Operational validation of IFS forecasts

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ECMWF

Contents

- Predictability of cloudiness
- Regional patterns
- Spread-error relationship
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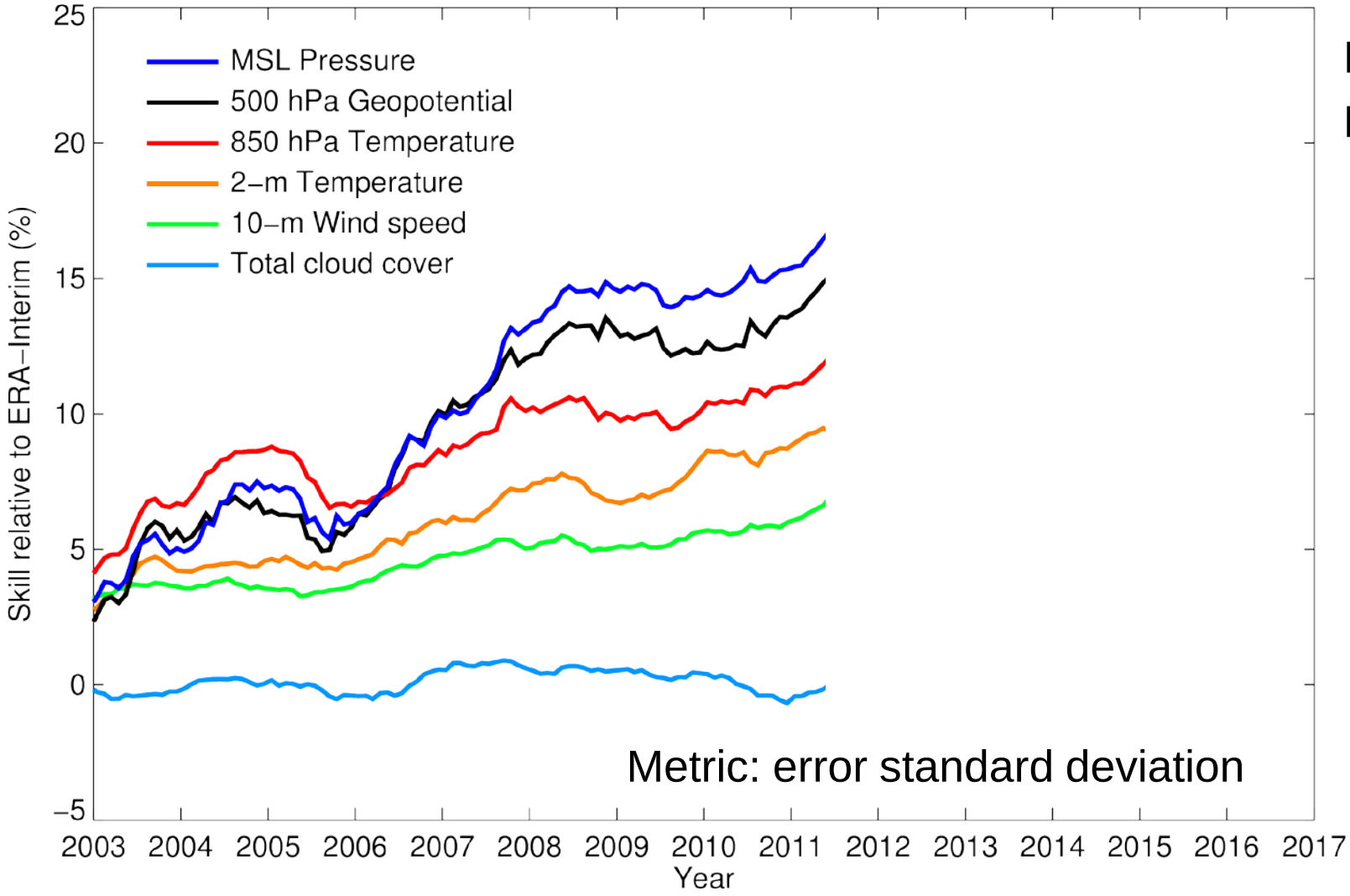
- Requirements

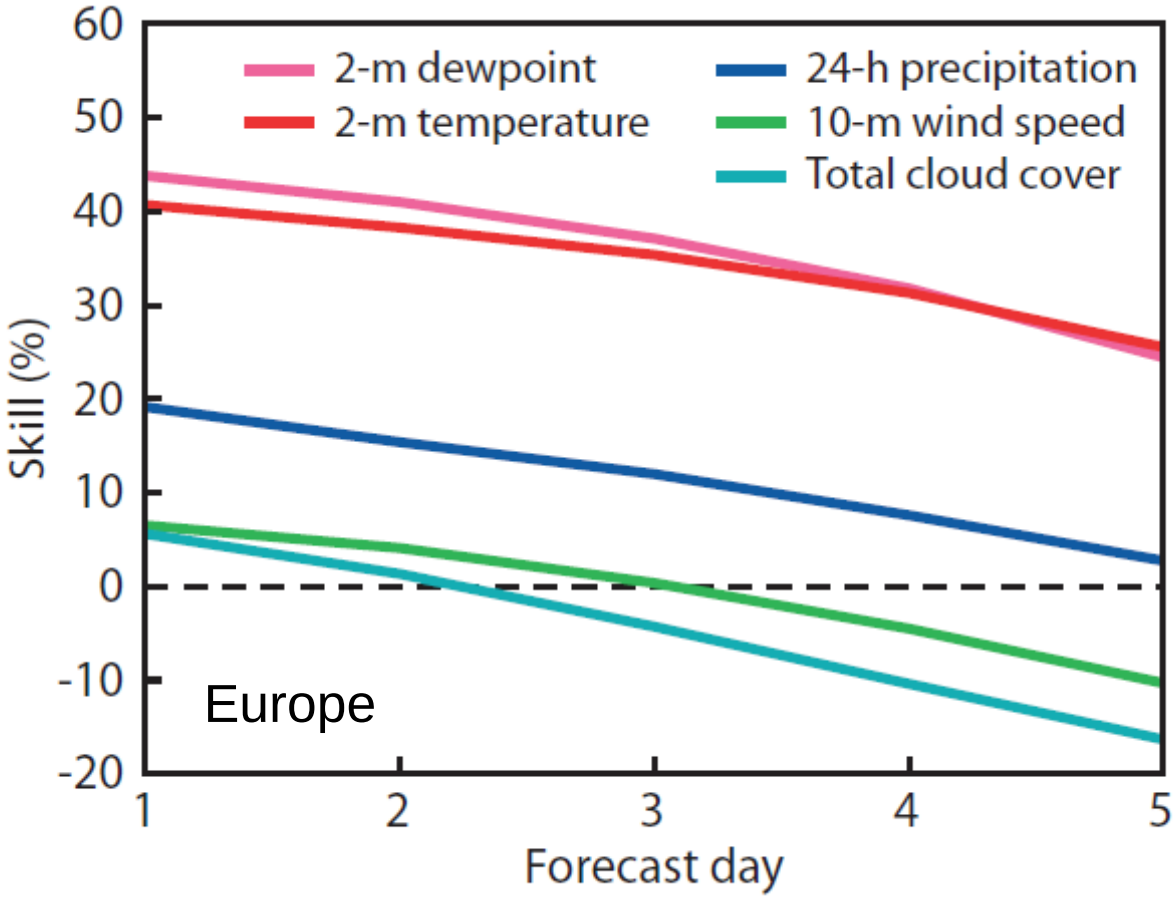
IFS forecast skill relative to ERA-Interim



