

Supplementary Material for “Water flow through sediments and at the ice-sediment interface beneath Sermeq Kujalleq (Store Glacier), Greenland”

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Introduction

The supplementary material includes two tables and four figures.

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Table S1: Statistics and notes for the boreholes drilled in 2019. Note that the drill-indicated maximum depths underestimate actual depth as they do not account for the elastic extension of the hose under load, with a disparity for full-depth boreholes of 1-2%. Two boreholes were abandoned when the drill hose started to snag, which we attribute to an insufficient borehole diameter caused by drilling too quickly.

Borehole	Date/time drilling started (UTC)	Max. drilling depth (m)	Notes
BH19a	2 July 2019 14:45	115.0	Abandoned
BH19b	2 July 2019 17:06	400.0	Geophone string
BH19c	4 July 2019 12:20	1031.0	Thermistor string, vibrating wire piezometer, and fibre optic cable
BH19d	12 July 2019 12:19	20.0	Seismic sparker
BH19e	12 July 2019 12:21	1013.3	Thermistor string and vibrating wire piezometer
BH19f	21 July 2019 11:12	180.0	Abandoned
BH19g	21 July 2019 16:39	1017.4	Current-loop pressure transducer

Table S2: Constants in the polynomial $y(t)$ of Equation 10 with error estimation.

Constant	Value
c_1	$+0.156 \pm 0.007 \text{ min}^{-2}$
c_2	$-0.540 \pm 0.0018 \text{ min}^{-3}$
c_3	$+0.920 \pm 0.02 \text{ min}^{-4}$
f_D	$+0.168 \pm 0.003$

