

WP1

Quantifying the relationships between Arctic sea ice drift and strength

David Docquier,

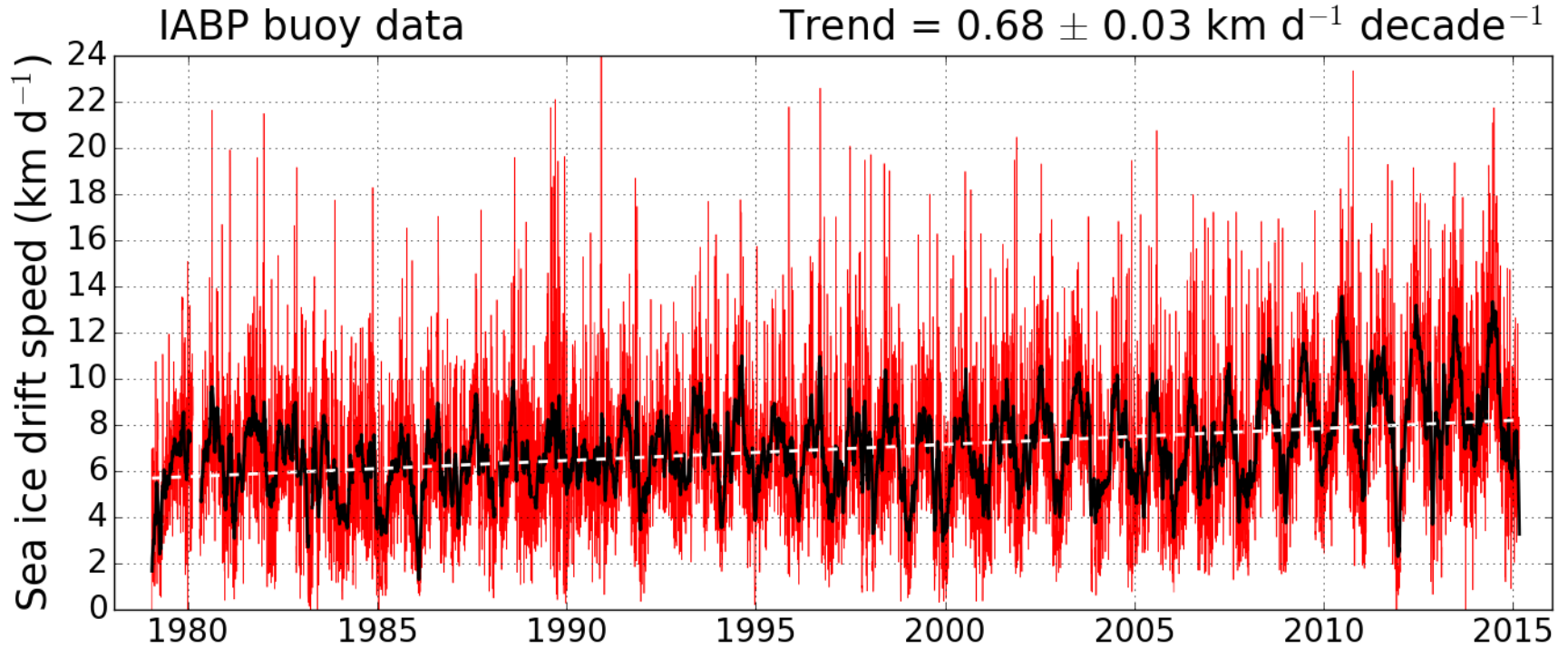
F. Massonnet, T. Fichefet

