Stockholm University

Department of Meteorology

Climate and the general circulation (MO7021)

The Arctic Climate

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Author: Fredrik Bergelv (fredrik.bergelv@live.se)

Supervisor: Johan Nilsson

Contents

1 Introduction

The Arctic and the Antarctic are two unique regions on Earth that are characterized by extreme cold temperatures, vast ice sheets, and unique ecosystems. The Arctic is located in the northern hemisphere and is centred around the North Pole.

This is so [National Snow and Ice Data Center, 2026].

1.1 Things to write bout

1. Köppen characteristics
2. Cryosphere
3. Geographical features, the atmospheric general circulation, regional weather patterns, and ocean currents
4. Based on the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (available online) account briefly for ongoing and future **climate change** in your study area
5. human society (ethical aspects)

Sea ice make the sea surface act more like land. In between ocean and land.

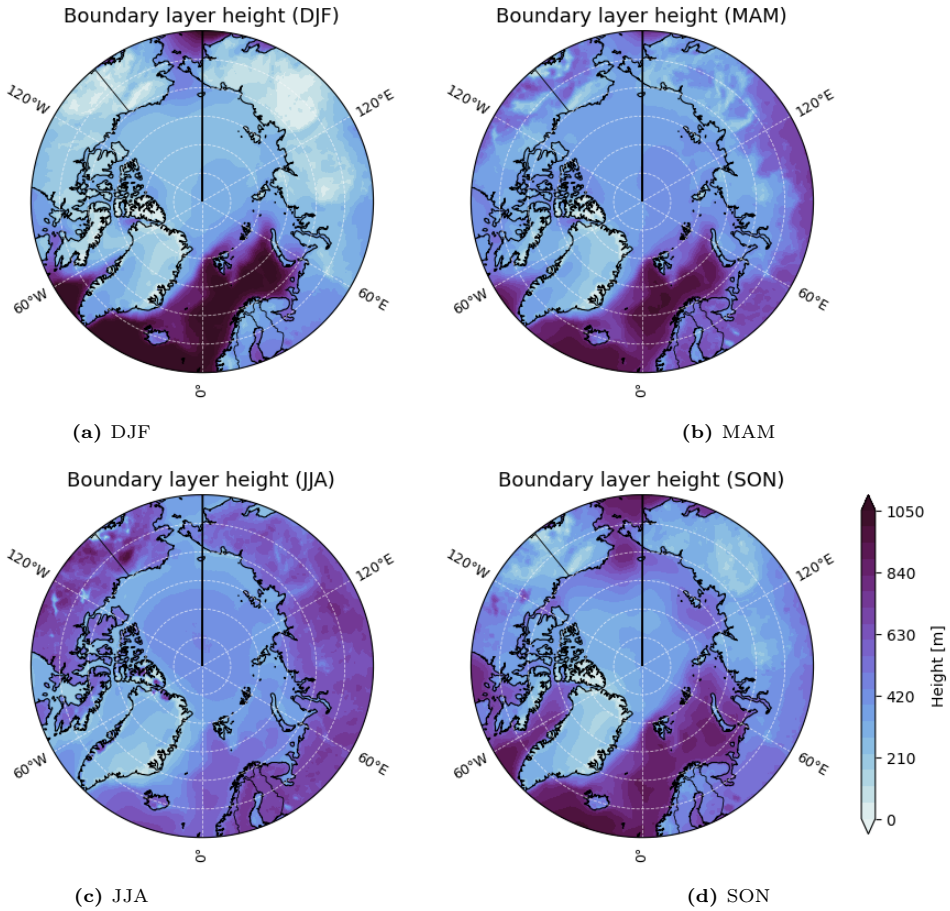
1.2 Background

When dealing with the Arctic, it is important to define the region. The Arctic is commonly defined as the area north of the Arctic Circle, which is located at approximately 66°33" N latitude [National Snow and Ice Data Center, 2026, Serreze and Barry, 2009]. However, others define the Arctic based on the extent of the Arctic ecosystem, which requires a July mean temperature under 10 $°C$ [National Snow and Ice Data Center, 2026]. Using this definition, the Arctic can be divided into two main sub-regions, including the Arctic maritime region and the Arctic continental region according to National Snow and Ice Data Center [2026].