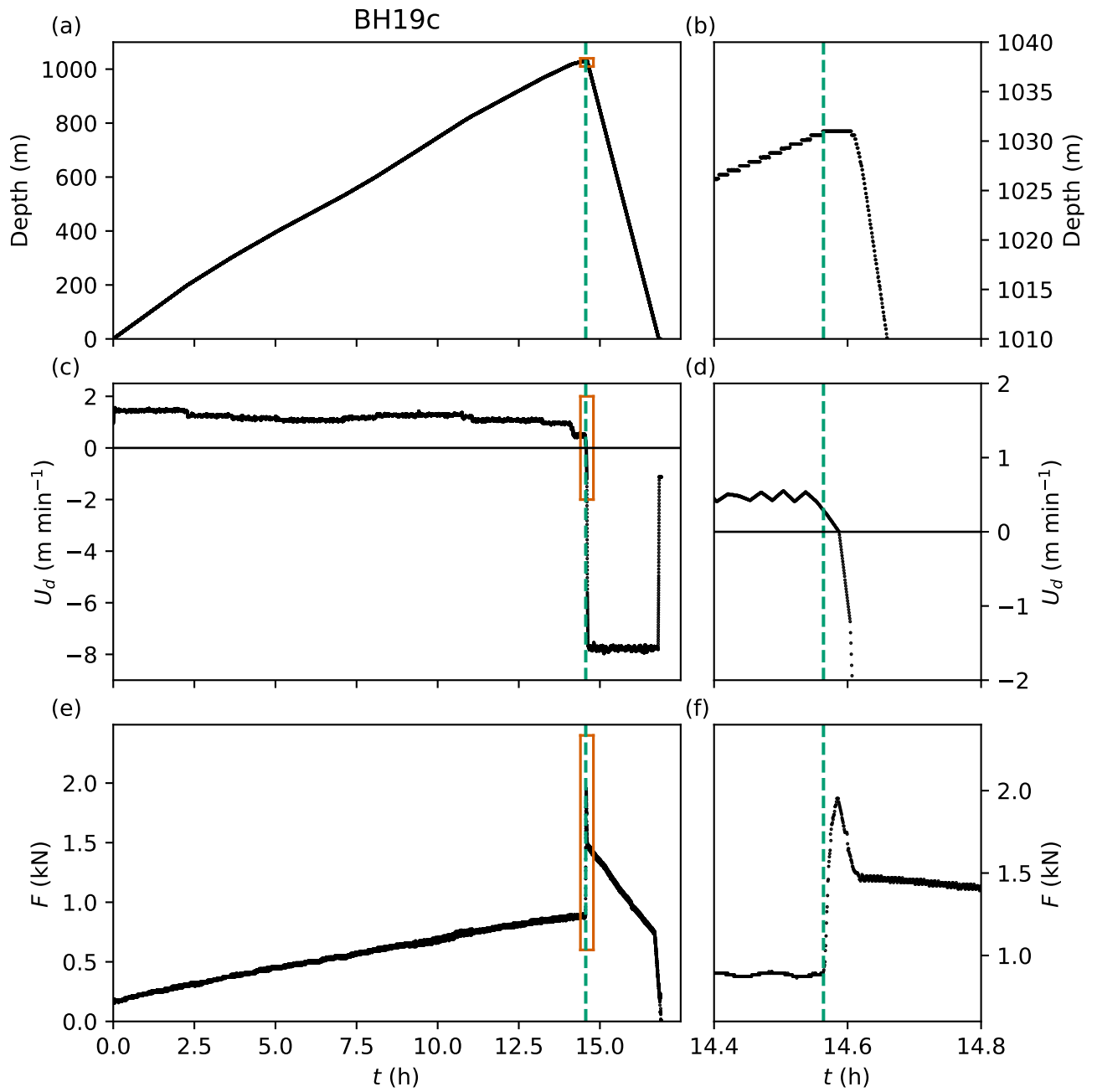


Figure S1: Time series of drill (a,b) depth, (c,d) velocity, and (e,f) force recorded on the drill tower during the drilling of BH19c. The extent of (b), (d), and (f) are shown by red outlines on (a), (c), and (e). Green vertical dashed lines marking the point of breakthrough.

