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Assessment of satellite based cloud climate data records over the Arctic

The objective of the study is to evaluate and intercompare four cloud Climate Data Records (CDR) and assess changes in Arctic cloud properties

Clouds play an important role in the Arctic surface energy budget. Yet very little is known about their climatological characteristics and their response to warming and decreasing sea-ice.

Currently there exist 4 satellite based global CDRs of cloud properties that cover more than 30+ year time period. They are evaluated in this workpackage to understand commonalities and differences and their strengths and weaknesses. The trends in cloudiness are also evaluated.

Access to data: CLARA-A2:

<https://www.atmos-chem-phys.net/17/5809/2017/>

PATMOS-x: <https://cimss.ssec.wisc.edu/patmosx/>

ESA Cloud_cci: <http://www.esa-cloud-cci.org/>

ISCCP: <https://www.ncdc.noaa.gov/isccp/>

Figure 1 shows trends in total cloud fraction based on CLARA-A2 climate data (1982-2016). Cloudiness is increasing during autumn.

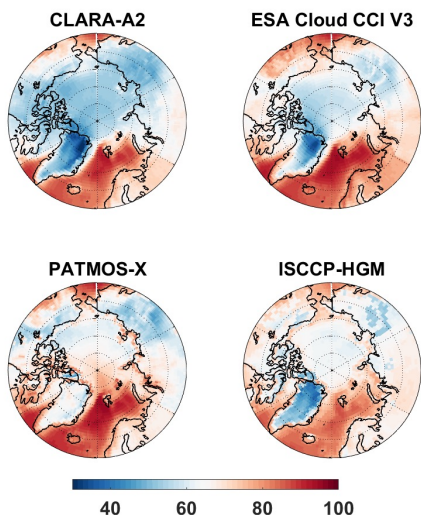
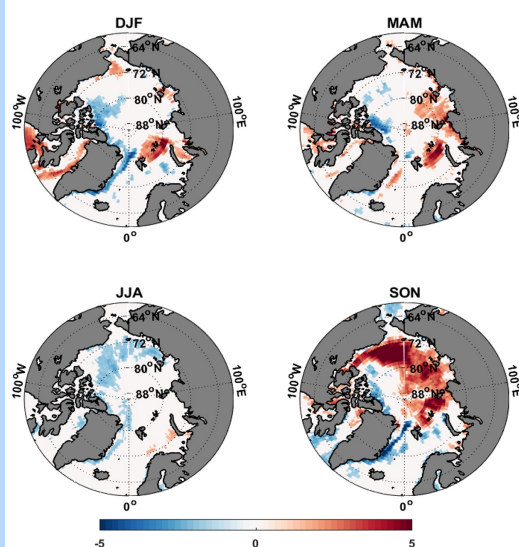


Figure 2. Comparison of climatological mean cloud fraction in four CDRs (1982-2016)

The data are used for

- Climate researchers at the universities and research institutes
- Agencies monitoring extreme events in the Arctic
- Global and regional climate modelling community
- Energy and resources planning

Reference:

Devasthale A., Sedlar J., Tjernström M., Kokhanovsky A. (2020) A Climatological Overview of Arctic Clouds. In: Kokhanovsky A., Tomasi C. (eds) Physics and Chemistry of the Arctic Atmosphere. Springer Polar Sciences. Springer, Cham. https://doi.org/10.1007/978-3-030-33566-3_5