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D.J.Huntley

# AGE LIST
# Optical Dating and Thermoluminescence Dating
# Simon Fraser University

Some notes about the samples, methods and ages are given below. Full details are usually given in the referenced publications.

Age codes are:

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| **SFU-0-** | optical age |
| **SFU-TL-** | conventional thermoluminescence (TL) age |
| **SFU-TL-A** | TL authenticity age |
| **SFU-TL-S** | TL sediment age |

Two problems presented themselves when making this age list. The first was whether or not to include "modern" (zero-age) samples since for these the actual radiation dose rate is usually not of relevance, hence no useful age can be calculated. The second problem was whether or not to include ages that were clearly "wrong"; there may in fact be nothing wrong with the age, just that it represents the time elapsed since the last sunlight exposure, and that may not have occurred at the time of the last sedimentation. No attempt has been made to deal with these problems consistently; a number may have been assigned even if no actual age is presented or published. In some cases a set of numbers is assigned without specific allocation to a set of published results.

If no country is stated the sample is from Canada.

For the optical ages, 2.41 eV excitation refers to the 514.5 nm (green) emission of an Argon laser, ~2.4 eV excitation refers to radiation from green light-emitting diodes. 1.4 eV excitation refers to 840 nm (approx) emission from light-emitting diodes.

“K-feldspar” means grains separated using a technique designed to concentrate K-feldspars; there are usually some plagioclase feldspar and quartz grains present.

Ages obtained from K-feldspars can be expected to be too low because of anomalous fading. The amount depends on the rate of anomalous fading, the age, and the time elapsed between irradiation and luminescence measurement; it can vary from a few percent to a factor of two or more. Starting about the year 2000, some optical ages have been corrected for anomalous fading, and where this has been done it is so indicated in the notes. The method of correction is described in Huntley and Lamothe (2001), and details of the corrections for those ages that have been corrected are provided in an Appendix.

Differences between an age listed here and a published age, or between two published ages, can occur when new information about the radiation dosimetry or the rate of anomalous fading has been obtained.

# OPTICAL AGES

**SFU-O-1** **KRGP-2** **62 ± 8 ka** Huntley *et al.*, 1985

2.41 eV excitation, 2-8 μm grains.
This is a layered pond or overbank silt deposit 25 cm below a wood layer for which there is a $^{14}C$ age of 58.8 ± 0.3 ka (QL-195). Collected in 1981 by W. M. R. Divigalpitiya with J. E. Armstrong, S. R. Hicock, G. W. Berger and D. J. Huntley from the Knight Rd. (84th Ave.) gravel pit, Surrey, B. C. (49° 9.3' N, 122° 55.6' W). See Divigalpitiya (1982) for a photograph. A TL age of 64 ± 12 ka was obtained for this sample (Divigalpitiya, 1982; Huntley *et al.*, 1983).

**SFU-O-2** **SPLS** **> 46 ± 14 ka** Godfrey-Smith *et al.*, 1988

Various excitations 1.6 - 3.0 eV; 90-125 μm feldspar grains. These results are notable because the equivalent dose was shown to be independent of the excitation photon energy over a wide range. The lower limit on the age is given as thermal fading was not adequately dealt with. The sample is from the St. Pierre lower sand from a section near Pierreville, P.Q. (46° 03' N, 72° 47' W) (Lamothe, 1984, 1985). It was collected 30-40 cm below a peat bed for which there is a $^{14}C$ age of 74.7 +2.7/-2.0 ka (QL-198). TL ages from several sedimentary units in this section are presented in Lamothe (1985) and Lamothe and Huntley (1988).

**SFU-O-3** **WSBS** **0 ka** Godfrey-Smith *et al.*, 1988.

Various excitations 1.6 - 2.6 eV, 150-180 μm quartz grains. The mean equivalent dose was 0.0 ± 0.7 Gy. This was a zero-age sample, intertidal sand from Whaling Station Bay, Hornby Is., B. C. (49° 32' N, 124° 37' W).

**SFU-O-4 to O-19** Godfrey-Smith, 1991

These numbers apply, unallocated, to a set of equivalent doses; these were compared to those calculated from known ages and dose rates. Some were in agreement but many were lower than expected.

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| **SFU-O-20** | **SESA-70, Robe I** | **0.8 ± 0.6 ka** | Huntley *et al.*, 1993b |
| **-21** | **SESA-80, Robe II** | **107 ± 36 ka** | |
| **-22** | **SESA-61, Woakwine I** | **114 ± 16 ka** | |
| **-23** | **SESA-71, Woakwine I** | **116 ± 16 ka** | |
| **-24** | **SESA-72, West Dairy** | **170 ± 20 ka** | |
| **-25** | **SESA-55, East Avenue** | **360 ± 33 ka** | |
| **-26** | **SESA-46, Baker** | **390 ± 40 ka** | |

1.4 eV excitation, sand-sized quartz grains. This was a test of the concept of optical dating using 1.4 eV excitation on inclusions (thought to be K-feldspars) within quartz grains. The samples are from the dune sequence in south-east South Australia, used as a test sequence for TL dating by Huntley *et al.* (1993a, 1994a). The ages are systematically a little low.

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| **SFU-O-27** | **SESA-61 Woakwine I** | **105 ± 10 ka** | Huntley *et al.*, 1996 |
| **-28** | **SESA-71 Woakwine I** | **132 ± 16 ka** | |

2.41 eV excitation, quartz grains. These two samples are from the Woakwine I dune in south-east South Australia, associated with the high sea-stand during the last interglacial at 122 ka. This was a test of the accuracy of optical dating using this method.

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| **SFU-O-29** | **BUCT-1-1** | **1090 ± 80 a** | Ollerhead, 1993 |
| **-30** | **BUCT-2-1** | **940 ± 70 a** | Ollerhead *et al.*, 1994 |
| **-31** | **BUCT-3-1** | **430 ± 40 a** | Ollerhead and Davidson-Arnott, 1995 |
| **-32** | **BUCT-4-1** | **220 ± 30 a** | |
| **-33** | **BUCT-5-1** | **5 ± 40 a** | |
| **-34** | **BUCT-8-1** | **240 ± 20 a** | |
| **-35** | **BUCT-9-1** | **280 ± 30 a** | |
| **-36** | **BUCT-9-2** | **250 ± 40 a** | |
| **-37** | **BUCT-10-1** | **300 ± 30 a** | |

1.4 eV excitation, 250-300 μm K-feldspar grains. These ages have been corrected for anomalous fading and are thus older than the published ages. This is a set of dune samples from Buctouche Spit, New Brunswick. There is support for the ages from a TL age for sample 1-1 of 1100 ± 200 a (SFU-TL-S145), and from historical evidence coupled with an assumed constant sediment aggradation rate.