The Arctic maritime region includes the Arctic Ocean and its surounding seas such as the Bering and Greenland Seas, as well as the Labrador Sea and Bafin Bay.

2 Data and Methods

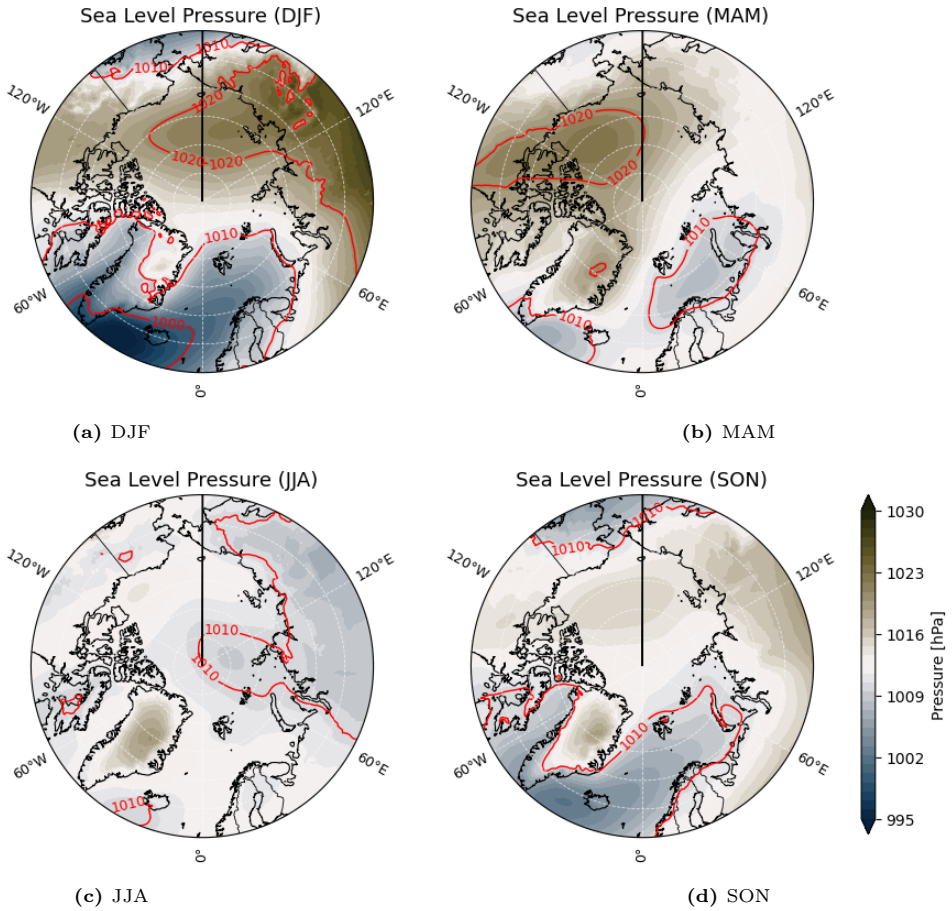
describe through which observations or techniques the data is constructed, as well as the methods you have used to analyse and present the data graphically. Here, it is important to discuss the reliability and limitations of the data as well as the analyses you have used.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

