Supplement to: Nuclear Waste Unveils Three Decades of Anthropogenic Carbon in the Canadian Arctic Ocean

Annabel Payne[1], Lorenza Raimondi[1], Anne-Marie Wefing[2], Christof Vockenhuber[1,3], Habacuc Pérez-Tribouillier[1,3], William Williams[4], Sarah Zimmermann[4], and Núria Casacuberta[1,3]

[1]*Department of Environmental Systems Science, ETHZ, Zürich, Switzerland*
[2]*Norwegian Polar Institute, Tromsø, Norway*
[3]*Laboratory of Ion Beam Physics, Department of Physics, ETHZ, Zürich, Switzerland*
[4]*Fisheries and Oceans Canada, Institute of Ocean Sciences, Sidney, BC, Canada*

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Information

This document includes:

- Supplementary figures S1, S2, S3, S4, S5, S6, S7.

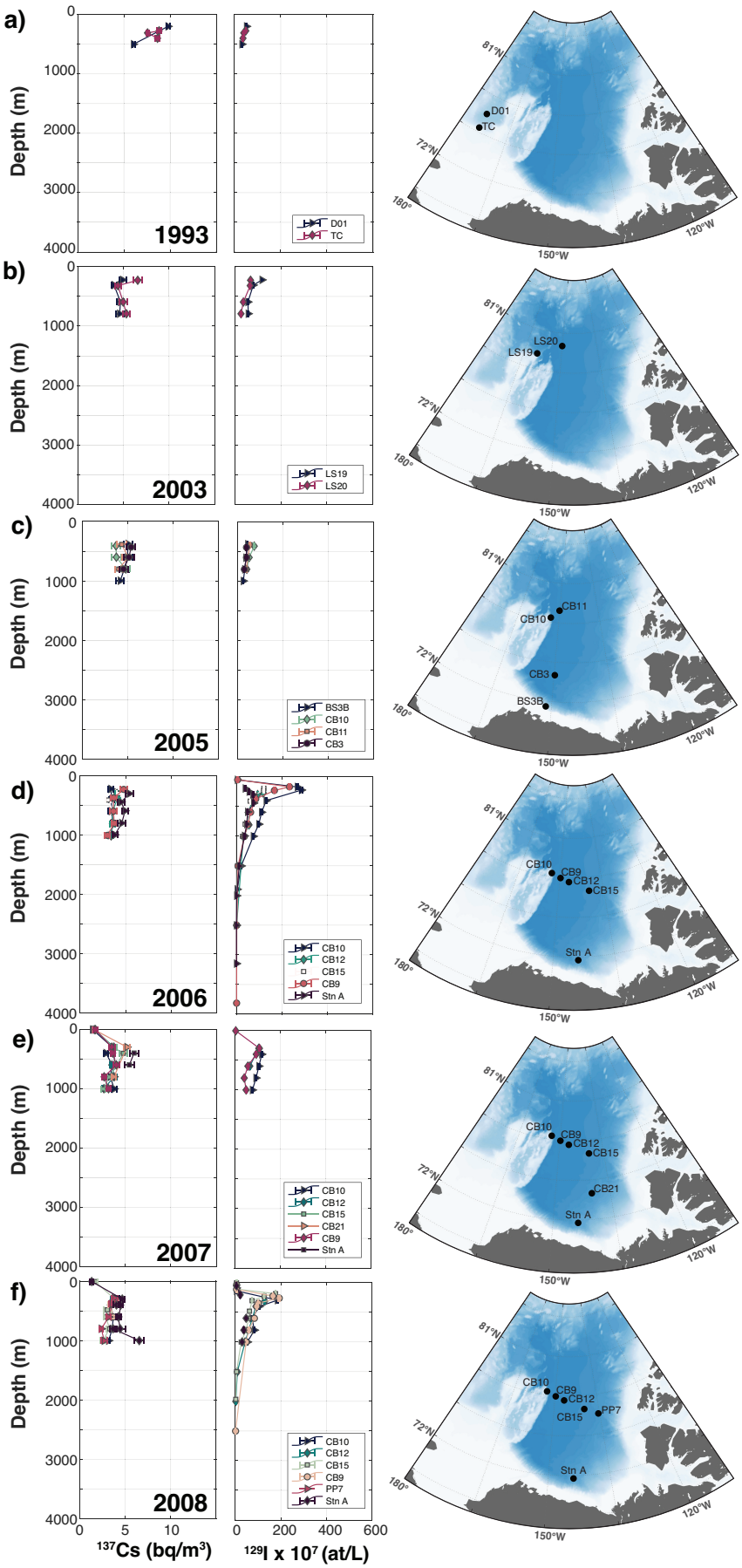

Figure 1: Depth profiles of all paired ^{137}Cs and ^{129}I data included in this study (1993-2008), error bars are measurement uncertainties.

