturally lit or natural fires;
- dates on naturally-occurring moa bones;
- dates for pollen cores;
- date sequences of interest to archaeologists even though most of the dates may not be archaeological, e.g. Poukawa.

The dates from archaeological sites form the bulk of the database. The other dates have been included only where they have been encountered while searching for archaeological dates. It should be noted that dates other than those that relate to archaeological sites are not complete and full details may not be present. None of the dates relating to the controversy over the date of arrival of kiore in New Zealand have been included at this stage but it is intended that they eventually will be.

## **Fields in the Database Are Defined As Follows**

### *Site name*

The name by which the sample site is commonly known. This may be the name of the site in the literature or used by the submitter. Some names are therefore of the nearest geographical feature such as a stream, lake, beach, bay or harbour. In the few places where there is no site name or the name was vague, an approximate location has been given in the feature description.

### *Site type*

Sites sampled for geological purposes usually have a fossil record number prefixed by "f" e.g. f102. In such cases, where the sample is of interest to archaeology because for example it may provide a maximum age for some archaeological event, it is included in the database and the site type is entered

as geological. Geological samples include dates for the lava flow on Rangitoto Island, for volcanic ash showers on Mt Taranaki, and for off-site geological stratigraphy on Chatham Island. Some geological samples are shell middens but as far as can be ascertained the sites have not yet been entered into the NZAA site-recording scheme. Site types for these samples are listed as geological.

The site type entered as pollen cores are dates for pollen cores, including those for pre-human sections of a core where the dates are part of a sequence extending into the period since human settlement.

#### *Map sheets, grid references, and site numbers*

For non-archaeological samples, details on submission forms were entered where they existed. If no grid reference was provided, an estimate was made from the description of location. Fossil numbers and map details for geological samples have not yet been confirmed by the New Zealand Geological Society.

#### *Feature name*

For archaeological dates, the feature is the archaeological context of the sample dated. It is intended to be read with field notes or an excavation report or publication and is a guide to the actual location of the sample. The entry is often a compilation based on a report and on the submission form.

For many archaeological samples, dates are inadequately reported in the literature: they may have no laboratory number; the date reported may be incorrect; or associated information may be sparse. This field should assist in the correct identification of a reported date with its sampled context.

For geological samples the feature name is the stratigraphic reference.

For pollen cores, the feature name is the core reference if known and sample depth.

#### *Laboratory details*

$\delta^{13}\text{C}$  is entered where it is known. Not all laboratories reported  $\delta^{13}\text{C}$ . Where a value for  $\delta^{13}\text{C}$  is known to have been assumed, the assumed value is entered.

The lack of generally agreed on standards and procedures in the early days of radiocarbon dating has led to some uncertainty about the interpretation of dates measured at the old DSIR Institute of Nuclear Sciences radiocarbon laboratory (now the Rafter Radiocarbon Laboratory). To resolve such questions and ensure that all radiocarbon ages are reported in a consistent manner, measurements

made at the Rafter Radiocarbon Laboratory prior to 1988 have been recalculated in accordance with the recommendations of Stuiver and Polach (1977, *Radiocarbon* 19(3):355-363) and stored on a database held at the Rafter Laboratory. From 1988, all results since NZ7543 have been reported in strict accordance with the Stuiver and Polach conventions. All accelerator mass spectrometry ages, identified by NZA numbers, follow the Stuiver and Polach (1977) conventions.

### *Sample details*

The sample identifier allocated by the collector or submitter is listed where it is known. The environment occupied by the sample while it was living is indicated as "T" for terrestrial, or as "M" for marine. The species listed that comprise the dated samples have been entered where they are known. In the case of shells, the most recent specific and generic names have been used. In the case of moa bones, charcoal and wood, the original names and spelling as used at the time of sample submission have been used.

### **Conclusion**

The New Zealand Radiocarbon Database for Archaeology will be updated every 6 months with radiocarbon measurements from both major laboratories (with the permission of submitters of the radiocarbon dates). Comments, additions and corrections to the database are invited from the general archaeological community.

### **Acknowledgements**

For data entry, Ruth Harper, Hugh Stockbridge, and Belinda McFadgen all of who worked in a volunteer capacity. Vanessa Tanner carried out the bulk of the data entry and checking. The database was compiled under DoC Project Investigation 900. The many requests for information about date details were promptly answered by Ms Dawn Chambers, Rafter Radiocarbon Laboratory and Dr Steve Robertson, Radiocarbon Laboratory Australian National University. Colleagues in the New Zealand archaeological fraternity equally as promptly answered the many requests for details about submitted samples. For consulting his files of archaeological site record forms and answering numerous requests for site information and grid references, we thank Tony Walton.

### **Reference**

Stuiver, M. and Polach, H.A. 1977. Discussion: Reporting of  $^{14}\text{C}$  data. *Radiocarbon* 19: 355-63.