

ONLINE RESOURCE 1

Article title: **Post-glacial carbon stocks in two restricted Patagonian fjord basins (52°S) using acoustic profiles and sediment cores**

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Fig. S1 Empirical variograms and fitted Gaussian models for the four geostatistically simulated surfaces. *a* BC basin floor. *b* BC basal acoustic horizon. *c* BT basin floor. *d* BT basal acoustic horizon. Grey points: empirical semivariance, marker size proportional to the number of point pairs per lag bin. Orange line: fitted Gaussian model ($z \sim 1$, multi-start fitting with four initial ranges per surface). Fitted parameters in Table S1.

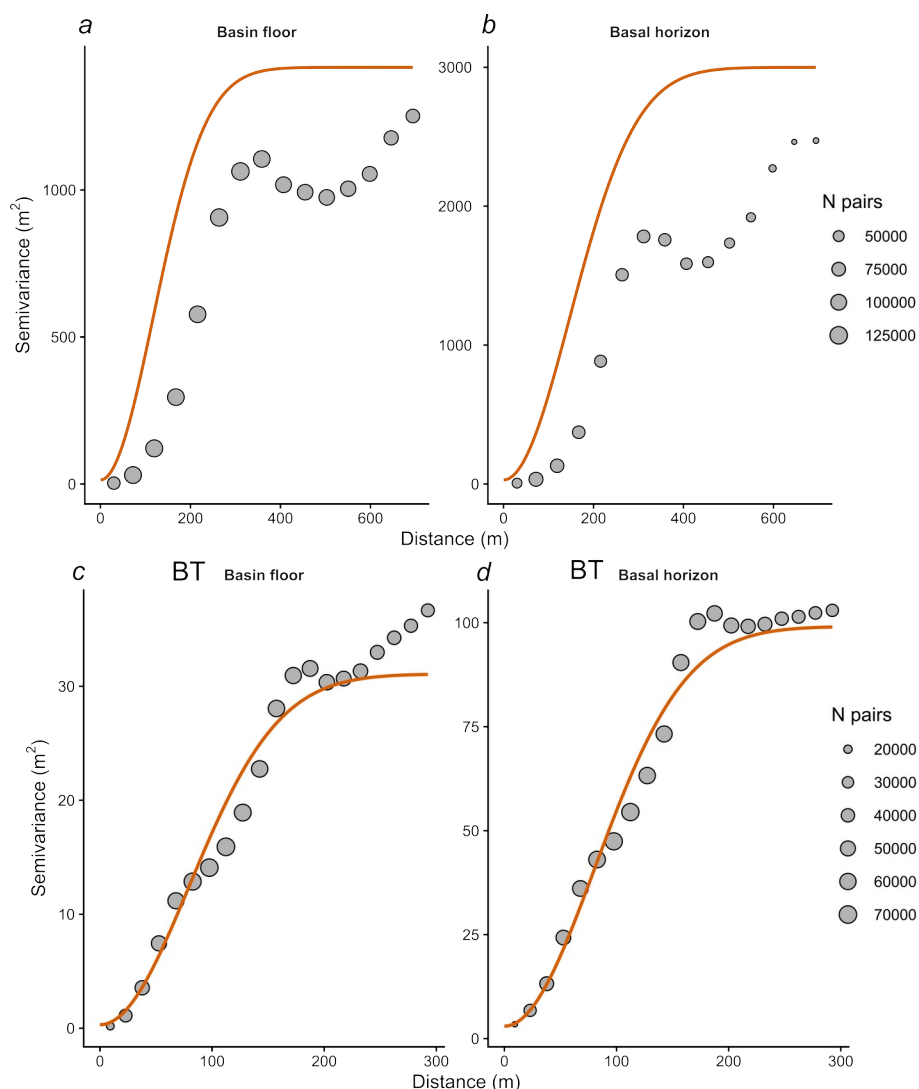


Fig. S2 Leave-one-out cross-validation diagnostics for the four acoustic surfaces conditioning the sequential Gaussian simulation. Rows correspond to surfaces: a BC basin floor. b BC basal acoustic horizon. c BT basin floor. d BT basal acoustic horizon. Columns show three diagnostics for each surface: (1) predicted versus observed depth, with the 1:1 relation shown as a dashed line and RMSE, mean error and R^2 annotated; (2) residuals (predicted – observed) against observed depth, with a horizontal reference at zero; (3) normal quantile-quantile plot of the residuals, with a straight reference line indicating perfect normality.