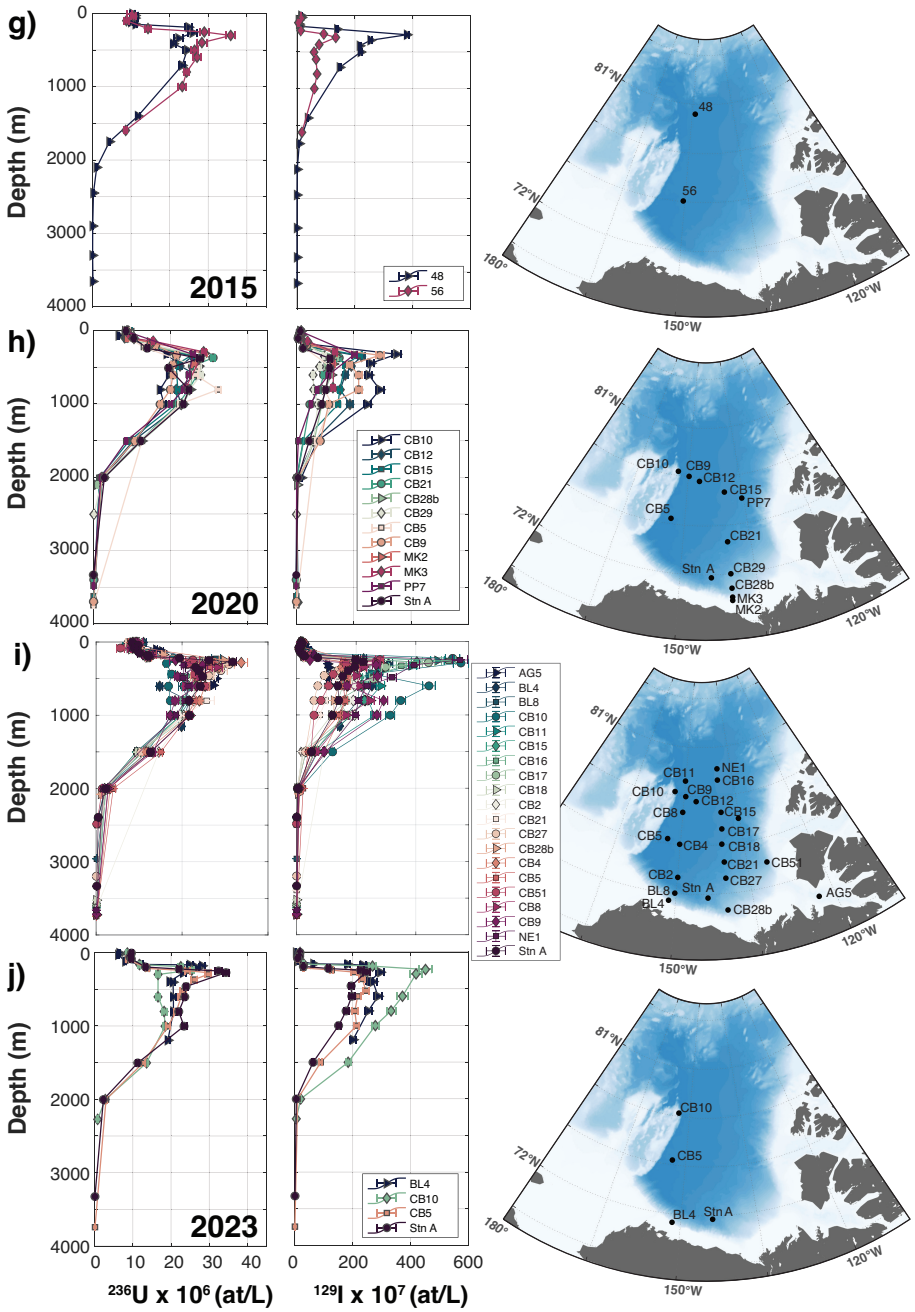

Figure 2: Depth profiles of all paired ^{236}U and ^{129}I data included in this study (2015-2023), error bars are measurement uncertainties.