**SFU-O-38** **EIDS** unpublished

1.4 eV excitation, 180-250 µm K-feldspar grains, delta sand from east-central Ellesmere Is. (78˚ 42.6'N, 74˚ 43.0'W) (Blake, 1992). Sampled by W. Blake Jr., G.S.C., Ottawa, for comparison with a $^{14}C$ age (shell) of 8470 ± 100 years (GSC-3314). The results show that this material had not been exposed to sunlight since the last interglacial or earlier.

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| **SFU-O-39** | **BBP4** | **0** | Lian *et al.*, 1995; Hu, 1994 |
| **-40** | **HCP1** | **16.4 ± 1.5 ka** | |
| **-41** | **LCP5** | **31.2 ± 2.6 ka** | |
| **-42** | **MPS1** | **119 ± 9 ka** | |
| **-43** | **MPS2** | **112 ± 11 ka** | |
| **-44** | **WFP1** | **107 ± 8 ka** | |
| **-45** | **SSP2** | **660 ± 120 ka** | |

1.4 eV excitation, 4-11 µm grains. This set of samples was used to test the accuracy of optical dating on minerals extracted from peat and organic-rich sediments. BBP4 is from Burns Bog, Delta, B.C., HCP1 is from a peat bed, Hollyburn Creek, North Vancouver, B.C., LCP5 is from peat, Lynn Canyon, North Vancouver, B.C., MPS1 & 2 are from organic-rich sediment, Muir Point, southern Vancouver Island, B.C., WFP1 is from a peat bed, Whidbey Island, Washington State, U.S.A., and SSP2 is from a peat bed, Salmon Springs, Sumner, Washington State, U.S.A.

**SFU-O-46** **SESA-74** **680 ± 130 ka** Huntley *et al.*, 1994b

Method as for O-20 to O-26. The sample is from the West Naracoorte Range.

**SFU-O-47** **DY23** **> 290 ± 30 ka** Hu, 1994

1.4 eV excitation, 200 µm K-feldspar grains. The sample is from stratum 3 (red sand) of the Diring Yuriakh archaeological site, by the Lena R., 140 km upstream from Yakutsk, Siberia (Mochanov, 1988).

**SFU-O-48** **DY8** **>74 ka** Richards, 1994

1.4 eV excitation, quartz extracted from a pebble from the artifact layer (stratum 5), where overlain by stratum 6, of the Diring Yuriakh archaeological site, by the Lena R., 140 km upstream from Yakutsk, Siberia (Mochanov, 1988). The author’s cautions about this age should be noted.

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| **SFU-O-49** | **CBTS2** | **1285 ± 95 a** | Huntley and Clague, 1996 |
| **-50** | **TTS** | **260 ± 20 a** | |
| **-51** | **TTS3** | **325 ± 25 a** | |
| **-52** | **PATS1** | **355 ± 45** | |

1.4 eV excitation on 90-125 or 180-250 µm K-feldspar grains. The samples are tsunami-laid sands from Cultus Bay, Washington State, U.S.A. and the west coast of Vancouver Island, B.C.

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| **SFU-O-53** | **FHTS-1** | **920 ± 170 a** | Baril, 1997 |
| **-54** | **FHTS-2** | **5300 ± 700 a** | |
| **-55** | **FHTS-3** | **650 ± 170 a** | |
| **-56** | **KHTS-1** | **270 ± 50 a** | |
| **-57** | **KHTS-2** | **120 ± 40 a** | |
| **-58** | **NITS** | **2100 ± 500 a** | |
| **-59** | **NRTS** | **540 ± 90 a** | |
| **-60** | **ZCTS** | **11,700 ± 700 a** | |

1.4 eV excitation, sand-sized K-feldspar grains. Most of the samples are tsunami-laid sands from the west coast of Vancouver Island, B.C. FH=Fair harbour, KH=Koprino Harbour, NI=Neurotsos Inlet, Z=Zeballos. NRTS is from Niawiakum River estuary, Washington State, U.S.A. FHTS-1, KHTS-1, NITS and NRTS are associated with the AD1700 tsunami. FHTS-3 and KHTS-2 are associated with the AD1964 tsunami. FHTS-2 and ZCTS are probably flood deposits. Equivalent doses for putative source materials were also obtained.

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| **SFU-O-61** | **CCL1** | **7.4 ± 0.5 ka** | Lian and Huntley, 1999 |
| **-62** | **CCL2** | **11 ± 1 ka** | Lian, 1997 |
| **-63** | **CCL3** | **2.5 ± 0.2 ka** | |
| **-64** | **CCL4** | **2.6 ± 0.2 ka** | |

1.4 eV excitation, 4-11 µm grains. This set of samples was used to test the accuracy of optical dating on minerals extracted from postglacial aeolian sediments. CCL1 & 2 are from above and below Mazama tephra; CCL3 & 4 are from above and below Bridge River tephra. The section is near Chisholm Canyon, Fraser canyon, near Big Bar, B.C.

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| **SFU-O-65** | **BLRL1** | **45 ± 4 ka** | Lian and Huntley, 1999 |
| **-66** | **BLRL2** | **94 ± 17 ka** | Lian, 1997 |
| **-67** | **BLRL3** | **28 ± 4 ka** | |
| **-68** | **BLRL4** | **82 ± 15 ka** | |
| **-69** | **BLRL5** | **30 ± 2 ka** | |

1.4 eV (infrared diode) excitation, 4-11 μm grains. This set of samples showed that a Holocene aeolian deposit is not necessarily suitable for optical dating; in this case it is because the grains were encased in a carbonate cement and the transport distance was short. The samples were from road cuttings along Big Bar Lake Rd., north-west of Clinton, B.C.

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| **SFU-O-70** | **WBDS1** | **0.8 ± 0.3 ka** | Lian and Huntley, 1999 |
| **-71** | **WBDS2** | **1.1 ± 0.4 ka** | Lian, 1997 |

1.4 eV excitation, 4-11 μm grains. This set of samples was used to test whether or not optical dating on minerals extracted from an active dune gives an age of zero. The dune is near the confluence of Watson bar Creek and the Fraser River, B.C.

