NOAA Operational Modeling in the Arctic

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WALCC

NWS/NOS/U. Notre Dame
Tides, wind waves, storm surge, and sea ice

Current Op'nl Sea Ices

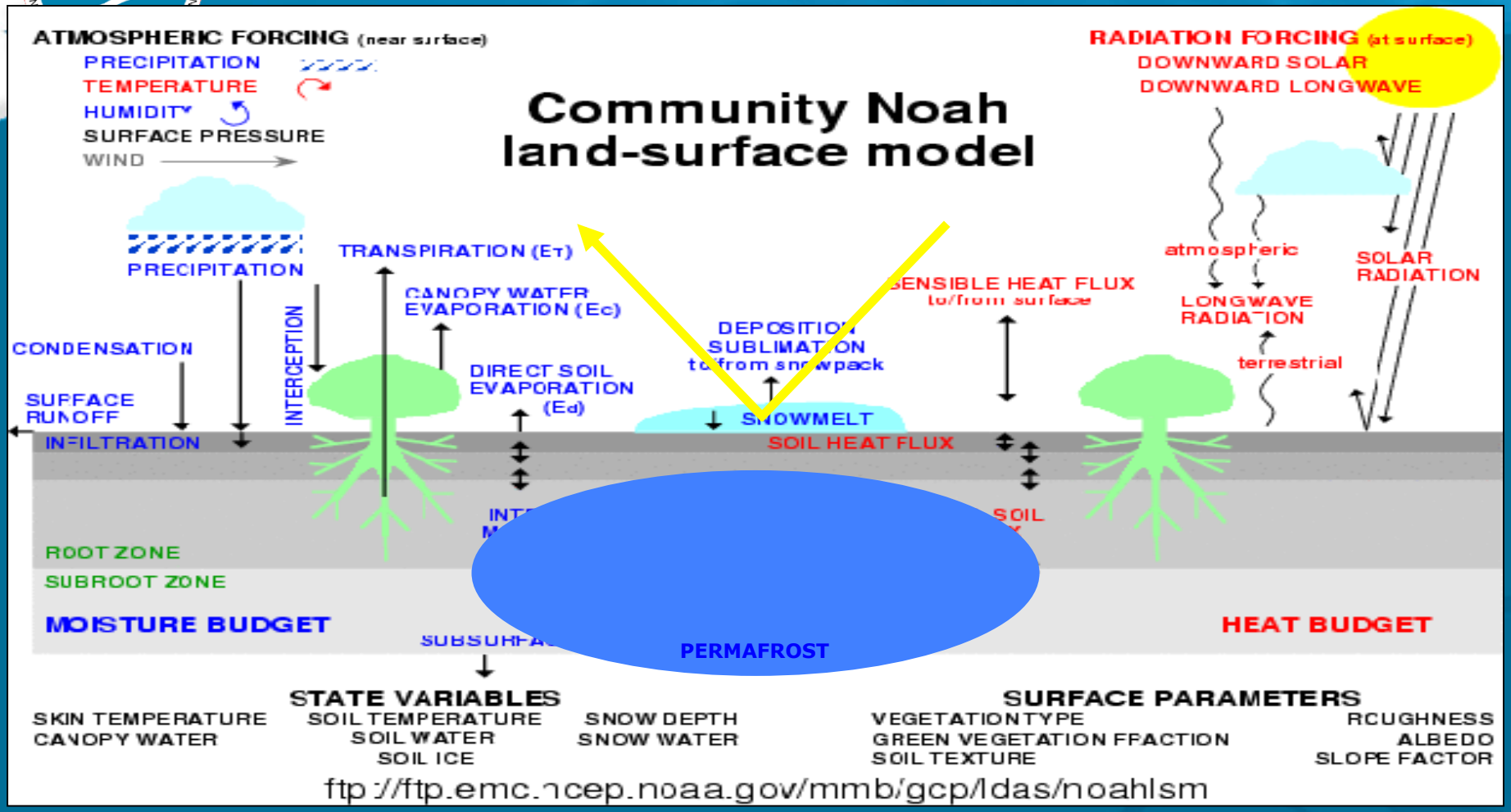
Model	Dynamics	Thermodynamics	Range
NAM	None	3m ~land (NoAH)	84 hr
GFS	None	Thickness, not concentration	384 hr
CFS	GFDL	GFDL	9 months
RTOFS Global	None	Energy Loan	120 hr
Drift	Free Drift	None	384 hr

