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From: **ASSW 2017 PRAGUE | Abstracts** <abstracts@assw2017.eu>
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Subject: ASSW 2017 PRAGUE - Abstract submission confirmation
To: erlend.moster@gmail.com

The Arctic Science Summit Week 2017
31 March – 7 April 2017, Prague, Czech Republic

Dear Dr. Erlend Moster Knudsen,

Thank you for submitting your abstract for the upcoming ASSW 2017 PRAGUE Summit.

Your abstract is successfully saved in our database. Changes are allowed until the deadline - 16 December 2016.

Please find the overview of the saved abstract below:

Session	**4. Hemispheric and regional atmospheric impacts of a rapidly changing Arctic climate**
Presentation Preference	**Oral or Poster**
Abstract Title	**Observational Evidence for Predictive Skills from Arctic Summer Sea Ice Extent**
Author(s)	E.M. Knudsen[1], D. Thompson[2], T. Furevik[3]. [1]University of Cologne, Institute for Geophysics and Meteorology, Köln, Germany. [2]Colorado State University, Department of Atmospheric Science, Fort Collins, USA. [3]University of Bergen, Geophysical Institute / Bjerknes Centre for Climate Research, Bergen, Norway.
Keywords	**Arctic amplification** **Arctic sea ice**
Abstract Text	**The Arctic is warming twice as fast as the global average. This feature, known as the Arctic amplification, results in and is a result of the melting sea ice in the region. The latter connection is understood to have significant impact on large-scale atmospheric circulation at high- and midlatitudes.** **Using National Snow and Ice Data Center sea ice data and ERA-Interim reanalysis data, we here show that summer sea ice extent (SIE) and temperature are the most important predictors of annual SIE minimum (maximum from July and June to September,**

respectively). Winter SIE and temperature also have significant prediction skill for spring SIE, while spring and autumn conversely show low memory into following season.

Based on the most important month for annual SIE minimum prediction (July), we then performed a lead/lag regression analysis of sea ice concentration, temperature and atmospheric circulation. We find that anomalous low July SIE is associated with significant warming (cooling) in the troposphere (stratosphere) within the Arctic Circle from May to September, along with weakened Westerlies. Before and after this period, summer sea ice anomalies have little impact.

Our results offer new understanding for seasonal sea ice prediction of the opening Arctic Ocean. This is of high interest to many actors, also beyond the scientific community. Moreover, we add to the ongoing heavily debated role Arctic amplification has for weather extremes in midlatitudes.

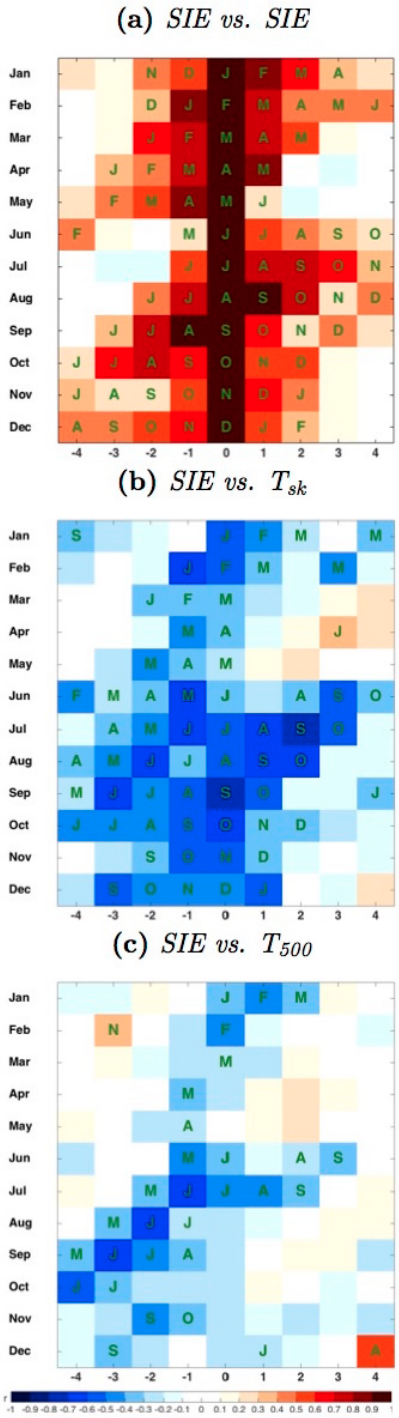

Figure 1: *Monthly lead/lag correlation coefficients between (a) Arctic sea ice extent (SIE) and SIE (autocorrelation), (b) SIE and skin temperature (T_{sk}) and SIE and* 500 *hPa temperature (T_{500}). For each SIE month along the y-axis, negative (positive) values along the x-axis represent correlation from a previous (the current) T_{sk}, SIE or T_{500} (SIE) month to the current (a coming) SIE (T_{sk}, SIE or T_{500}) month. Significant correlations on a* 95 *% confidence level ($\alpha = 0.05$) are indicated by the initial of the lead/lag month, where the threshold for significance is dependent on month and lead/lag value. The thresholds are assessed using the t statistic, where the effective sample size is estimated using the relationship outlined in Bretherton et al. (1999). All data are deseasonalized and detrended, and T_{sk} and T_{500} are spatially averaged over the Arctic (defined* 66.5–90.0° *N).*

Should you have any questions or queries, please do not hesitate to contact us.

Kind regards,
Summit Secretariat