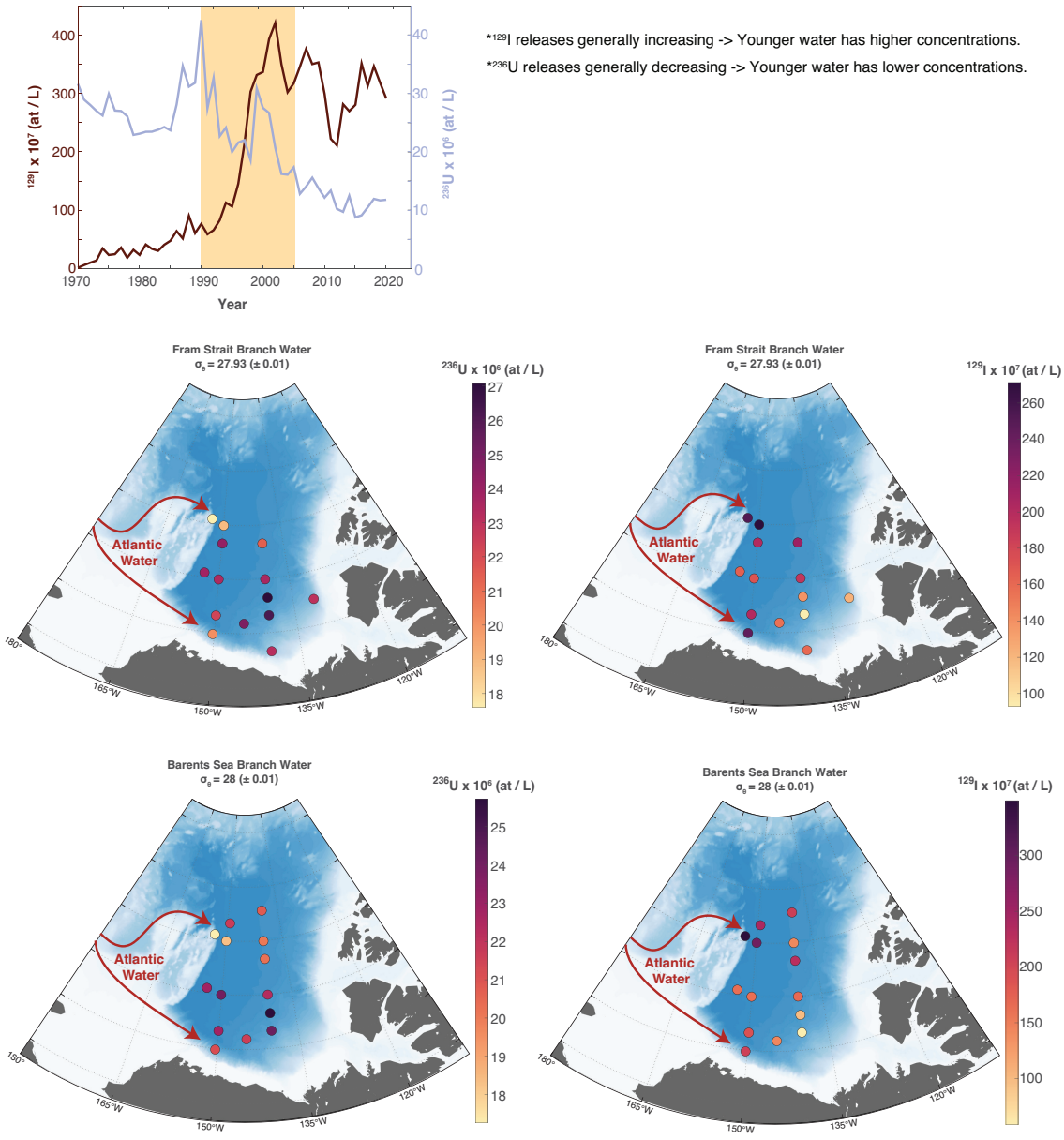

Figure 3: 2022 JOIS/BGOS ^{129}I and ^{236}U data plotted as dAW and core AW isosurface plots. The input function is inset, highlighting the input function region where Atlantic Water measured in the Canada Basin could have been tagged with the nuclear reprocessing tracer signal (≈35 - 20 years ago). This means that younger waters entering the basin will have higher (and increasing) ^{129}I signals, and lower (and decreasing) ^{236}U signals.

