Proposal for extension of Class 4 intercomparison to include sea ice concentration

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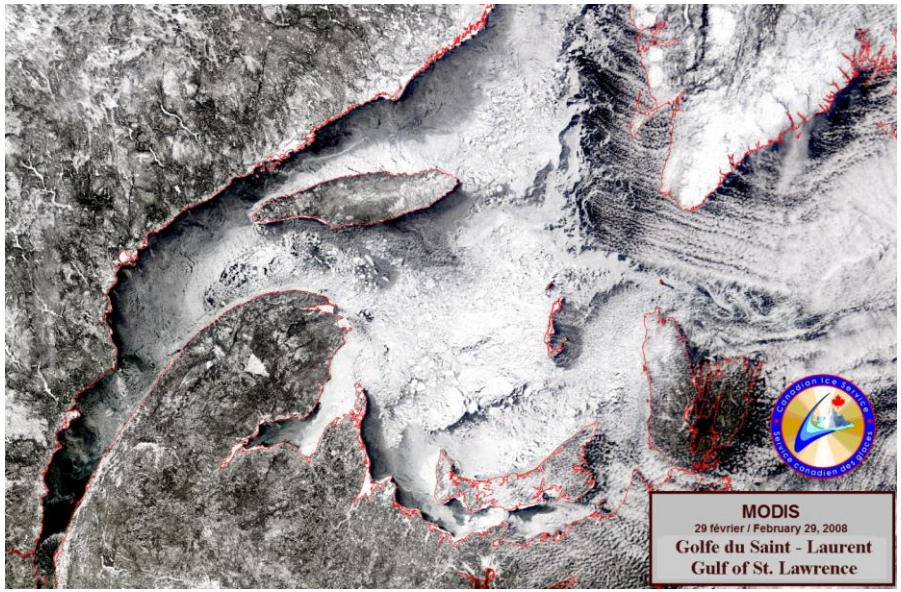
CONCEPTS
CANADIAN OPERATIONAL NETWORK OF COUPLED ENVIRONMENTAL PREDICTION SYSTEMS



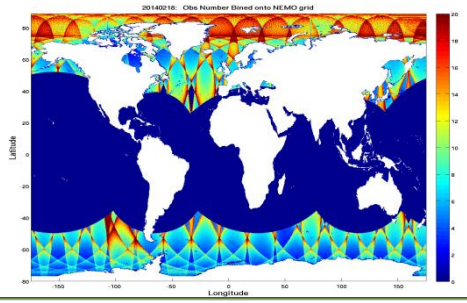
GOVST-V, Oct. 13-17, Beijing, China

Environment Canada
Fisheries and Oceans Canada
Mercator Ocean
Ocean Forecasters
CONCEPTS
National Defence

Motivation

- Increasing interest in polar regions in recent years
  - Marine transportation and security, resource exploitation
- Relevance for coupling to NWP
  - Large uncertainty in skill of forecasts and quality of fluxes
- Upcoming Year of Polar Prediction
  - Opportunity for GOV to highlight maturity of our systems
  - Make use of additional observations
    - Further extension of class4 ice?
- Challenge:
  - Finding a suitable dataset…

Reference dataset : AMSR2



Advantages

- Recent launch should allow several years of data and thus continuity in scores
- Good coverage
- Fairly small footprint (~14km)
- Not yet used by GOV data assimilation systems

