

The Malina oceanographic expedition: understanding the impact of climate change on the fate of terrestrial carbon exported to the Arctic Ocean

Philippe Massicotte¹, xxx xxx², yyy yyy³, and Marcel Babin¹

¹UMI Takuvik, CNRS/Université Laval, Québec, QC Canada

Correspondence: Marcel Babin (marcel.babin@takuvik.ulaval.ca)

Abstract.

1 Introduction

xxx

2 Study area, environmental conditions and sampling strategy

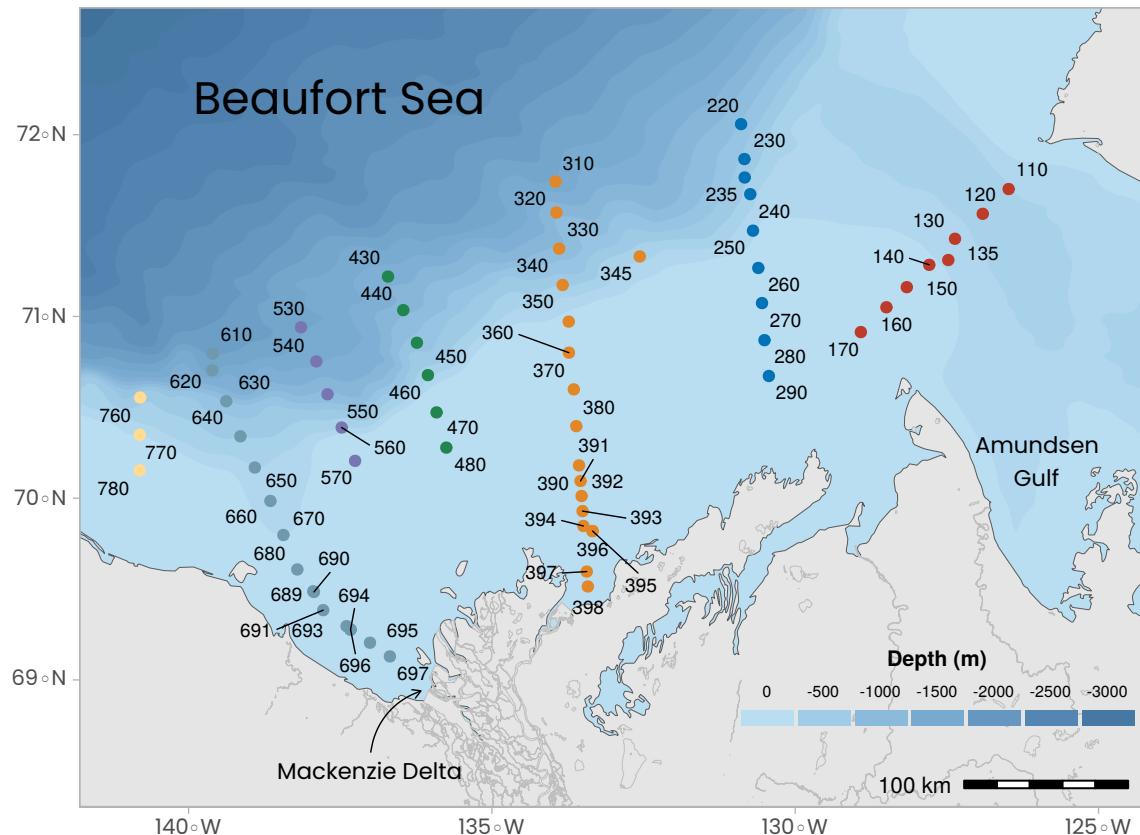
5 2.1 Study area and environmental conditions

2.2 Sampling strategy

2.2.1 CTD and rosette deployments

3 Figures

A



B

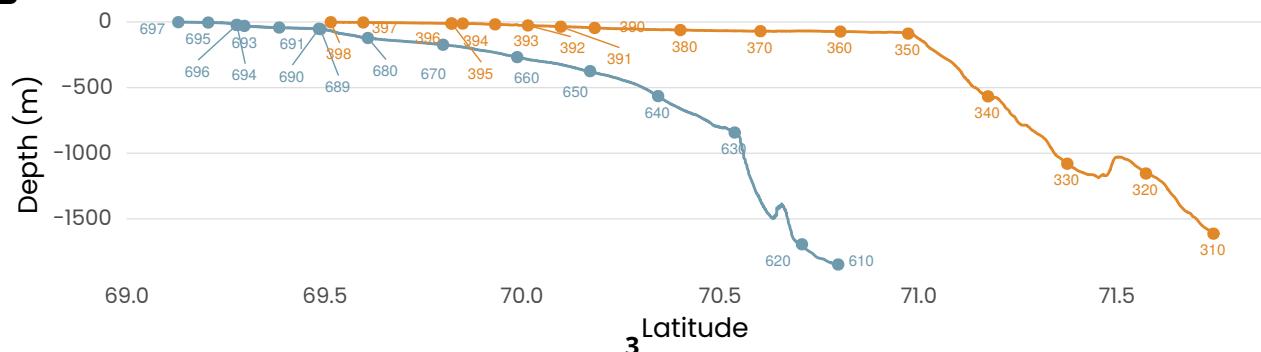


Figure 1. (A) Localizations of the sampling sites visited during the MALINA 2009 campaign. The colors of the dots represent the seven transects visited during the mission. (B) Latitudinal bathymetric profiles for transects 600 and 300. Bathymetric data from