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| **SFU-O-72** | **GCSS1** | **124 ± 18 ka** | Lian *et al*. 1999, Lian 1997 |
| **SFU-O-73** | **GCSS2** | **128 ± 16 ka** | |

1.4 eV excitation, 4-11 μm grains. These two samples of outwash silt were from the Gillon Creek section, near Pavilion, B.C. The ages are considered to be upper limits for the age of the silt and the overlying sediments.

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| **SFU-O-74** | **BBCS1** | **183 ± 41 ka** | Lian and Hicock, 2001 |
| **SFU-O-75** | **BBCS4** | **86 ± 19 ka** | Lian, 1997 |
| **SFU-O-76** | **BBCS5-C** | **88 ± 18 ka** | |
| **SFU-O-77** | **BBCS5-S** | **120 ± 16 ka** | |
| **SFU-O-78** | **ChCS1** | **92 ± 17 ka** | |
| **SFU-O-79** | **CCS1** | **127 ± 24 ka** | |
| **SFU-O-80** | **WBCS1** | **69 ± 15 ka** | |
| **SFU-O-81** | **WBCS2** | **65 ± 10 ka** | |
| **SFU-O-82** | **WBCS3** | **73 ± 17 ka** | |
| **SFU-O-83** | **WL84-5** | **31 ± 3 ka** | |

1.4 eV excitation, 2-8 or 4-11 μm grains. All samples from glaciolacustrine valley fill, and all except the last are from the Fraser Canyon, near Big Bar, B.C. The ages are considered to be upper limits to the time since the sediments were deposited, and were obtained to constrain models of formation. The BBCS samples were from sections near Big Bar Creek. ChCS1 was from a unit near Chisholm Canyon. CCS1was from a unit exposed near the mouth of Cavanagh Creek, about 8 km SW of Kelly Lake. The WBCS series are from a unit at the confluence of Watson Bar Creek and the Fraser River. WL84-5 is the same sample for which a TL sediment age was obtained by Berger et al., 1986.

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| **SFU-O-84** | **BBCS3** | **252 ± 43 ka** | Lian, 1997 |
| **SFU-O-85** | **BBRS1** | **>688 ± 156 ka** | |
| **SFU-O-86** | **JRCS1** | **52 ± 19 ka** | |

1.4 eV excitation, 2-8 or 4-11 μm grains. BBCS3 is from high-energy glaciolacustrine sediment, ~1 km SE of the settlement of Big Bar Creek. BBRS1 is from the late Pliocene - mid Pleistocene sequence on the north side of Big Bar Creek valley. JRCS1 provides an upper limit for (glacio) lacustrine sediments in Jesmond Valley. These sites are all NW of Clinton, B.C.

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| **SFU-O-87** | **SN-27** | **4.99 ± 0.23 ka** | van Heteren et al. 2000 |
| **SFU-O-88** | **SN-25d** | **4.41 ± 0.18 ka** | Huntley and Lamothe, 2001 |
| **SFU-O-89** | **SN-25s** | **4.23 ± 0.19 ka** | |
| **SFU-O-90** | **SN-4d** | **3.90 ± 0.23 ka** | |
| **SFU-O-91** | **SN-4s** | **4.36 ± 0.19 ka** | |
| **SFU-O-92** | **SN-10** | **4.02 ± 0.18 ka** | |
| **SFU-O-93** | **SN-37** | **3.59 ± 0.17 ka** | |
| **SFU-O-94** | **SN-30** | **3.60 ± 0.17 ka** | |
| **SFU-O-95** | **SN-38** | **2.89 ± 0.13 ka** | |
| **SFU-O-96** | **SN-6** | **2.46 ± 0.11 ka** | |
| **SFU-O-97** | **SN-G2** | **2.39 ± 0.09 ka** | |
| **SFU-O-98** | **SN-H3** | **2.39 ± 0.09 ka** | |
| **SFU-O-99** | **SN-47** | **2.16 ± 0.10 ka** | |
| **SFU-O-100** | **SN-45** | **1.93 ± 0.09 ka** | |

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| **SFU-O-101** | **SN-55** | **1.37 ± 0.06 ka** | |
| **SFU-O-102** | **SN-O2** | **0.048 ± 0.007 ka** | |
| **SFU-O-103** | **SN-BP** | **0.12 ± 0.02 ka** | |
| **SFU-O-104** | **SN-11** | **0.324 ± 0.017 ka** | |
| **SFU-O-105** | **SN-12** | **0.276 ± 0.016 ka** | |
| **SFU-O-106** | **SN-17** | **0.987 ± 0.048 ka** | |
| **SFU-O-107** | **SN-18** | **0.211 ± 0.015 ka** | |
| **SFU-O-108** | **SN-44** | **0.187 ± 0.014 ka** | |
| **SFU-O-109** | **SN-80** | **0.301 ± 0.015 ka** | |
| **SFU-O-110** | **SN-SS** | **0.011 ± 0.011 ka** | |

1.4 eV excitation, 180-250, 250-300 or 210-355 μm K-feldspar grains. The ages have been corrected for anomalous fading and are before AD1995. These samples were from the aeolian base of the dunes on Sandy Neck, Cape Cod, Massachusetts, U.S.A., and were taken to determine whether or not optical dating could be used to determine sea level vs time. Four high-precision $^{14}$C ages were available for comparison; the corrected ages here are slightly lower than those in van Heteren et al. (2000) due to use of an updated anomalous fading rate.

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| **SFU-O-111** | **HOND92-29** | **>4.3 ± 0.3 ka** | Rockwell *et al.*, 2000 |
| **SFU-O-112** | **HOND92-18** | **37 ± 3 ka** | Huntley, 2001 |
| **SFU-O-113** | **HOND92-4** | **>24.6 ± 1.3 ka** | |
| **SFU-O-114** | **MELVL93-5** | **10.5 ± 0.6 ka** | |

1.4 eV excitation, sand-sized K-feldspar grains. The samples were part of a study of past earthquake faults in the Landers region of California, U.S.A. The ages of HOND92-18 and MELVL93-5 have been corrected for anomalous fading, which is severe for these samples. The ages for the other two samples have not been corrected and are thus shown as lower limits. MELVL93-5 is also found in Huntley and Lamothe (2001).

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| **SFU-O-115** | **IC1-01** | **>112 ± 15 ka** | Huntley and Lian, 1999 |

1.4 eV excitation, 90-125 μm K-feldspar grains. This sample is from a Holocene cliff-top aeolian deposit on the west side of Onetree Creek, 16 km E and 3 km N of Duchess, Alberta. This is an example of an aeolian deposit that was exposed to little or no sunlight during transport and deposition. The age is shown as a lower limit because it has not been corrected for anomalous fading.

