

**Table S1:** Data used for isocon analysis (see Figure 9) of structural units of the outcrops investigated in this study as well as derived isocon slopes (m) and mass gains. Data for structural units (hanging-wall; PSZ; footwall) are averages calculated from data presented in Table 5.

location	unit	MnO	P <sub>2</sub> O <sub>5</sub>	TiO <sub>2</sub>	Na <sub>2</sub> O	K <sub>2</sub> O	CaO	MgO	Fe <sub>2</sub> O <sub>3</sub> <sup>a</sup>	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	LOI	m	mass gain [%]
Alpine Schist <sup>b</sup>	host rock	0.09	0.16	0.66	3.27	2.75	2.02	1.63	4.48	15.35	67.20	2.01		
Brook Street Terrane <sup>c</sup>	host rock	0.18	0.13	0.84	2.39	0.59	11.16	7.67	10.37	15.14	47.80	3.74		
Havelock Creek	PSZ	0.13	0.20	0.81	1.77	1.39	7.85	4.20	6.49	13.60	51.70	11.49	0.78	27.40
Gaunt Creek	PSZ	0.13	0.19	0.76	1.94	3.27	6.78	3.64	6.66	13.43	51.40	11.38	0.78	28.07
	footwall	0.11	0.21	0.79	2.10	2.94	5.22	3.67	6.05	13.92	55.35	9.28	0.84	19.70
DFDP-1A	hanging-wall	0.09	0.16	0.63	1.18	3.50	4.49	3.07	4.75	13.31	55.51	13.02	0.84	19.72
	PSZ	0.06	0.18	0.56	1.29	3.80	2.03	2.12	4.00	13.25	62.62	9.71	0.93	7.37
Waikukupa Thrust	hanging-wall	0.12	0.10	0.67	3.52	0.42	4.16	3.84	6.29	13.30	57.65	9.53	0.87	15.58
	PSZ	0.21	0.14	0.65	1.12	1.95	17.53	2.70	5.67	11.41	44.47	13.74	0.68	47.02
	footwall	0.11	0.15	0.81	3.03	1.82	2.47	2.74	6.12	14.75	64.98	2.74	0.97	3.22
Martyr River	hanging-wall	0.11	0.18	0.69	2.27	1.80	8.74	4.50	6.11	13.45	52.67	8.96	1.05	-4.44
	PSZ	0.10	0.14	0.56	2.09	1.55	3.50	10.59	5.99	11.07	56.61	7.34	1.09	-8.54

<sup>a</sup> Fe<sub>2</sub>O<sub>3</sub> is total Fe content.

<sup>b</sup> Alpine Schist data is average from (i) samples from DFDP-2B drill cuttings ICDP5052EXGY601, ICDP5052EXOY601 and ICDP5052EXLY601 (presented in Table 4 of Toy et al. (2017); (ii) samples from the Whitcombe River area (presented in Table 1 of Roser and Cooper, 1990); (iii) samples from the Big Bluff drillcore (presented in Table 2 of Roser and Cooper, 1990; except for sample 45491, which has an unusual composition); (iv) samples from the Franz Josef – Fox Glacier area (presented in Grapes et al., 1982).

<sup>c</sup> Values presented are averages derived from Table 1 in Spandler et al. (2005) and exclude data from Bluff Complex and Takitimu Mountains.