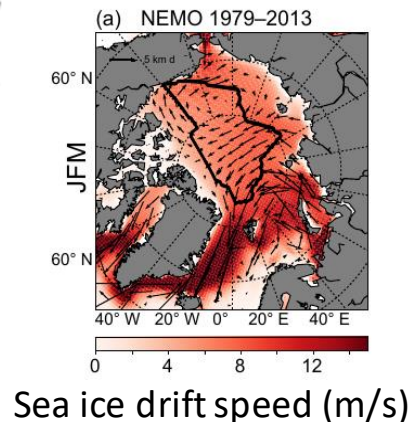
NASA / Kathryn
Hansen



NSIDC / Andy
Mahoney

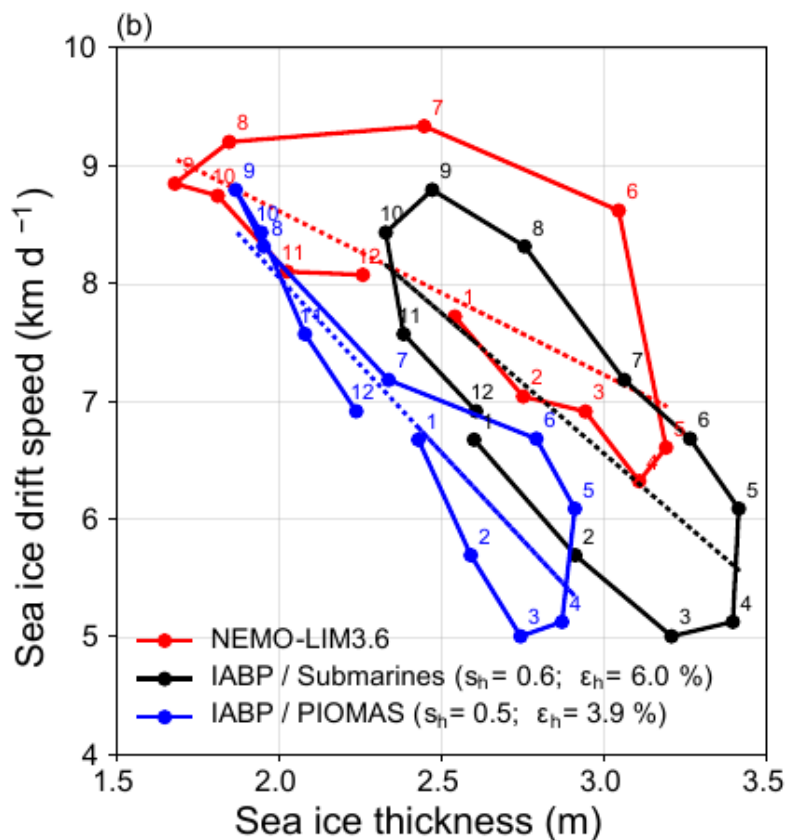
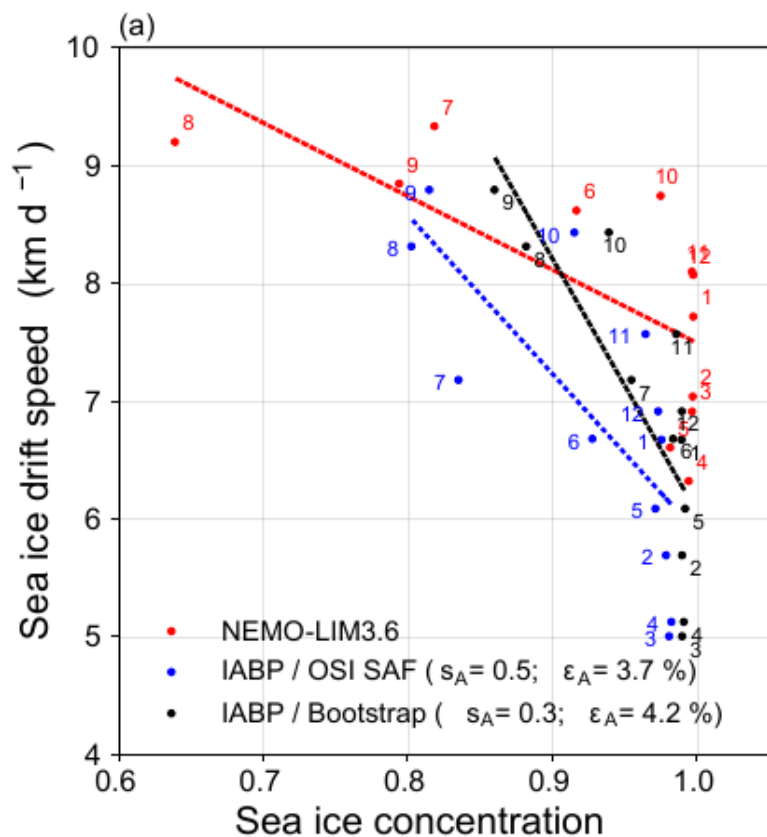