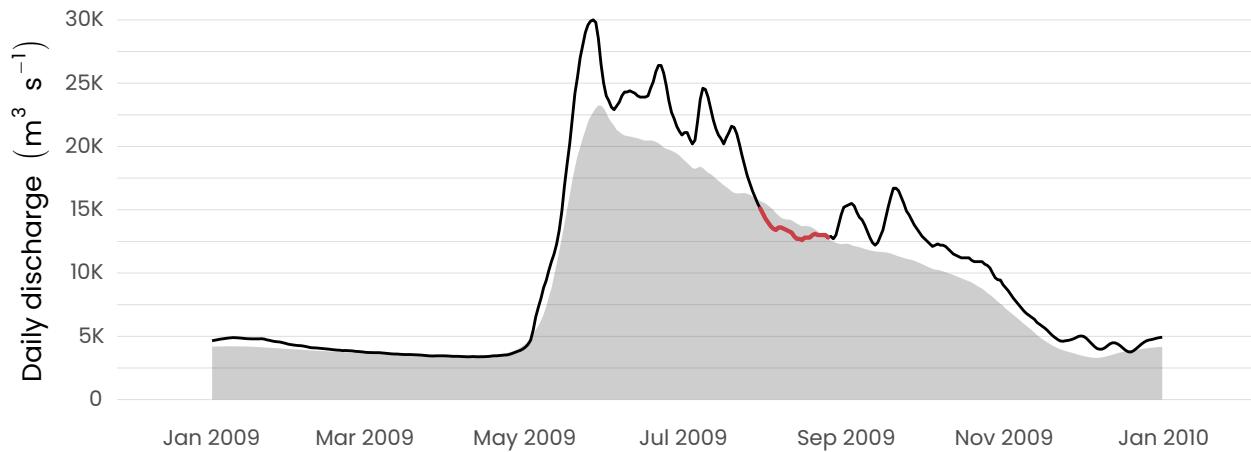
A**B**

Figure 2. (A) Daily discharge of the Mackenzie river at the Arctic Red River junction (station 10LC014). The black line corresponds to the 2009 discharge whereas the colored segment identifies the period of the MALINA campaign. The shaded area is the mean discharge calculated between 1972 and 2016. Discharge data from Government of Canada (https://wateroffice.ec.gc.ca/search/historical_e.html). (B) Hourly air temperature recorded from the Amundsen's foredeck meteorological tower during the campaign.