NH extra-tropics

Day 5

IFS forecast skill horizon (point forecasts)



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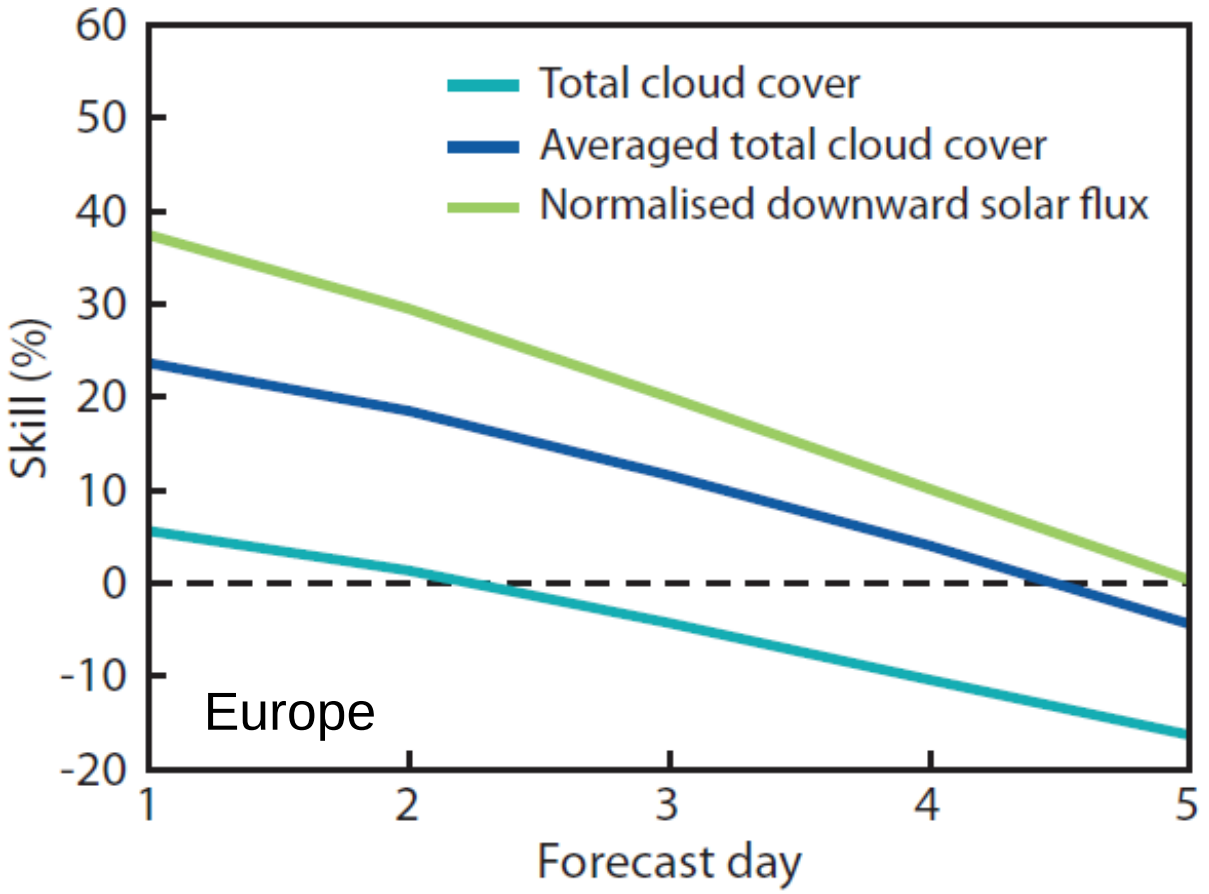
IFS forecast skill horizon (point forecasts)