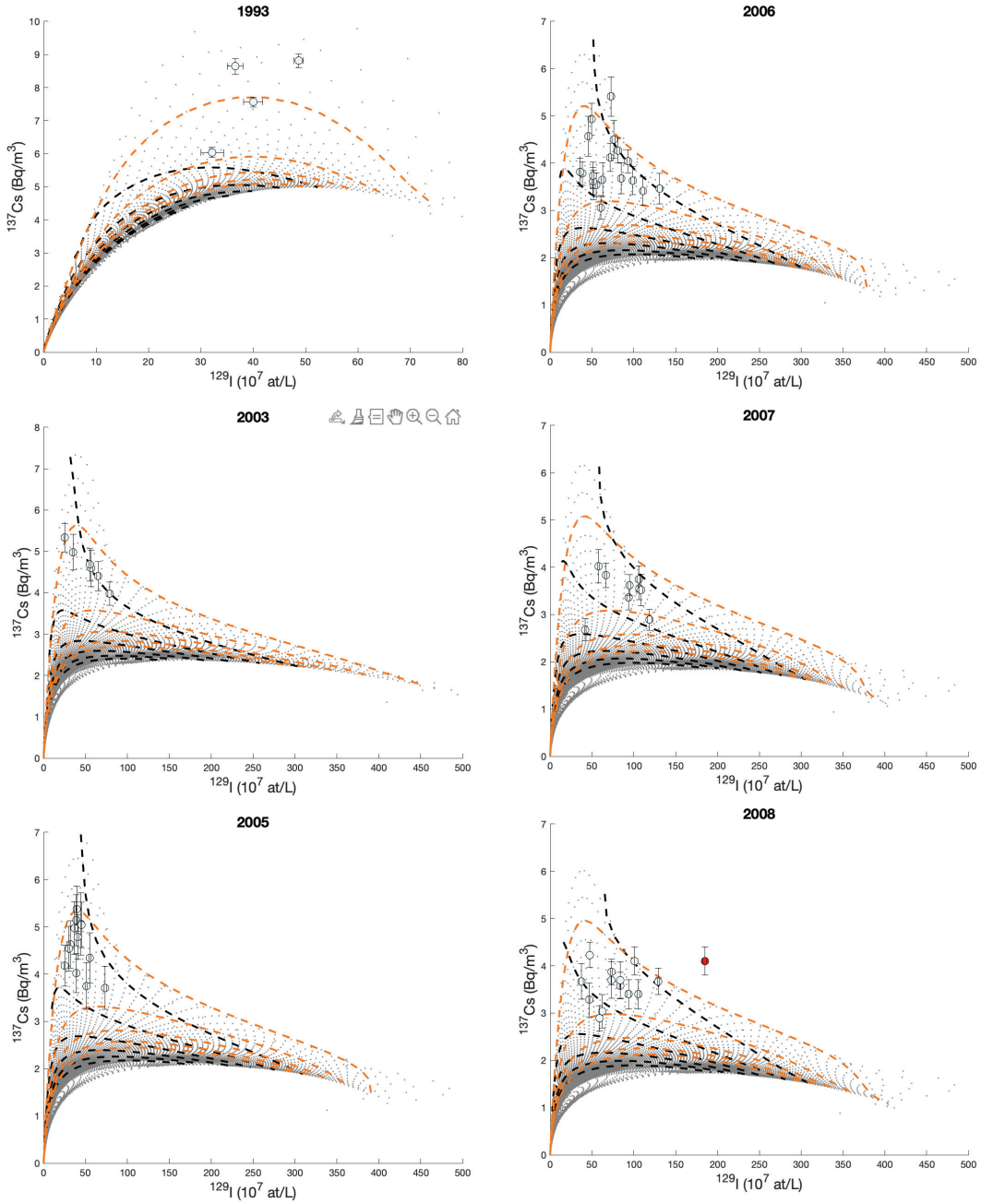

Figure 4: TTD Grids for each year with all data within the Atlantic Water (1993-2008). The axes are labelled with water concentration values of each tracer. Each dot represents the possible Δ-Γ combinations using the Atlantic layer input function. White markers are data we included in the following C_{ant} calculations, and red markers are excluded as they do not fit within the TTD domain. Error bars are the calculated measurement error. Note that the shape of the grid depends on each tracer's input function and is unique for each year and tracer pair. Orange dashed lines are Δ isolines; black lines are Γ isolines.