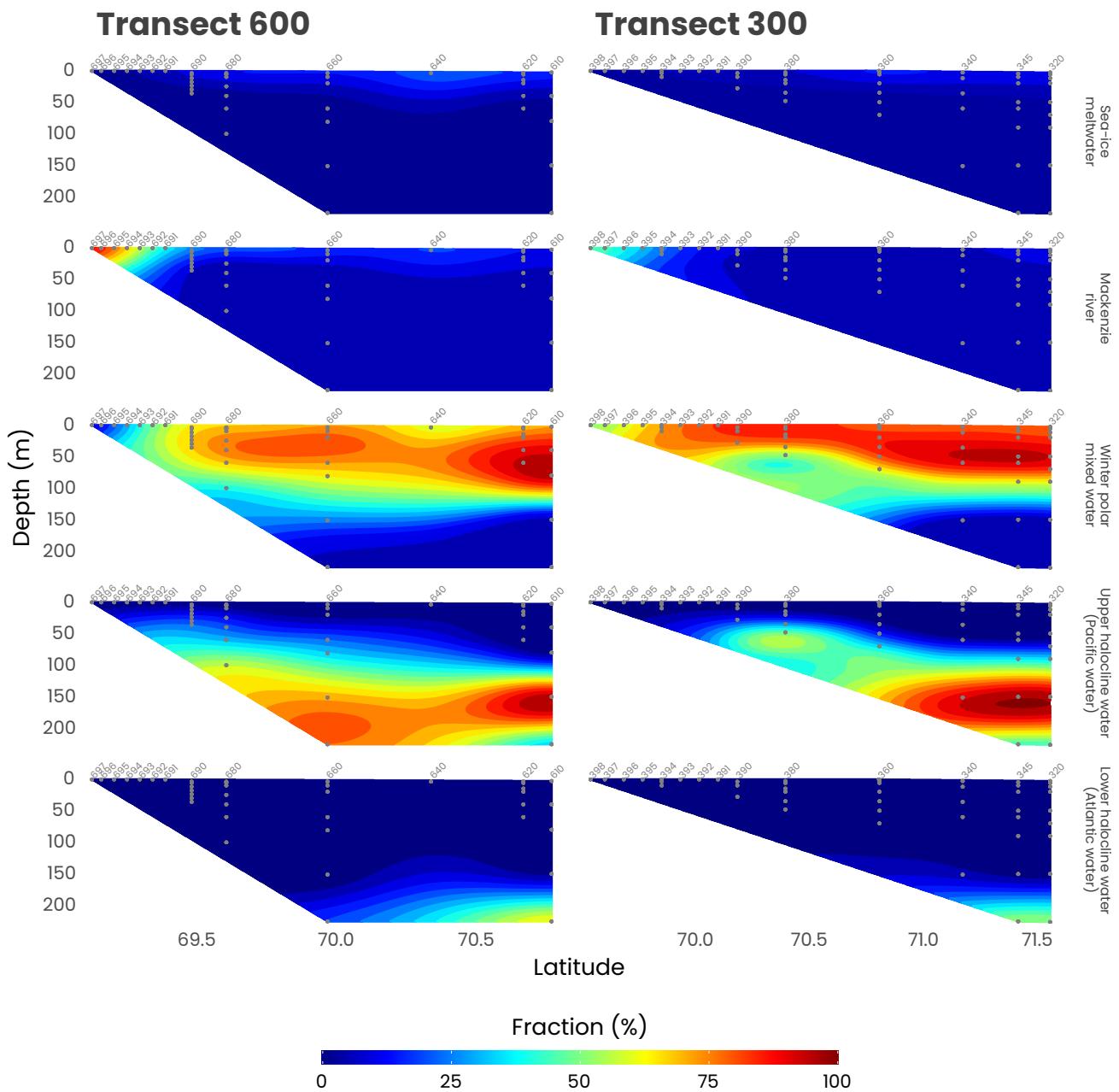


Figure 3. Latitudinal distribution of source water types along transects 600 and 300 (see Fig. 1). Station numbers are identified in light gray on top of each panel.

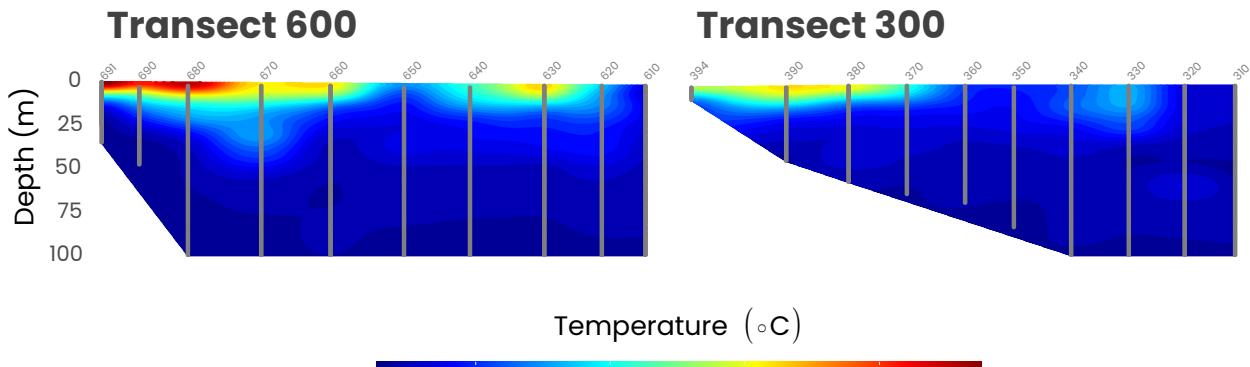
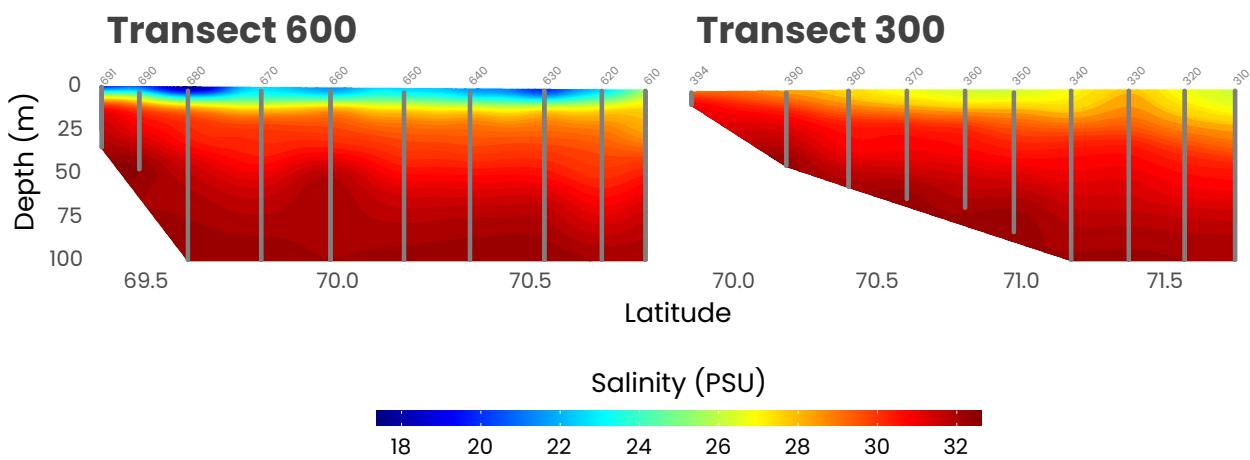
A**B**

Figure 4. Latitudinal cross-sections of temperature (A) and salinity (B) measured by the CTD (gray dots) in transects 600 and 300. Station numbers are identified in light gray on top of each panel.