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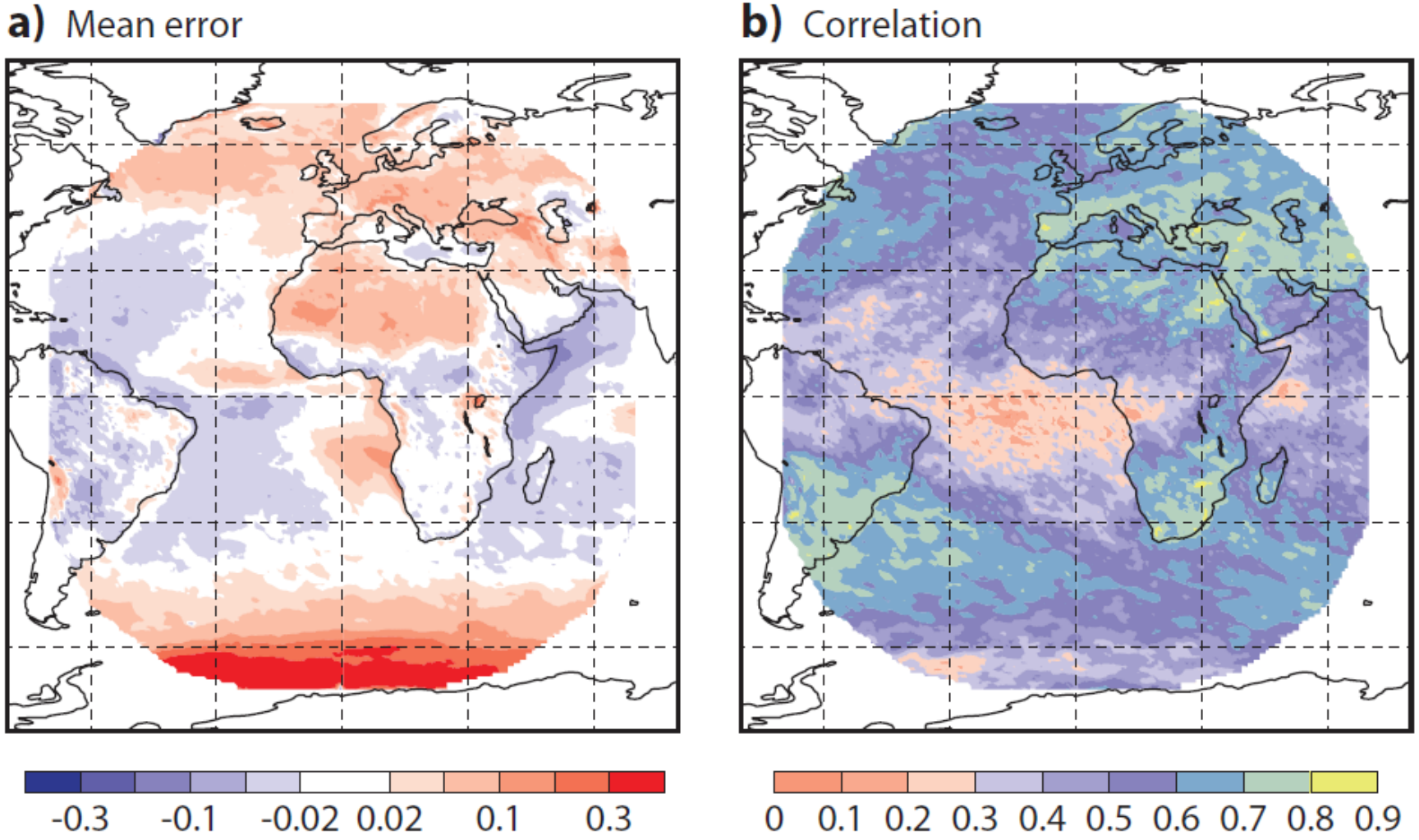
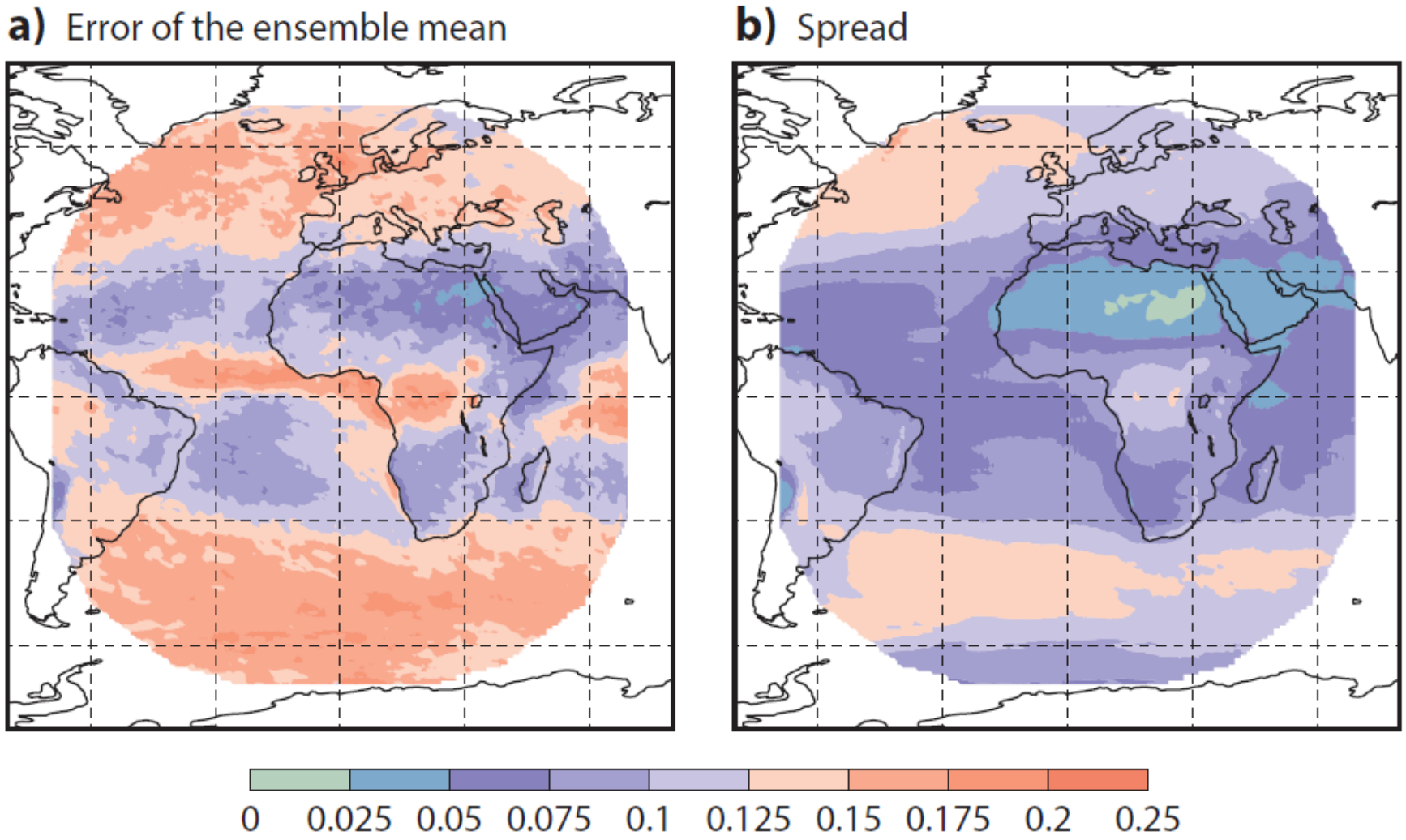
Regional patterns of forecast skill (SIS, normalized)