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| **SFU-O-116** | **IC2-01** | **980 ± 60 a** | Wolfe at al., in press |
| **-117** | **IC3-01** | **229 ± 20 a** | |
| **-118** | **IC4-01** | **4540 ± 420 a** | |
| **-119** | **IC5-01** | **2940 ± 200 a** | |
| **-120** | **IC5-02** | **260 ± 26 a** | |

1.4 eV excitation, 90-125 or 180-250 μm K-feldspar grains. The ages have been corrected for anomalous fading. The samples are from sand dunes in the Duchess dunefield, north of Duchess, Alberta.

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| **SFU-O-121** | **SW6-01** | **5.4 ± 0.6 ka** | Wolfe et al., 2001 |
| **SFU-O-122** | **SW6-01** | **5.3 ± 0.3 ka** | Huntley and Lamothe, 2001 |

The first age was obtained using 90-125 μm quartz grains and 2.41 eV excitation. The second age was obtained using 1.4 eV excitation and 90-125 μm K-feldspar grains, and has been corrected for anomalous fading. The sample is from basal sand of the Burstall sand hills, Saskatchewan.

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| **SFU-O-123** | **SW1-02** | **68 ± 12 a** | Wolfe et al. 2001 |
| **-124** | **SW2-02** | **109 ± 8 a** | |
| **-125** | **SW3-02** | **91 ± 5 a** | |
| **-126** | **SW4-01** | **793 ± 87 a** | |
| **-127** | **SW4-02** | **1160 ± 90 a** | |
| **-128** | **SW5-01** | **216 ± 11 a** | |
| **-129** | **SW6-02** | **168 ± 9 a** | |
| **-130** | **SAW94-23** | **85 ± 5 a** | |
| **-131** | **SAW94-30** | **123 ± 6 a** | |
| **-132** | **SAW94-31** | **94 ± 6 a** | |
| **-133** | **SAW94-32** | **116 ± 7 a** | |
| **-134** | **SAW94-33** | **94 ± 6 a** | |
| **-135** | **SAW94-34** | **152 ± 8 a** | |
| **-136** | **SAW94-35** | **125 ± 5 a** | |

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| **-137** | **SAW94-36** | **174 ± 8 a** |
| **-138** | **SAW94-37** | **168 ± 7 a** |
| **-139** | **SAW94-38** | **160 ± 10 a** |
| **-140** | **SAW94-39** | **137 ± 9 a** |
| **-141** | **SAW94-40** | **117 ± 7 a** |
| **-142** | **SAW94-41** | **17 ± 5 a** |
| **-143** | **SAW94-50** | **129 ± 9 a** |
| **-144** | **SAW94-51** | **105 ± 8 a** |
| **-145** | **SAW94-70** | **-4 ± 7 a** |
| **-146** | **SAW94-71** | **92 ± 7 a** |
| **-147** | **SAW94-81** | **307 ± 21 a** |
| **-148** | **SAW94-82** | **252 ± 17 a** |
| **-149** | **SAW94-83** | **163 ± 7 a** |
| **-150** | **SAW95-01** | **115 ± 5 a** |
| **-151** | **SAW95-02** | **143 ± 9 a** |
| **-152** | **SAW95-03** | **129 ± 6 a** |
| **-153** | **SAW95-04** | **116 ± 5 a** |
| **-154** | **SAW95-07** | **117 ± 6 a** |
| **-155** | **SAW95-08** | **151 ± 6 a** |
| **-156** | **SAW95-10** | **180 ± 8 a** |
| **-157** | **SAW95-11** | **185 ± 8 a** |

1.4 eV excitation 90-125 or 180-250 μm K-feldspar grains. The ages of SW4-01 and 4-02 only have been corrected for anomalous fading, and thus are higher than presented in Wolfe et al., 2001. The ages are before AD1995. The samples are from sand dunes from the Great Sand Hills region of southern Saskatchewan. The ages help relate past dune activity to climate change. A subset of these ages (SAW94-30 to -41, 95-10 and -11 from the Seward Sand Hills) may be found in David et al. (1999) and were used to determine the 'activity cycle' of a dune.

**SFU-O-158** **SAW94-88** **403 ± 27 a** Wolfe et al., in press
1.4 eV excitation, 180-250 μm K-feldspar grains. The age has been corrected for anomalous fading and is before AD1995. This sample is from a sand dune in the Duchess dunefield, north of Duchess, Alberta, and is part of the SFU-116 to 120 set.

**SFU-O-159** **SAW95-09** **10.7 ± 0.5 ka** unpublished
1.4 eV excitation, 180-150 μm K-feldspar grains. The age has been corrected for anomalous fading. The sample is from a dune on the north side of Sandy Lake, N.W.T. (60˚32' N, 114˚33' W).

**SFU-O-160** **CPIW** **16.1 ± 1.2 ka** unpublished
1.4 eV excitation, 180-250 μm K-feldspar grains. The age has been corrected for anomalous fading. The sample is from a sand wedge at Crumbling Point, Summer Island, Mackenzie R. delta, N.W.T. Several optical ages, average 14.0 ± 1.0 ka, from sand wedges at Crumbling Point were presented by Murton et al., 1997.

**SFU-O-161** **DLS** **27 ± 6 ka** unpublished
1.4 eV excitation, 4-11 μm K-feldspar grains. The sample is silty sediment from the centre of a lake formed at the retreating margin of the Late Wisconsinan ice sheet. The expected age was 12-14 ka. The sample provenance is at Hwy 844, midway between Hwy 873 and Hwy 874, 5 km SE of Duchess, Alberta. Sample provided by I.A.Campbell, University of Alberta.

**SFU-O-162** **DRDS** **13.0 ± 0.8 ka** unpublished
1.4 eV excitation, 90-125 μm K-feldspar grains. The sample is sandy river sediment from a delta at the head of the lake of the previous sample. The provenance is 1 km W. of Hwy 36, 8 km N of Hwy 550, about 10 km NNW of Duchess, Alberta. Sample provided by I.A.Campbell, University of Alberta.

**SFU-O-163** **DY24** **14.7 ± 1.3 ka** Huntley and Lamothe, 2001
1.4 eV excitation, 180-250 μm K-feldspar grains. The age has been corrected for anomalous fading. The sample is from stratum 14, an aeolian deposit, of the Diring Yuriakh archaeological site, by the Lena R., 140 km upstream from Yakutsk, Siberia (Mochanov, 1988).

