

General Comment

The revision gives the impression of having been prepared somewhat quickly. The change-tracked text suggests that several newly added phrases would benefit from further language polishing. In addition, the Introduction could more clearly articulate the motivation for the study and the specific research question being addressed. I would strongly recommend professional proofreading by a native speaker or careful language polishing (e.g., with the assistance of an LLM).

Line-by-line comments

Abstract

lines 17–19: I would suggest rephrasing for clarity and readability:

Due to an influx of anomalously low salinity water from the North Atlantic, whole Barents Sea salinity declined during the period from 2016 to 2022.

Also, is this a result demonstrated in the paper? Can it be stated that the salinity decline was caused by North Atlantic inflow based on the presented data analysis?

line 19: I suggest using “decrease” instead of “reduction”.

lines 21–24: This point could benefit from clarification. Earlier it is stated that the whole Barents Sea freshened due to North Atlantic inflow, whereas here the Northern Barents Sea is described as being additionally influenced by an Arctic signal. It would be helpful to briefly indicate in the abstract which methods allow distinguishing between these influences.

Introduction

line 33: It should be “influence” rather than “influencing”:
“can weaken... and ...influence” for correct parallel structure.

lines 40–42: It is not entirely clear what the propagation speeds refer to (e.g., AW advection velocity?). A clearer connection between the clauses would improve readability, for example: “..., which correspond to a 2–3 year lag ...” or “..., resulting in a 2–3 year lag ...”. Please consider rephrasing.

lines 43–45: It is difficult to follow what happens to Arctic-origin water. Is the Labrador Current shifting poleward or moving off the continental shelf? The second part of the sentence would benefit from clarification. Also, the second mention of the Holliday paper at the end is redundant.

line 48: The phrasing is somewhat unclear. “These events” appear to refer to the 2012–2016 period, yet the sentence mentions both strong and weak gyre circulation during 2005–2016 and 1993–2005. It would be helpful to clarify what is meant here.

line 53: “into the downstream” is not ideal phrasing; a clearer alternative would be:
“...propagation of the negative salinity anomaly downstream in the Nordic Seas ...”

Figure 1 caption: For the Svinøy and BSO sections, it would be helpful to include more information in the text about the origin of the Svinøy section data.

line 70: “lower salinity Arctic water” could be expressed more clearly as “less saline Arctic water” or “fresher Arctic water”.

line 89: Consider removing “outflow” and keeping:
“The dense waters exiting the BS...”

line 92: “associated with freshwater and sea ice import”.

line 93: “in this paper” instead of “in here”.

General comment on Introduction:

The Introduction provides a useful overview of existing studies, but the specific research question or knowledge gap addressed by this work is not yet clearly articulated. It currently reads more as a general overview of processes influencing the Barents Sea. It would strengthen the manuscript to more explicitly identify what remains unresolved in the literature and how this study addresses that gap. Additionally, it would be helpful to briefly motivate the chosen methods and explain why they are suitable for addressing the stated research question. This context is currently absent in both the Introduction and the Methods section.

Data and methods

line 107: sea surface temperatures~~s~~, sea ice concentrations~~s~~

line 119: It would be helpful to mention the ERA-5 spatial resolution.

lines 121–122: Suggested phrasing:
“ICES data: The temperature, salinity, and density data at BSO and Svinøy sections are obtained from the ICES database”.

Results

line 127: Was a weighted vertical mean used? If not, this may affect the representation and could be briefly discussed.

lines 131–134:
“The salinity minimum aligns..., provided an advection” – the tense usage is inconsistent; please revise for consistency.

lines 137–140: The phrase “at a lag” is unclear. Please specify what the lag refers to (e.g., between SBS and NBS, or relative to upstream forcing).

line 154: The lagged correlation analysis.

lines 168–170: The sentence would benefit from rephrasing for clarity.

line 196: A positive trend is not clearly visible in Fig. 4; please clarify.

lines 197–198:

“similar trend during the time-period due to a decrease...” – please specify which period is being referred to.

Figure 5 caption:

“TOPAZ4b reanalysis derived winter mean (NDJFM) sea ice drift velocity (cm/s) difference during the two time periods (2016–2024) and (1993–2015).”

This describes a difference between two periods, but it is not immediately clear what is subtracted from what. Additionally, panel 5a is quite small and difficult to interpret. It may be helpful to include separate maps for each period mean to improve readability.

line 217: “respectively” is used twice; consider removing the first instance. SAT has already been defined earlier.

lines 219–220: The period 1993–2024 includes the last ten years; this should be clarified.

line 224: The Methods section does not mention the use of any authors’ models; it appears that reanalysis data is used. Please clarify.

line 275: Please clarify what is meant by “our model results”.

lines 282–285: This sentence is difficult to follow and would benefit from rephrasing: “Our results indicate..., to a large degree reflect...”

lines 295–296: The density of the bottom water, which is used to support this conclusion, could be shown in the paper but is currently not included.