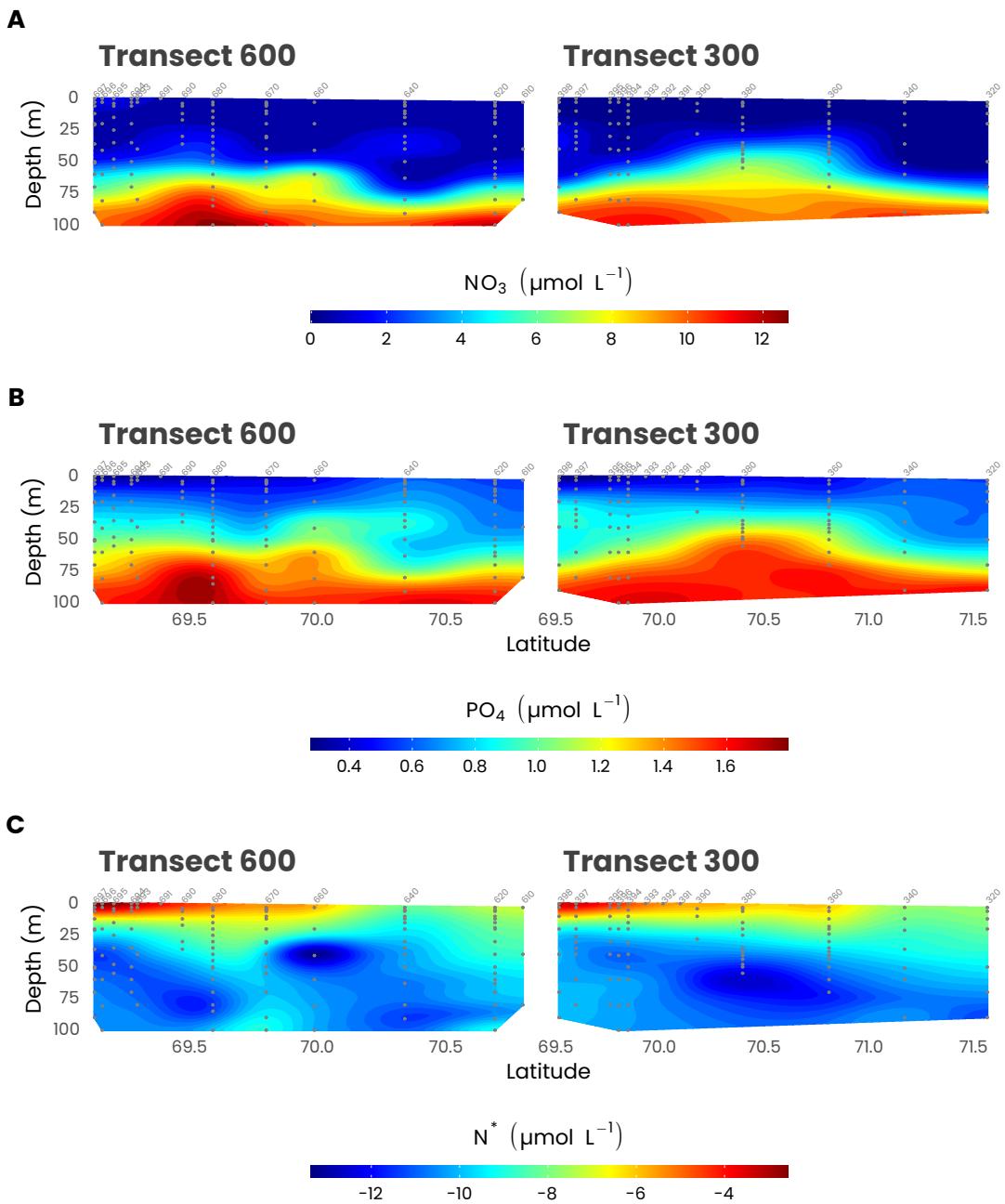


Figure 5. Latitudinal cross-sections of (A) NO₃⁻ and (B) PO₄³⁻ measured from niskin bottles (gray dots) in transects 600 and 300. (C) N* defined as N - rP with r = N/P = 13.1 (see the text for the details). Station numbers are identified in light gray on top of each panel.

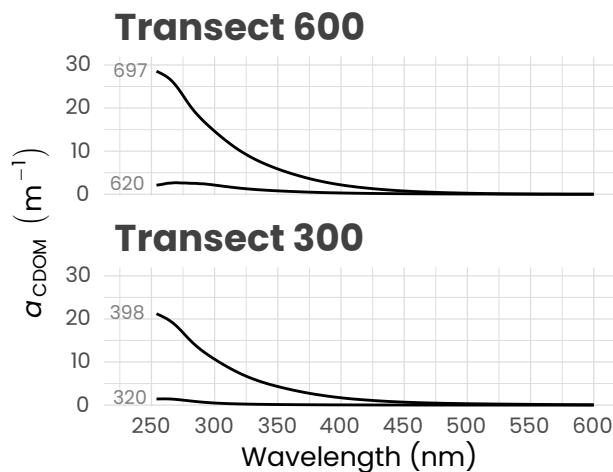
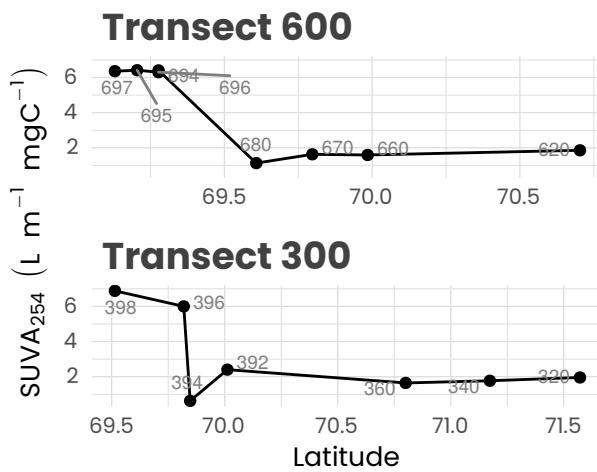
A**B**