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| **SFU-O-164** | **SAW94-60** | **17.8 ± 1.5 ka** | Huntley and Lamothe, 2001 |
| **-165** | **SAW94-61** | **22.5 ± 1.2 ka** | |

1.4 eV excitation, 180-250 µm (94-60) or 90-125 µm (94-61) K-feldspar grains. The ages have been corrected for anomalous fading. The samples are from the "upper loess" and "lower loess" respectively near the top of the west block of the Cypress Hills, Alberta. The ages for these samples given in Huntley and Lian, 1999, were not corrected for anomalous fading.

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| **SFU-O-166** | **SAW94-62** | **21.8 ± 1.5 ka** | unpublished |

1.4 eV excitation, 106-125 µm K-feldspar grains. The age has been corrected for anomalous fading. The sample is a postglacial loess containing Glacier Peak tephra, from just north of the Cypress Hills, Alberta. The age of 14.3 ± 0.7 ka given in Huntley and Lian, 1999, was not corrected for anomalous fading.

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|---|---|---|---|
| **SFU-O-167** | **SAW97-01** | **31 ± 7 a** | unpublished |
| **-168** | **SAW97-02** | **35 ± 8 a** | |
| **-169** | **SAW97-04** | **42 ± 7 a** | |
| **-170** | **SAW97-05** | **32 ± 11 a** | |
| **-171** | **SAW97-07** | **50 ± 8 a** | |
| **-172** | **SAW97-08** | **94 ± 7 a** | |
| **-173** | **SAW97-10** | **5.68 ± 0.27 ka** | |
| **-174** | **SAW97-11** | **4.10 ± 0.15 ka** | |
| **-175** | **SAW97-12** | **2.08 ± 0.12 ka** | |
| **-176** | **SAW97-13** | **3.44 ± 0.15 ka** | |
| **-177** | **SAW97-14** | **3.04 ± 0.15 ka** | |

1.4 eV excitation, 250-350 µm K-feldspar grains. The ages have been corrected for anomalous fading and are before AD1997. Samples are from the Brandon Sand Hills, Manitoba. SAW97-10 to -12 are from the Brookdale section and SAW97-13 & -14 are from the Henry Fast section.

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|---|---|---|---|
| **SFU-O-178** | **BLS2** | **< 1.59 ± 0.18 ka** | Ollerhead et al. 2001 |
| **-179** | **BLS5** | **< 5.20 ± 0.53 ka** | |
| **-180** | **BLS6** | **< 5.17 ± 0.52 ka** | |
| **-181** | **BLZ7** | **2.95 ± 0.20 ka** | |
| **-182** | **BLAA10** | **4.40 ± 0.23 ka** | |

1.4 eV excitation, 250-355 µm K-feldspar grains. All ages have been corrected for anomalous fading. The samples were taken from tsunami-deposited sand layers in cores from Bradley Lake, Oregon, U.S.A. The ages of BLZ7 and BLAA10 appear also in Huntley and Lamothe (2001).

| | | | |
|---|---|---|---|
| **SFU-O-183** | **BN1/70** | **105 ± 8 ka** | unpublished |
| **-184** | **BN1/2** | **197 ± 14 ka** | |
| **-185** | **BN3/1.2** | **71 ± 8 ka** | |
| **-186** | **IA1/2.5** | **188 ± 14 ka** | |
| **-187** | **IA1/3.5** | **215 ± 15 ka** | |
| **-188** | **IA2/60** | **22 ± 3 ka** | |

~2.4 eV excitation, 180-250 µm quartz grains. The samples are from aeolian deposits near Barton and Immarna, western South Australia.

## THERMOLUMINESCENCE AGES (conventional)

| | | | | |
|---|---|---|---|---|
| **SFU-TL-A20** | | | **235 ± 17 a** | Williams *et al.*, 1991, 1992-93 |

This is a sherd from a Mediterranean-style pot dredged up accidentally from the sea bottom off Langara Island, N.W. Queen Charlotte Islands, B. C. It is one of the earliest artifacts from European visitors to British Columbia, the first of whom, on record, came in AD 1774.

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|---|---|---|---|---|
| **SFU-TL-1** | **Ouvea** | **52-2** | **210 ± 25 a** | Huntley *et al.*, 1983b |
| **-2** | | **52-3** | **190 ± 50 a** | |
| **-3** | | **52-4** | **120 ± 25 a** | |
| **-4** | | **52-6** | **110 ± 15 a** | |
| **-5** | **Maré** | **52-9** | **> 2000 ± 700 a** | |
| **-6** | | **52-10** | **> 1700 ± 300 a** | |

These are a set of potsherds from the Loyalty Islands, Oceania.

| | | |
|---|---|---|
| **SFU-TL-7** | **EcRq2 #1** | unpublished |

This archaeological sample had not been sufficiently heated in antiquity that a TL age could be obtained. For Arcas Consultants.

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|---|---|---|---|
| **SFU-TL-8** | **St. Helens, Wn** | **0.48 ± 0.05 ka** | Berger, 1985a |
| **-9** | **White River (east lobe)** | **3.0 ± 0.6 ka** | |
| **-10** | **Bridge River** | **1.9 ± 0.2 ka** | |
| **-11** | **St. Helens Yn** | **6.1 ± 0.6 ka** | |
| **-12** | **Mazama** | **7.8 ± 0.5 ka** | |
| **-13** | **St. Helens S** | **> 9.2 ± 0.6 ka** | |
| **-14** | **Lake Tapps** | **> 400 ± 20 ka** | |
| **-15** | **Bishop** | **> 380 ± 40 ka** | |
| **-16** | **Coutlee** | **> 670 ± 70 ka** | |

These are tephra from B.C., the Yukon, and the northwestern U.S.A. Measurements were made on 2-11 μm airfall glass extracted from the tephra. The ages are consistent with the known ages except for the White River and St. Helens Yn samples. These ages supercede the TL ages in Berger and Huntley, 1983.

| | | | |
|---|---|---|---|
| **SFU-TL-17** | **Otay R.** | **14 ka** | Berger and Huntley, 1986; Reeves, 1985 |

A fire hearth in terrace sediments of the Otay R., U.S.A. One of the oldest archaeological ages in North America.

| | | | |
|---|---|---|---|
| **SFU-TL-18** | **Old Crow tephra** | **110 ± 12 ka** | Berger, 1987 |

The sample is from near Fairbanks, Alaska, U.S.A. 4-11 μm glass was measured. See also SFU-TL-S-108.

