



PolarMERRA: A Polar-Focused Global Reanalysis Project for Scientific and Stakeholder Needs

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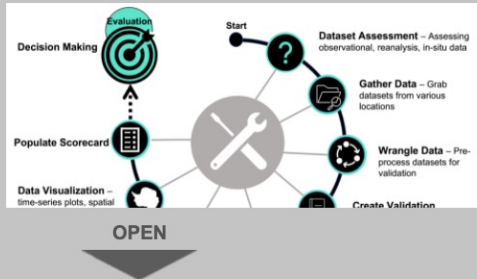
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An Easy-to-use Assessment Framework

As part of PolarMERRA, we are implementing a quantitative validation

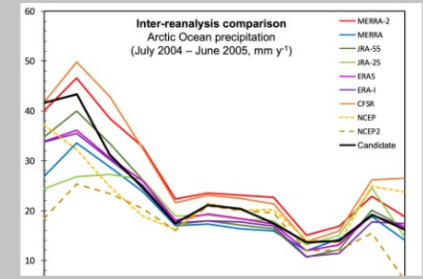


PolarMERRA: An Introduction

The *PolarMERRA* initiative, a joint effort between NASA's Cryospheric Sciences and Modeling and Prediction programs, seeks to improve the representation of cryospheric and polar atmospheric processes in NASA's GEOS model and to develop an open-source framework for quantitative evaluation of polar-relevant variables against current and future satellite and in-situ observations, models, and reanalyses.

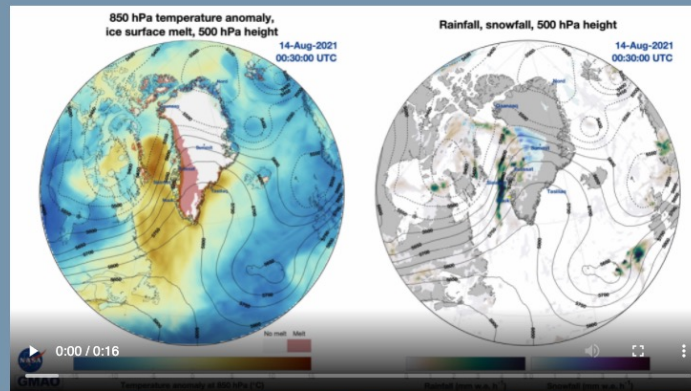
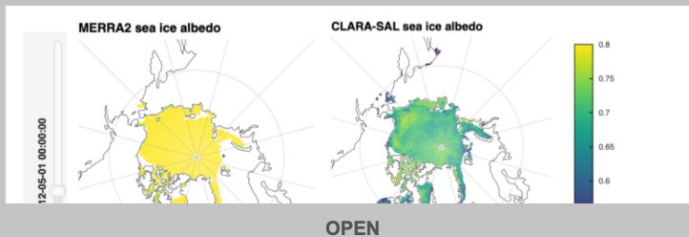
Arctic Precipitation Improvements

MERRA-2 produces an excess of precipitation over the Arctic Ocean relative to other reanalyses (right)



Assessment Framework: Initial Capabilities

The current validation system straight-forward intercomparison of observations and model results over Arctic sea ice (below) and the Greenland Ice Sheet (below). These systems will be expanded to include the Antarctic and additional processes and datasets.



Surface conditions preceding and during the rain and melt event on the Greenland Ice Sheet in August 2021 from the GEOS-FP analysis. GEOS-FP, GMAO's weather prediction system will be the basis for a 21st century reanalysis and the associated PolarMERRA specific replay. The GEOS-FP

Arctic Surface Temperature Improvements

MERRA-2 winter and early spring 2-meter air temperatures show a warm bias when compared to sea ice buoys (below). Analysis suggests that the principal causes of these biases are issues with the radiative flux parameterization and limited polar observations.