Disadvantages

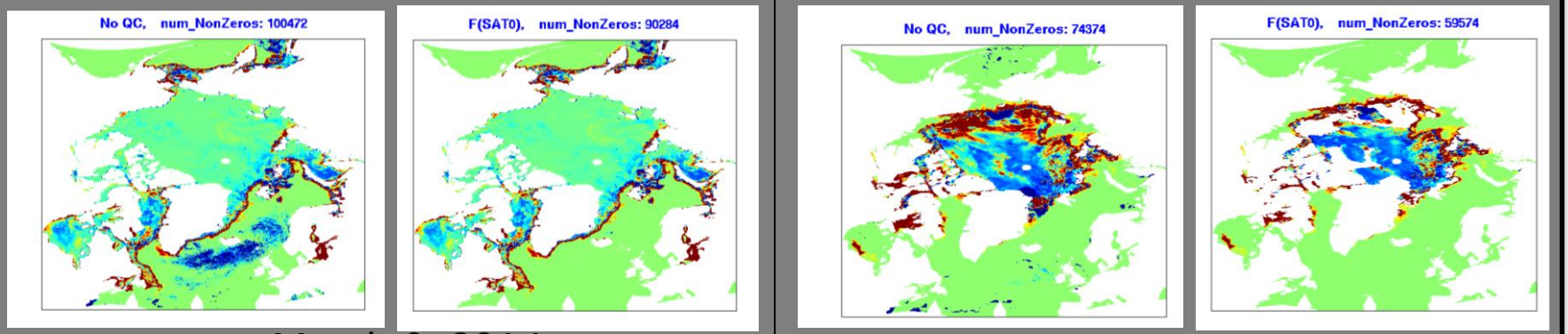
- Ice concentration values from passive microwave sensors sensitive to choice of retrieval algorithm and tiepoints
- Known difficulties with surface melt in summer

Proposed strategy

- Use AMSR2 with NasaTeam2 retrieval
- Include quality control flags from CMC-3DVar
  - But don't reject data (ie don't apply flags)
- Flag data as bad where:
  - CMC SST analysis > 4°C
  - CMC Surface Air Temperature > 0C, 2C, 4C