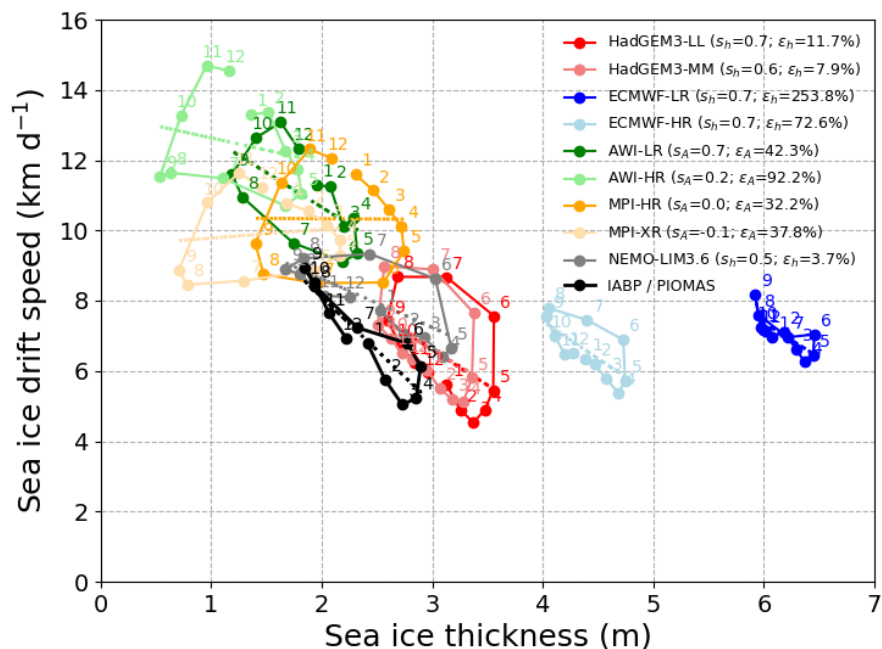
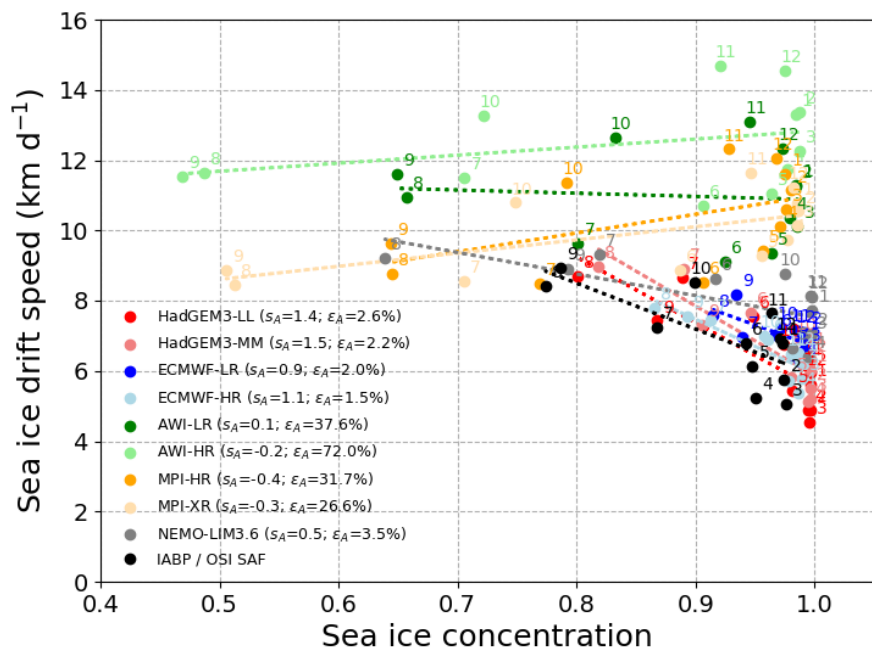
Sea ice drift speed vs. concentration/thickness

NEMO-LIM forced by DFS5.2
Observations
1979–2013



Sea ice drift speed vs. concentration/thickness

Coupled Stream 1 hist-1950 runs
 NEMO-LIM forced by DFS5.2
 Observations
 1979-2014

