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How predictable were Arctic cyclones in summer on medium-range timescales?

Arctic cyclones (ACs) are a severe atmospheric phenomenon that affects the Arctic environment. This study assesses the forecast skills of 5 leading operational medium-range ensemble forecasts (CMC, ECMWF, JMA, NCEP and UKMO) and an ensemble reforecast at NOAA for extraordinary ACs that occurred in summer during 1986–2016. Twenty-six (ten) extraordinary ACs in summer during 1986–2016 (2008–2016, for which the operational forecasts are available) showed no trend in their central pressure, size, and frequency. For both the operational forecasts and the reforecast, average existence probability of the predicted ACs was >0.9 at lead times of ≤ 3.0 – 3.5 days. Average central position error was less than half of the mean radius of the ACs (433.1 km (469.1 km) for 26 (10) ACs) at lead times of 2.5–4.5 days. Average central pressure error of the predicted ACs was 5.5–10.7 hPa at such lead times. Therefore, these ensemble prediction systems generally predict the position of ACs within 433.1 km (469.1 km) 2.5–4.5 days before they mature. Besides, there is no trend of improvements in forecast skills of existence, central pressure and position of the extraordinary ACs at all lead times.

Primary authors: Dr YAMAGAMI, Akio (Center for Computational Sciences, University of Tsukuba); MATSUEDA, Mio (Center for Computational Sciences, University of Tsukuba); Prof. TANAKA, Hiroshi (Center for Computational Sciences, University of Tsukuba)

Presenter: MATSUEDA, Mio (Center for Computational Sciences, University of Tsukuba)

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