



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

Canada

Forecasting Regional Arctic Sea Ice from a Month to Seasons (FRAMS)



WGSIP 21, Moscow, 29-31 May 2019

Photo: Lene Østvand

Welcome to the Arctic RCC Network

RCCs are Centres of Excellence that assist WMO Members in a given region to deliver better climate services and products including regional long-range forecasts, and to strengthen their capacity to meet national climate information needs.

ArcRCC-Network is based on the [WMO RCC](#) concept with active contributions from all the Arctic Council member countries through a mutually agreed structure consisting of three sub-regional geographical nodes, namely, (i) North America Node, (ii) Northern Europe and Greenland Node and (iii) Eurasia Node.

FRAMS primary objective: develop capacity for user-relevant, multi-model sea ice forecasts, informed by WMO GPCs, supporting new Arctic RCC

Climate monitoring

Climate monitoring products to be shown here.

Long-range forecasting

Products like seasonal outlooks.

Data access

Search datasets for the Arctic.

Northern Europe and Greenland Node

Collaboration between Norway, Sweden, Denmark, Finland and Iceland.

North American Node

Collaboration between Canada and USA.

Northern Eurasia Node

Led by the Russian Federation.

Norway: data services

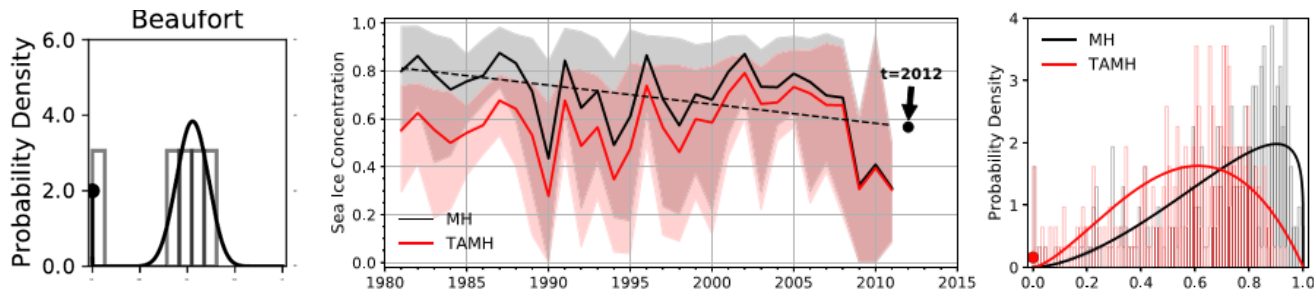
Canada: forecast production

Russia: climate monitoring

Sea ice = Highly Recommended Product

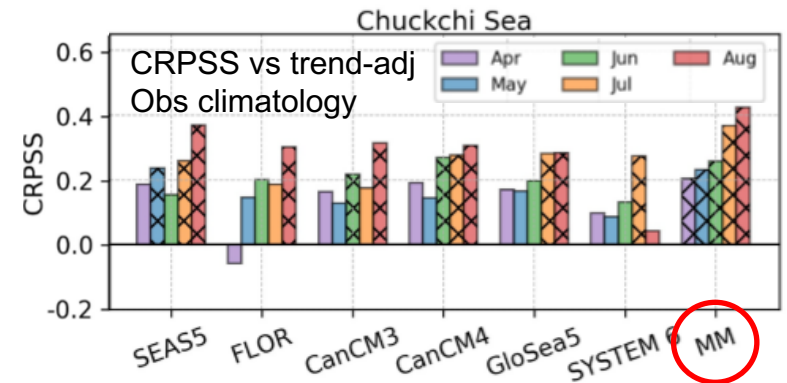
Sea ice forecast product development

- Calibrated multi-model forecasts of Sea Ice Probability $P(\text{SIC} > X\%)$
 - Method: fit to inflated beta distribution + trend-adjusted quantile mapping