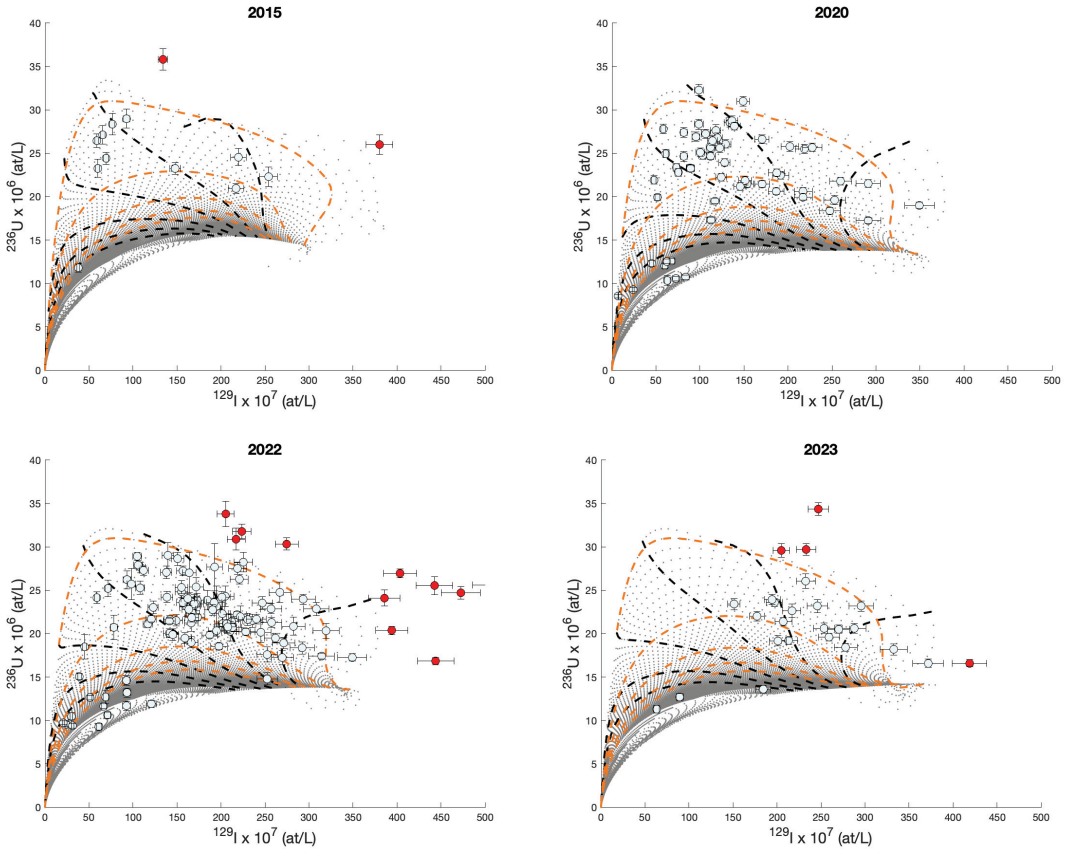

Figure 5: TTD Grids for each year with all data within the Atlantic Water (2015-2023). The axes are labelled with water concentration values of each tracer. Each dot represents the possible Δ-Γ combinations using the Atlantic layer input function. White markers are data we included in the following C_{ant} calculations, and red markers are excluded as they do not fit within the TTD domain. Error bars are the