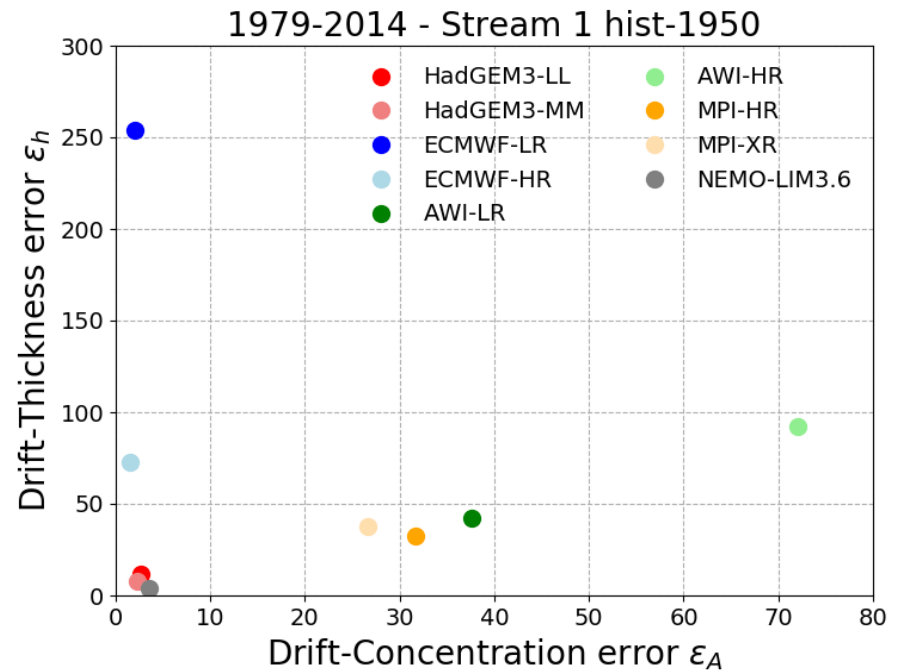
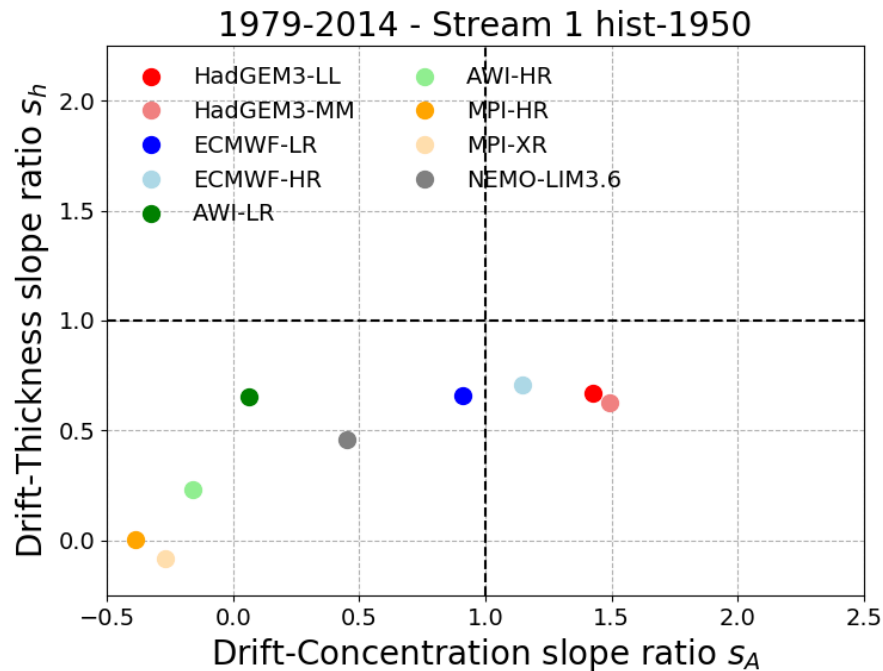


Building the metrics

Slope ratio: ratio between modeled and observed drift-concentration and drift-thickness slopes

Error: mean normalized distance between modeled and observed points (cfr RMSE)