## THERMOLUMINESCENCE SEDIMENT AGES

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|---|---|---|---|---|
| **SFU-TL-S1** | **RC8-39** | **7-10 cm** | **9.3 ka** | Wintle and Huntley 1979a, 1980 |
| **-S2** | | **116-119** | **30 ka** | |
| **-S3** | | **228-231** | **51 ka** | |
| **-S4** | | **340-343** | **76 ka** | |
| **-S5** | | **578-581** | **85 ka** | |
| **-S6** | | **900-903** | **140 ka** | |
| **-S7** | **TT28-14** | **10-12 cm** | **21 ka** | Wintle and Huntley, 1980 |
| **-S8** | | **18-20** | **20 ka** | |
| **-S9** | | **37.5-39.5** | **29 ka** | |
| **-S10** | | **74.5-76.5** | **51 ka** | |
| **-S11** | | **107-109** | **63 ka** | |
| **-S12** | | **166.5-168.5** | **96 ka** | |

RC8-39 (42°53'S, 42°21'E, 4330 m) and TT28-14 (33°26'N, 173°38'E, 5079 m) are deep ocean cores. The ages for RC8-39 compare favourably with those from Cycladophora Davisiana variations.

**SFU-TL-S13 to -S20** **RC8-39, RC16-168, RC17-115 V22-195, V23-100, Hu75-41, Hu75-42, Hu75-54** — Wintle and Huntley, 1979b

The samples are from core tops from the above named cores to test whether or not they yielded an equivalent dose suitably close to zero.

**SFU-TL-S21 to S66**

These numbers apply, unallocated, to the ages in Huntley *et al* 1983a. This work was a survey which included samples from archaeological sites HaRk-1, DhRq-21 and ElSx-1, several peats and organic-rich sediments (also in Divigalpitiya, 1982), several river sediments, silts and a glacial till.

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|---|---|---|---|---|
| **SFU-TL-S67** | **GS7102-9** | **4-8 cm** | **1.0 ± 0.5 ka** | Berger *et al.*, 1984 |
| **-S68** | | **12-18** | **2.2 ± 0.7 ka** | |
| **-S69** | | **43-45** | **5 ± 1 ka** | |
| **-S70** | | **102-106** | **16 ± 3 ka** | |
| **-S71** | | **202-206** | **13 ± 2 ka** | |
| **-S72** | | **303-308** | **24 ± 3 ka** | |
| **-S73** | | **353-356** | **22 ± 3 ka** | |

GS7102-9 is a core from just southeast of De Soto Canyon on the continental slope off northwestern Florida, U.S.A. (29°00'N, 87°00'W, 695 m). The TL ages are comparable with $^{14}C$ ages.

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|---|---|---|---|
| **SFU-TL-S74** | **WC-HT** | **140 ± 15 ka** | Berger, 1984 |
| **-S75** | **U-Thorncliffe** | **35.9 ± 5.4 ka** | |
| **-S76** | **WC-ST** | **66.5 ± 6.8 ka** | |

WC-HT and WC-ST are the Halton till and Sunnybrook diamict from Woodbridge Cut near Toronto. The upper Thorncliffe formation sample was collected from the Hi section of the Scarborough Bluffs, Toronto. The Halton till is a lodgement till deposited ~ 13-12 ka and the TL age indicates that it was not exposed to sunlight at that time. More recent TL ages from this sequence can be found in Berger and Eyles, Geology 22**,** 31-34, 1994.

| | | | |
|---|---|---|---|
| **SFU-TL-S77** | **Gore Creek - silt rich** | **55 ± 13 ka** | Berger, 1985b |
| **-S78** | **Gore Creek - clay rich** | **14.2 ± 2.3 ka** | |

These samples are from the varved glaciolacustrine silt at Gore Creek, near Kamloops, B.C., deposited 11-10 ka ago at the end of the last glaciation. These results demonstrate that the coarser summer layer (silt rich) did not receive adequate sunlight exposure at the time of deposition, but that the finer winter layer (clay rich) did.

**SFU-TL-S79 to S81** — Reeves, 1985

Scripps Tower archaeological site, La Jolla, California, U.S.A., and Fletcher Wash site, El Cajon Valley. The quoted ages should not have been published; there is no reason to believe them (Berger and Huntley, 1986).

**SFU-TL-S82 to S93** Equivalent doses for 12 zero-age samples. — Huntley, 1985

**SFU-TL-S94 to S104** **QNL84-, WL84-** Berger *et al.*, 1987

These ages were obtained for a set of 11 glaciolacustrine sediments from near Williams Lake and Quesnel in central British Columbia in a study to determine which of such sediments can produce correct ages.

**SFU-TL-S105 to S107** **FISV-A,B,C** Colman *et al* ., 1986

3 samples from Fisher Valley, Utah, U.S.A. of ages < 200 a, 610 ka, and intermediate age. The TL results were not consistant with the known ages.

**SFU-TL-S108** **unnamed loess** **108 ± 16 ka** Berger, 1987

This sample is loess from above Old Crow tephra near Fairbanks, Alaska; the age is consistent with that obtained for the tephra (SFU-TL-14).

**SFU-TL-S109** **BNGS** unpublished, 1987

This is a glaciomarine silt from Herschel Bay, Ellesmere Is., of known age ~ 9 ka, provided by Dr. W. Blake Jr., G.S.C., Ottawa. The results showed that the sample had not been exposed to sunlight at ~ 9 ka. The equivalent dose was much larger than appropriate for this age, and no plateau was obtained. The conclusion was supported by some preliminary optical dating measurements.

**SFU-TL-S110 to S112** **FaSu-19 #2, #6, #10** unpublished report, 1988

These samples are from an archaeological site on Kwatna Inlet, B.C., provided by P. Hobler of S.F.U. #6 and #10 were clearly not exposed to sunlight at the time of deposition. #2 gave an equivalent dose, with a poor plateau, indicative of an age of 1-2 ka.

**SFU-TL-S113 to S124** Kirkey, 1988

These numbers are assigned unallocated to the ages in this thesis. These ages are for dunes in the sequence from southeast South Australia, and are superceded by those below.

**SFU-TL-S125 to S144** Pierreville and St.-Pierre Lamothe & Huntley, 1988

A set of 20 ages from various sediments from sections near Pierreville and St.-Pierre-les-Becquets, P.Q.

**SFU-TL-S145** **BUCT 1-1** **1100 ± 200 a** Ollerhead *et al*., 1994, Ollerhead, 1993

R-Γ method, 300-355 μm quartz. See also SFU-0-29; beach dune, Buctouche Spit, New Brunswick.

