Table 6: Late Cretaceous to Paleogene ages

Mineral	Isotope system	Age (Ma)	Host rock	Source
Metamorphic ages				
Garnet	Sm-Nd	98	Schist	Vry et al. (2004)
Garnet	Lu-Hf	97-75	Schist	Vry et al. (2004), Briggs et al. (2018)
Zircon	U-Pb	84-50	Schist	Cooper and Ireland (2015), Cooper and Palin (2018), Briggs et al. (2018)
Zircon	U-Pb	82-67	Pegmatite	Chamberlain et al. (1995), Batt et al. (1995)
Monazite	U-Pb	82-68	Pegmatite	Chamberlain et al. (1995), Marcotte et al. (2005)
Monazite	U-Pb	83-71	Schist	Mortimer and Cooper (2004), Scott et al. (2015)
Rutile	U-Pb	74-66	Orthogneiss	Flowers et al. (2005)
Cooling ages				
Zircon	FT	97-46	Schist, Gneiss	White and Green (1986), Ring and Bernet (2010), Ring et al. (2018)
Apatite	FT	80-72	Schist, Geniss	Schulte et al. (2014)
Biotite	K-Ar	61-44	Schist	Rattenbury (1987)
Magmatic ages				
Dike	K/Ar, Ar/Ar, U-Pb	97-61	Lamprophyre, Trachyte, Basanite, Camptonite	van der Meer et al. (2016)

FT = fission track.

Table 2: Stewart Island apatite fission-track lengths and Dpar

Sample	Age (Ma)	± 1 σ	U (ppm)	± 1 σ	n	Mean Length (µm)	± 1 σ	Mean Dar (µm)
SI06-3	75.2	5.9	28	2	40	13.39	0.21	2.31
SI06-13	75.6	5.8	22	2	2	13.16	0.26	2.36
SI06-15	75.3	5.9	13	1	28	13.33	0.25	2.04
SI06-20	68.8	6.5	9	1	5	8.47	1.27	1.76
SI06-21	75.3	6.4	26	2	28	13.03	0.26	1.99
P52239	84.4	5.9	22	2	15	13.67	0.26	1.74
P68117	81.9	8.4	6	1	27	13.12	0.38	1.90
P57396	73.6	5.0	40	2	44	13.53	0.23	2.21

Table 3: Stewart Island zircon fission-track ages

Sample	n	ρ_s (10^{-5} cm^{-2})	N_s	ρ_i (10^{-5} cm^{-2})	N_i	ρ_d (10^{-5} cm^{-2})	$P(\chi^2)$	Age (Ma)	± 1 σ	U (ppm)	± 1 σ
SI06-1	10	40.2	(477)	13.3	(158)	2.10	72.2	108.1	10.2	95	15
SI06-2	6	45.5	(283)	20.7	(129)	2.09	70.8	78.4	8.6	149	27
SI06-5	15	41.2	(810)	15.5	(305)	2.09	7.7	96.3	8.6	112	13
SI06-6	10	33.6	(363)	13.2	(142)	2.08	82.2	90.6	9.2	95	16
SI06-8	7	23.4	(311)	7.30	(97)	2.07	98.8	113.2	13.4	53	11
SI06-13	9	44.8	(506)	13.5	(152)	2.06	57.1	114.3	11.7	98	16
SI06-15	13	17.7	(893)	4.62	(233)	2.05	29.8	133.8	10.4	34	5
SI06-16	10	49.0	(553)	16.5	(186)	2.05	48.5	103.8	9.2	121	18
SI06-17	13	33.2	(524)	9.26	(146)	2.04	96.3	124.8	12.1	68	12
SI06-18	8	38.5	(473)	10.9	(134)	2.04	35.5	122.7	12.6	80	14
SI06-19	12	36.9	(783)	12.0	(255)	2.03	93.5	106.4	8.1	89	12
SI06-20	8	31.5	(293)	12.4	(115)	2.03	65.6	88.2	10.0	91	17
SI06-21	7	50.5	(302)	17.7	(106)	2.02	93.9	98.3	11.4	131	26
P52239	14	39.1	(666)	9.70	(165)	2.17	60.0	148.8	13.4	67	11
P57396	15	47.4	(916)	14.1	(272)	2.17	50.9	124.1	9.1	97	12
P59397	10	48.6	(536)	16.8	(186)	2.16	34.9	106.1	9.4	117	18
P63568	4	28.6	(102)	1.15	(41)	2.16	36.1	91.5	17.1	80	25
P63988	5	40.4	(161)	17.8	(71)	2.14	74.2	82.9	11.9	125	30
P67587	11	41.7	(533)	20.0	(256)	2.14	15.1	76.9	7.3	141	18
P67603	10	45.9	(526)	21.1	(242)	2.13	26.1	81.4	7.8	149	20
P67604	12	54.8	(682)	16.5	(206)	2.13	16.1	119.4	11.2	117	17

Note: Fission-track age is given as Central Age (Galbraith and Laslett, 1993). Samples were counted dry with a BH-2 Olympus microscope at 1250x magnification. Ages were calculated with the BINOMFIT program of Brandon (2005), using a zeta value of 343.52±6.35 (Bernet) and the IRMM 540 uranium glass standard (15 ppm U).

Table 4: Stewart Island HeFTy Inversion modeling solutions

Sample	Good fits	Acceptable fits	AFT model age (Ma)	GOF	AFT model track length (µm)	GOF	ZFT model age (Ma)	GOF
SI06-3	2965	11931	74.7	0.98	14.61 ± 1.00	0.98	-	-
SI06-15	5868	18003	75.9	1.00	14.36 ± 1.00	0.99	-	-
SI06-21	1394	13049	76.9	0.98	13.11 ± 1.23	0.80	99.3	0.93
P52239	9668	20283	84.7	0.97	15.05 ± 0.74	1.00	149	1.00
P68117	4038	13266	82.0	1.00	14.07 ± 1.34	0.99	-	-
P57396	2606	8997	75.5	0.97	14.54 ± 0.98	1.00	124	0.99

Note: All solutions are based on 100,000 paths tried inverse modeling runs. GOF = Goodness of fit.