GIOPS Analysis – AMSR2

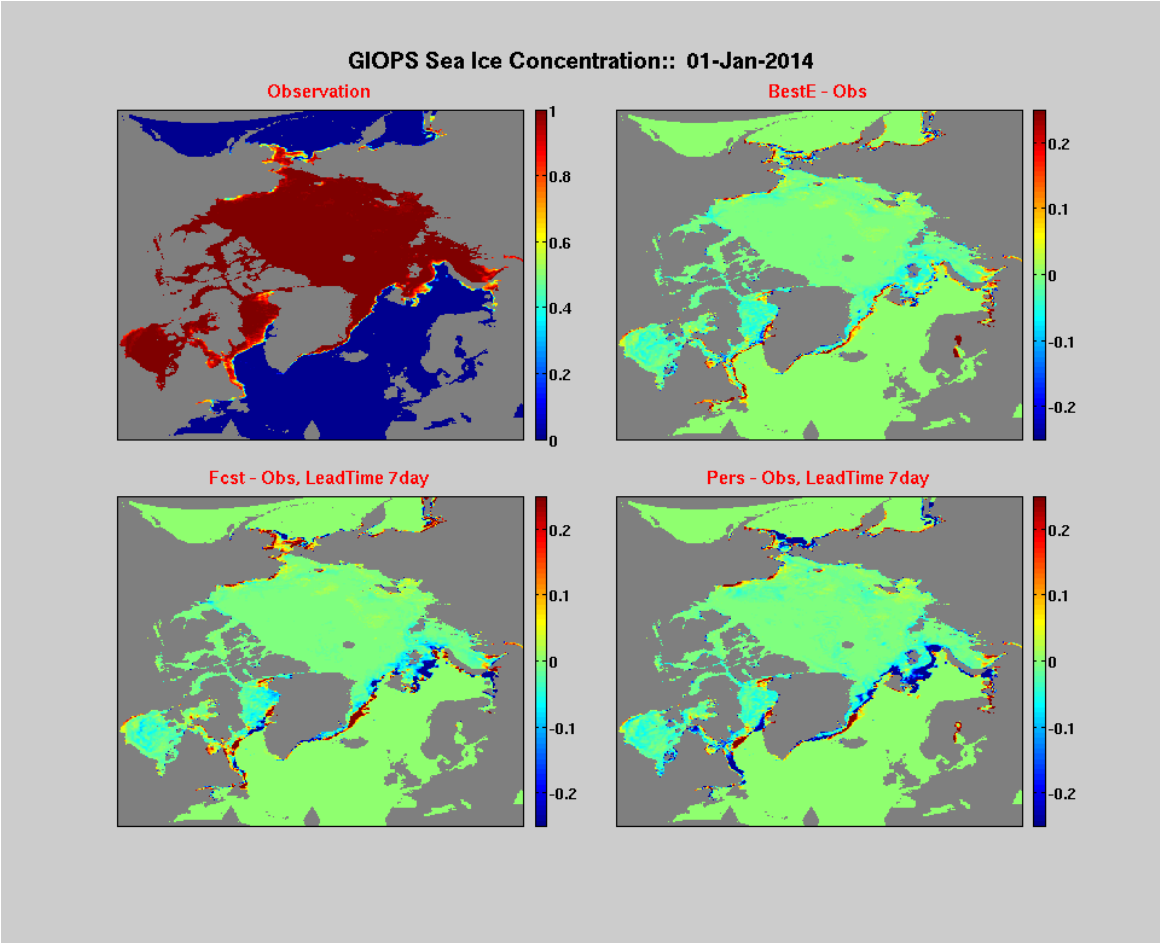
No QC | SST > 4C | No QC | SAT > 0C



March 6, 2014 | August 6, 2014

Results for GIOPS over 2014

QC flags: SST > 4C applied, but not SAT > 0C



