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## Is the impact of climate oscillations changing over the Greenland Ice Sheet?

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Greenland Block Index (GBI) and North Atlantic Oscillation (NAO) are climate indices widely used for climatological studies especially over the Greenland Ice Sheet (GrIS). Particularly in summer, they are highly and negatively correlated; both have a strong relationship to near surface processes around the GrIS; their magnitude creates non-linear feedbacks and influences the low troposphere, shaping spatial accumulation and ablation patterns.

NAO is a measure of the surface pressure difference over the North Atlantic, providing insight of intensity and location of the jet stream. GBI denotes the general circulation over Greenland at the 500-hPa level and depending on its signal promotes heat and moist advection towards inland.

Based on the 1959-2019 period, the extreme summer melt of 2019 recorded the highest mean summer GBI while the extreme summer melt of 2012 recorded the lowest mean summer NAO. Their impact, however, goes beyond the melting season since the inter-seasonal phase change of these two indices may enhance/ postpone early melt/late refreezing and vice-versa.

Supported by 62 years of high-resolution regional climate model output (RACMO2.3p2), this work uses a statistical approach to analyze inter-seasonal variability of climate oscillations and their impact on the surface energy budget components over the GrIS. Also, teleconnection changes in a changing climate are hypothesized.