Figure 6. **(A)** Absorption spectra between 254 and 600 nm of chromophoric dissolved organic matter (α_{CDOM}) measured at the surface for the northern and southern stations of the transects 600 and 300. **(B)** Specific UV absorbance at 254 nm ($SUVA_{254}$, i.e. absorption of light at 254 nm per unit of carbon) at surface for stations along transects 600 and 300. Stations are identified in light gray.

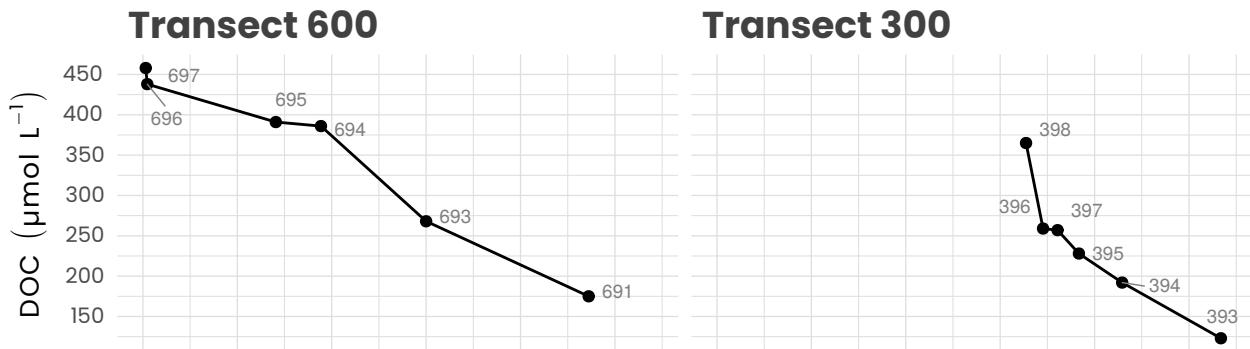
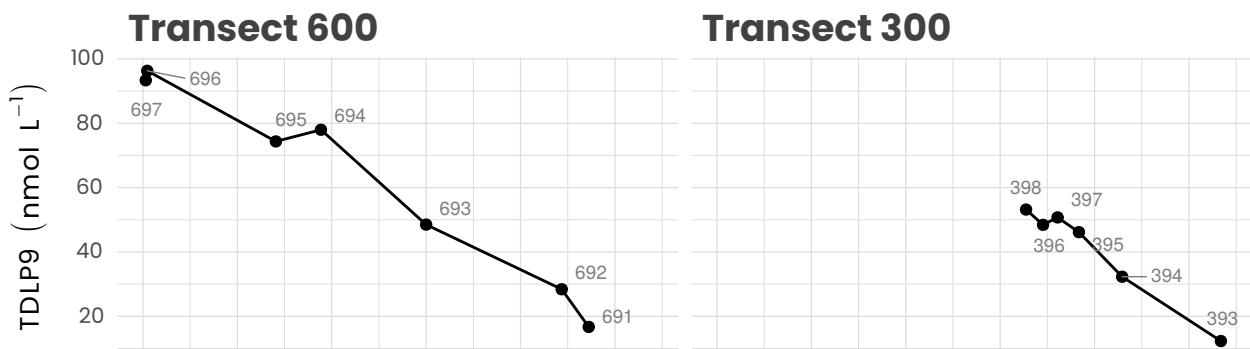
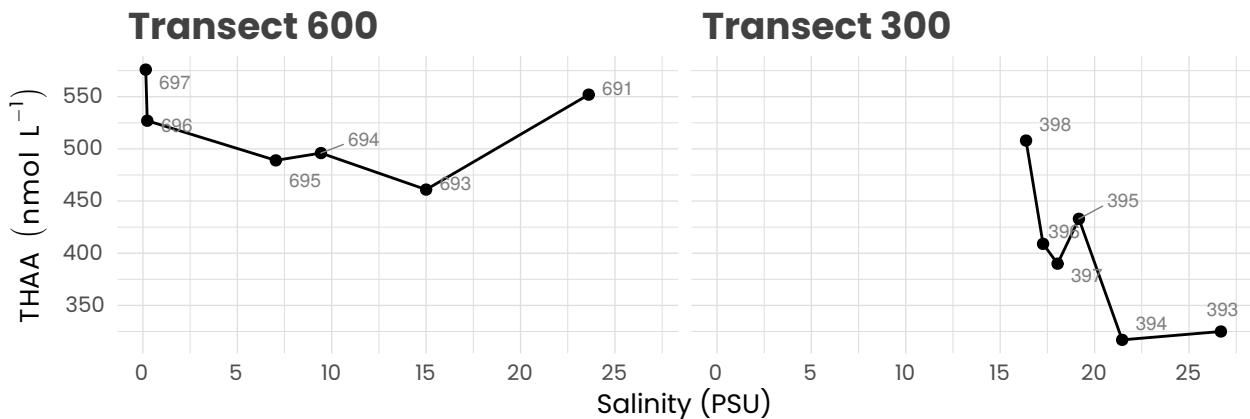
A**B****C**

Figure 7. Concentrations of (A) dissolved organic carbon (DOC), (B) total dissolved lignin phenols (TDLP₉), and (C) total hydrolysable amino acids (THAA) measured along transects 600 and 300, and plotted against salinity.