calculated measurement error. Note that the shape of the grid depends on each tracer's input function and is unique for each year and tracer pair. Orange dashed lines are Δ isolines; black lines are Γ isolines.

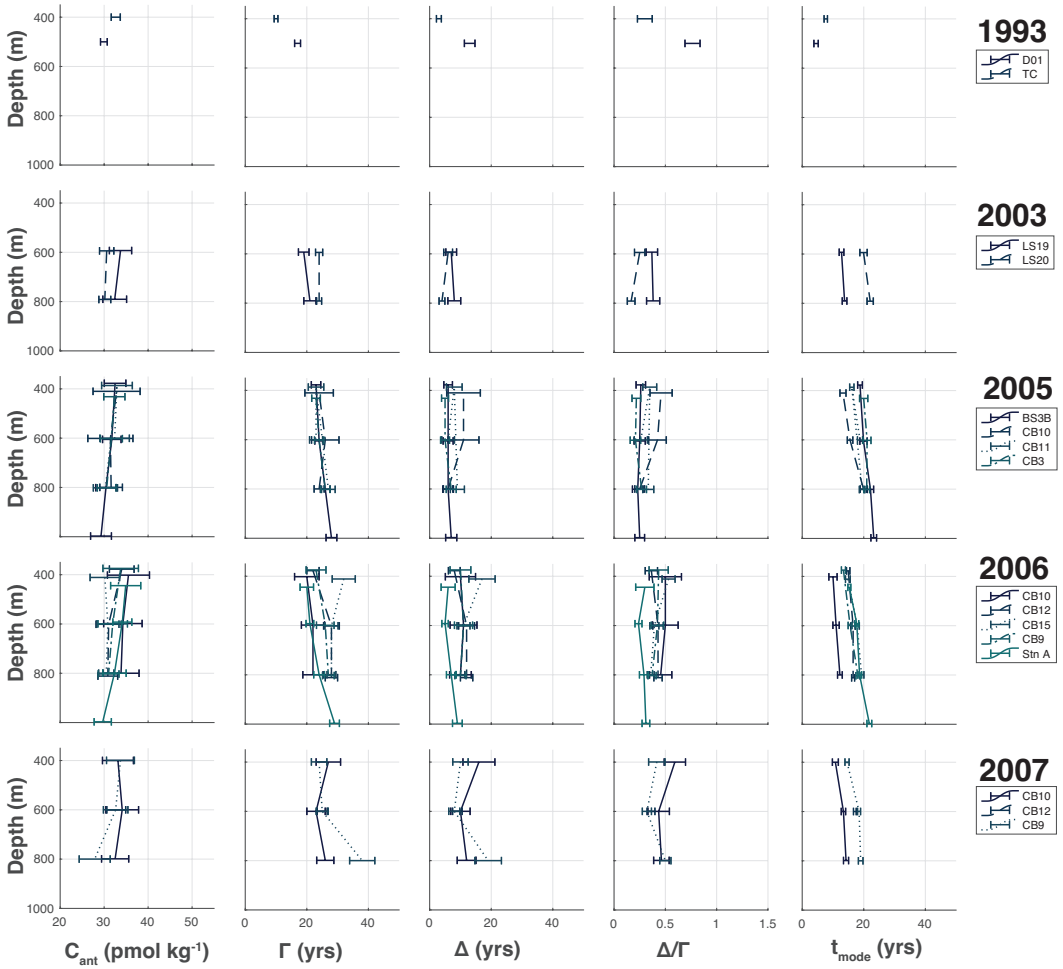

Figure 6: Depth profiles of TTD Parameters and C_{ant} for years 1993-2008. Error bars are the uncertainty from Monte-Carlo simulations. C_{ant} errors are calculated by propagating Δ and Γ uncertainties.