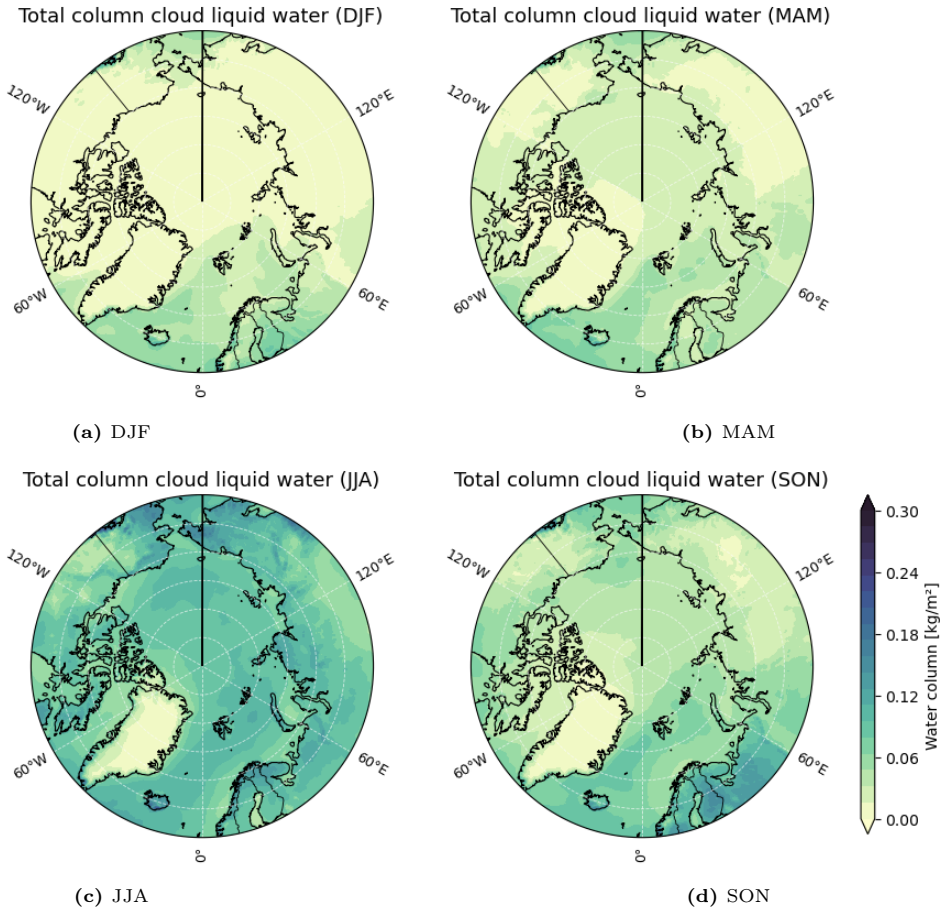
Figure 1: Seasonal mean boundary layer height (m) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

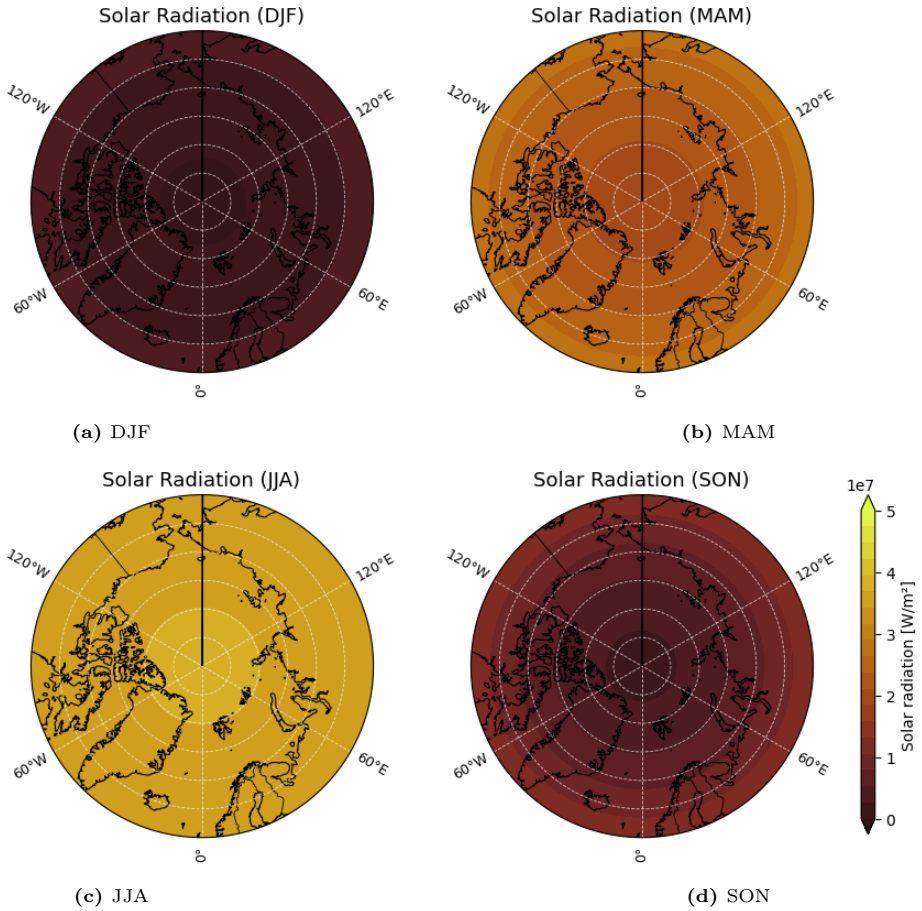
Figure 2: Seasonal mean sea level pressure (hPa) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