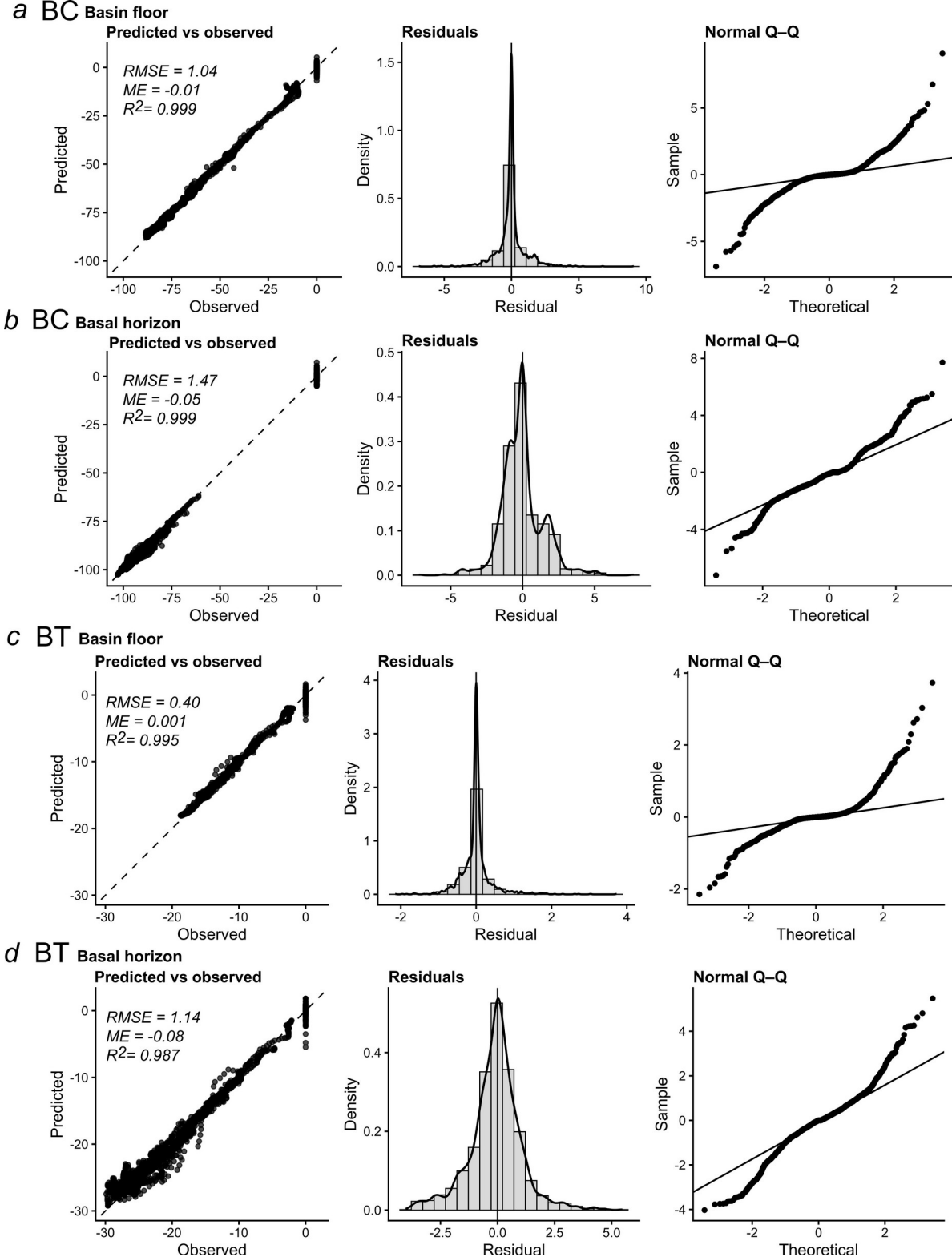


Fig. S3 Standard deviation of simulated sediment thickness across the 1000 realisations of the sequential Gaussian simulation. *a* Bahía Caribe (BC). *b* Bahía Trampa (BT). Colour scale: standard deviation in metres. Survey tracks are overlain as thin black lines.