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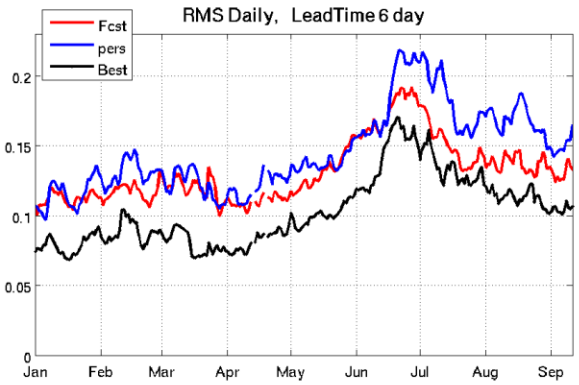
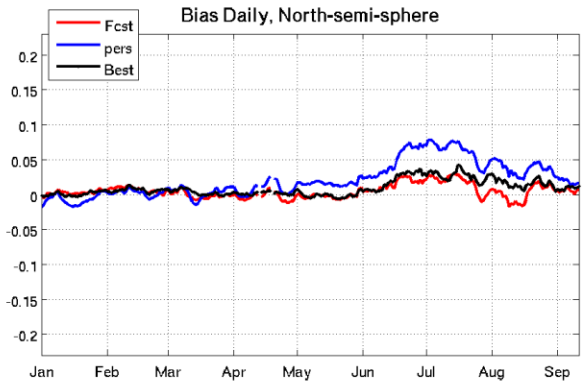
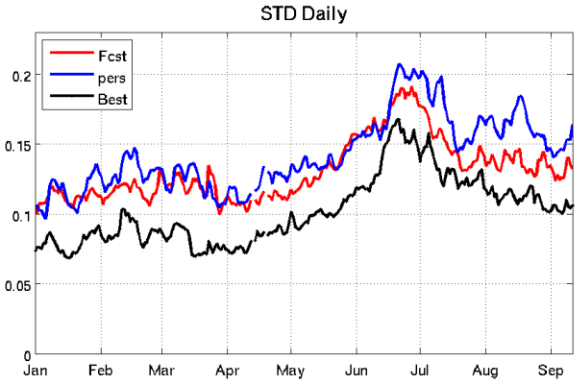
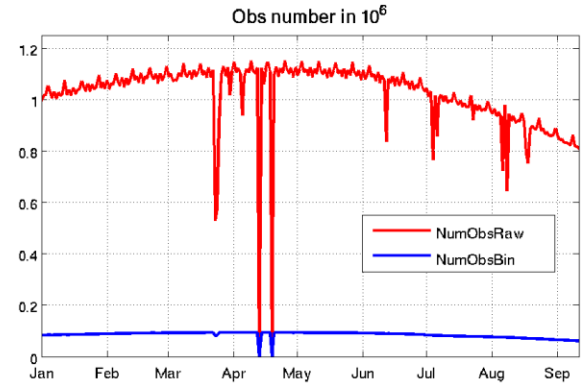