http://polar.ncep.noaa.gov/develop/icemodel/

icemodel

nansen

NCEP-NCAR unified Noah land model



- Noah land model: relevant land physics & assoc. land data sets; lower boundary conditions (heat, moisture, momentum) for NAM, GFS, CFS.
- *Arctic conditions: tundra vegetation, improve snow/ice processes (melt-refreeze, snow age/albedo, permafrost), hydrology/river-routing.*

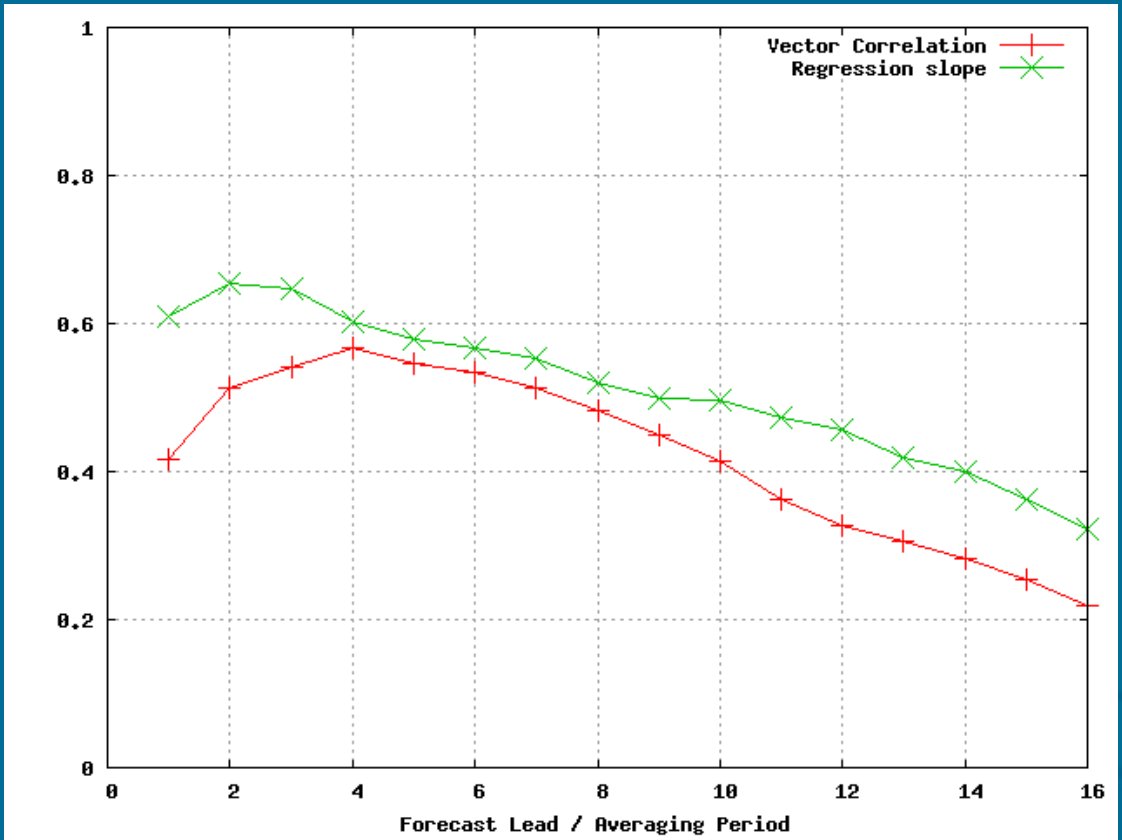
Drift Skill – Error Radius

Model	Year	24 hrs	48 hrs
NCEP	2010	6.3 km	12.5 km
NCEP	2009	4.7 km	8.8 km
PIPS 2.0	2008	7.2 km	
ACNFS	2008	6.6 km	
NCEP	2008	4.7 km	8.7 km