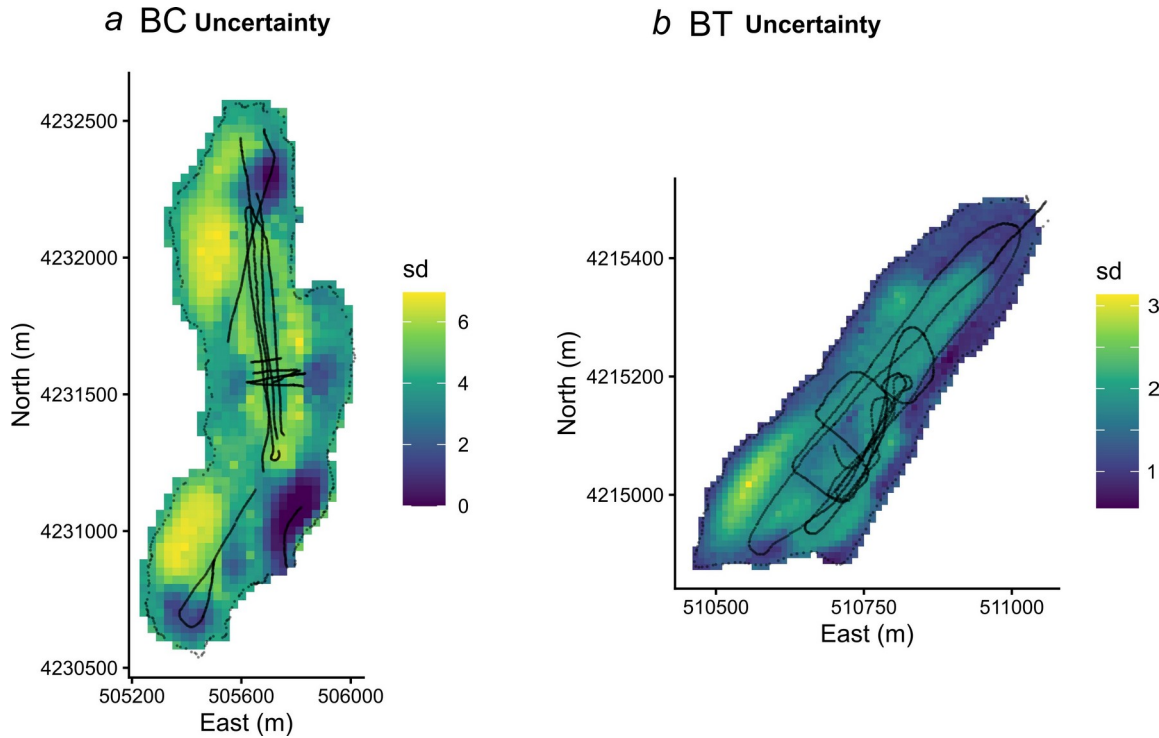


Fig. S5 Full-column basin carbon stocks under the two scenarios of the stratigraphic sensitivity analysis (§3.3). *a* Bahía Caribe (BC). *b* Bahía Trampa (BT). Green: organic carbon; purple: inorganic carbon. Scenario A: cored-interval-only lower bound. Scenario B: constant-density default, used for the main stock estimate. Error bars: 95% simulation intervals from the 1000 conditional simulation realisations.