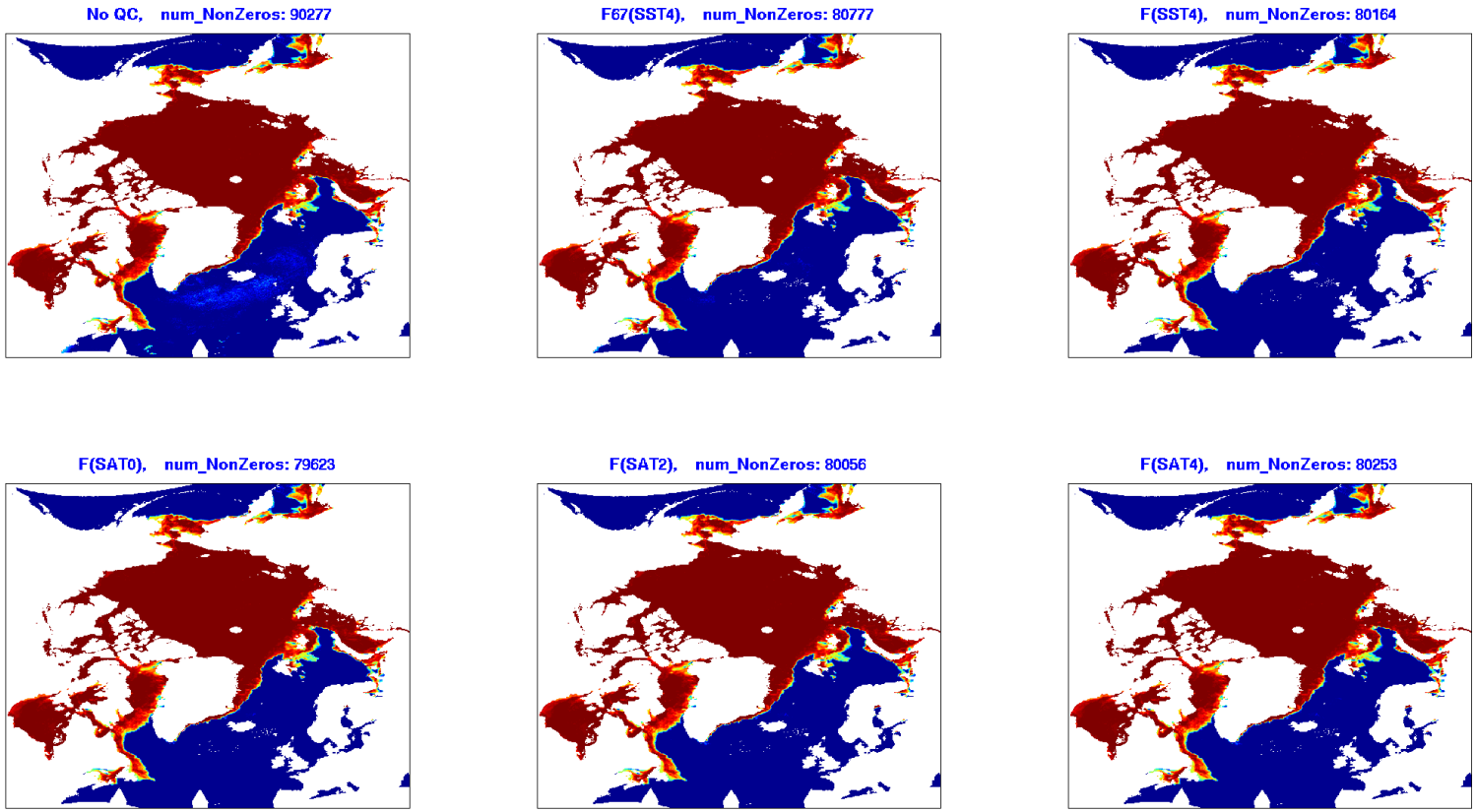




Status

- AMSR2 data feed running routinely. Being transferred to CMC operations to provide 24/7 support.
- Calculation of model equivalent added to Observation Operator code provided by UK Metoffice
- Full system running routinely at CMC
