Table S1: Domain-averaged RACMO2.3p2 surface melt and melt season dates, defined as the first and last instance of three consecutive days of melt

Year	Melt (m w. e.)	Melt season dates	Melt season duration (days)
2011	2.72	4 June – 30 August	87
2012	3.03	26 May – 25 August	91
2015	1.65	13 June – 9 September	88
2016	2.81	9 May – 2 September	116

Table S2: SaDS model parameters.

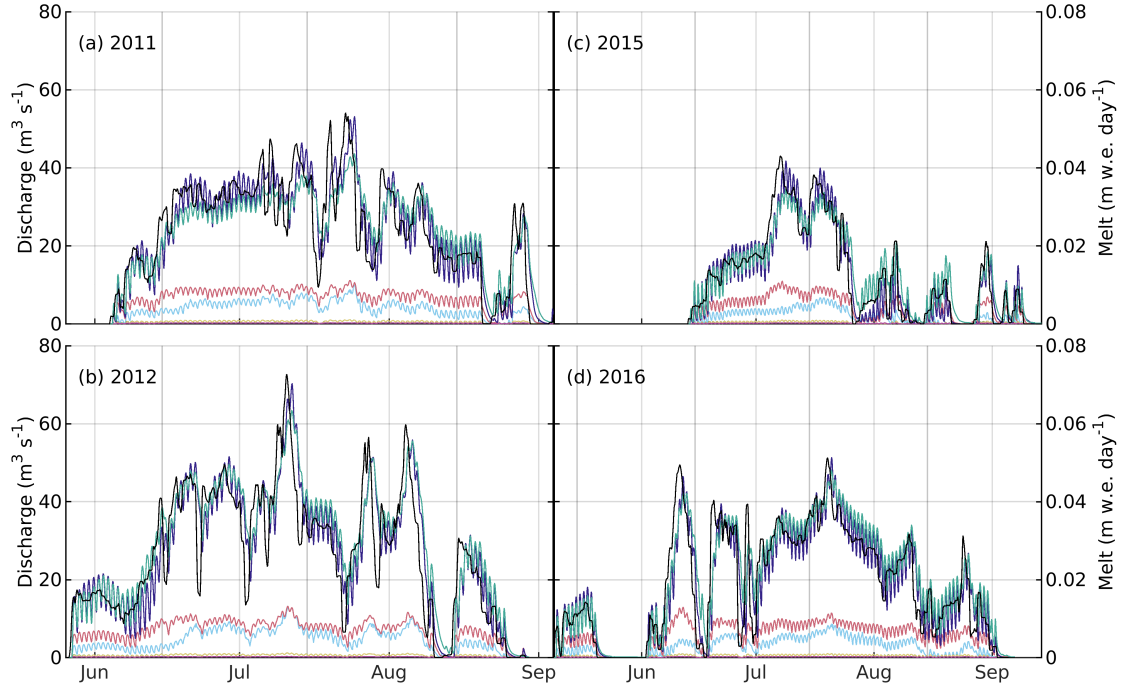| Parameter	Description	Value	Units
α_s	Distributed sheet flow exponent	$\frac{5}{4}$	-
β_s	Distributed sheet flow exponent	$\frac{3}{2}$	-
α_c	Channel flow exponent	$\frac{5}{3}$	-
β_c	Channel flow exponent	$\frac{3}{2}$	-
k_s	Distributed sheet hydraulic conductivity	1.0	$\mathrm{m}^{(2-\alpha_s)}\,\mathrm{s}^{-1}$
k_c	Channel hydraulic conductivity	15	$\mathrm{m}^{(2-\alpha_c)}\,\mathrm{s}^{-1}$
r	Channel width-to-depth ratio	5.0	-
ζ	Exchange ratio	0.2	-
dt	Timestep	20	s
ρ_i	Density of ice	910	$\mathrm{kg\,m}^{-3}$