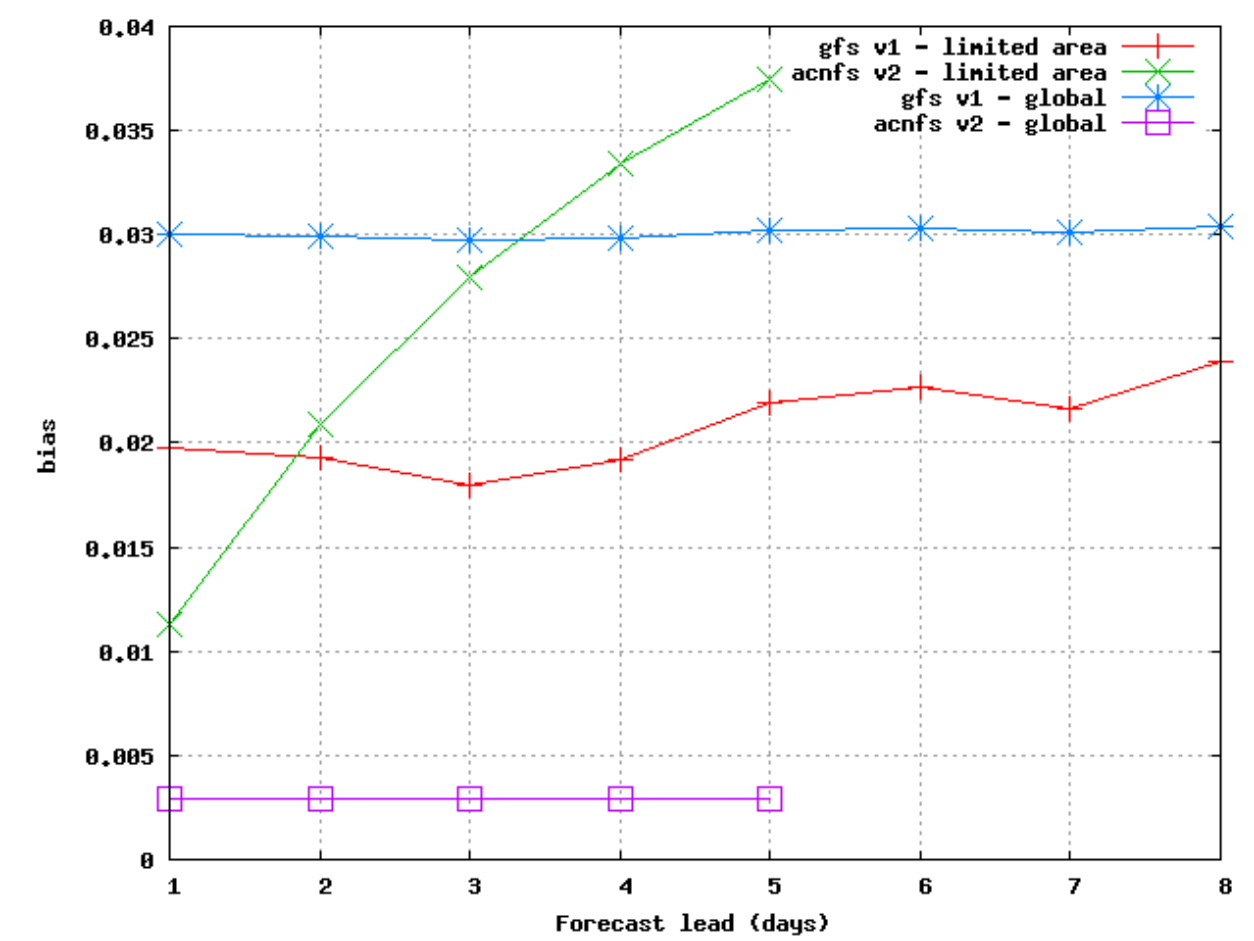
http://polar.ncep.noaa.gov/seaice/drift.verification/

