Supporting Information for "Moulin density impacts the effect of subglacial hydrology on ice dynamics"

B. de Fleurian[1], P. M. Langebroek[2]

[1]Department of Earth Science, University of Bergen, Bjerknes Centre for Climate Research, Bergen, NORWAY

[2]NORCE Norwegian Research Centre AS, Bjerknes Centre for Climate Research, Bergen, NORWAY

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Introduction This document presents two figures following the one produced in the main manuscript but for the ensembles that are not shown in the manuscript. We also present here a table containing the main parameters of the model and the values that were used for this study.

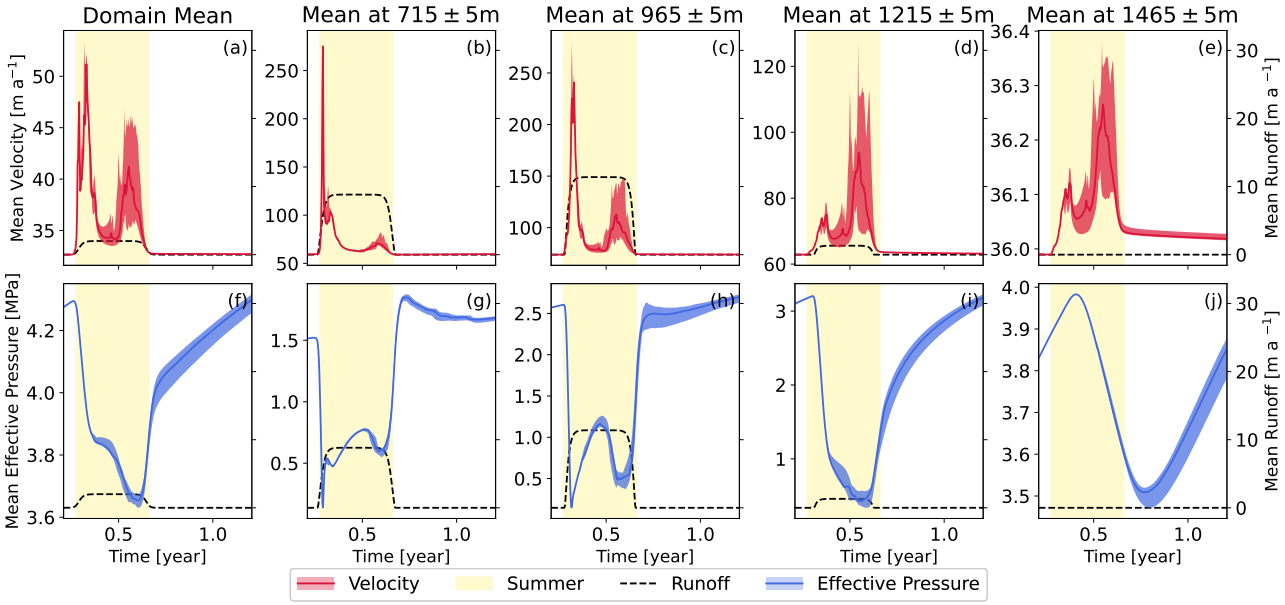

Figure S1. Evolution of velocities (a to e) and effective pressures (f to j) presented as a mean value for the whole domain (a and f) or a given elevation band (b-e and g-j) for the *Fine* ensemble. The red line and shading show the mean ensemble and spread of the velocity respectively. In the same way, the blue colour represents the effective pressure while the dashed black line is the runoff presented on the right axis. Note that the runoff axis is the same for every plot but that this is not true for the velocity and effective pressure axes. The yellow shading represents the summer period from day 100 to 241.