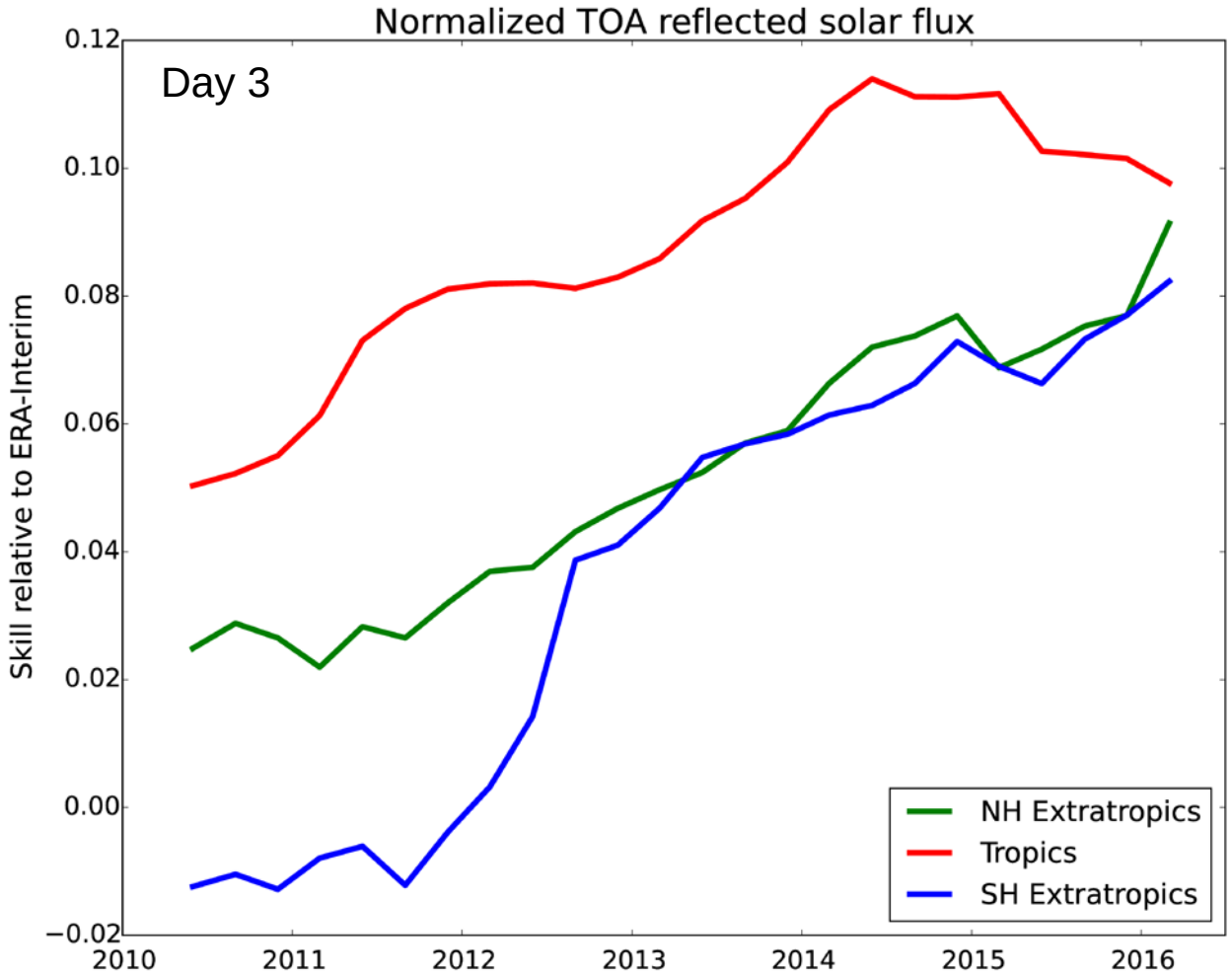
Day 3

ENS verification: spread v error (SIS, normalized)