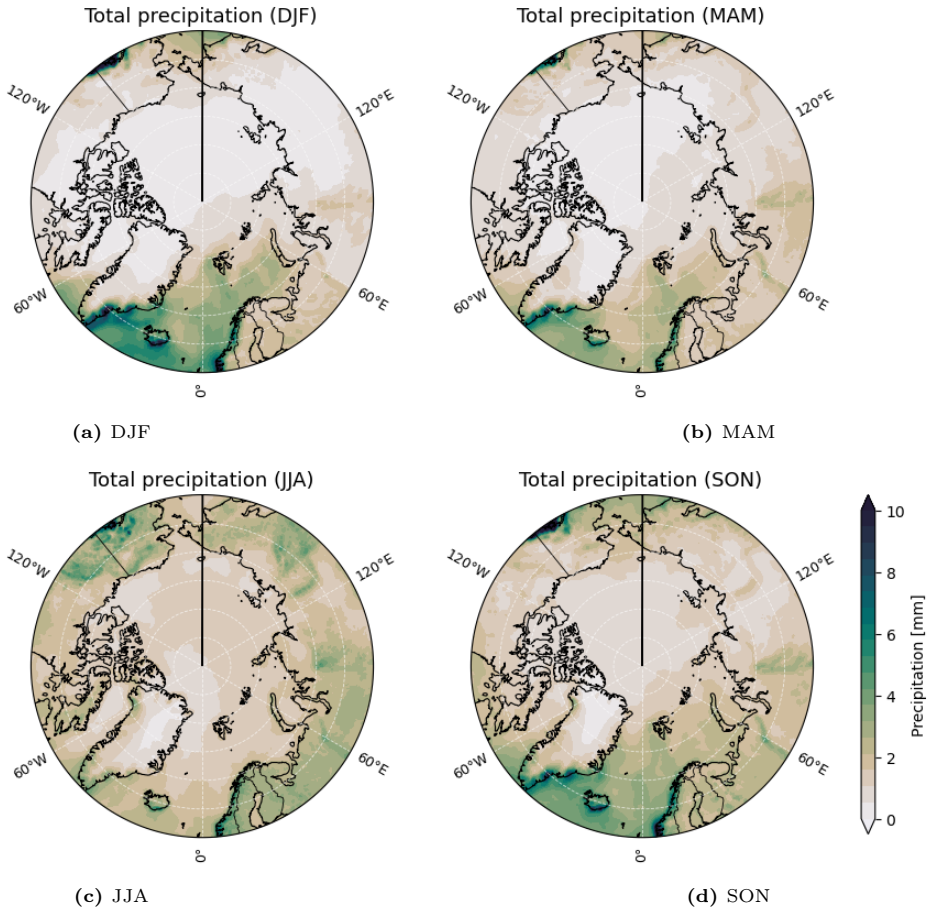
Figure 3: Seasonal mean total column cloud liquid water (kg m^{-2}) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

