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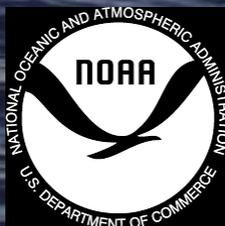
ANALOGS FOR ARCTIC FORECASTING

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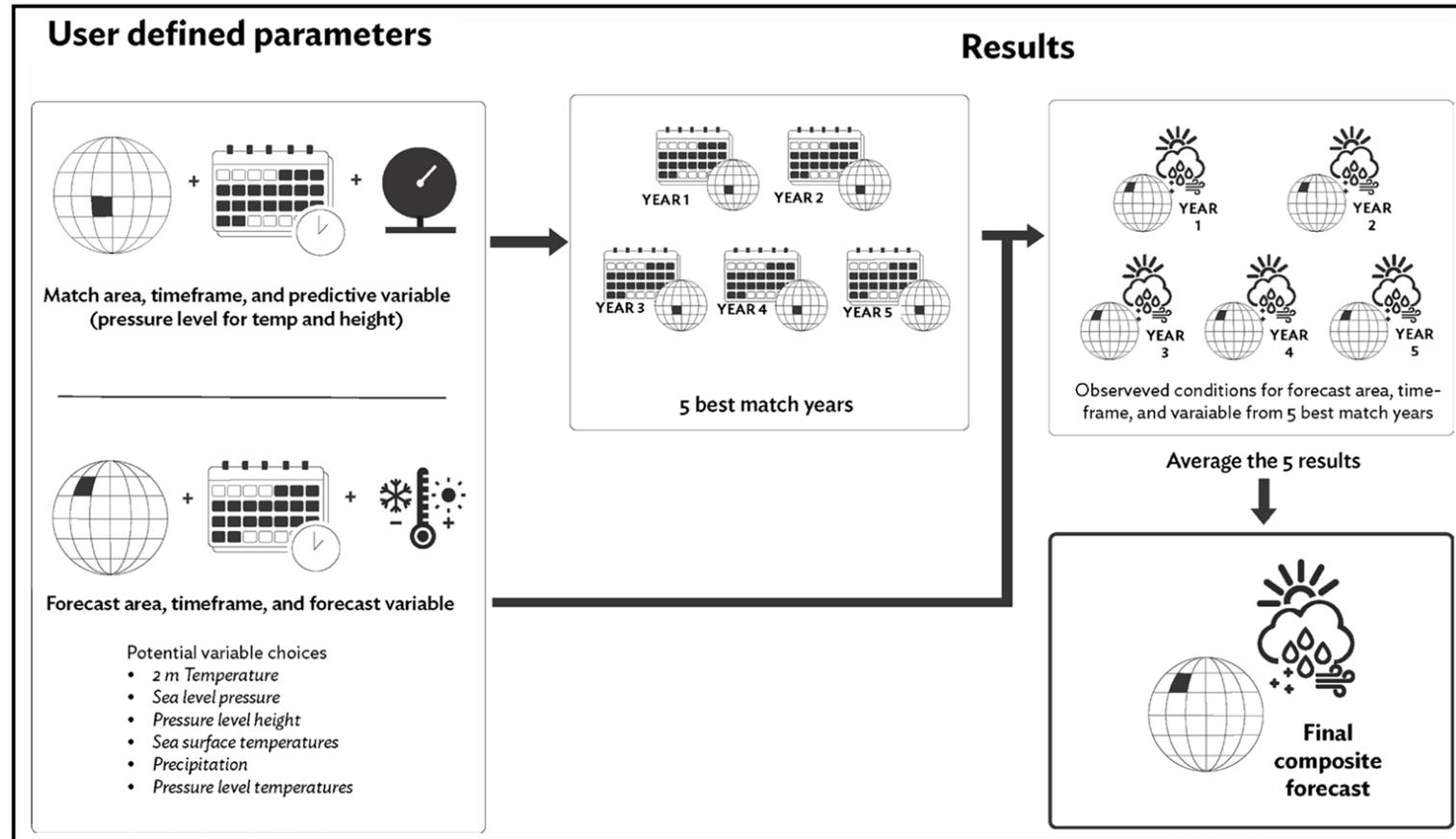
Lightning Points

1. Seasonal scale dynamic climate models struggle at high latitude
2. Analog outlooks system developed using NCEP/NCAR Reanalysis (R1)
3. Temperature outlooks as good or better than dynamic models at high latitudes