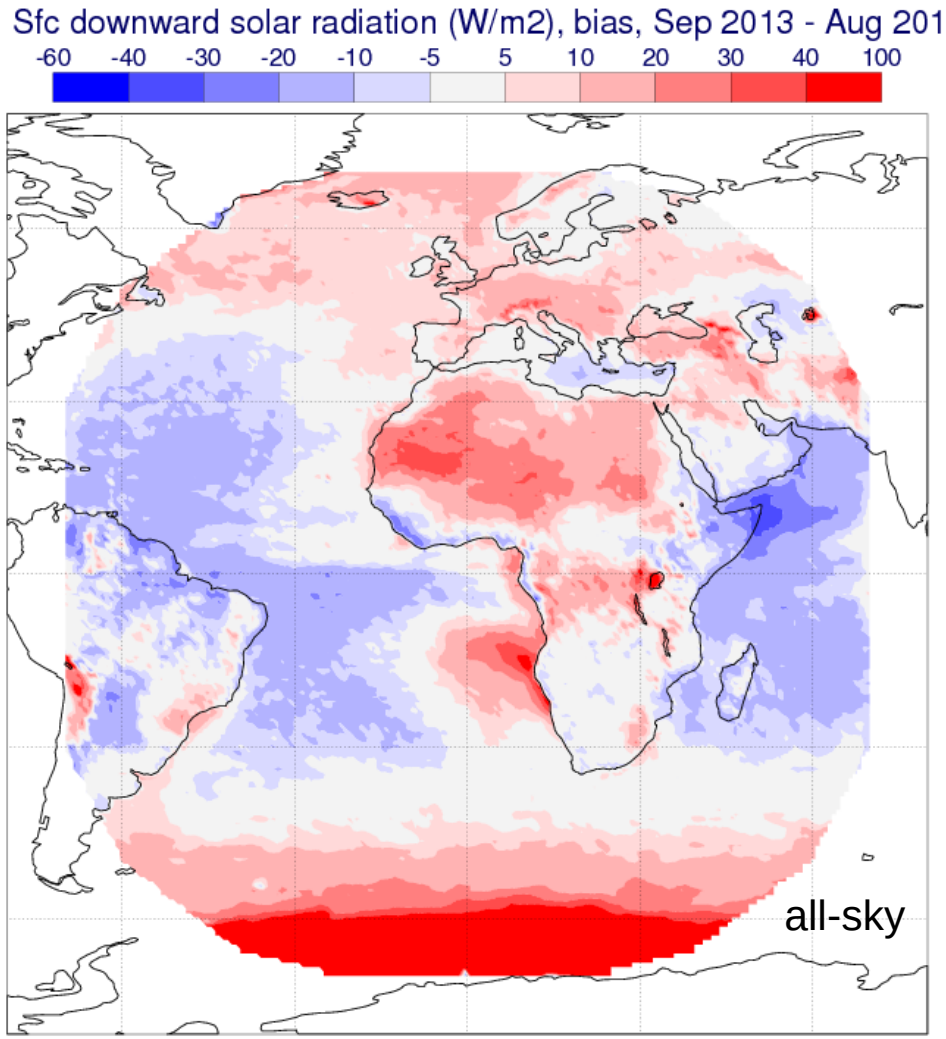


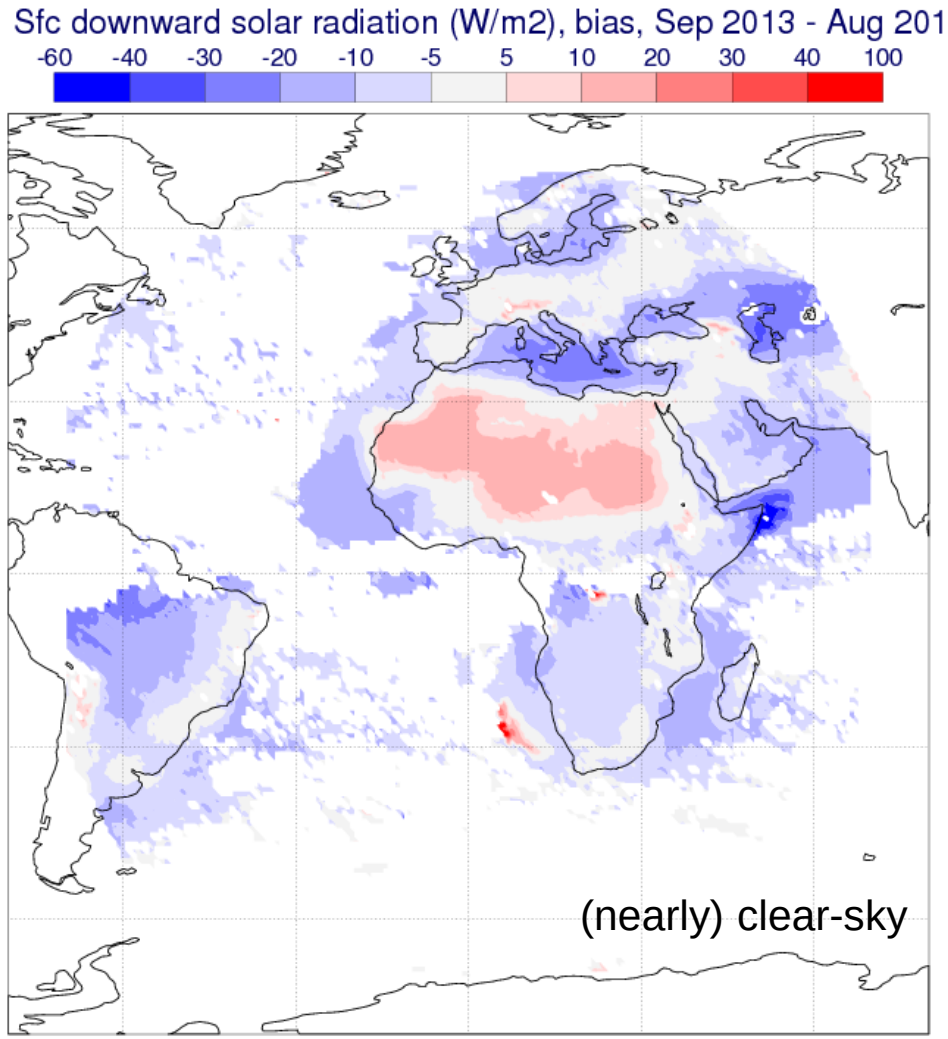
Day 3

Monitoring cloud forecast skill using TRS

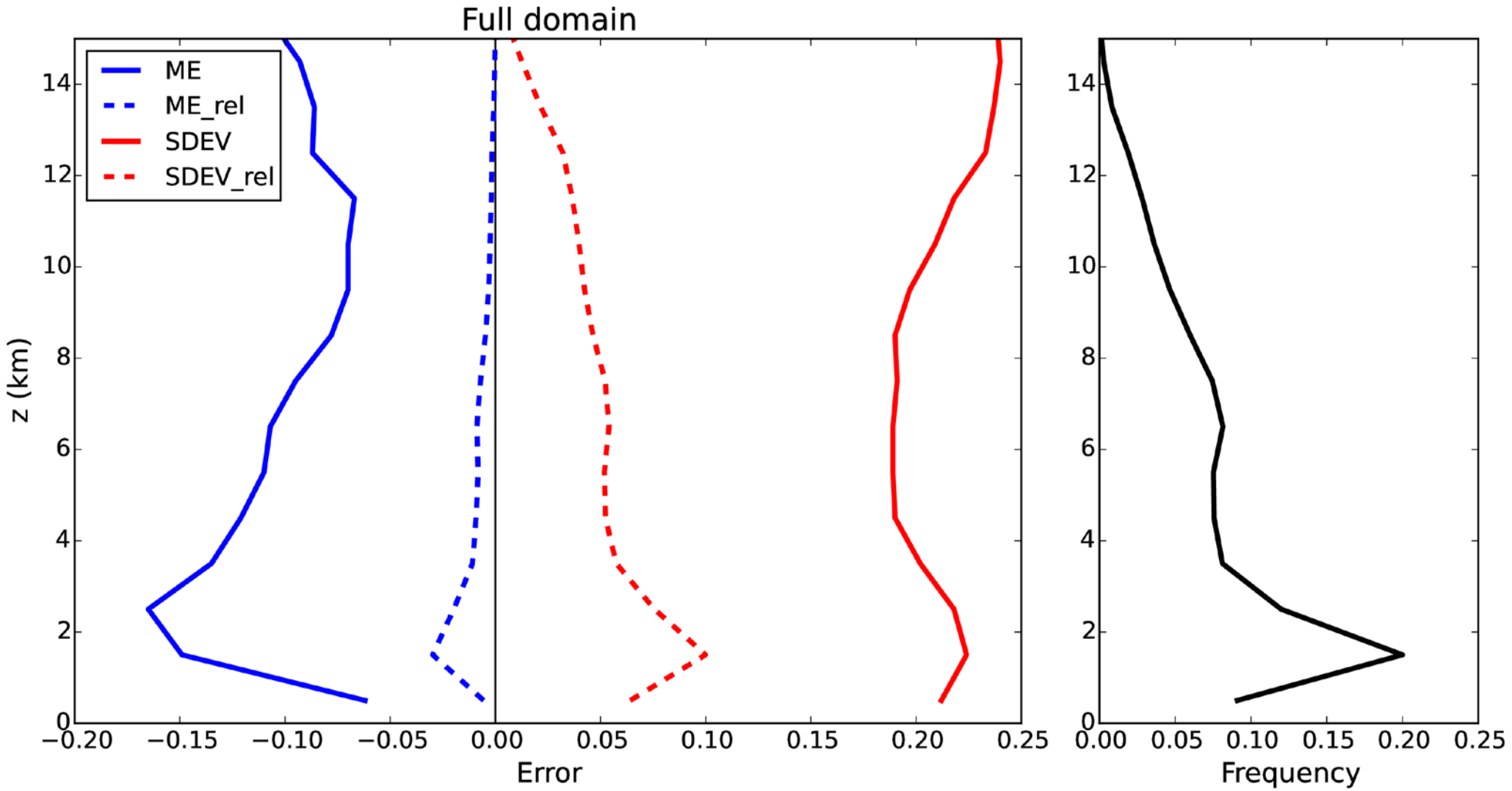


Using cloud fraction for stratifying radiation bias





