Salt-marsh foraminiferal record of ten large Holocene (last 7500 yrs) earthquakes on a subducting plate margin, Hawkes Bay, New Zealand

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Supplementary File 6. Table of ages determined by radiocarbon and tephra dating of samples from Holocene cores from Ahuriri Inlet, Hawkes Bay, New Zealand.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Core and depth | Material dated | 13C  (‰) | Age (conventional radiocarbon years BP) | Calibrated calendar  years BP (confidence) |
| **Poraiti**  **Excavation** | Hull (1986) |  |  |  |
| 30 cm | articulated *A. stutchburyi* | 0.3 | NZA5612: 774±45 | 510-320 (95.4%) |
| 60 cm | articulated *A. stutchburyi* | 0.2 | NZA5613: 859±82 | 642-335 (95.4%) |
| 80 cm | tree in growth position | -27.2 | NZA5611: 1791±60 | 1822-1537 (96.8%) |
| 80 cm | peat and twigs | -27.0 | NZA5610: 1735±60 | 1733-1430 (95.2%) |
| 150 cm | Taupo Tephra |  |  | 1728-1708 (95.4%) |
| **A2** | Hayward et al. (2006; unpubl.) |  |  |  |
| 405-415 cm | small *A. stutchburyi* | - | Wk39376: 3829±25 | 3916-3707 (95.4%) |
| 486 cm | single *Austrovenus stutchburyi* | -1.8 | Wk16242 : 4187±100 | 4585-4002 (95.4%) |
| **A4-A5-A7** | Hayward et al. (2006) |  |  |  |
| 90-100 cmcd | articulated *A. stutchburyi* ‘s | -1.5 | Wk35524 : 895±36 | 615-475 (95.4%) |
| 473 cmcd | articulated *A. stutchburyi* | -1.4 | Wk15806 : 4716±36 | 5185-4849 (95.4%) |
| 654 cmcd | wood | -26.0 | Wk15807 : 5125±36 | 5918-5732 (95.4%) |
| 742 cm | unidentified tephra |  |  | >50,000 |
| **A6** | Hayward et al. (2006) |  |  |  |
| 175 cm | Taupo Tephra |  |  | 1728-1708 (95.4%) |
| 244 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| **A11** | Hayward et al. (2006; unpubl.) |  |  |  |
| 543 cm | small bivalve shells & foraminifera *Ammonia* tests | - | Wk38820: 6546±44 | 7220-6968 (95.4%) |
| 590 cm | wood | -24.7 | Wk15808: 6356±39 | 7412-7160 (93.4%) |
| **A13** | Hayward et al. (2006) |  |  |  |
| 470 cm | unidentified tephra |  |  | >50,000 |
| **A14** | Hayward et al. (2006) |  |  |  |
| 125 cm | articulated *A. stutchburyi* | 0.0 | Wk15809: 2100±88 | 1930-1511 (95.4%) |
| **A15** | Hayward et al. (2006) |  |  |  |
| 125 cm | reworked Waimihia Tephra |  |  | 3580-3450 (94.3%) |
| 212 cm | wood | -27.9 | Wk15810: 2895±33 | 3076-2857 (95.3%) |
| 358 cm | wood | -28.0 | Wk15811: 4151±113 | 4872-4289 (95.4%) |
| 400 cm | Whakatane Tephra |  |  | 5671-5379 (54.9%) |
| **A16** | Hayward et al. (2006; unpubl.) |  |  |  |
| 205 cm | unabraded *A. stutchburyi* &  *Arthritica bifurca* | - | Wk38821: 2129±25 | 1850-1665 (95.4%) |
| 215 cm | peat | - | Wk38822: 2731±25 | 2852-2751 (95.4%) |
| 269 cm | ?Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| 380 cm | peat | -28.4 | Wk15812: 4497±67 | 5296-4877 (86.4%) |
| **A17** |  |  |  |  |
| 145-150 cm | broken cockle shells | - | Wk39377: 2090±25 | 1802-1607 (95.4%) |
| 157-165 cm | peat | -27.8 | WK36218: 2880±25 | 3059-2860 (95.4%) |
| **A19** |  |  |  |  |
| 180-185 cm | *Amphibola* & cockle shells | - | Wk39378: 2167±25 | 1875-1705 (95.4%) |
| **PH3** |  |  |  |  |
| 113-120 cm | peat | - | Wk38819: 1419±20 | 1310-1272 (95.4%) |
| 197 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| **PH5** |  |  |  |  |
| 45-50 cm | articulated *A. stutchburyi* | -0.7 | Wk35522: 761±25 | 494-335 (95.4%) |
| 70-80 cm | peat | -28.9 | Wk35523: 1368±34 | 1300-1183 (95.4%) |
| **PL1** |  |  |  |  |
| 120-125 cm | peat | -26.7 | Wk34161: 1159±26 | 1063-961 (95.4%) |
| 275 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| **PL4** |  |  |  |  |