ANALOG FORECAST SYSTEM

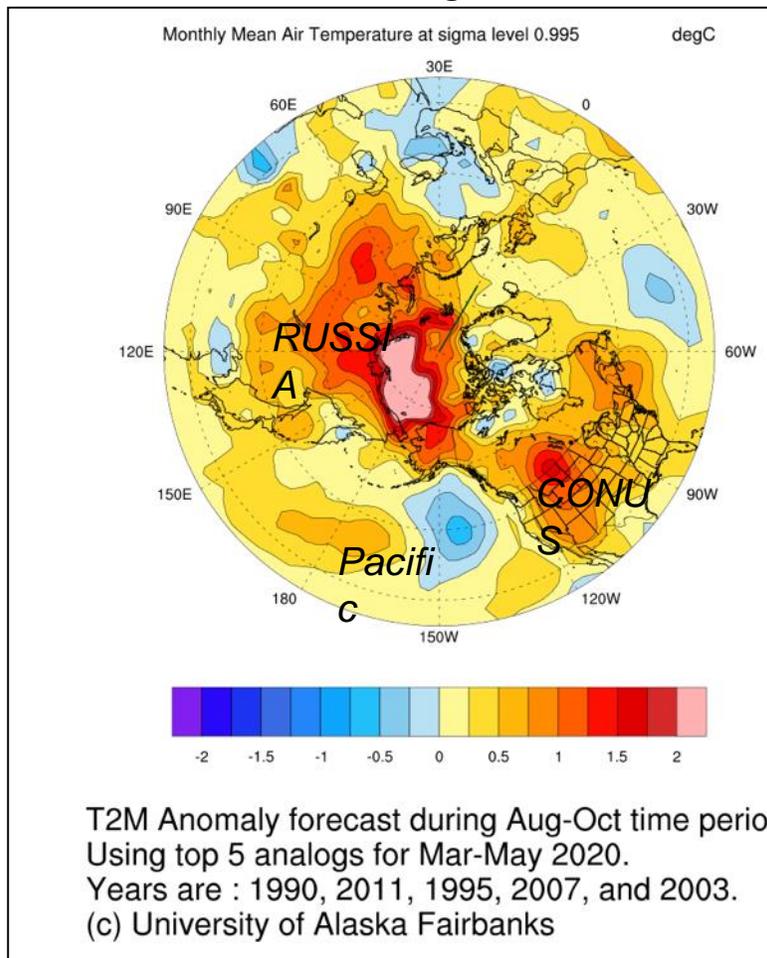
- NCEP/NCAR R1 Reanalysis data are used to generate historical matches
- Multiple variables, antecedent months, and spatial domain can be specified in analog selection
- Pattern matches are based on root mean square error