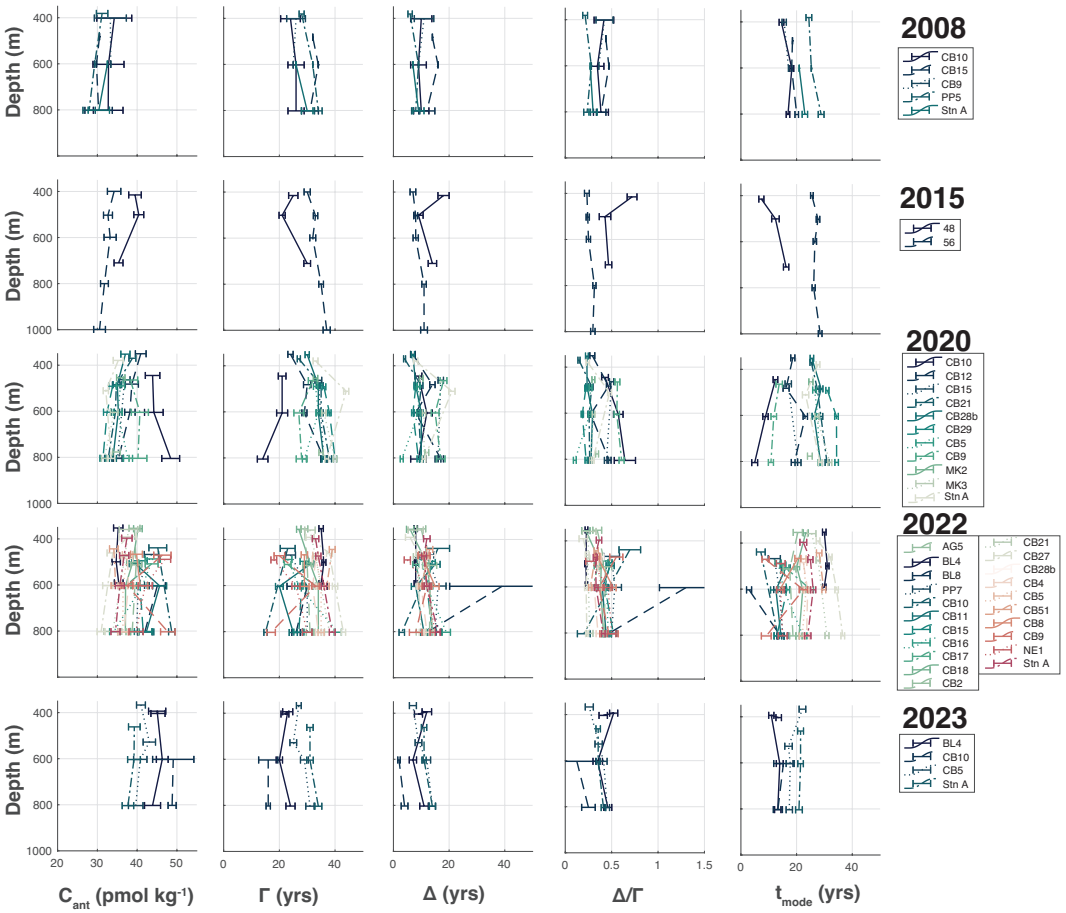

Figure 7: Depth profiles of TTD Parameters and C_{ant} for years 2015-2023.Error bars are the uncertainty from Monte-Carlo simulations. C_{ant} errors are calculated by propagating Δ and Γ uncertainties.