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|---|---|---|---|---|
| **SFU-TL-S146** | **SESA-1** | **Woakwine I** | **132 ± 6 ka** | Huntley *et al*.,1993a |
| **-S147** | **-3** | **Woakwine II/III** | **230 ± 11 ka** | |
| **-S148** | **-53** | **Reedy Creek** | **258 ± 25 ka** | |
| **-S149** | **-5** | **West Avenue** | **342 ± 32 ka** | |
| **-S150** | **-55** | **East Avenue** | **414 ± 29 ka** | |
| **-S151** | **-46** | **Baker** | **456 ± 37 ka** | |
| **-S152** | **-47** | **Harper** | **585 ± 44 ka** | |
| **-S153** | **-63** | **East Naracoorte** | **720 ± 70 ka** | |

Regeneration method, quartz sand-sized grains. The samples are from a set of stranded beach dunes in south-east South Australia. The ages are compared to those of high sea-stands from the $\delta^{18}O$ record.

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|---|---|---|---|---|
| **SFU-TL-S154** | **SESA-80** | **Robe III** | **116 ± 6 ka** | Huntley *et al.*, 1994a |
| **-S155** | **-61** | **Woakwine I** | **118 ± 4 ka** | |
| **-S156** | **-71** | **Woakwine I** | **132 ± 9 ka** | |
| **-S157** | **-72** | **West Diary** | **196 ± 12 ka** | |
| **-S158** | **-74** | **West Naracoorte** | **800 ± 100 ka** | |

A continuation of the above.

**SFU-TL-S159** **SVP1** **41 ± 7 ka** Lian and Hickin, 1993; Lian, 1991

This is peat from the lower Seymour Valley, North Vancouver, B.C. for which a radiocarbon age of 29.44 ± 0.3 ka (Beta-46053) was also obtained.

| | | | | |
|---|---|---|---|---|
| **SFU-TL-S160** | **SESA-97** | **dune at Nelson** | **178 ± 13 ka** | Murray-Wallace *et al.*, 1996 |
| **-S161** | **SESA-98** | **Burleigh Range** | **237 ± 16 ka** | |
| **-S162** | **SESA-95** | **Caveton Range** | **320 ± 22 ka** | |

A continuation of S146 to S158. These samples are from near Mount Gambier, south-east South Australia.

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|---|---|---|---|---|
| **SFU-TL-S163** | **SESA-121** | **Coorong PP** | **95 ± 6 ka** | Huntley and Prescott, 2001 |
| **-S164** | **SESA-92** | **East Dairy** | **292 ± 25 ka** | |
| **-S165** | **SESA-99** | **Millicent** | **255 ± 24 ka** | |
| **-S166** | **SESA-93** | **West Avenue** | **315 ± 25 ka** | |
| **-S167** | **SESA-55** | **East Avenue** | **404 ± 23 ka** | |
| **-S168** | **SESA-6** | **Stewarts/Cave** | **725 ± 100 ka** | |
| **-S169** | **SESA-62** | **Koppamurra** | **145 ± 19 ka** | |

A continuation of S146 to S158. The authors' notes regarding the East Dairy and Millicent ages should be noted. Unlike the others, Koppamurra is not a dune; the sample was from an aeolian deposit on top of the Koppamurra Range.

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**Appendix** **Details of the corrections for anomalous fading** Dec 4, 2001

Where indicated above, the ages have been corrected for anomalous fading as described by Huntley and Lamothe (2001). The fading rates used were those obtained using method 'b' of Huntley and Lamothe, except as noted. The details are as follows.

Listed in order are:

the SFU age number,
the sample identification label used in the SFU laboratory,
the age without correction for anomalous fading,
the time delay between irradiation and measurement,
the fading rate used, in % per decade starting 2 days after irradiation
[1] means the rate used was measured for this sample
[2] means the rate used was measured for one sample of this set
[3] means the rate used was an average of two or more samples from the set
[4] means the rate used was that of a sample thought to be of similar source material
the corrected age, in bold type.
[5] means the rate used was obtained using method 'a' of Huntley and Lamothe.

| | | | | | |
|---|---|---|---|---|---|
| **SFU-O-29** | **BUCT-1-1** | 765 ± 45 a | 7 d | 6.7 ± 0.5[2] | **1090 ± 80 a** |
| **-30** | **BUCT-2-1** | 660 ± 45 a | 6 d | " | **940 ± 70 a** |
| **-31** | **BUCT-3-1** | 310 ± 25 a | " | " | **430 ± 40 a** |
| **-32** | **BUCT-4-1** | 165 ± 20 a | " | " | **220 ± 30 a** |
| **-33** | **BUCT-5-1** | 5 ± 30 a | " | " | **5 ± 40 a** |
| **-34** | **BUCT-8-1** | 180 ± 15 a | 8 d | " | **240 ± 20 a** |
| **-35** | **BUCT-9-1** | 205 ± 20 a | " | " | **280 ± 30 a** |
| **-36** | **BUCT-9-2** | 190 ± 25 a | " | " | **250 ± 40 a** |
| **-37** | **BUCT-10-1** | 225 ± 20 a | " | " | **300 ± 30 a** |
| | | | | | |
| **SFU-O-87** | **SN-27** | 4.33 ± 0.18 ka | 150 d | 3.4 ± 0.4[3] | **4.99 ± 0.23 ka** |
| **-88** | **SN-25** | 3.83 ± 0.14 ka | " | " | **4.41 ± 0.18 ka** |
| **-89** | **SN-25s** | 3.68 ± 0.15 ka | " | " | **4.23 ± 0.19 ka** |
| **-90** | **SN-4d** | 3.40 ± 0.19 ka | " | " | **3.90 ± 0.23 ka** |
| **-91** | **SN-4s** | 3.79 ± 0.15 ka | " | " | **4.36 ± 0.19 ka** |
| **-92** | **SN-10** | 3.50 ± 0.14 ka | " | " | **4.02 ± 0.18 ka** |
| **-93** | **SN-37** | 3.13 ± 0.14 ka | " | " | **3.59 ± 0.17 ka** |
| **-94** | **SN-30** | 3.14 ± 0.14 ka | " | " | **3.60 ± 0.17 ka** |
| **-95** | **SN-38** | 2.53 ± 0.10 ka | " | " | **2.89 ± 0.13 ka** |
| **-96** | **SN-6** | 2.16 ± 0.09 ka | " | " | **2.46 ± 0.11 ka** |
| **-97** | **SN-G2** | 2.10 ± 0.07 ka | " | " | **2.39 ± 0.09 ka** |
| **-98** | **SN-H3** | 2.10 ± 0.07 ka | " | " | **2.39 ± 0.09 ka** |
| **-99** | **SN-47** | 1.90 ± 0.08 ka | " | " | **2.16 ± 0.10 ka** |
| **-100** | **SN-45** | 1.70 ± 0.07 ka | " | " | **1.93 ± 0.09 ka** |
| **-101** | **SN-55** | 1.22 ± 0.05 ka | " | " | **1.37 ± 0.06 ka** |
| **-102** | **SN-O2** | 45 ± 6 a | " | " | **48 ± 7 a** |
| **-103** | **SN-BP** | 110 ± 20 a | " | " | **120 ± 20 a** |
| **-104** | **SN-11** | 291 ± 15 a | 66 d | " | **324 ± 17 a** |
| **-105** | **SN-12** | 249 ± 14 a | " | " | **276 ± 16 a** |
| **-106** | **SN-17** | 870 ± 40 a | " | " | **987 ± 48 a** |
| **-107** | **SN-18** | 191 ± 13 a | " | " | **211 ± 15 a** |
| **-108** | **SN-44** | 170 ± 12 a | " | " | **187 ± 14 a** |
| **-109** | **SN-80** | 271 ± 13 a | " | " | **301 ± 15 a** |
| **-110** | **SN-SS** | 10 ± 10 a | " | " | **11 ± 11 a** |
| | | | | | |
| **SFU-O-112** | **HOND92-18** | 16.7 ± 0.9 ka | 13 d | 9.7± 0.3[1] | **41 ± 3 ka** |
| **SFU-O-114** | **MELVL93-5** | 6.1 ± 0.3 ka | 13 d | 7.8 ± 0.3[1] | **10.5 ± 0.6 ka** |
| | | | | | |
| **SFU-O-116** | **IC2-01** | 826 ± 47 a | 17 d | 3.8 ± 0.4[2] | **980 ± 60 a** |
| **-117** | **IC3-01** | 203 ± 17 a | 44 d | " | **229 ± 20 a** |