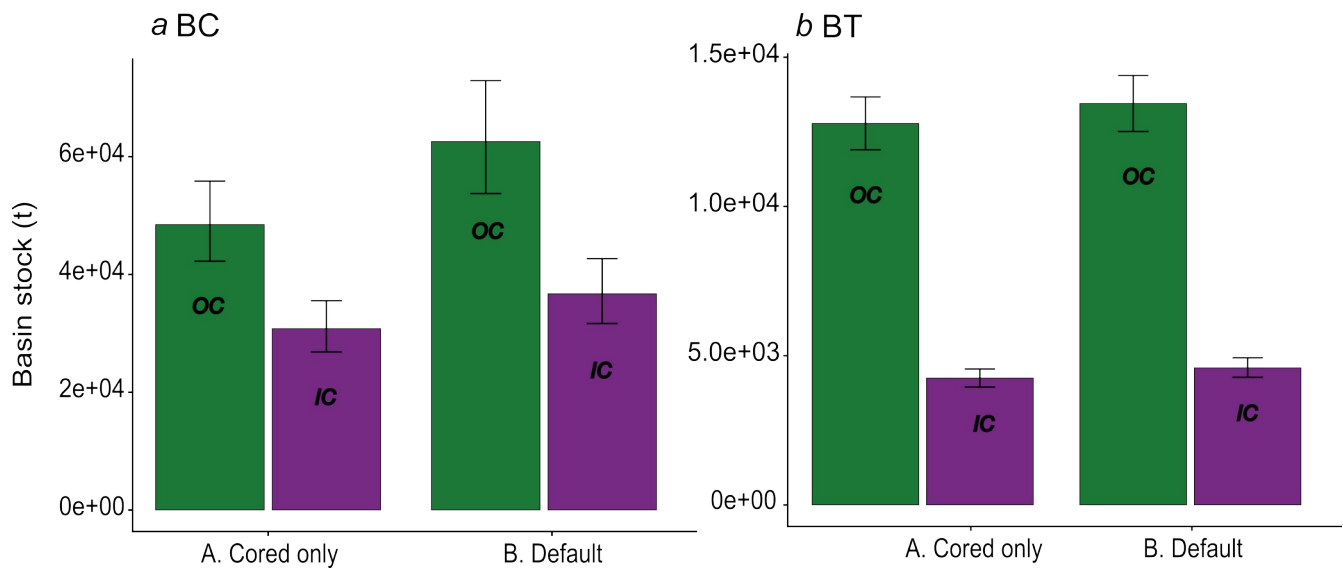


Table S1 Fitted parameters of the Gaussian variogram models used for the conditional simulation of each acoustic surface. The same fitting procedure ($z \sim 1$, multi-start with four initial range values, weighted least squares method 7) was applied uniformly to the four surfaces. Nugget and partial sill in m^2 ; range in m.

Basin	Surface	Model	Nugget	Partial sill	Range (m)	R^2	RMSE (m)	ME (m)
BC	Basin floor	Gau, $z \sim 1$	14	1403	331	0.999	1.04	-0.01
BC	Basal horizon	Gau, $z \sim 1$	30	2970	416	0.999	1.47	-0.05
BT	Basin floor	Gau, $z \sim 1$	0.3	31	178	0.995	0.40	0.00
BT	Basal horizon	Gau, $z \sim 1$	3.0	96	180	0.987	1.14	-0.08

Table S2 Upper-10-cm carbon inventories per replicate gravity core in the two basins (Bahía Caribe, BC; Bahía Trampa, BT). TOC_10cm and TIC_10cm are the total organic and total inorganic carbon inventories over the upper 10 cm of sediment (kg C m^{-2}), obtained from the depth-integrated volumetric carbon densities in each replicate core. TC_10cm is the sum of TOC_10cm and TIC_10cm. NA indicates cores in which OC and IC were not analysed separately; the corresponding TC_10cm was measured directly.

Core	TOC_10cm	TIC_10cm	TC_10cm
BCGr1	NA	NA	2.4
BCGr2	1.24	0.71	1.95
BCGr3	1.64	0.98	2.62
BTGr1	1.88	0.51	2.39
BTGr2	NA	NA	2.52
BTGr3	1.71	0.46	2.17