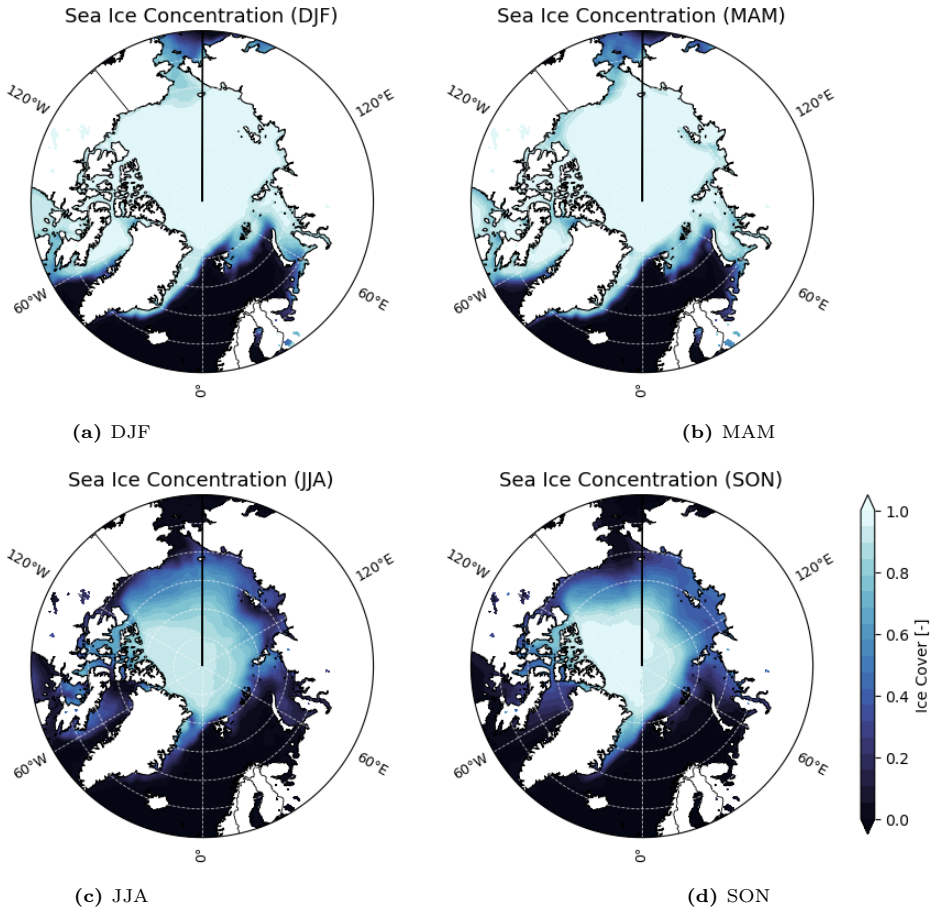
Figure 4: Seasonal mean incoming solar radiation (W m^{-2}) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

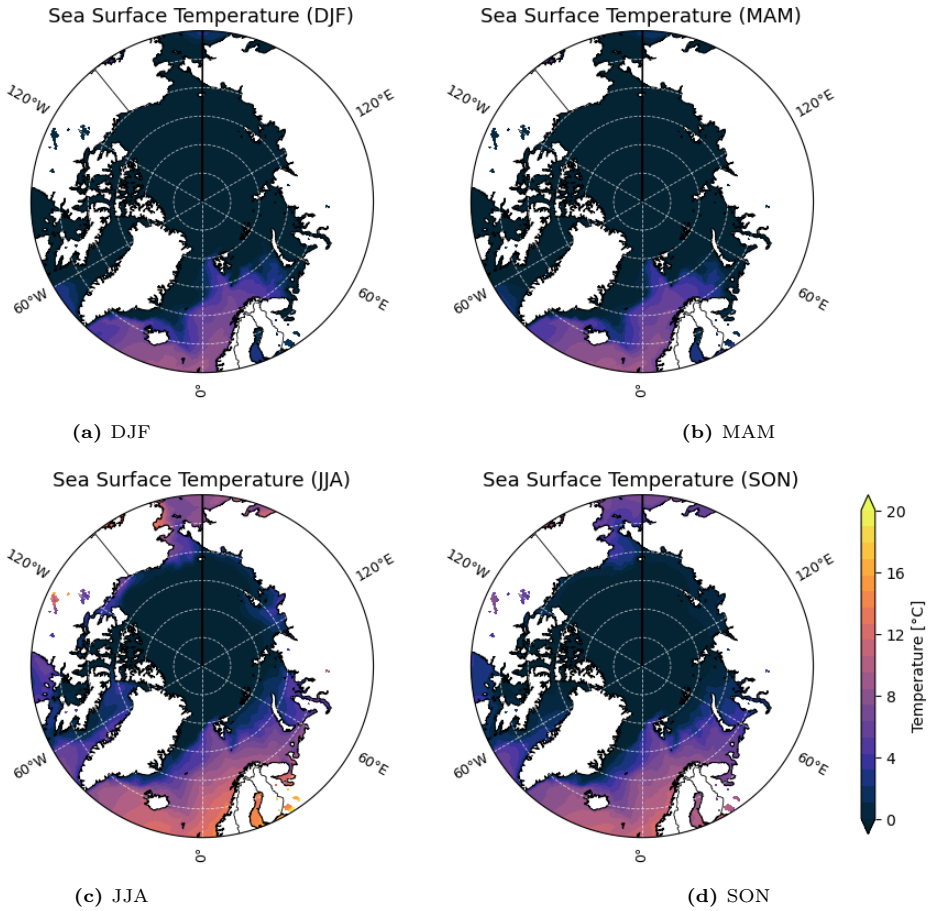
Figure 5: Seasonal mean monthly total precipitation (mm) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