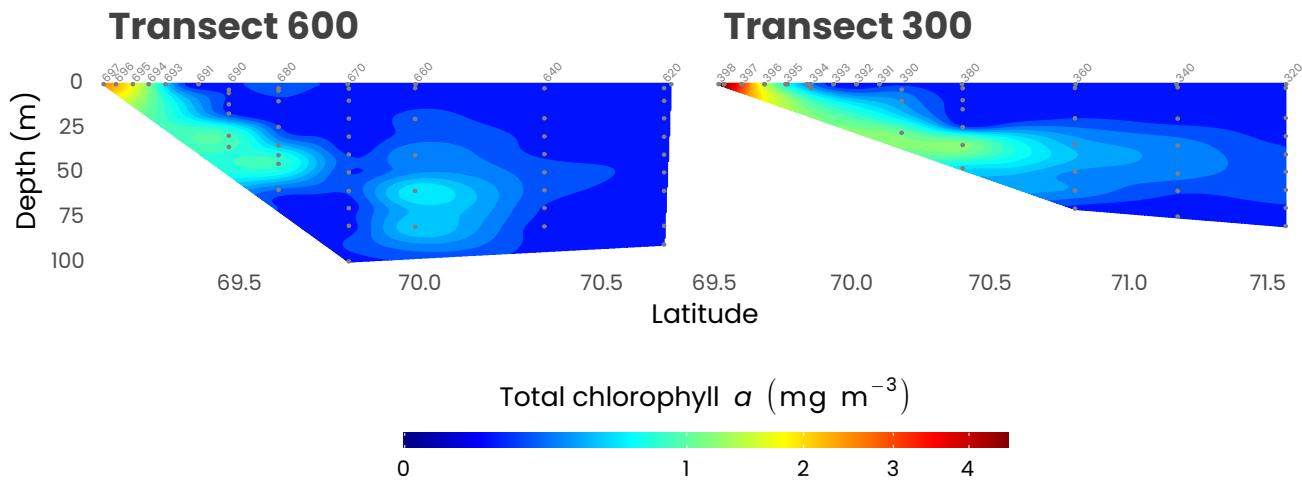


Figure 8. Latitudinal cross-sections of total chlorophyll-a measured from HPLC (gray dots) in transects 600 and 300. Station numbers are identified in light gray on top of each panel.