Dependence of cloud fraction error on cloud top height



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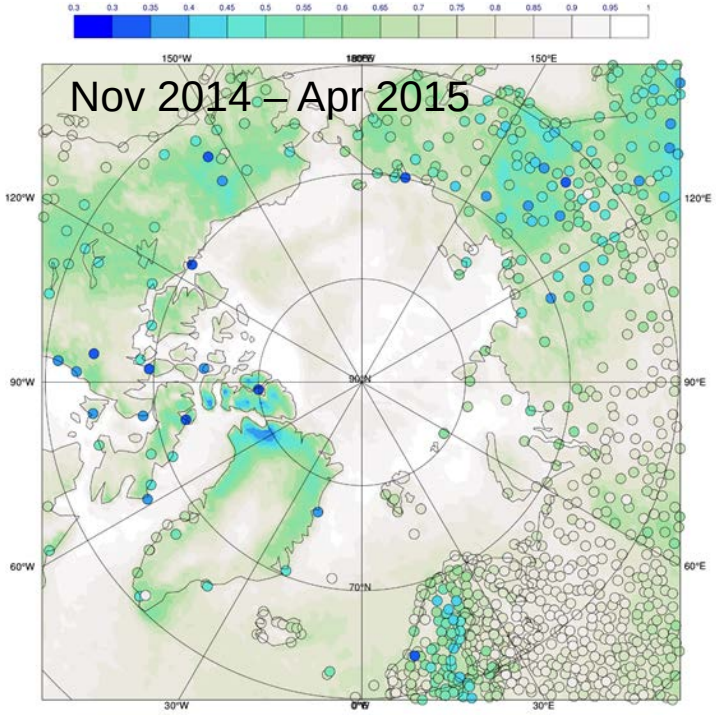
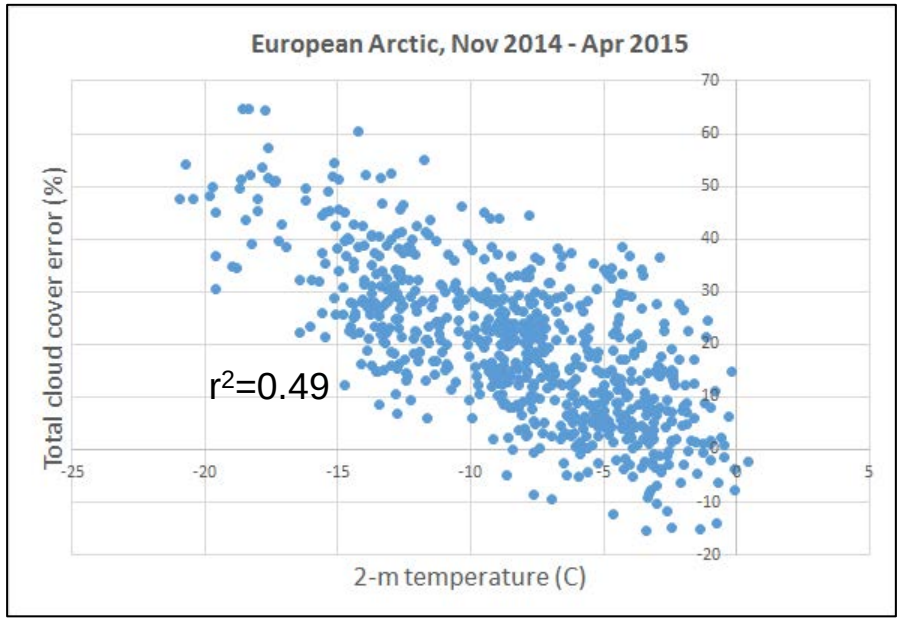
Based on CM SAF products CFC and CTH