| | | | | | |
|---|---|---|---|---|---|
| **-118** | **IC4-01** | 3700 ± 320 a | 11 d | “ | **4540 ± 420 a** |
| **-119** | **IC5-01** | 2400 ± 150 a | 7 d | “ | **2940 ± 200 a** |
| **-120** | **IC5-02** | 230 ± 22a | 46 d | 3.8 ± 0.4[1] | **260 ± 26 a** |
| **SFU-O-122** | **SW6-01** | 4.19 ± 0.20 ka | 32 d | 4.7 ± 0.3[1] | **5.3 ± 0.3 ka** |
| **SFU-O-126** | **SW4-01** | 640 ± 60 a | 15 d | 4.8 ± 1.0[1,5] | **793 ± 87 a** |
| **-127** | **SW4-02** | 930 ± 50 a | 18 d | 4.8 ± 1.0[2] | **1160 ± 90 a** |
| **SFU-O-158** | **SAW94-88** | 344 ± 22 a | 10 d | 3.8 ± 0.4[2] | **403 ± 27 a** |
| **SFU-O-159** | **SAW95-09** | 8.4 ± 0.4 ka | 212 d | 4.8 ± 0.3[1] | **10.7 ± 0.5 ka** |
| **SFU-O-160** | **CPIW** | 12.4 ± 0.8 ka | 68 d | 4.7 ± 0.5[1] | **16.1 ± 1.2 ka** |
| **SFU-O-162** | **DRDS** | 9.8 ± 0.5 ka | 15 d | 4.7 ± 0.5 | **13.0 ± 0.8 ka** |
| **SFU-O-163** | **DY24** | 10.6 ± 0.6 ka | 152 d | 6.0 ± 1.0[1] | **14.7 ± 1.3 ka** |
| **SFU-O-164** | **SAW94-60** | 11.8 ± 0.9 ka | 240 d | 7.2 ± 0.4[1] | **17.8 ± 1.5 ka** |
| **-165** | **SAW94-61** | 14.7 ± 0.6 ka | 240 d | 7.2 ± 0.4[2] | **22.5 ± 1.2 ka** |
| **SFU-O-166** | **SAW94-62** | 14.9 ± 0.8 ka | 240 d | 6.7 ± 0.4[1] | **21.8 ± 1.5 ka** |
| **SFU-O-167** | **SAW97-01** | 27 ± 6 a | 63 d | 6.0 ± 0.3[2] | **31 ± 7 a** |
| **-168** | **SAW97-02** | 31 ± 7 a | “ | “ | **35 ± 8 a** |
| **-169** | **SAW97-04** | 37 ± 6 a | “ | “ | **42 ± 7 a** |
| **-170** | **SAW97-05** | 28 ± 9 a | “ | “ | **32 ± 11 a** |
| **-171** | **SAW97-07** | 43 ± 7 a | “ | “ | **50 ± 8 a** |
| **-172** | **SAW97-08** | 80 ± 6 a | “ | 6.0 ± 0.3[1] | **94 ± 7 a** |
| **SFU-O-173** | **SAW97-10** | 4.06 ± 0.16 ka | 74 d | 6.4 ± 0.4[2] | **5.68 ± 0.27 ka** |
| **-174** | **SAW97-11** | 2.97 ± 0.08 ka | 74 d | “ | **4.10 ± 0.15 ka** |
| **-175** | **SAW97-12** | 1.55 ± 0.08 ka | 72 d | 6.4 ± 0.4[1] | **2.08 ± 0.12 ka** |
| **SFU-O-176** | **SAW97-13** | 2.51 ± 0.09 ka | 73 d | 6.6 ± 0.3[1] | **3.44 ± 0.15** |
| **-177** | **SAW97-14** | 2.23 ± 0.09 ka | “ | 6.6 ± 0.3[2] | **3.04 ± 0.15** |
| **SFU-O-178** | **BLS2** | <1310 ± 140 a | 35 d | 4.4 ± 0.5[3] | **< 1.59 ± 0.18 ka** |
| **-179** | **BLS5** | <4320 ± 420 a | 222 d | “ | **< 5.20 ± 0.53 ka** |
| **-180** | **BLS6** | <4300 ± 410 a | 223 d | “ | **< 5.17 ± 0.52 ka** |
| **-181** | **BLZ7** | 2400 ± 150 a | 43 d | “ | **2.95 ± 0.20 ka** |
| **-182** | **BLAA10** | 3670 ± 170 a | 221 d | “ | **4.40 ± 0.23 ka** |