# Article information:

Transient Increase in Arctic Deep-Water Formation and Ocean Circulation under Sea Ice Retreat in: Journal of Climate Volume 35 Issue 1 (2022)
[https://journals.ametsoc.org/configurable/content/journals$002fclim$002f35$002f1$002fJCLI-D-21-0152.1.xml?t:ac=journals%24002fclim%24002f35%24002f1%24002fJCLI-D-21-0152.1.xml](https://journals.ametsoc.org/configurable/content/journals%24002fclim%24002f35%24002f1%24002fJCLI-D-21-0152.1.xml?t:ac=journals%24002fclim%24002f35%24002f1%24002fJCLI-D-21-0152.1.xml)

# Article summary:

1. The Arctic sea ice cover has been retreating rapidly in the last decades due to rising greenhouse gases, leading to a potential shutdown of North Atlantic deep-water formation.

2. This study investigates the northward shift of deep convection and its link to winter sea ice retreat under the RCP8.5 scenario using a long simulation with EC-Earth coupled with a dynamic Greenland ice sheet.

3. The experiment finds that enhanced air–sea buoyancy fluxes, facilitated by the retreat of the sea ice, deepen the mixed layer and strengthen overturning circulation in the central Arctic Ocean, potentially impacting the large-scale AMOC.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article is generally reliable and trustworthy as it provides evidence for its claims from multiple sources such as observations over the past 20 years, model simulations from Lique et al., Bitz et al., Brodeau and Koenigk, and Madsen et al., as well as CMIP5 protocol (Taylor et al.). The authors also provide detailed information on their methods and experiments used in this study, which adds to its trustworthiness.

However, there are some potential biases in this article that should be noted. Firstly, while the authors discuss potential changes in deep-water formation due to increased freshwater fluxes from Greenland ice sheet, they do not explore counterarguments or present both sides equally. Secondly, while they mention that enhanced convection could be an alternative explanation for strengthened Arctic overturning, they do not provide any evidence for this claim or explore it further. Thirdly, while they discuss potential impacts of Arctic overturning on large-scale AMOC circulation, they do not provide any evidence or explore possible risks associated with this change. Finally, while they mention that deep convection can disappear for a few years (e.g., Kim et al.), they do not provide any evidence or explore possible implications of this phenomenon further.

In conclusion, while this article is generally reliable and trustworthy due to its use of multiple sources and detailed information on methods used in this study, there are some potential biases that should be noted such as lack of exploration of counterarguments or risks associated with changes in deep-water formation and Arctic overturning circulation.

# Topics for further research:

* Arctic overturning circulation risks
* Greenland ice sheet freshwater fluxes
* Enhanced convection alternative explanations
* Deep convection disappearance implications
* Large-scale AMOC circulation impacts
* CMIP5 protocol Taylor et al.

# Report location:

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