Figure S1: Discharge into moulins in (a) 2011, (b) 2012, (c) 2015, and (d) 2016, with colours as in Figure 1. Light colours show instantaneous diurnal amplitude, and bold colours show the seven day moving average.
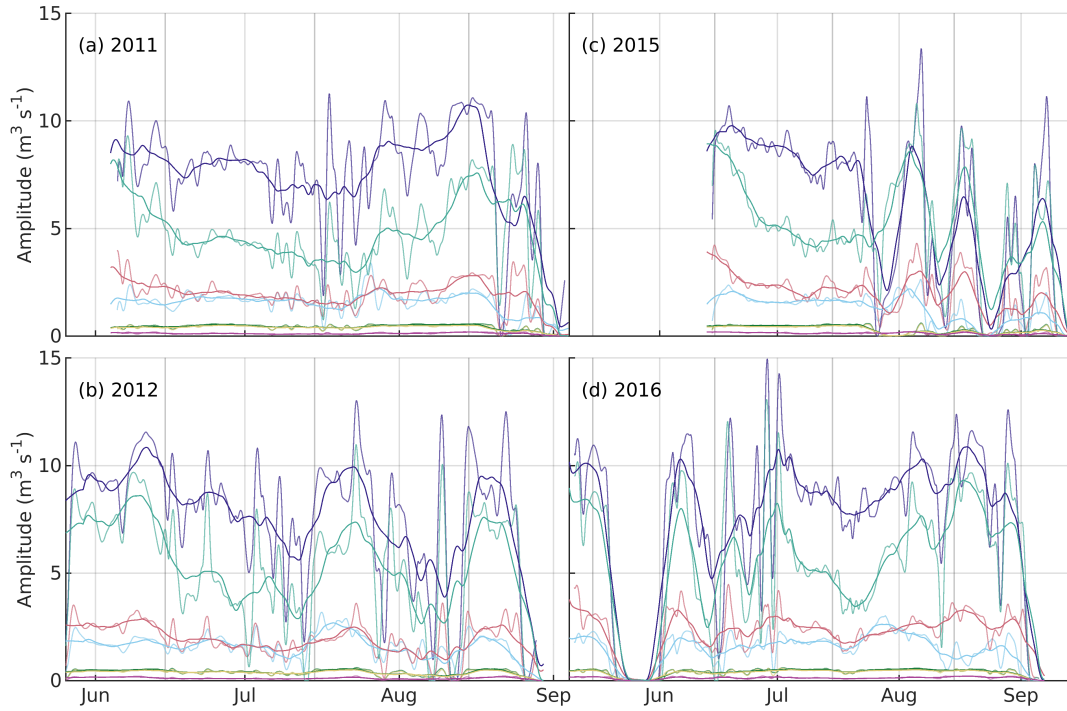

Figure S2: Diurnal amplitude of discharge into moulins in (a) 2011, (b) 2012, (c) 2015, and (d) 2016, with colours as in Figure 1.
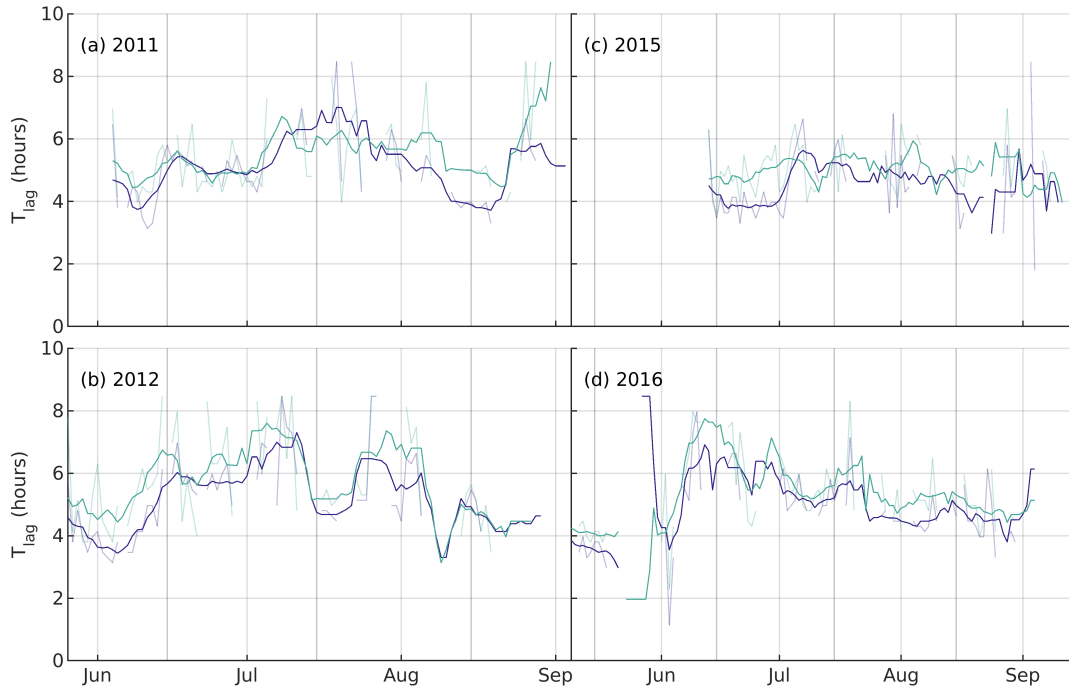
Figure S3: Lag time of moulin inputs for the two moulins with the highest input rate, with colours as in Figure S1.
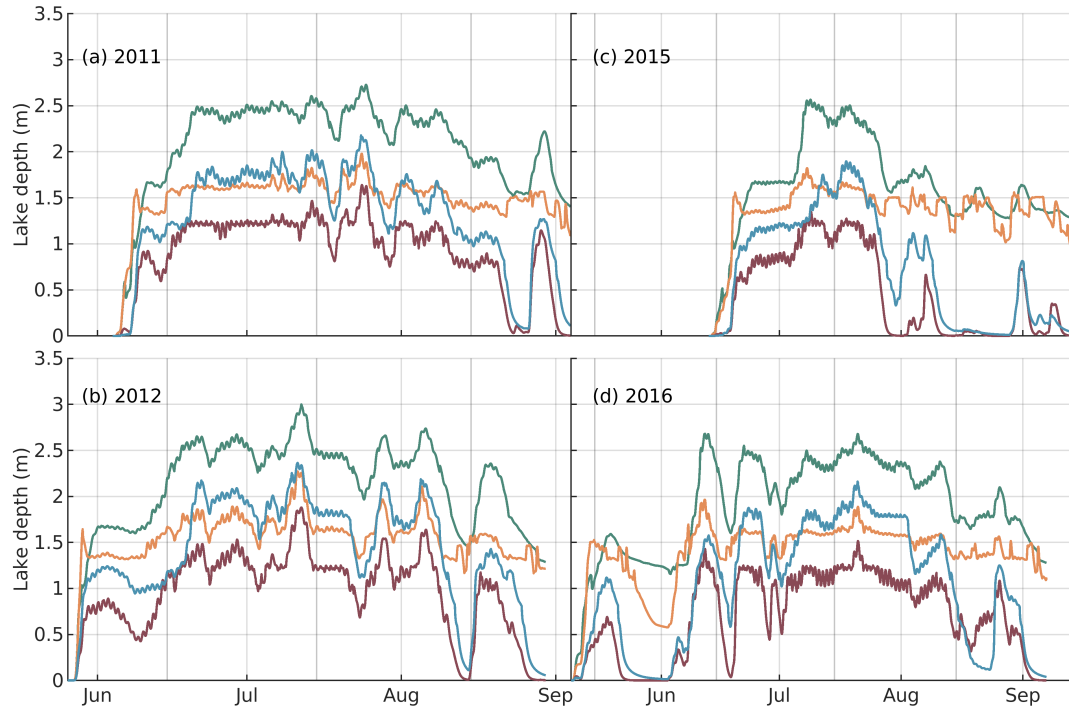