- Ready to start transferring to US GODAE ftp server

Example of QC flags for 2014-03-06



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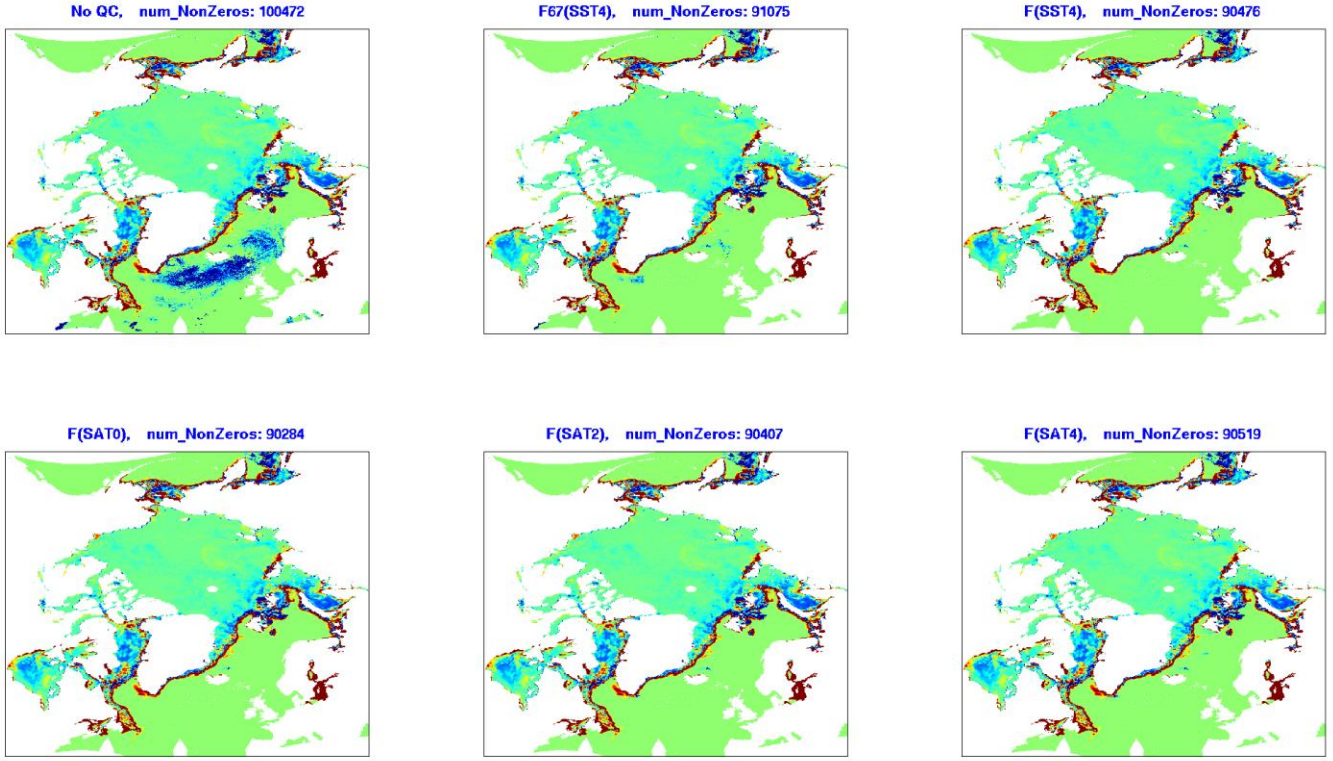
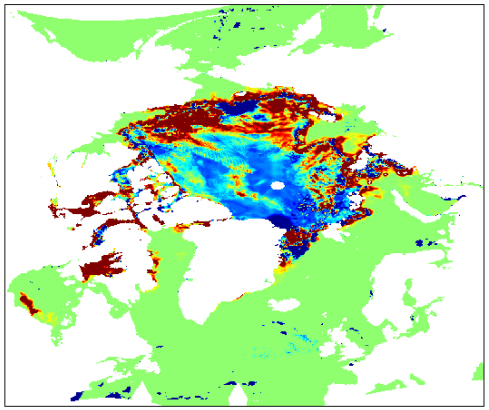
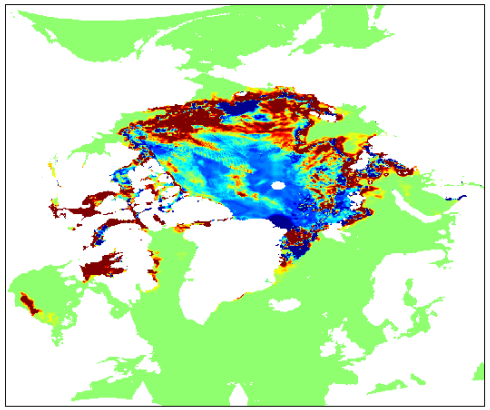


