Extended Data Table 1 Constrains used in estuary calculations

From: Development of ice-shelf estuaries promotes fractures and calving

Petermann Ice Shelf	Value	Uncertainty	Source
River duration (N)	59 d yr^{-1}	57- 60 d yr^{-1}	Landsat 8 imagery
Elevation change rate ($\frac{dh}{dT}$)	-0.27 m yr^{-1}	± 0.03 m yr^{-1}	Calculated from Washam et al.[1]
Initial channel elevation (h_i)	3.5 m	± 0.1 m	OIB DMS DEM[2,3]
Nansen Ice Shelf			
Waterfall duration (N)	18 d yr^{-1}	± 9.4 d yr^{-1}	Calculated and taken from Bell et al.[4]
Elevation change rate ($\frac{dh}{dT}$)	-0.018 m yr^{-1}	± 0.049 m yr^{-1}	Paolo et al.[5]
Initial channel elevation (h_i)	16 m	± 0.1 m	Bell et al.[4], OIB ATM[6]
Larsen B Ice Shelf			
Melt season duration (a)	55 d yr^{-1}	± 3.65 d yr^{-1}	Calculated from Scambos et al.[7]
Elevation change rate ($\frac{dh}{dT}$)	-0.17 m yr^{-1}	±0.11 m yr^{-1}	Shepherd et al. [8]
Initial channel elevation (h_i)	14.86 m	NA	Calculated from Rack and Rott[9]
Pine Island Ice Shelf			
Melt season duration (a)	37 d yr^{-1}	NA	Trusel et al.[10,11]
Elevation change rate ($\frac{dh}{dT}$)	-0.1480 m yr^{-1}	± 0.062 m yr^{-1}	Paolo et al.[5]
Initial channel elevation (h_i)	50.4 m	± 0.1 m	REMA

Constraints used in the estuary formation and timing calculations shown in Fig. 4a

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