Low cloudiness errors in the Arctic

- Strongly affect surface longwave radiation → sea ice
- Typically under stably stratified conditions
- Mainly a winter problem, strongly dependent on temperature





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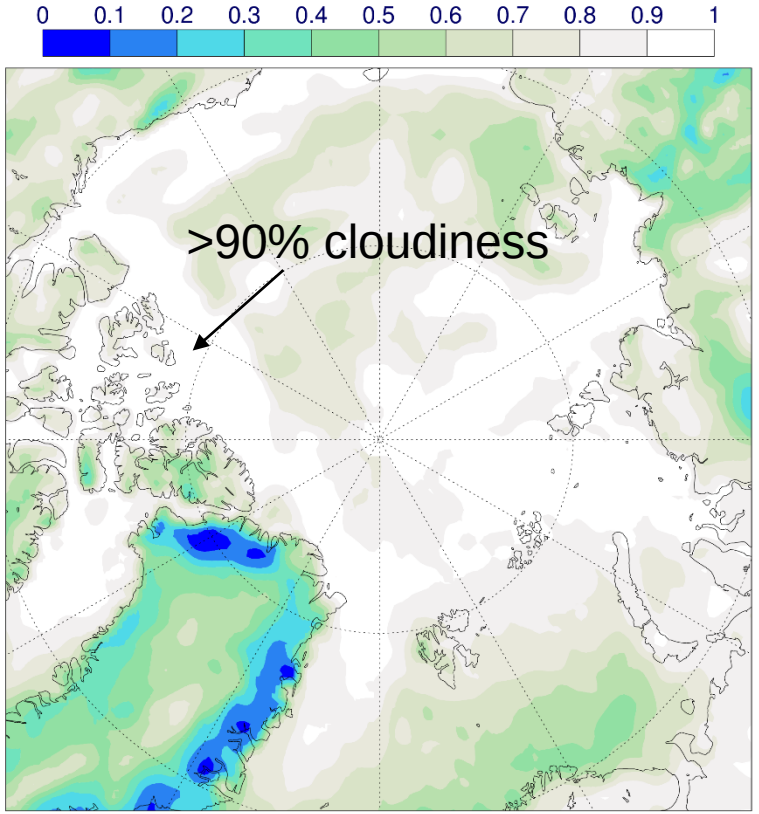
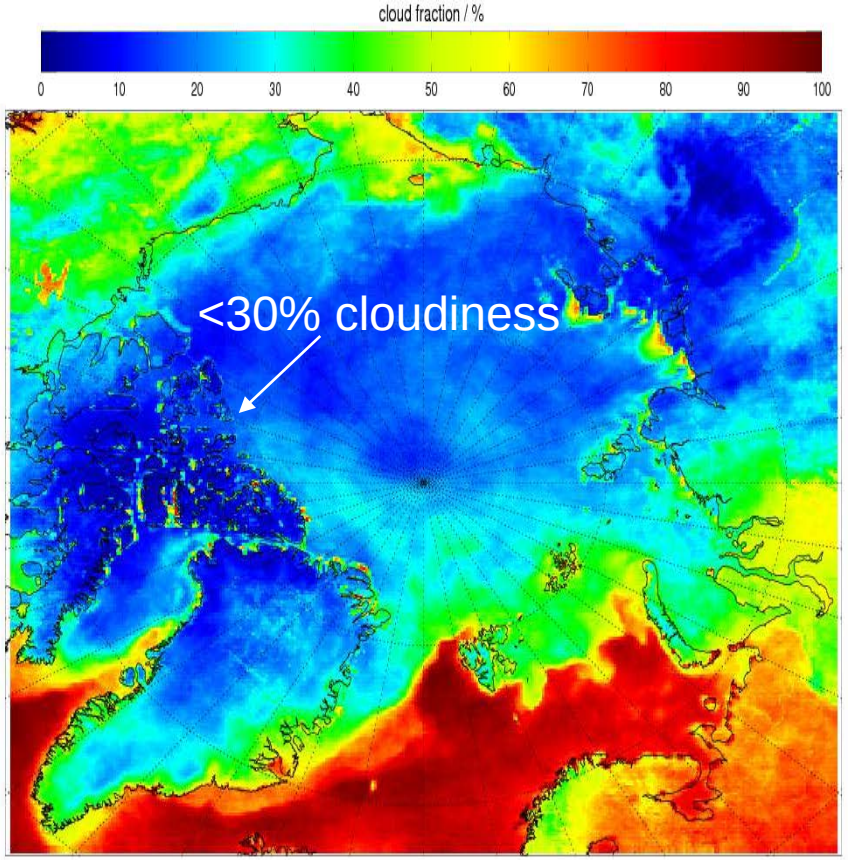
ERA-Interim v CM SAF cloud fraction

