

# **Silicon isotopes reveal a non-glacial source of silicon to Crescent Stream, McMurdo Dry Valleys, Antarctica**

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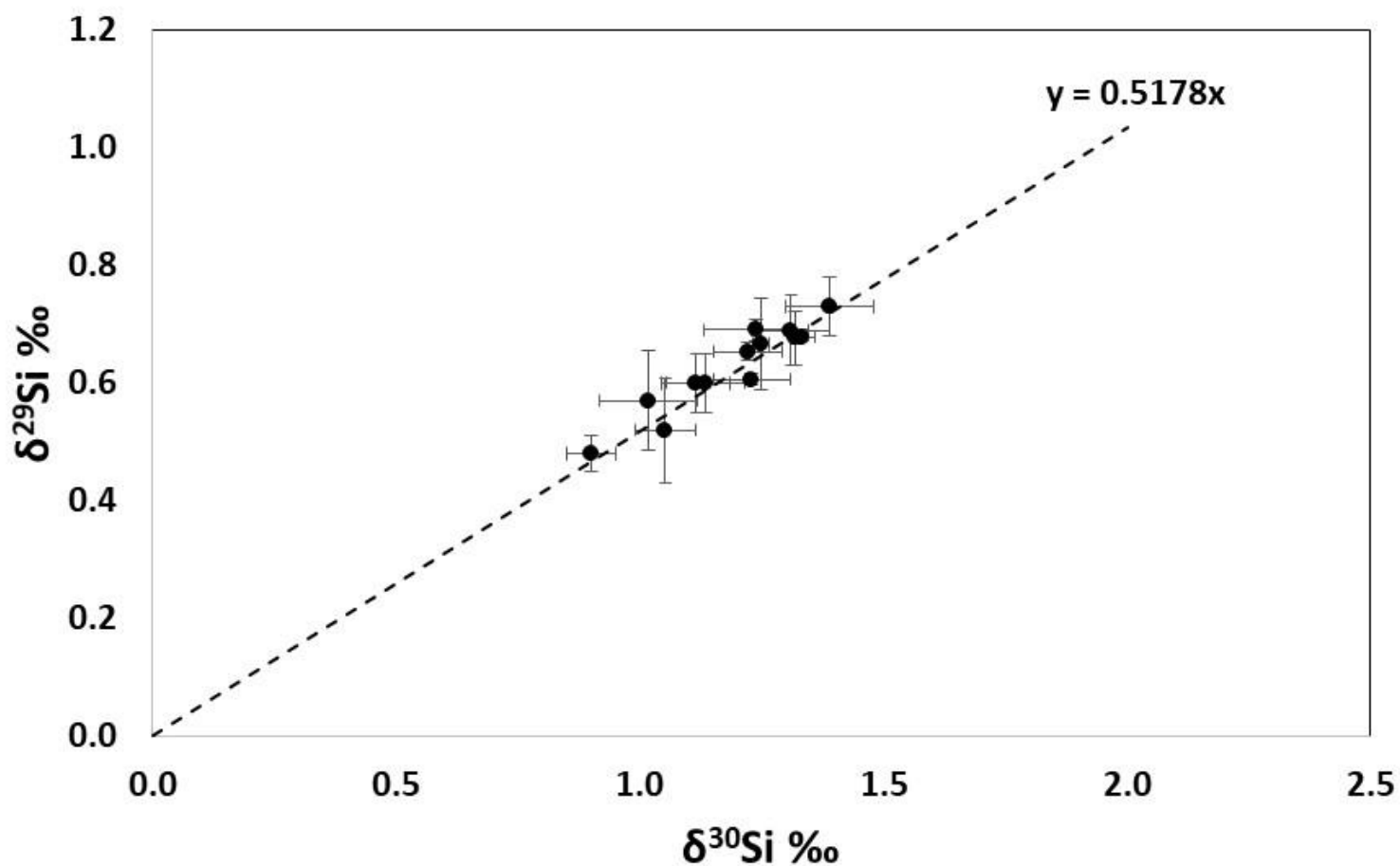
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Catherine Hirst

