

## ***Supplementary Material for ‘Sediment provenance in the Baker-Martínez fjord system (Chile, 48°S) indicated by magnetic susceptibility and inorganic geochemistry’***

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### **Content**

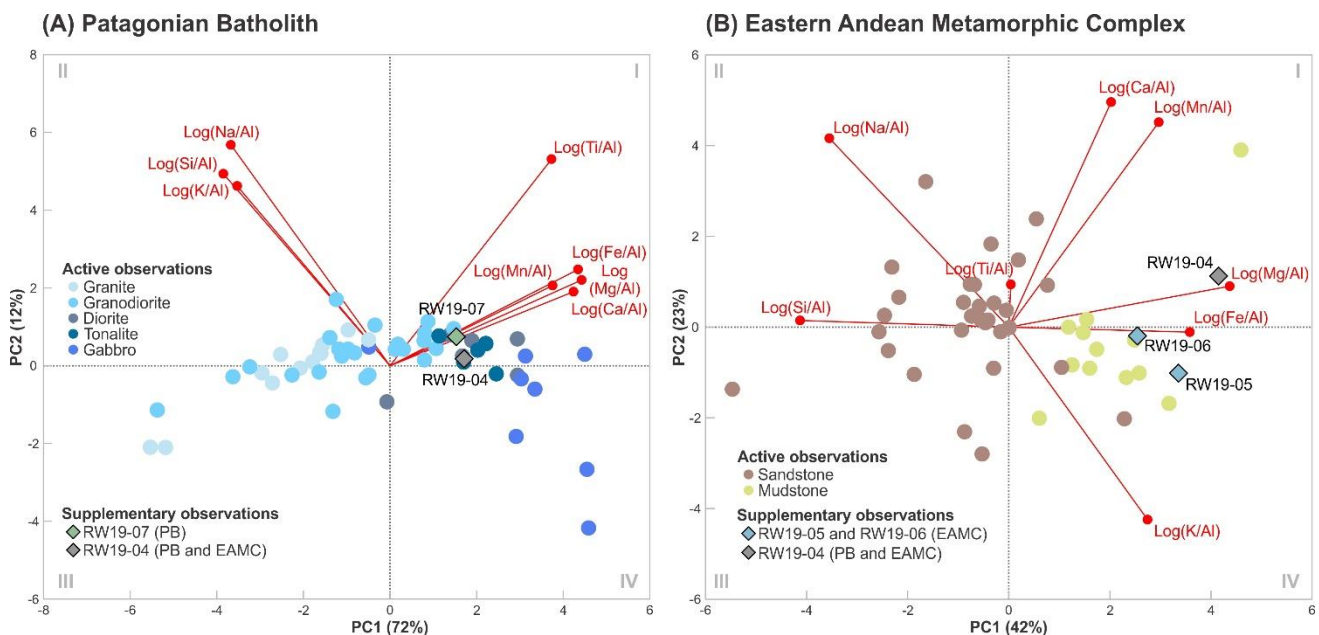
- Supplementary Table S1 (see separate Excel file)
- Supplementary Table S2
- Supplementary Text ‘Geochemical comparison of river suspended sediments with bedrock lithology’
- Figure S1
- References

**Table S2.** Correlation matrix of sedimentological and inorganic geochemical parameters measured on the fjord surface sediment samples. The Pearson correlation coefficient ( $r$ ) is indicated in blue and the  $p$ -value of the two-tailed test of significance ( $p$ ) in black. Correlations significant at the  $p < 0.01$  level are indicated in bold. Total organic carbon, biogenic opal and  $\text{CaCO}_3$  data are from De Wilde (2016) and Troch (2017).

	Total organic carbon (wt%)	Biogenic opal (wt%)	$\text{CaCO}_3$ (wt%)	Log(Fe/Al)	Log(K/Al)	Log(Mn/Al)	Log(Ti/Al)	Log(Zr/Al)
Total organic carbon (wt%)		0.00	0.00	0.89	0.68	0.36	0.88	0.63
Biogenic opal (wt%)	<b>0.72</b>		0.00	0.43	0.36	0.14	0.56	0.05
$\text{CaCO}_3$ (wt%)	<b>0.94</b>	<b>0.78</b>		0.45	0.74	0.25	0.74	0.29
Log(Fe/Al)	0.03	0.20	0.20		0.00	0.00	0.00	0.00
Log(K/Al)	0.10	0.24	0.09	<b>0.70</b>		0.00	0.05	0.00
Log(Mn/Al)	0.22	0.37	0.30	<b>0.77</b>	<b>0.64</b>		0.01	0.00
Log(Ti/Al)	-0.04	-0.15	0.09	<b>0.85</b>	0.46	0.57		0.02
Log(Zr/Al)	-0.12	-0.48	-0.28	<b>-0.89</b>	<b>-0.78</b>	<b>-0.74</b>	-0.54	

## Geochemical comparison of river suspended sediments with bedrock lithology

The major elemental geochemistry of the Patagonian Batholith and Eastern Andean Metamorphic Complex was compiled from the literature to relate the composition of each river suspended sediment sample (RW19) to specific bedrock lithologies within their watershed (Collins et al., 1998). Although Mesozoic and Cenozoic volcanic rocks, Miocene sedimentary rocks and fluvio-glacial deposits occur within the Baker and Pascua river watersheds (Fig. 1), these lithologies were not considered since (a) they only occur in minor proportions in the eastern part of the lower Baker River watershed and do not occur in the lower Pascua River watershed (Table 1), (b) sediments from the upper Baker River watershed are mainly trapped in lakes General Carrera and Cochrane, and those from the upper Pascua River watershed in Lake O'Higgins, and rarely reach the Baker-Martínez fjord system (HidroAysén, 2010; Vandekerckhove et al., 2020), (c) the Patagonian Batholith and Mesozoic and Cenozoic volcanic rocks are geochemically indistinguishable from each other (Liu et al., 2020), and (d) the higher precipitation and larger glacier cover in the western part of Baker River watershed cause faster erosion rates in, and larger sediment fluxes from, the west compared to the east (Fig. 1; Dussailant et al., 2012 and Amann et al., submitted).



**Figure S1.** Principal component biplots showing the geochemical composition of the various lithologies occurring in the (A) Patagonian Batholith (PB; Parada et al., 1997; Pankhurst et al., 1999; Hervé et al., 2007; Michelena and Kilian, 2015), and (B) Eastern Andean Metamorphic Complex (EAMC; Faúndez et al., 2002; Augustsson and Bahlburg, 2003) (active observations). P, Ba, Sr and Zr are not included since these elements were not analyzed by Pankhurst et al. (1999) and Michelena and Kilian (2015). The river suspended sediment samples are projected in the biplots (supplementary observations), according to the main lithology (PB and/or EAMC) occurring in their respective watersheds.

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