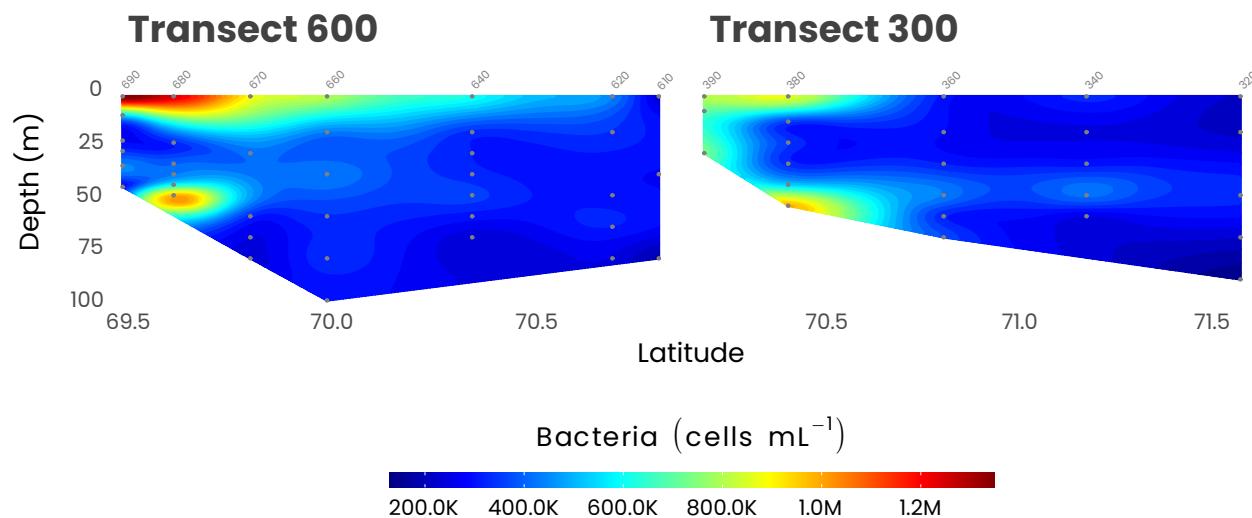
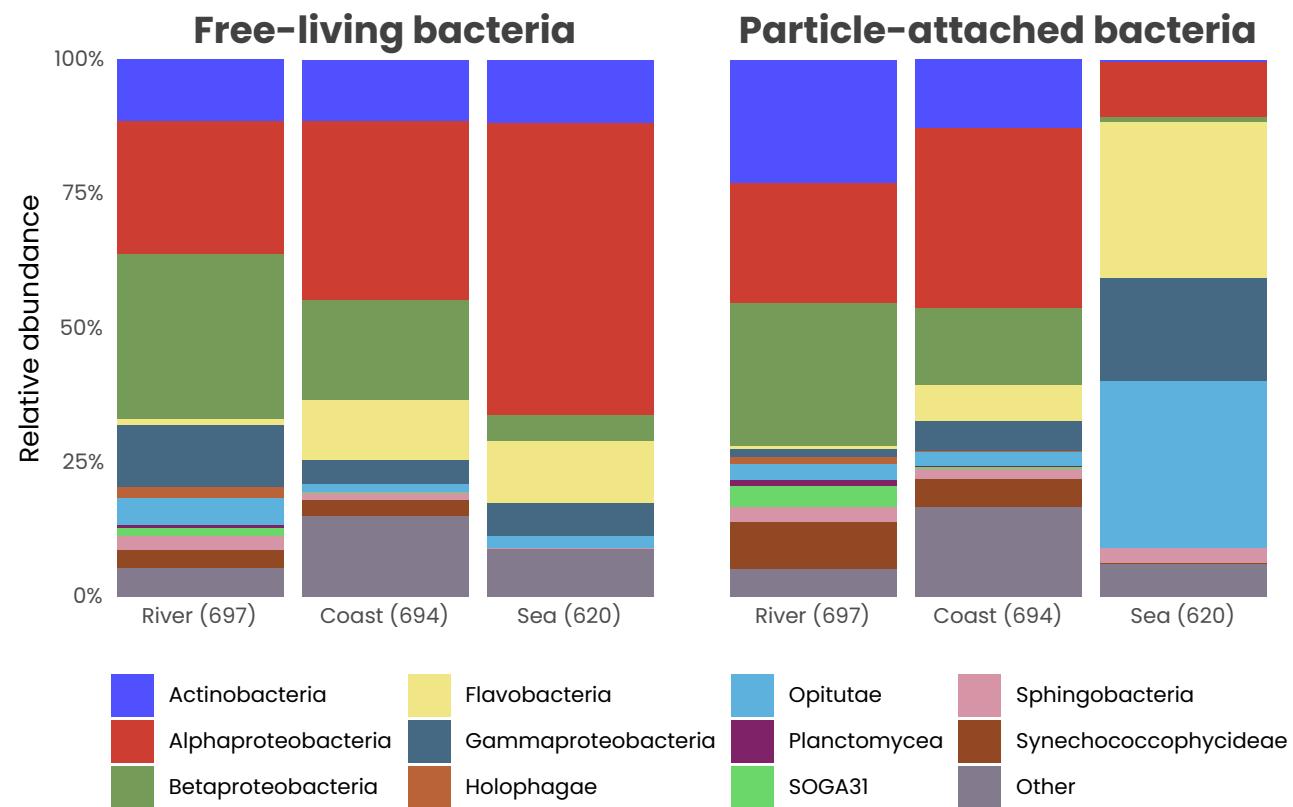
A**B**

Figure 9. (A) Latitudinal cross-sections of bacterial abundance measured from flow cytometry (gray dots) in transects 600 and 300. Station numbers are identified in light gray on top of each panel. (B) xxxx

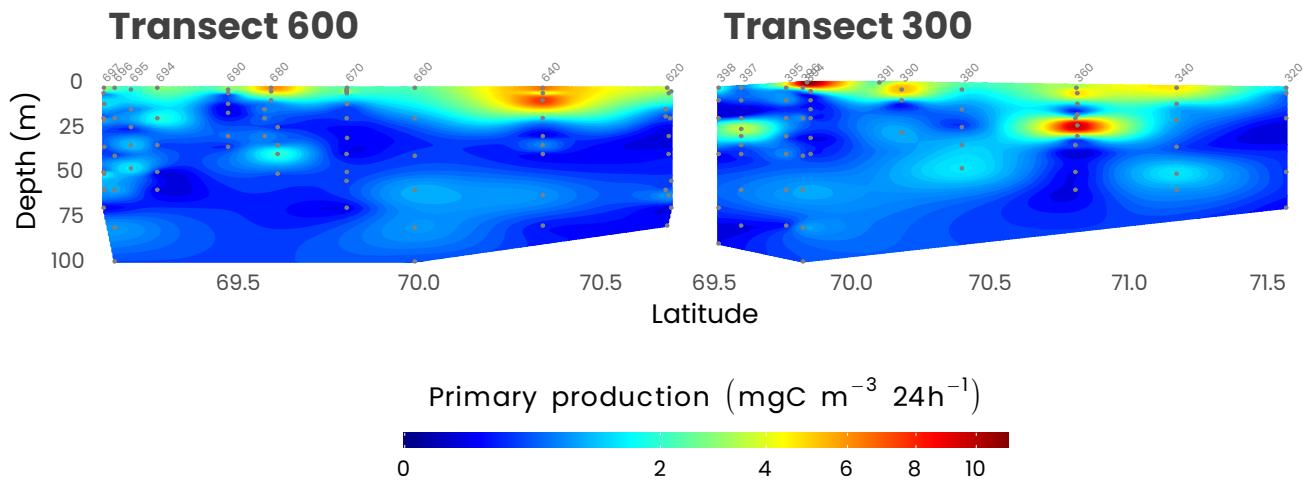


Figure 10. Latitudinal cross-sections of primary production measured from xxx (gray dots) in transects 600 and 300. Station numbers are identified in light gray on top of each panel.