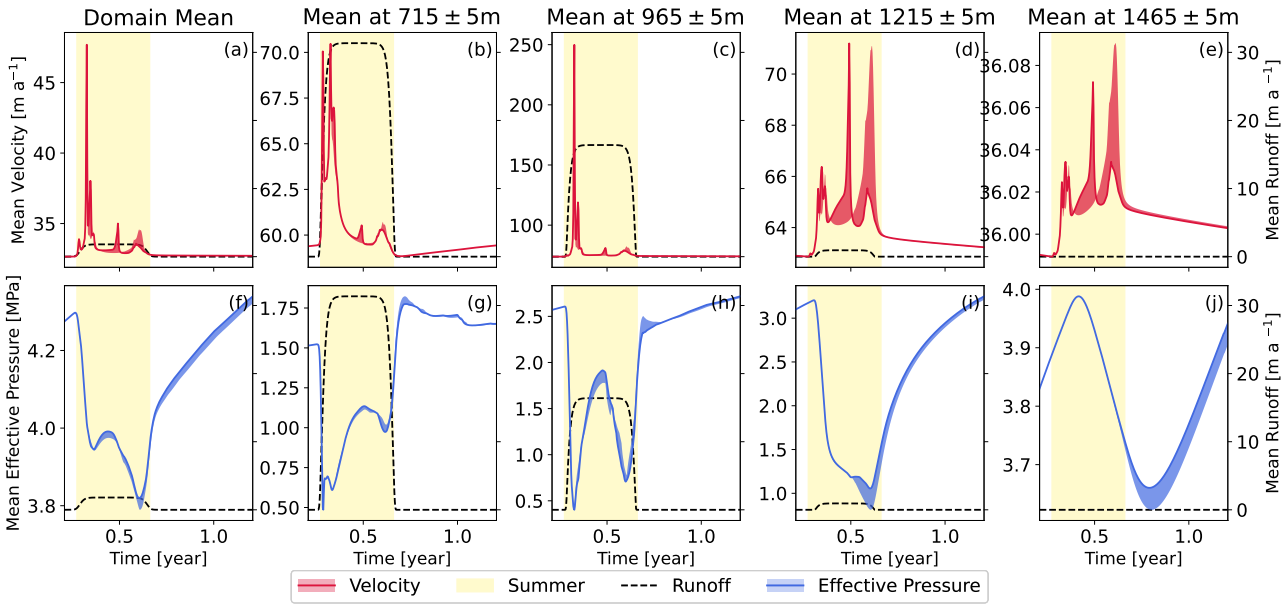

Figure S2. Evolution of velocities (a to e) and effective pressures (f to j) presented as a mean value for the whole domain (a and f) or a given elevation band (b-e and g-j) for the *Mid* ensemble. The red line and shading show the mean ensemble and spread of the velocity respectively. In the same way, the blue colour represents the effective pressure while the dashed black line is the runoff presented on the right axis. Note that the runoff axis is the same for every plot but that this is not true for the velocity and effective pressure axes. The yellow shading represents the summer period from day 100 to 241.

Table S1. Values of the model parameters.

Symbol	Parameter	Value
e_s	IDS thickness	20 m
e_e	EDS initial thickness	5.0×10^{-3} m
K_s	IDS conductivity	2.0×10^{-3} ms^{-1}
K_e	EDS conductivity	9.0×10^{1} ms^{-1}
ω	porosity	0.4
γ	leakage time	1.0×10^{-9} s^{-1}
A_s	Sliding Parameter	3.2×10^{-21} m $Pa^{-3}s^{-1}$
C	Iken's Bound	0.35
ρ_w	water density	$1,000$ kgm^{-3}
ρ_i	ice density	910 kgm^{-3}
g	gravitational acceleration	9.8 ms^{-2}
L	latent heat of fusion for the ice	3.34×10^{5} Jkg^{-1}
A	Glen's flow law parameter	6.34×10^{-25} $Pa^{-1}s^{-1}$
n	Glen's flow law exponent	3
μ	water viscosity	1.78×10^{-3} Nsm^{-2}
β_w	water compressibility	5.0×10^{-10} Pa^{-1}