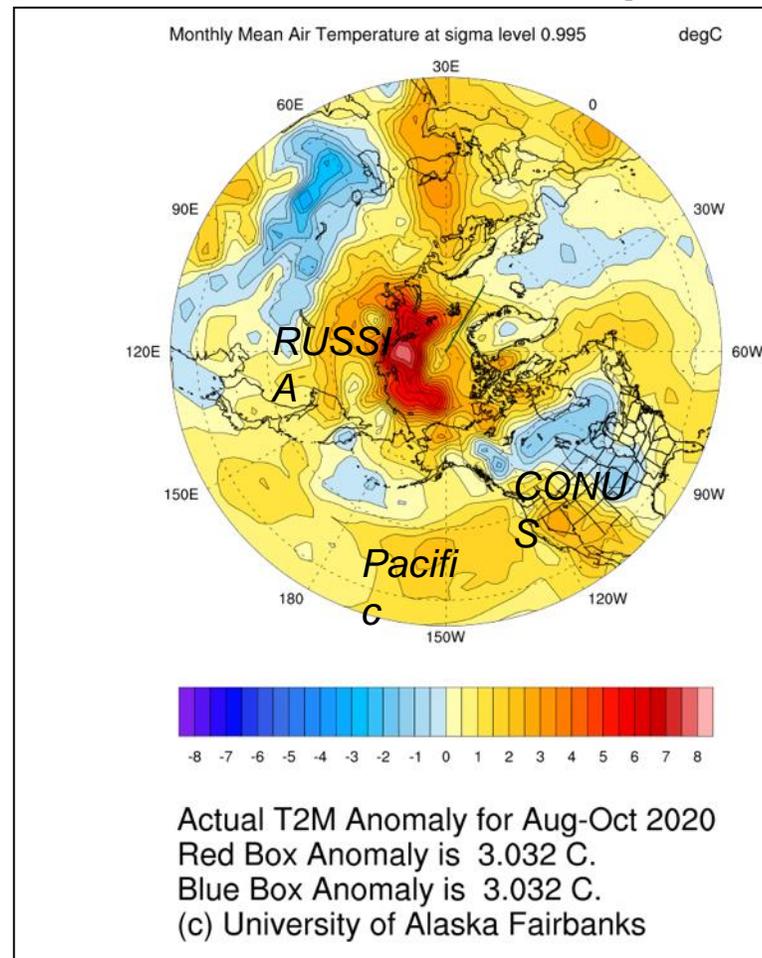
Arctic Focused Example

Aug-Oct Forecast Using Mar-May for Matches

ASO 2020 Analogs Forecast

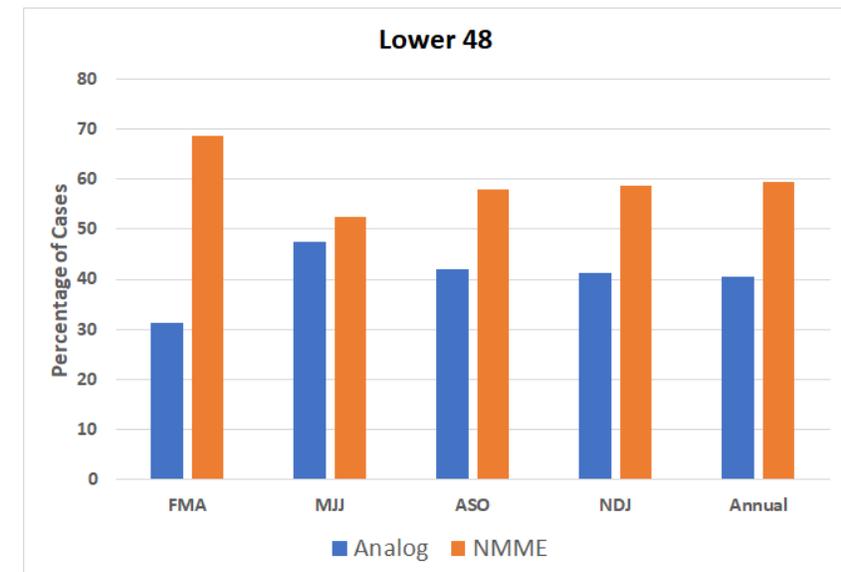
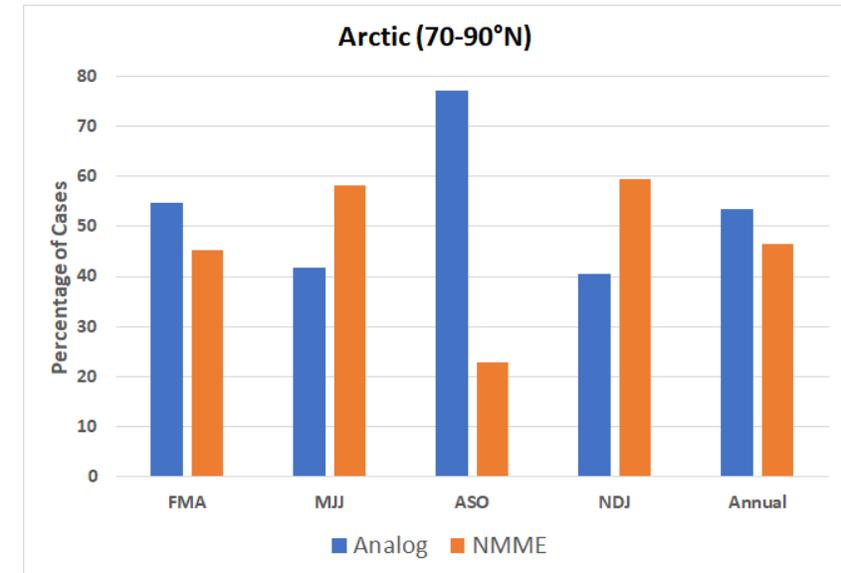


ASO 2020 Actual Temps



COMPARISON WITH DYNAMICAL FORECAST MODELS

- % of months (2012-2019) in which better forecast is produced by Analogs (blue) vs NMME dynamical models (orange)
- Analog system outperformed dynamical models in the Arctic, underperformed in the middle latitudes
- Analogs improvements especially noted in late summer and early autumn



An Analog Method for Seasonal Forecasting in Northern High Latitudes. Walsh, J.E., et. al. 2021. *Atmospheric and Climate Sciences*, 11(3), pp.469-485.



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