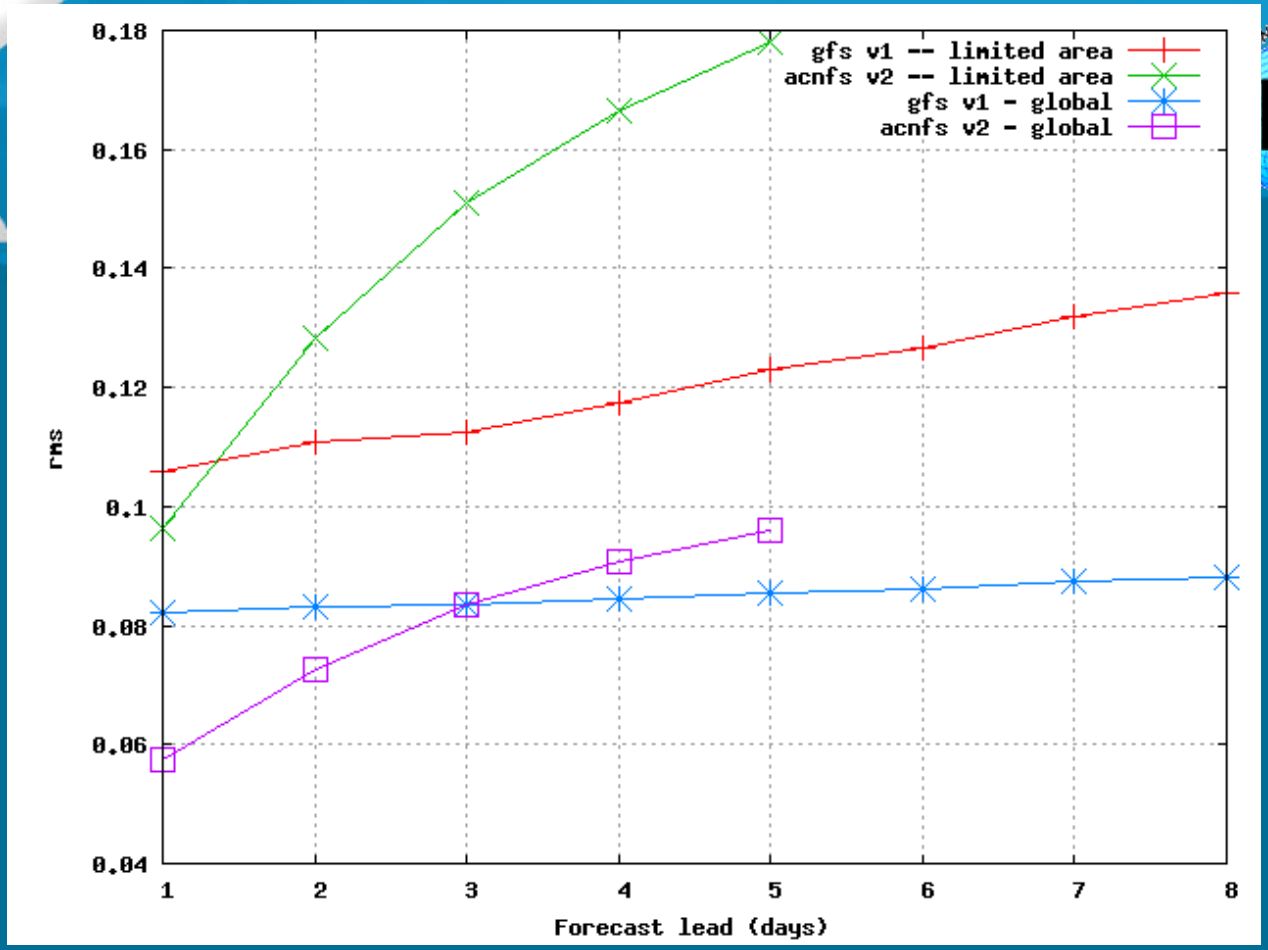
http://polar.ncep.noaa.gov/mmab/papers/tn315/