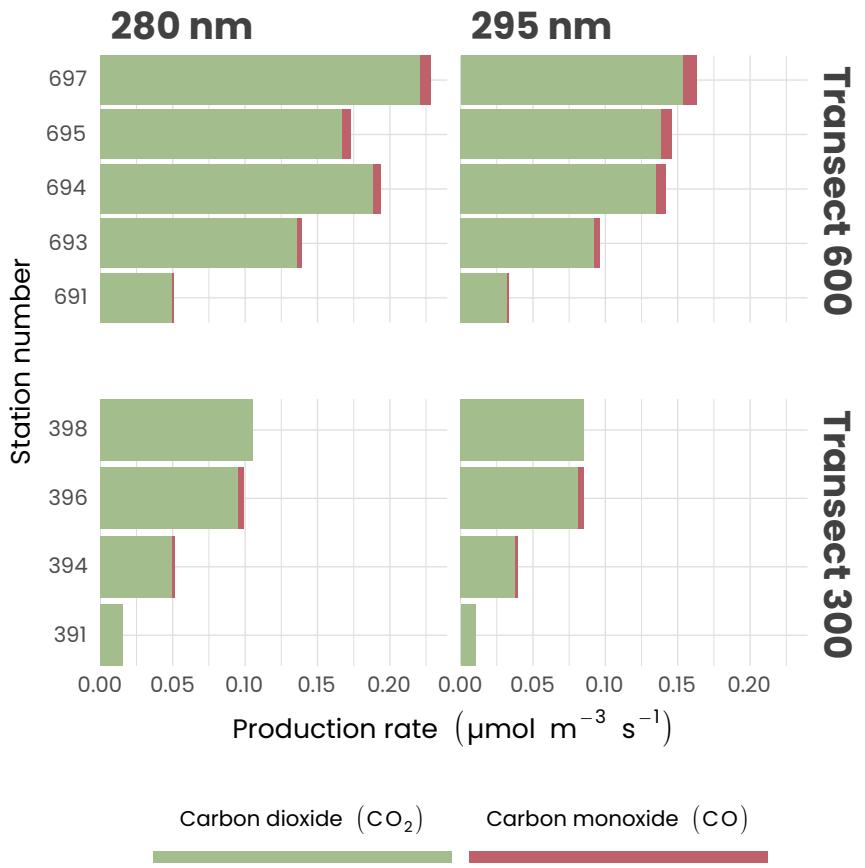


Figure 11. CO and CO₂ production measured at 280 and 295 nm at surface for stations of transects 600 and 300 (bold numbers on the right of the graph).

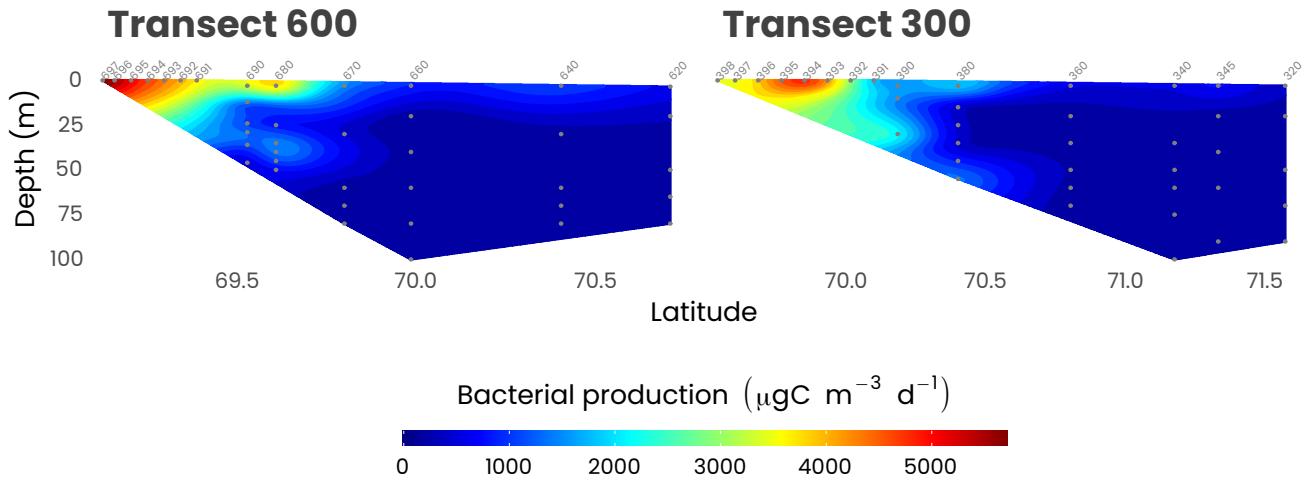


Figure 12. Latitudinal cross-sections of bacterial production measured from XXX (gray dots) in transects 600 and 300. Station numbers are identified in light gray on top of each panel.

4 Code and data availability

10 TODO

Author contributions.

Competing interests. The authos declar no competing interests.

Acknowledgements. xxxx

References