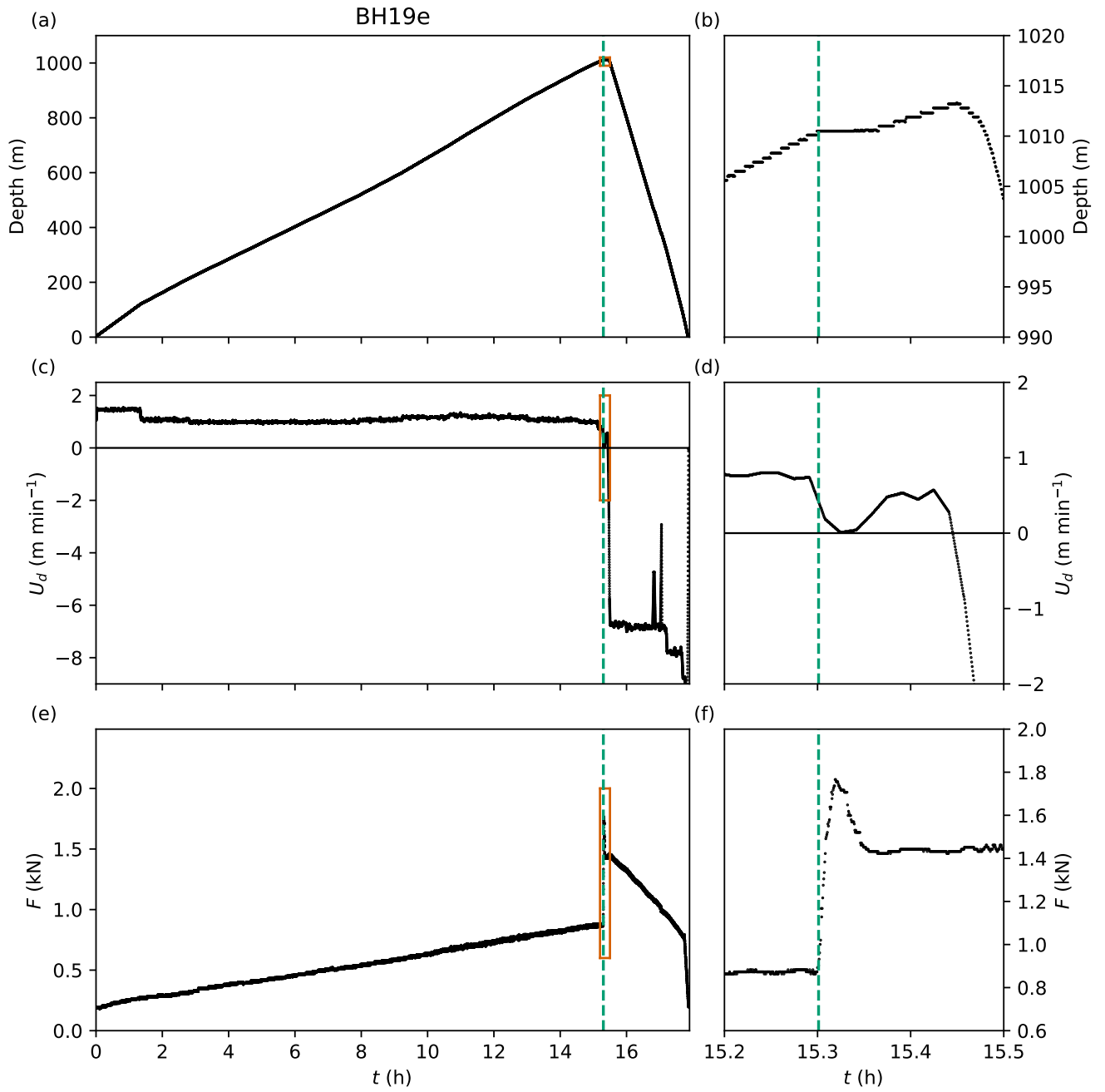


Figure S2: Plot of drill records for BH19e. See Figure S1 for a description.