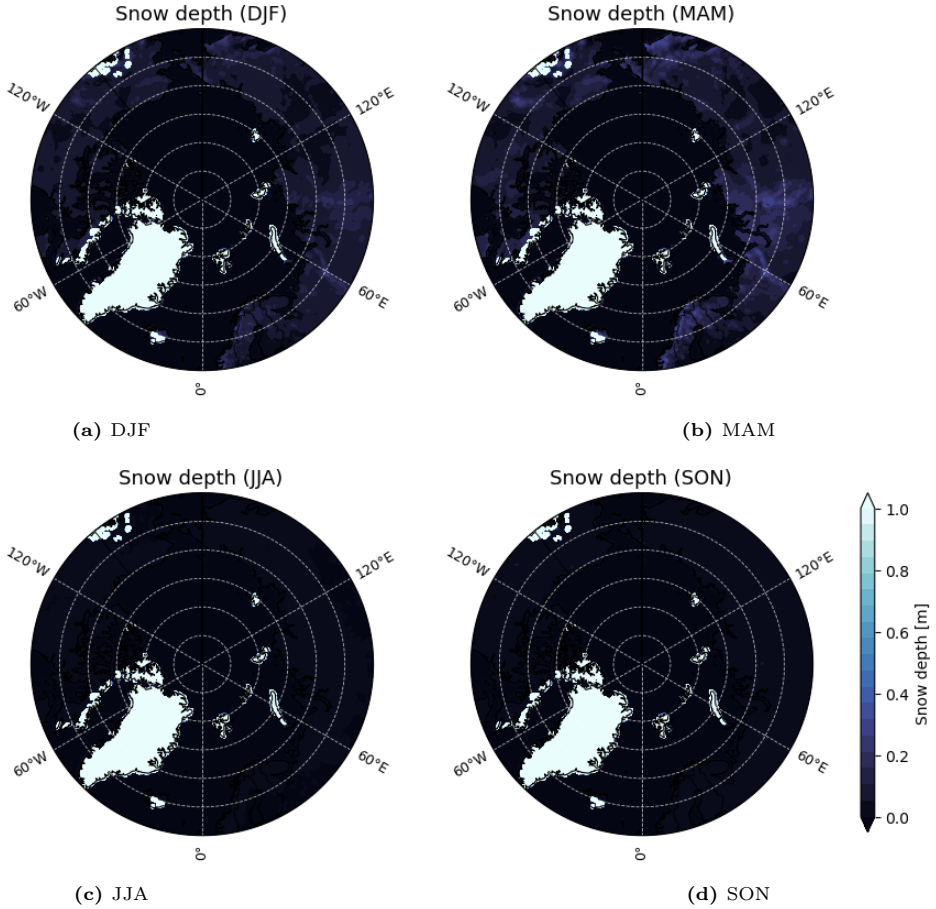
Figure 6: Seasonal mean sea ice concentration (-) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