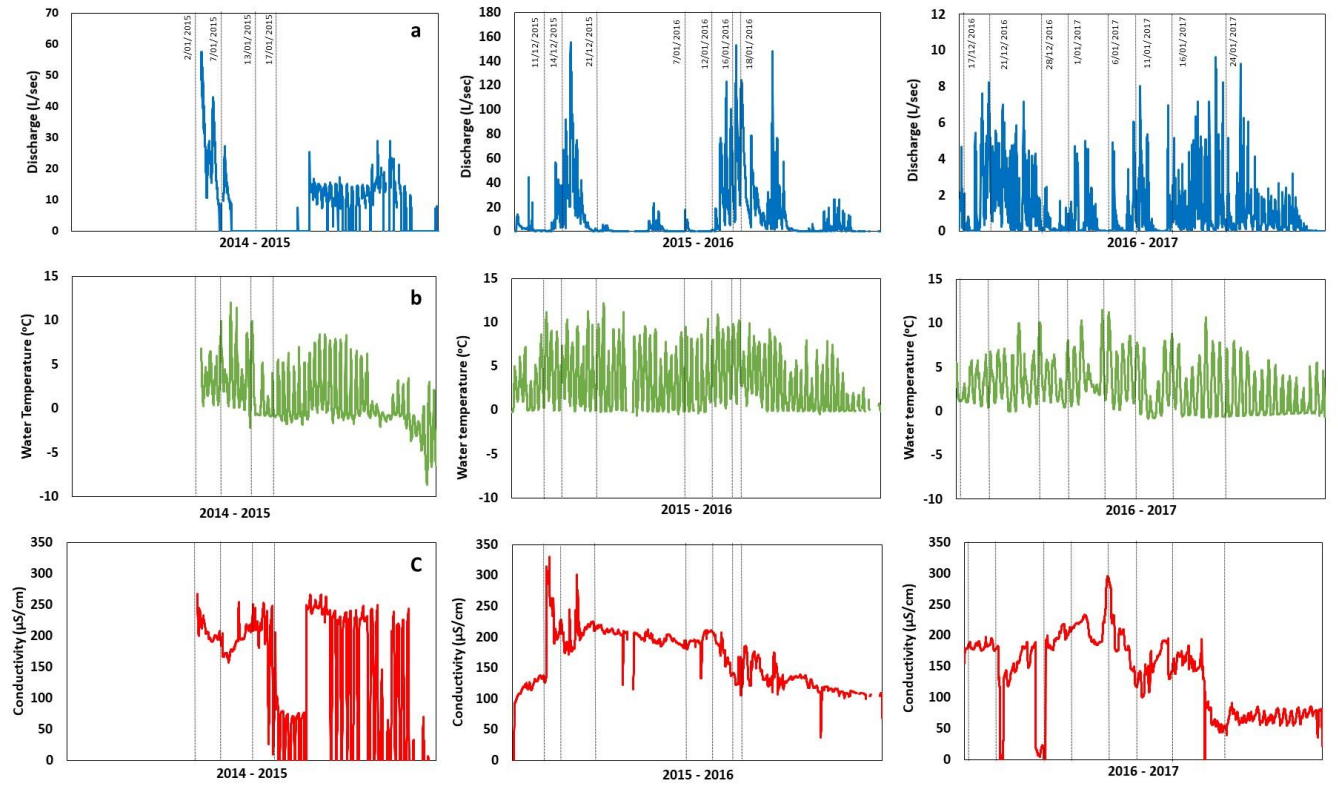
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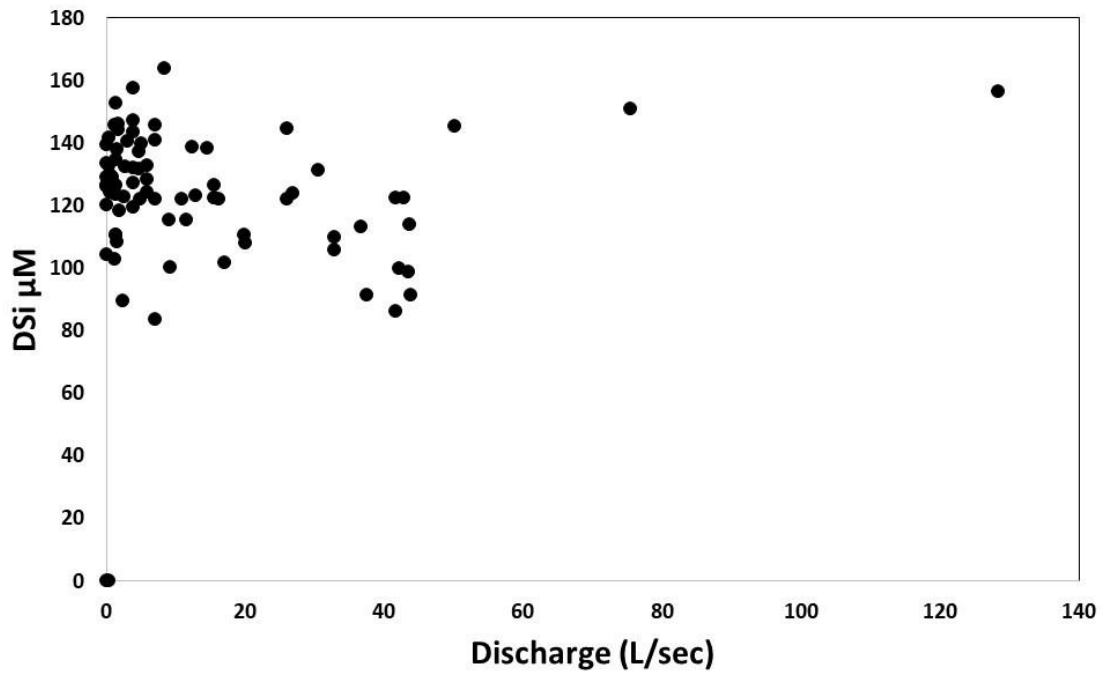
Supplementary information



