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Seasonal prediction in northern Atlantic Ocean and Norwegian Seas

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Recent operational systems are able to predict sea surface temperature (SST) on seasonal timescales in the extra-tropical North Atlantic and Nordic Seas to a high-degree and as high as in the tropical Pacific. While prediction on multi-year timescales is well documented, the source of the high skill on seasonal timescales is unclear and somewhat unexpected. Here, using the Norwegian Climate Prediction model, we show that the skill on seasonal timescales is associated primarily with low-frequency variability (timescales longer than five years). Consistently, there is high skill in predicting SST anomalies six seasons in advance, although there is a skill drop across boreal summer that seems associated with reduced vertical mixing. External forcing and initialized ocean variability contribute similarly to skill on seasonal timescales, as assessed through a heat budget analysis. Skill on these timescales can benefit fisheries and aqua culture.