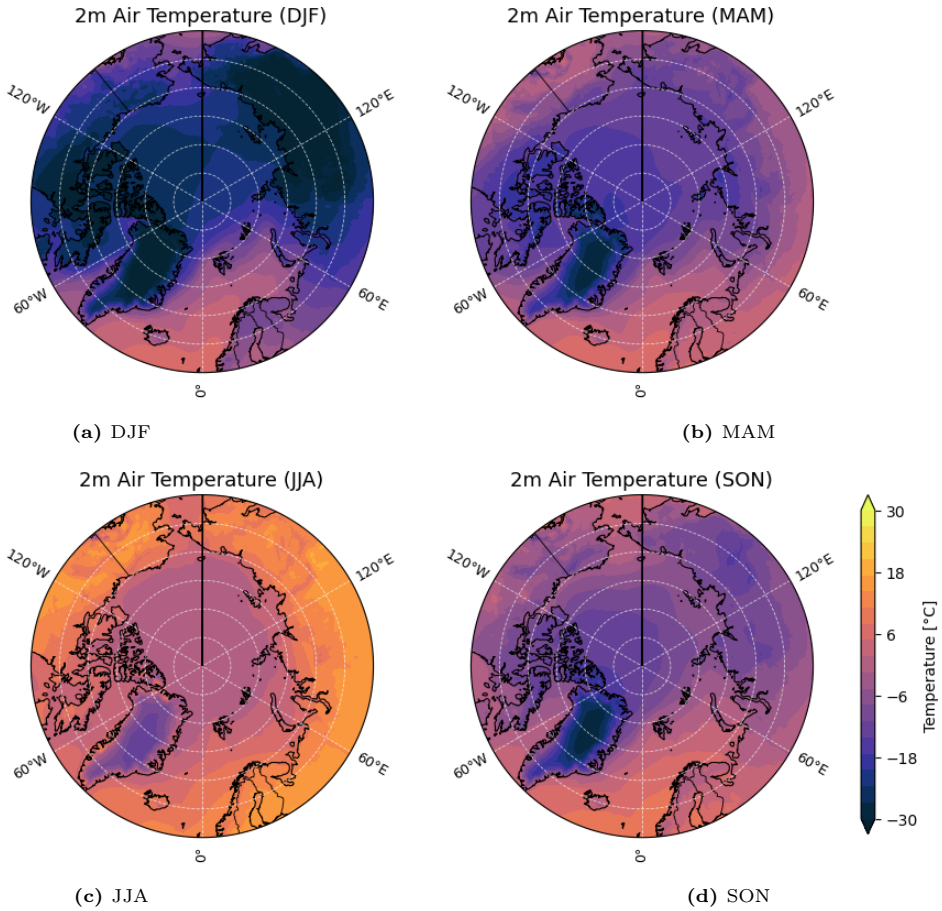
Figure 7: Seasonal mean sea surface temperature (°C) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

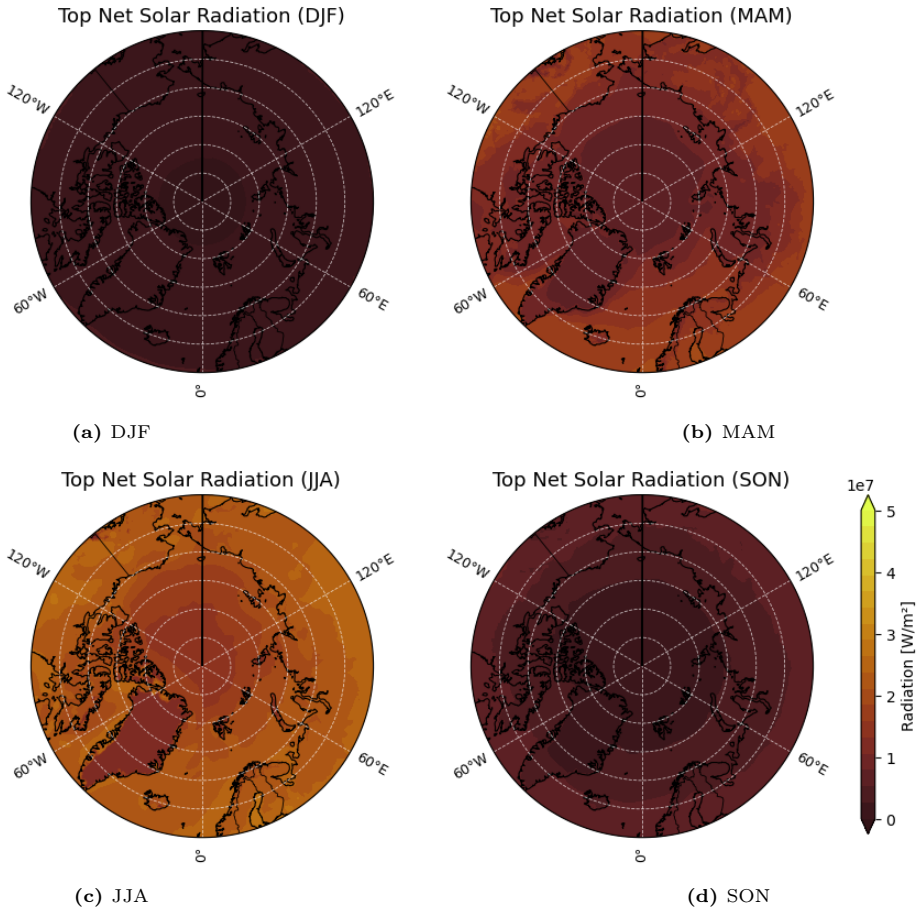
Figure 8: Seasonal mean monthly snow depth (m) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