S.I. Fig. 1 Three isotope plot for samples measured in this study (Table 1). Plot shows  $\delta^{29}\text{Si}$  versus  $\delta^{30}\text{Si}$  of samples, within error of the mass dependent fractionation array with a slope of 0.5178. This supports the interference-free determination of all three Si isotopes via MC-ICP-MS (Young et al., 2002).



S.I. Fig. 2 a-c Discharge, conductivity and water temperature data for 2014 – 2015, 2015 – 2016, 2016 – 2017 seasons determined at gauge F8 in Crescent Stream. Data source: LTER McMurdo Dry Valleys database, Gooseff and McKnight, (2019). The dashed lines correspond to the sampling days in Table 1.



S.I. Fig. 3 The relationship between long-term (1994 – 2014) discharge and dissolved silicon (DSi) concentrations (filtered at  $< 0.4 \mu\text{m}$ ). Data source: LTER McMurdo Dry Valleys database, Si concentrations: Lyons and Welch, (2015); discharge data: Gooseff and McKnight, (2019).

S.I. Table 1. Diatom species and their relative abundance in orange and black microbial mats in Crescent Stream in January 2014 and January 2016. The *species richness*, the number of different species represented in an ecological community, is also shown. The samples for diatom analysis were prepared and analyzed as described by Stanish et al. 2012. np = not present.

Genus	Species	Taxon ID	Microbial mat samples from Crescent Stream			
Mat type			channel (orange)	margin (black)	channel (orange)	margin (black)
Location ID			orange1	black1	CREorange2	CRE black1
Date			24-01-14	24-01-14	21-01-16	21-01-16
			Percent of total diatom valves			
Achnanthes	<i>taylorensis</i>	7	44.9	59	41.1	52.2
Chamaepinnularia	<i>deltaica</i>	75	np	np	np	0.9
Hantzschia	<i>abundans</i>	30	0.3	2	np	2.6
Hantzschia	<i>amphioxys</i>	29	1.6	6.3	np	3.7
Hantzschia	<i>hyperaustralis</i>	32	np	1	np	np
Hantzschia	<i>sp.</i>		np	np	0.5	np
Humidophila	<i>arcuata</i>	21	0.7	1	np	np
Humidophila	<i>contenta var. paralella</i>	17	4	0.7	np	np
Luticola	<i>austroatlantica</i>	47	10.8	5	7.7	5.6
Luticola	<i>dolia</i>	42	2.5	7.7	10.6	6.9
Luticola	<i>elegans</i>	387	10.4	1.6	4.6	4.2
Luticola	<i>gaussi</i>	37	0.7	0.3	np	0.5
Luticola	<i>laeta</i>	38	0.5	1	np	1.8
Luticola	<i>mcknightiae</i>	44	4.2	1.2	5.1	3.6
Luticola	<i>murrayi</i>	39	np	np	np	0.5
Luticola	<i>mutica</i>	40	np	0.3	np	np
Luticola	<i>muticopsis</i>	41	10.6	4.8	9.5	10.7
Luticola	<i>permuticopsis</i>	43	6	2	2.3	1.8
Luticola Lsp NaN			0.9	0.9	5.3	1.4
Mayamaea	<i>atomus</i>	50	np	1	np	np
Mayamaea	<i>var. 1</i>	49	np	0.7	np	0.9
Muelleria	<i>peraustralis</i>	55	0.2	np	np	np
Muelleria	<i>meridionalis</i>	54	np	np	np	0.9
Navicula	<i>seibigiana</i>	58	0.3	np	np	np
Nitzschia	<i>australocommutata</i>	66	np	2	np	0.5
Nitzschia	<i>westiorum</i>	70	1.4	0.7	np	np
Navicula	<i>shackeltoni</i>	61	np	np	np	0.4
<b>Species richness</b>			<b>17</b>	<b>20</b>	<b>9</b>	<b>18</b>

## **References**

Stanish, L. F., T. J. Kohler, R. M. M. Esposito, B. L. Simmons, U. N. Nielsen, D. H. Wall, D. R. Nemergut, D. M. McKnight. 2012. Extreme streams: flow intermittency as a control on diatom communities in meltwater streams in the McMurdo Dry Valleys, Antarctica. *Canadian Journal of Fisheries and Aquatic Sciences*. 69: 1405-1419, DOI: 10.1139/F2012-022.