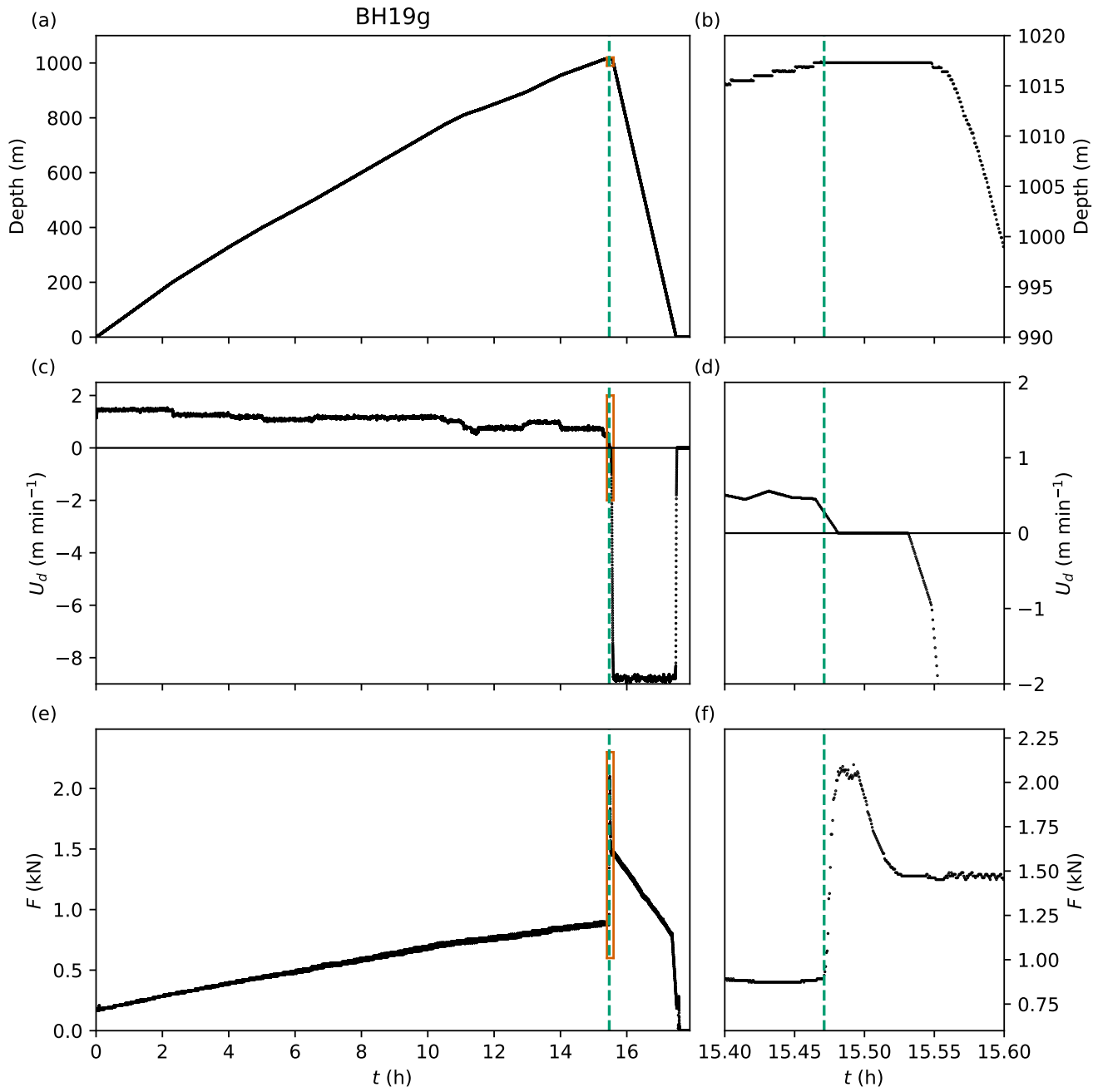


Figure S3: Plot of drill records for BH19g. See Figure S1 for a description.

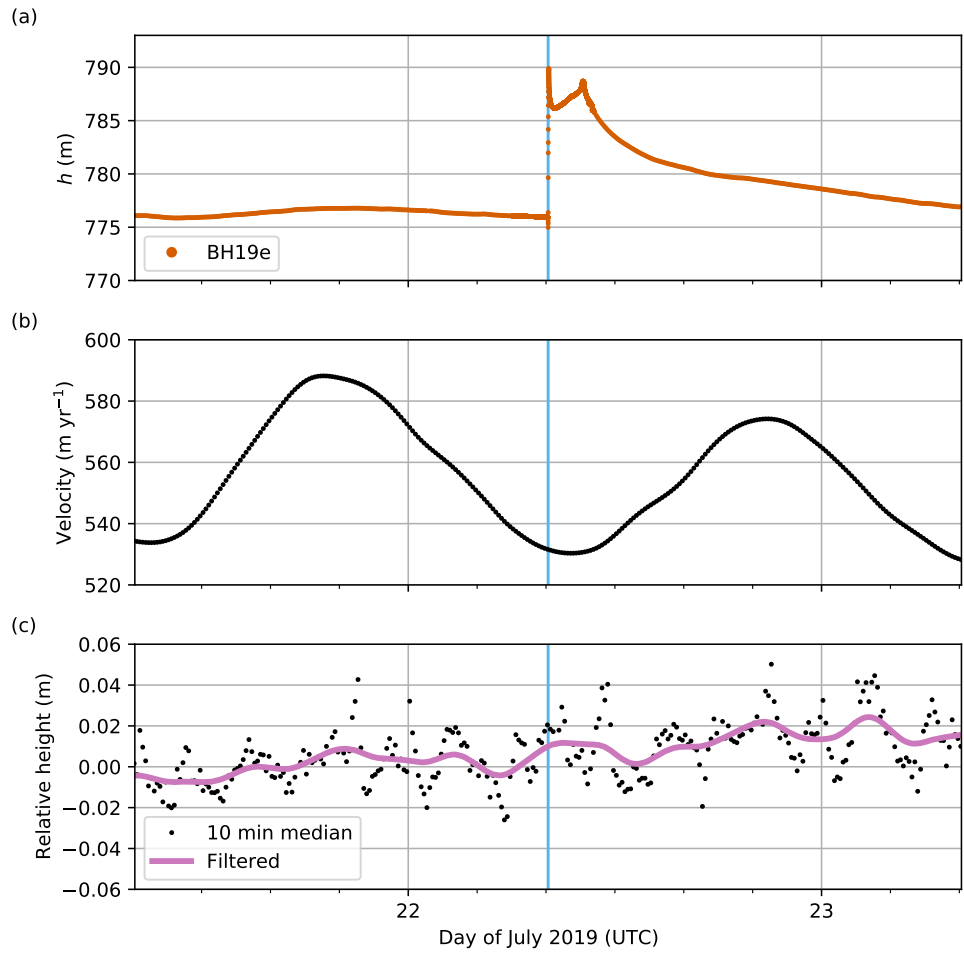


Figure S4: Time series of (a) hydraulic head in BH19e, (b) ice surface horizontal velocity and (c) relative surface height centred on the time of BH19g breakthrough, which is marked by the vertical blue line.