Example of QC flags for 2014-08-06

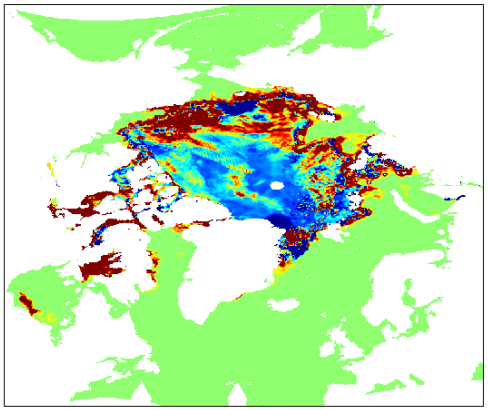
No QC, num_NonZeros: 74374



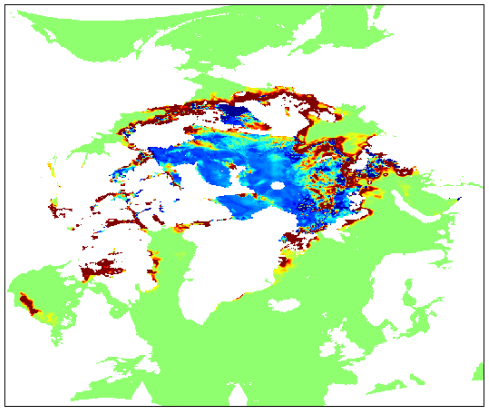
F67(SST4), num_NonZeros: 72835



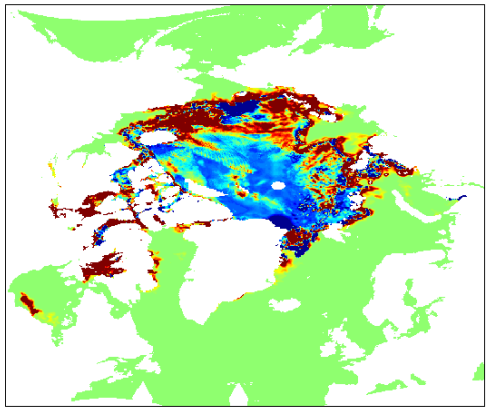
F(SST4), num_NonZeros: 72834



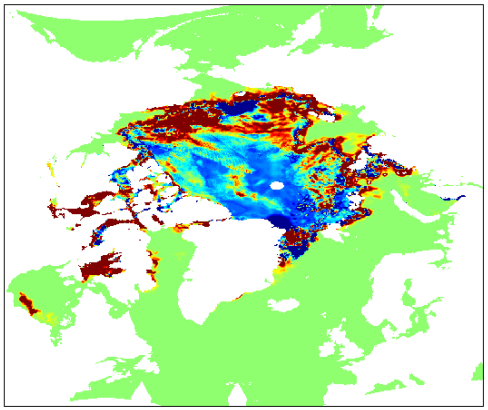
F(SAT0), num_NonZeros: 59574



F(SAT2), num_NonZeros: 71094



F(SAT4), num_NonZeros: 72810