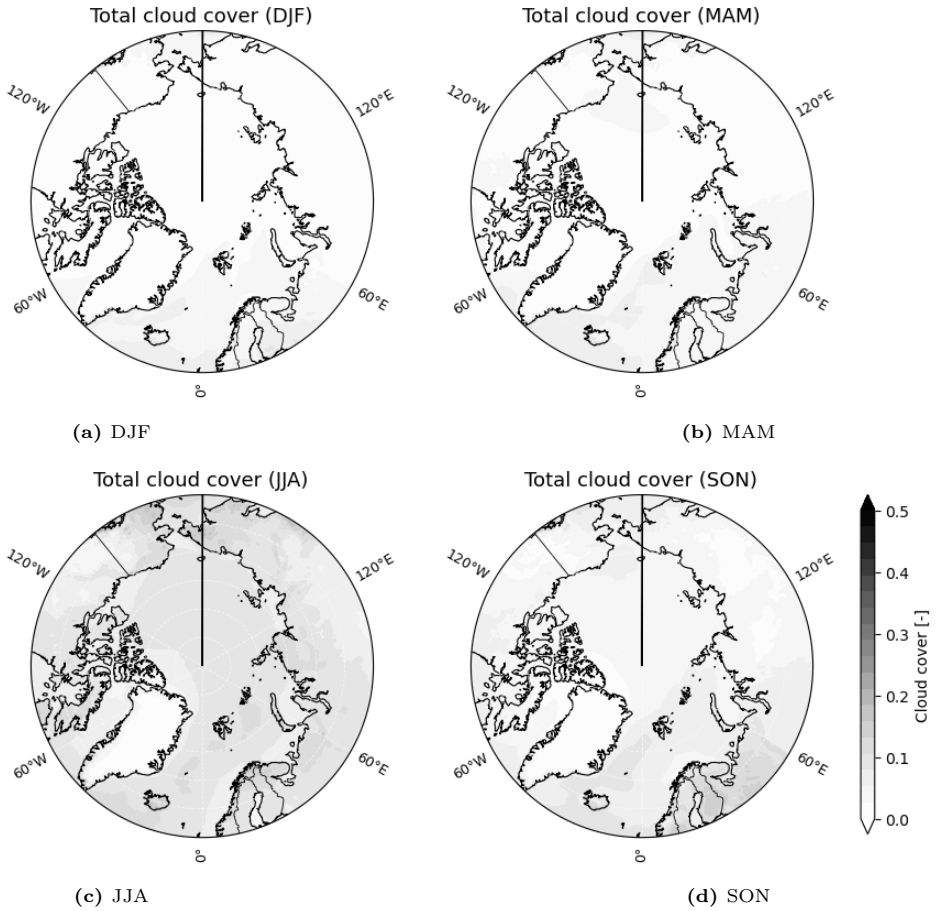
Figure 9: Seasonal mean 2m air temperature (°C) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

Figure 10: Seasonal mean top net solar radiation (W m^{-2}) for 2012–2021 for DJF, MAM, JJA, and SON.



(a) DJF **(b)** MAM

(c) JJA **(d)** SON

Figure 11: Seasonal mean total cloud cover (-) for 2012–2021 for DJF, MAM, JJA, and SON.

3 The Regional Climate and the General Circulation

4 Regional Climate and the General Circulation

5 Climate Changes: Ongoing and Projected for the Future

6 The Climate Impact on Societal Activities

7 Conclusion

References

National Snow and Ice Data Center. Arctic weather and climate: Factors affecting arctic weather and climate, 2026. URL `https://nsidc.org/learn/parts-cryosphere/arctic-weather-and-climate/science-arctic-weather-and-climate`. A part of CIRES at the University of Colorado Boulder. Accessed: 22 February 2026.

Mark C. Serreze and Roger G. Barry. *The Arctic Climate System*. Cambridge University Press, 2009. ISBN 9780521881582. Detailed analysis of Arctic atmospheric, oceanic, and cryospheric climate processes.