EGU2020-10690
https://doi.org/10.5194/egusphere-egu2020-10690
EGU General Assembly 2020

Understanding cyclone variability in the Barents Sea

Erica Madonna[1,2], Gabriel Hes[1,2,3], Clio Michel[1,2], Camille Li[1,2], and Peter Yu Feng Siew[1,2]
[1]University of Bergen, Geophysical Institute, Bergen, Norway (erica.madonna@uib.no)
[2]Bjerknes Centre for Climate Research, Bergen, Norway
[3]Départment de Géosciences, École Normale Supérieure, PSL Research University, Paris, France

Extratropical cyclones are a key player for the global energy budget as they transport a large amount of moisture and heat from mid- to high-latitudes. One of the main corridors for cyclones entering the Arctic from the North Atlantic is the Barents Sea, a region that has experienced the largest decrease in winter sea ice during the past decades. On the one hand, some studies showed that moisture transported by cyclones to the Arctic can lead to drastic temperature increases and sea ice melt. On the other hand, it has been suggested that the location of the sea ice edge can influence the tracks of cyclones. Therefore, it is crucial to understand what controls cyclone tracks through the Barents Sea into the Arctic to explain and potentially predict climate variability at high latitudes.

To address this question, we track cyclones from 1979 to 2018 in the ERA-Interim data set, characterizing and quantifying them depending on their genesis location and path. The focus is on cyclones entering the Barents Sea from the North Atlantic as they carry the most moisture into the Arctic. Despite a clear declining trend in sea ice in the Barents Sea, our results show neither significant changes in cyclone frequency nor in their tracks. However, we find that the large-scale flow and in particular the presence or absence of blocking in the Barents Sea influence the cyclone frequency in this region, providing a potential mechanism that controls high latitude climate variability.

How to cite: Madonna, E., Hes, G., Michel, C., Li, C., and Siew, P. Y. F.: Understanding cyclone variability in the Barents Sea, EGU General Assembly 2020, Online, 4–8 May 2020, EGU2020-10690, https://doi.org/10.5194/egusphere-egu2020-10690, 2020