Figure S4: Supraglacial lake water depths for lakes L1 (green, elevation 1215 m), L2 (gold, elevation 1218 m), L3 (red, elevation 1276 m), and L4 (blue, elevation 1387 m).
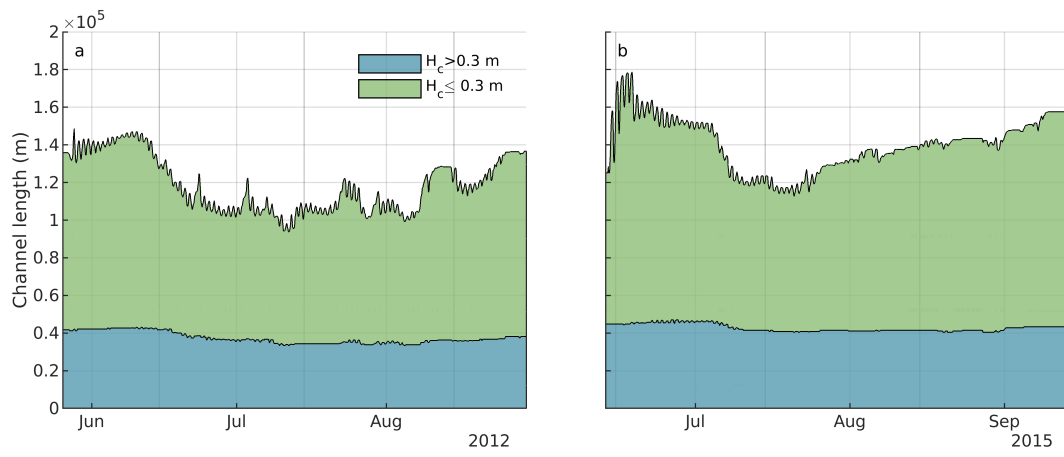
Figure S5: Cumulative length of incised supraglacial channels, partitioned between large (incision depth $H_c > 0.3\ m$) and small channels ($H_c \leq 0.3$ m), for (a) 2012 and (b) 2015.