1-31 Dec 2014



ERA-Interim



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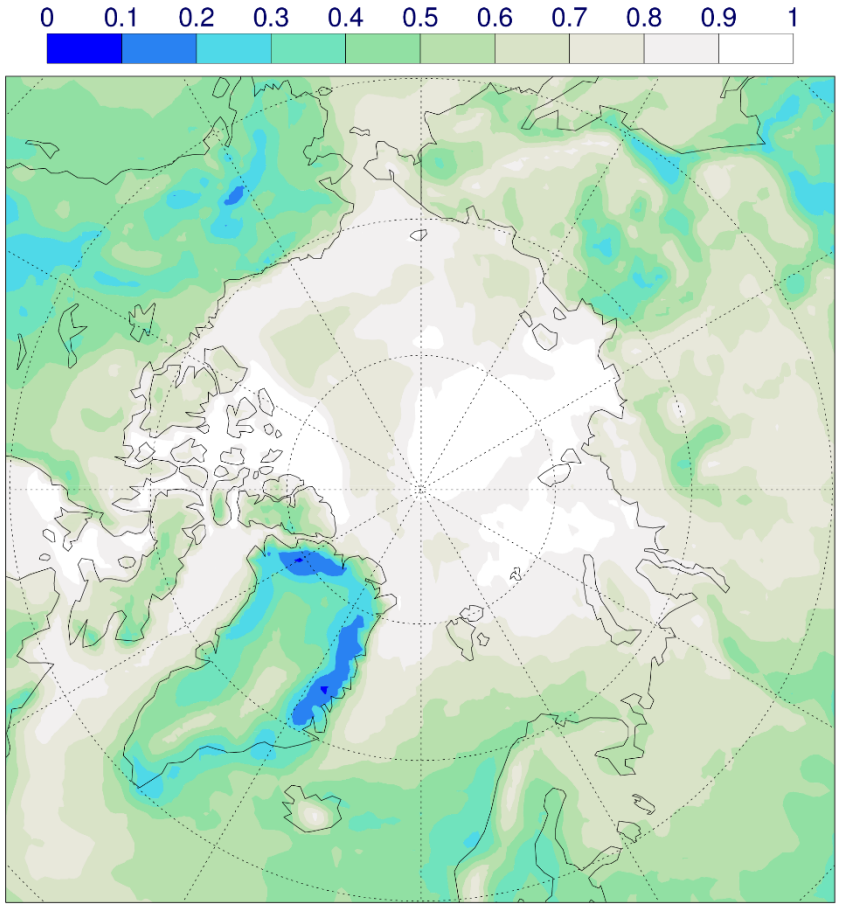
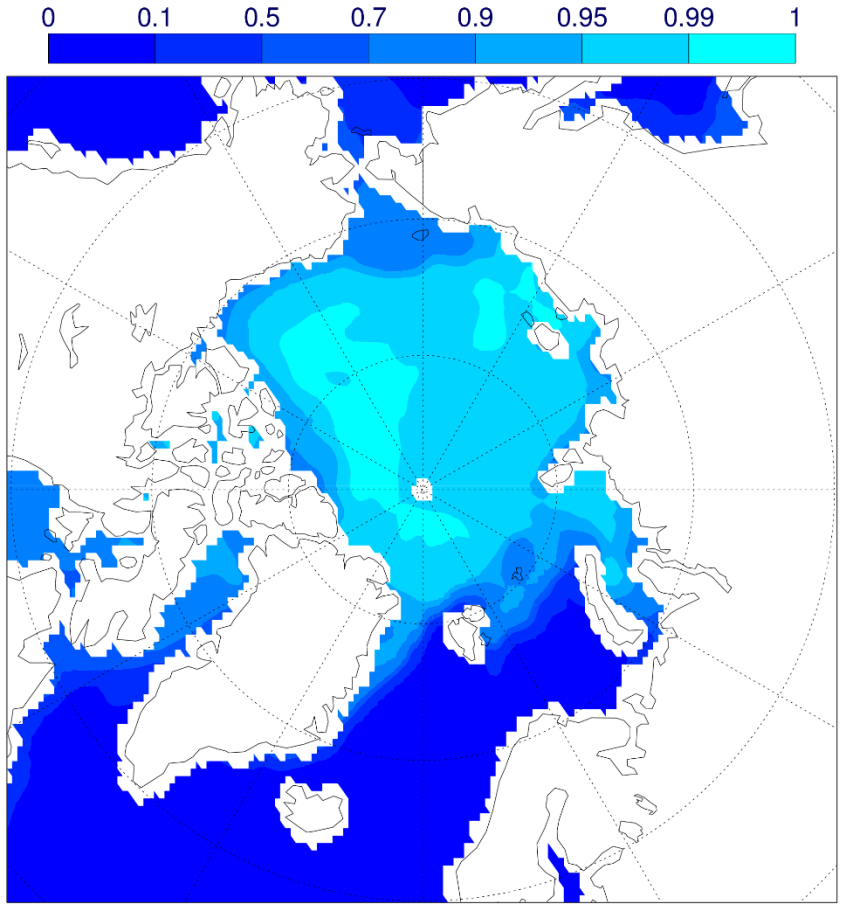
Cloudiness and sea-ice

ERA-Interim
Nov 2014 –
Apr 2015



Low cloud cover



Sea ice
concentration

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Outlook / requirements

- Homogeneous dataset which is as near to real time as possible
- Estimates of systematic and non-systematic errors
- SIS useful to infer ‘radiatively equivalent’ cloud forecast skill
- TRS useful since more directly observed
- YOPP (2017-2019): cloud/radiation products for Arctic

Conclusions

- CM SAF operational datasets highly useful in forecast evaluation
- Provide forecast skill monitoring and error diagnostic
- Highlight regional problems associated with certain cloud regimes
- Additional focus due to YOPP: cloudiness in the Arctic