| 108 cm | articulated *A. stutchburyi* | 0.1 | Wk35520: 1346±25 | 1001-830 (95.4%) |
| 119-123 cm | organic C-rich sediment | -25.9 | Wk36216: 1284±25 | 1266-1072 (95.4%) |
| 173-180 cm | broken cockle shell fragments | -0.5 | Wk36217: 1718±25 | 1363-1242 (95.4%) |
| 198-206 cm | peat | -27.2 | Wk35521: 1747±26 | 1702-1544 (95.4%) |
| **PR3** |  |  |  |  |
| 150-155 cm | peat | -29.3 | Wk34160: 1217±26 | 1179-983 (95.4%) |
| 210-215 cm | tiny bivalve fragments | - | Wk39379: 1482±25 | 1158-974 (95.4%) |
| **PR3B** |  |  |  |  |
| 120-130 cm | articulated *A. stutchburyi* | -1.0 | Wk35525: 1247±25 | 901-742 (95.4%) |
| 225-230 cm | peat | -28.7 | Wk35526: 1613±25 | 1533-1403 (93.7%) |
| **PR5** |  |  |  |  |
| 290-300 cm | unabraded ­*A. stutchburyi* &  *Arthritica bifurca* | - | Wk38818:2130±25 | 1851-1668 (95.4%) |
| 337-342 cm | peat | -28.1 | Wk35527: 2096±25 | 2094-1930 (95.4%) |
| 400-410 cm | organic C-rich sediment | -27.3 | Wk36219: 3568±25 | 3891-3701 (95.4%) |
| **PR6** |  |  |  |  |
| 96-102 cm | organic C-rich sediment | -26.6 | Wk36220: 977±25 | 921-788 (95.4%) |
| 177-190 cm | organic C-rich sediment | -26.8 | Wk36221: 1187±25 | 1093-962 (94.4%) |
| **PR7** |  |  |  |  |
| 447-449 cm | mixed tephra |  |  | <5500 |
| **PR8** |  |  |  |  |
| 290-295 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| 435-445 cm | reworked Kawakawa Tephra |  |  | ~25,000 |
| **Oh3** |  |  |  |  |
| 275-280 cm | foraminifera *Ammonia* tests | - | Wk38816: 3430±60 | 3485-3167 (95.4%) |
| 291-295 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |
| **Oh11** |  |  |  |  |
| 150-155 cm | peat | -28.5 | Wk35528: 254±25 | 309-151 (95.4%) |
| **Oh14** |  |  |  |  |
| 167-177 cm | well-preserved single cockles | - | Wk39380: 839±25 | 534-444 (95.4%) |
| 195-200 cm | small double cockles | -0.9 | Wk36222: 978±25 | 645-530 (95.4%) |
| 255-259 cm | broken cockle shell fragments | 0.5 | Wk36223: 1184±25 | 841-675 (95.4%) |
| 264-267 cm | peat | -28.5 | Wk35529: 1324±25 | 1279-1175 (90.8%) |
| 331 cm | woody twig | - | Wk39381: 2453±25 | 2696-2348 (95.4%) |
| 341-346 cm | peat | -29.5 | Wk35530: 2914±25 | 3076-2878 (93.0%) |
| **Oh18** |  |  |  |  |
| 170-175 cm | peat | -29.2 | Wk35531: 288±25 | 440-277 (87.1%) |
| **Oh23** |  |  |  |  |
| 250-255 cm | peat | - | Wk40146: 2209±20 | 2310-2090 (95.4%) |
| 310-320 cm | peat | - | Wk40417: 1180±20 | 1070-970 (95.4%) |
| **Oh24** |  |  |  |  |
| 180-190 cm | broken cockle shells | - | Wk39383: 1363±25 | 1032-881 (95.4%) |
| 190-200 cm | mixed tephra |  |  | <3400 |
| 200-210 cm | peat | - | Wk38817: 842±21 | 741-675 (95.4%) |
| 380-390 cm | Waimihia Tephra |  |  | 3509-3293 (94.3%) |

Tephra identified using mineral content and glass chemistry and quoted calibrated ages follow Lowe et al. (2013); radiometric carbon dates by University of Waikato, Radiometric Dating Laboratory (Wk catalogue numbers). 14C ages have been converted into calibrated calendar ages using the program OxCal v4.2.4 (Bronk Ramsey, 2013) using the ShCal 13 atmospheric curve for wood, peat and organic-rich mud samples (Hogg et al., 2013) and for marine shell samples the Marine13 curve (Reimer et al., 2013) with a Delta-R of -30 ± 13. Uncertainties are quoted at 2-sigma unless stated otherwise. Four radiometric ages by Institute of Geological and Nuclear Sciences (NZ catalogue numbers) from Hull (1986) are given together with their newly calibrated calendar ages. cmcd = centimetres composite depth.

Refrences

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