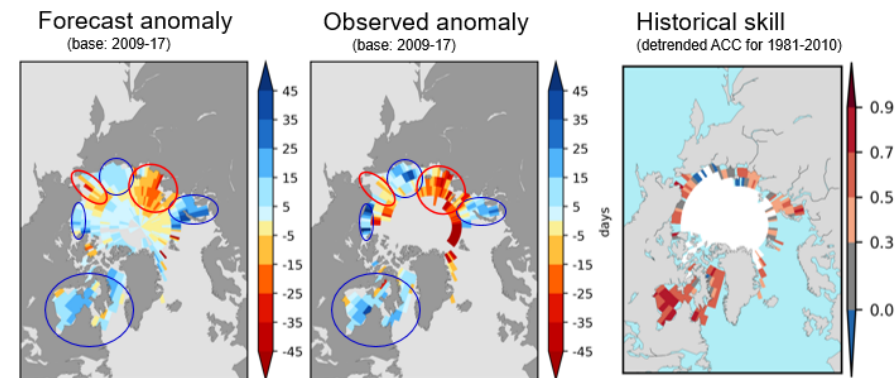
Dirkson et al., J. Clim 2019
Dirkson et al., GRL subm.

- MME based on CanSIPS, SEAS5, GloSea5, MF System 6, GFDL FLOR outperforms individual models →



- Ice-free dates & freeze-up dates
 - Obtained from daily concentrations
 - Skillful, verified well in 2018 →
 - Just CanSIPS so far
 - MM calibrated probabilistic under development

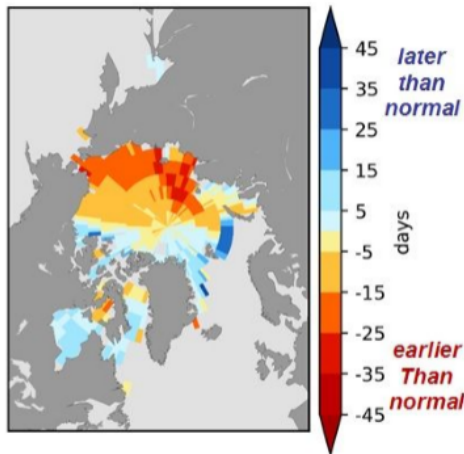
Sigmond et al., GRL 2016
Dirkson et al., to be subm.



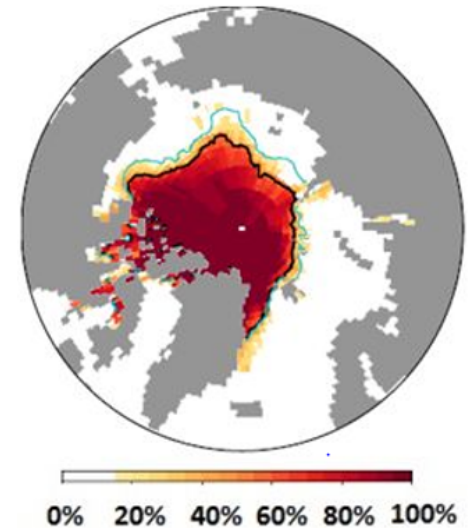
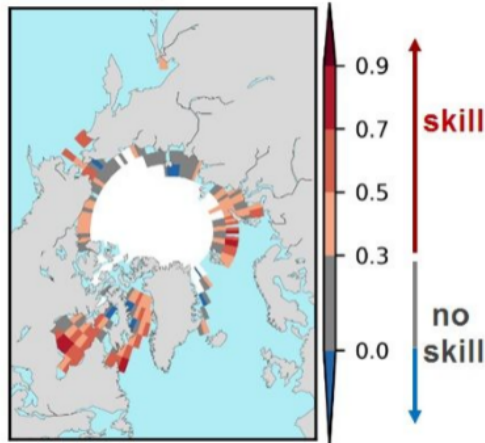
Third Session of the Pan-Arctic Regional Climate Outlook Forum (PARCOF-3), Rovaniemi, Finland, May 2019

Consensus Statement for the Arctic Summer 2019 Season Outlook

Break-up Date Anomaly
Climatology Period 2009-2017



Historical Forecast Skill
Detrended anomaly correlation coefficient 1981-2010



PARCOF sea ice forecasts from CanSIPS until
real-time multi-model products available

Figure 9. September 2019 probability of sea ice at concentrations greater than 15% from CanSIPS (ECCC). Ensemble mean ice extent from CanSIPS (black) and observed mean ice extent 2009-2017 (green).