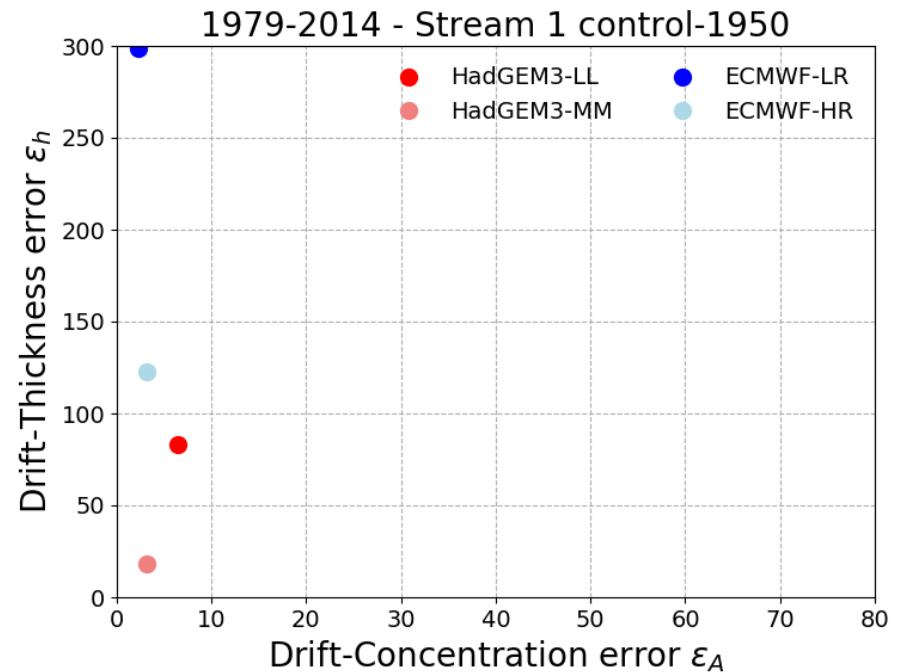
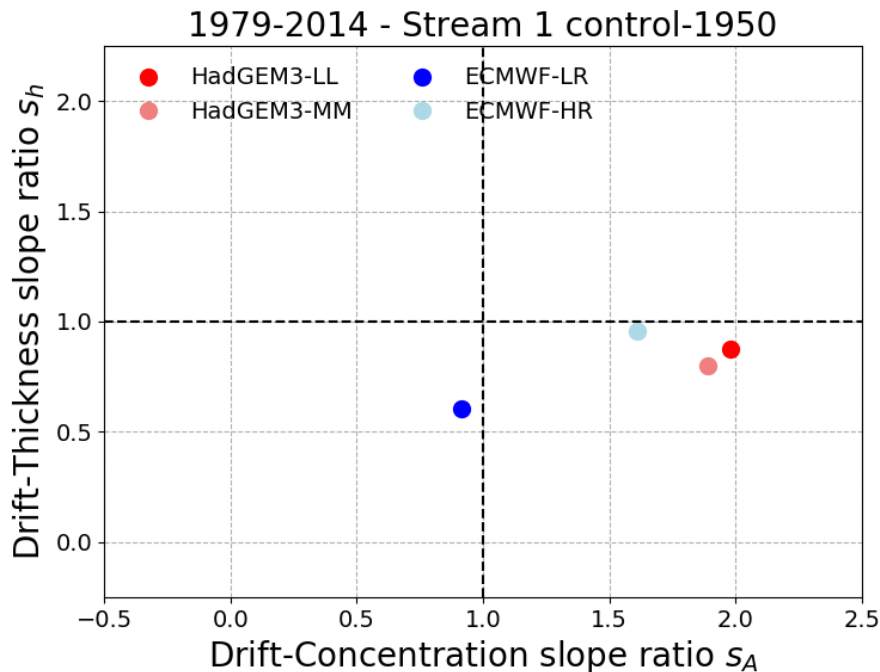
Coupled Stream 1 hist-1950 runs
NEMO-LIM forced by DFS5.2
Observations
1979-2014



Slope ratio: ratio between modeled and observed drift-concentration and drift-thickness slopes

Error: mean normalized distance between modeled and observed points (cfr RMSE)

Coupled Stream 1 control-1950 runs
Observations
1979-2014



Challenges and Outlook

- Some models have 'good' slope ratios but 'bad' errors
- One model may be good at representing the drift-strength relationships but bad in representing other processes, and conversely
- Observational uncertainty needs to be taken into account
 - Ice thickness uncertainties
 - Slope ratio: standard deviation of slope
 - (Weighted) Mean of observations?
- Sensitivity experiments are needed to fully explore the drift-strength relationships
- Domain choice is important