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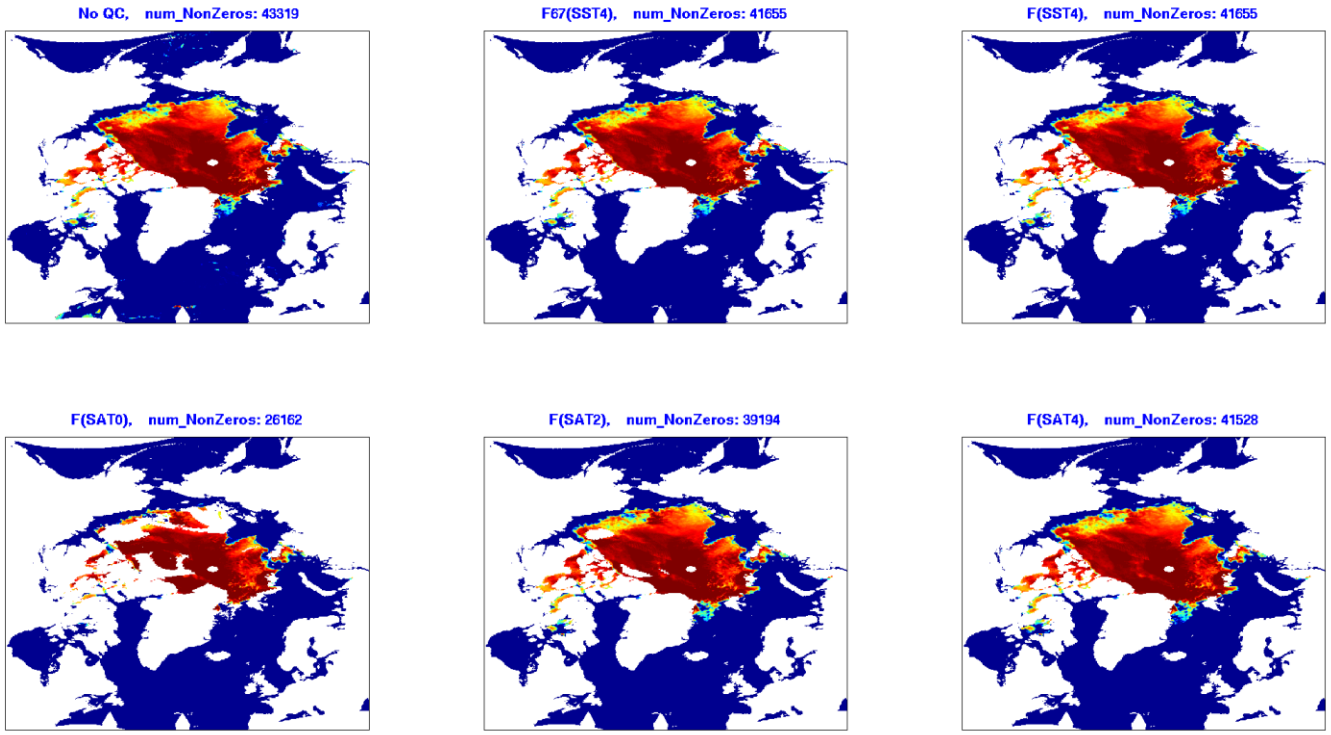
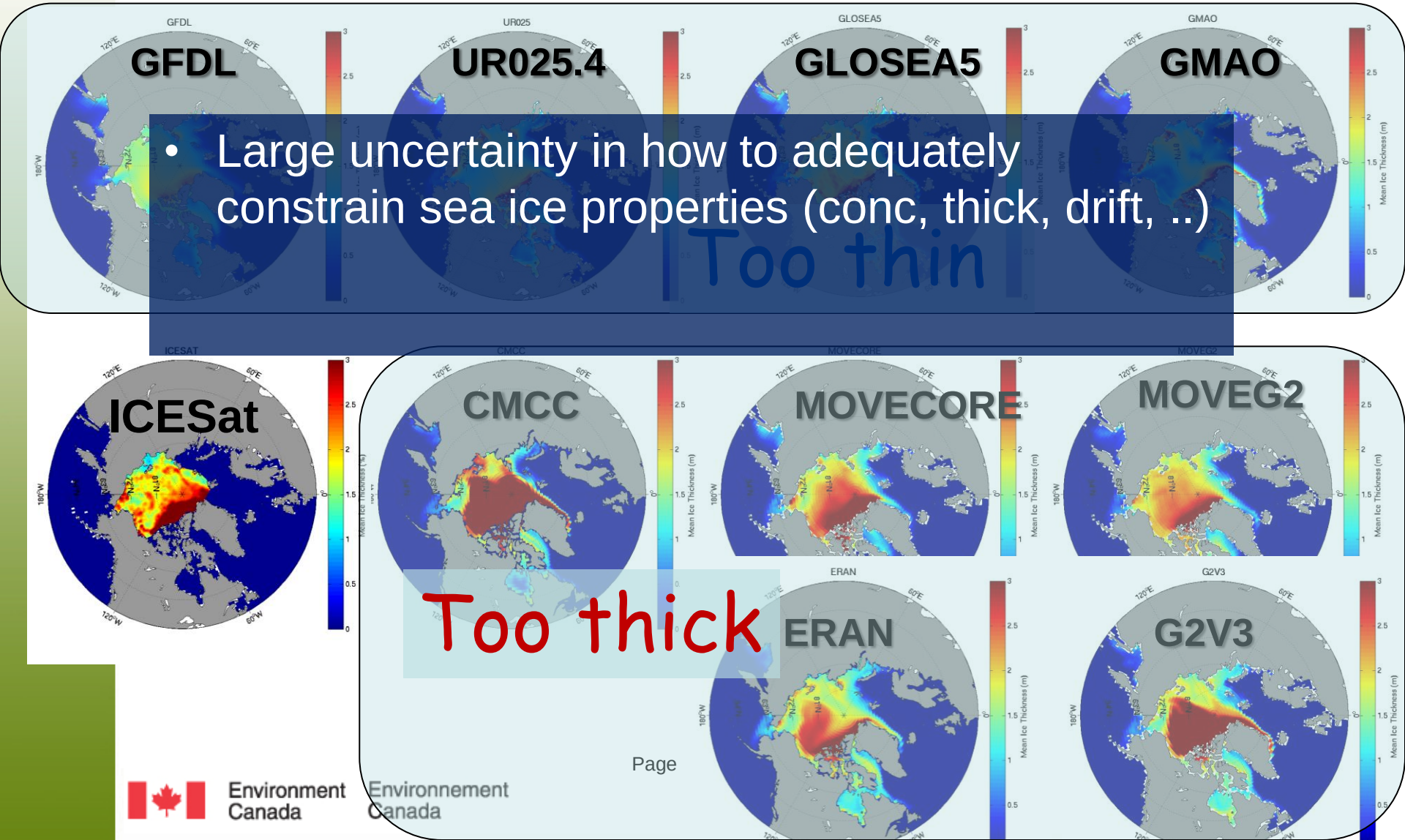


Ocean Reanalysis Intercomparison Project

Mean March Sea Ice Thickness: 2007



- Large uncertainty in how to adequately constrain sea ice properties (conc, thick, drift, ..)

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