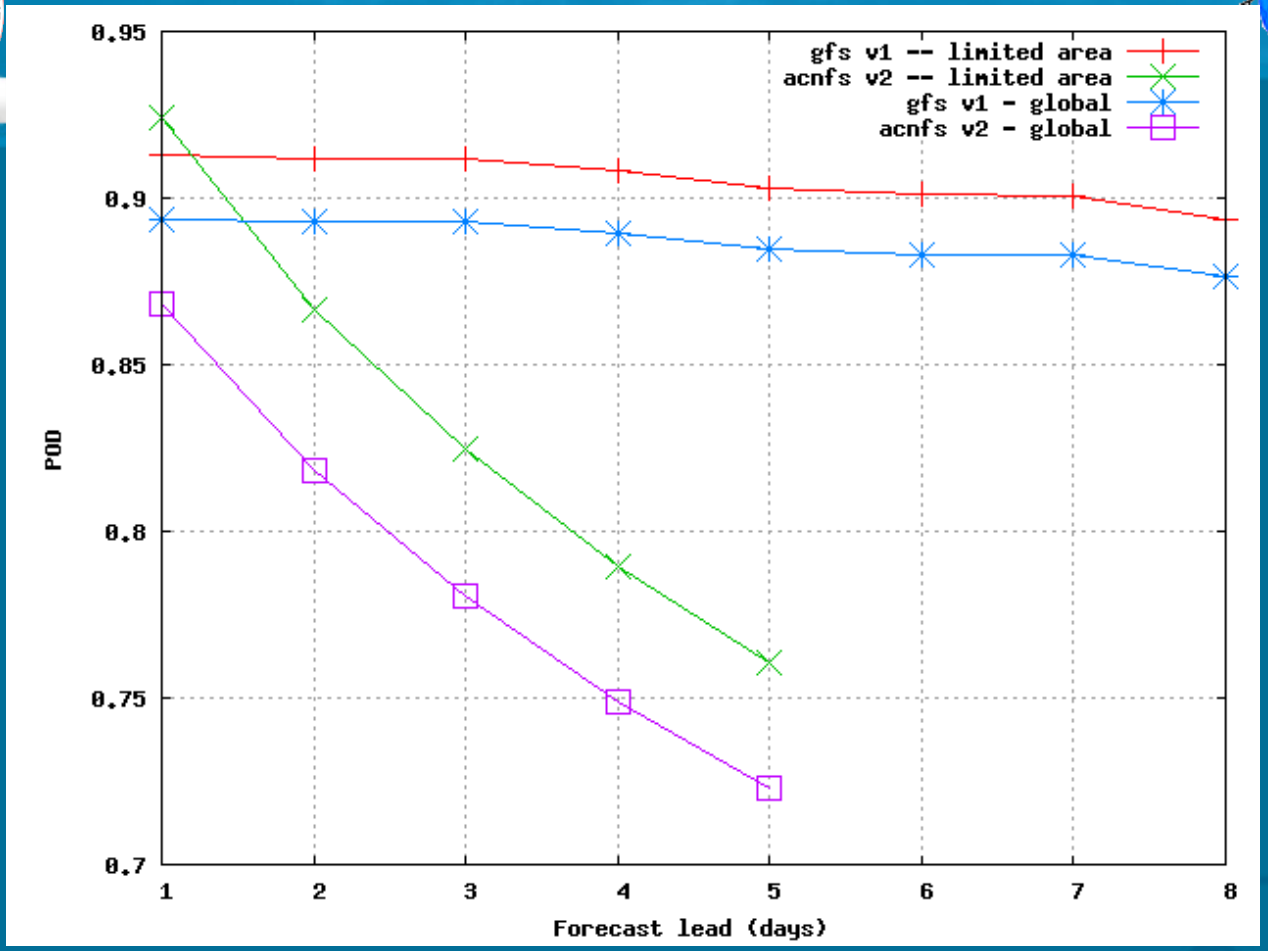
Drift Skill


Vector Correlation
Regression slope
1
0.8
0.6
0.4
0.2
0
0
2
4
6
8
10
12
14
16
Forecast Lead / Averaging Period

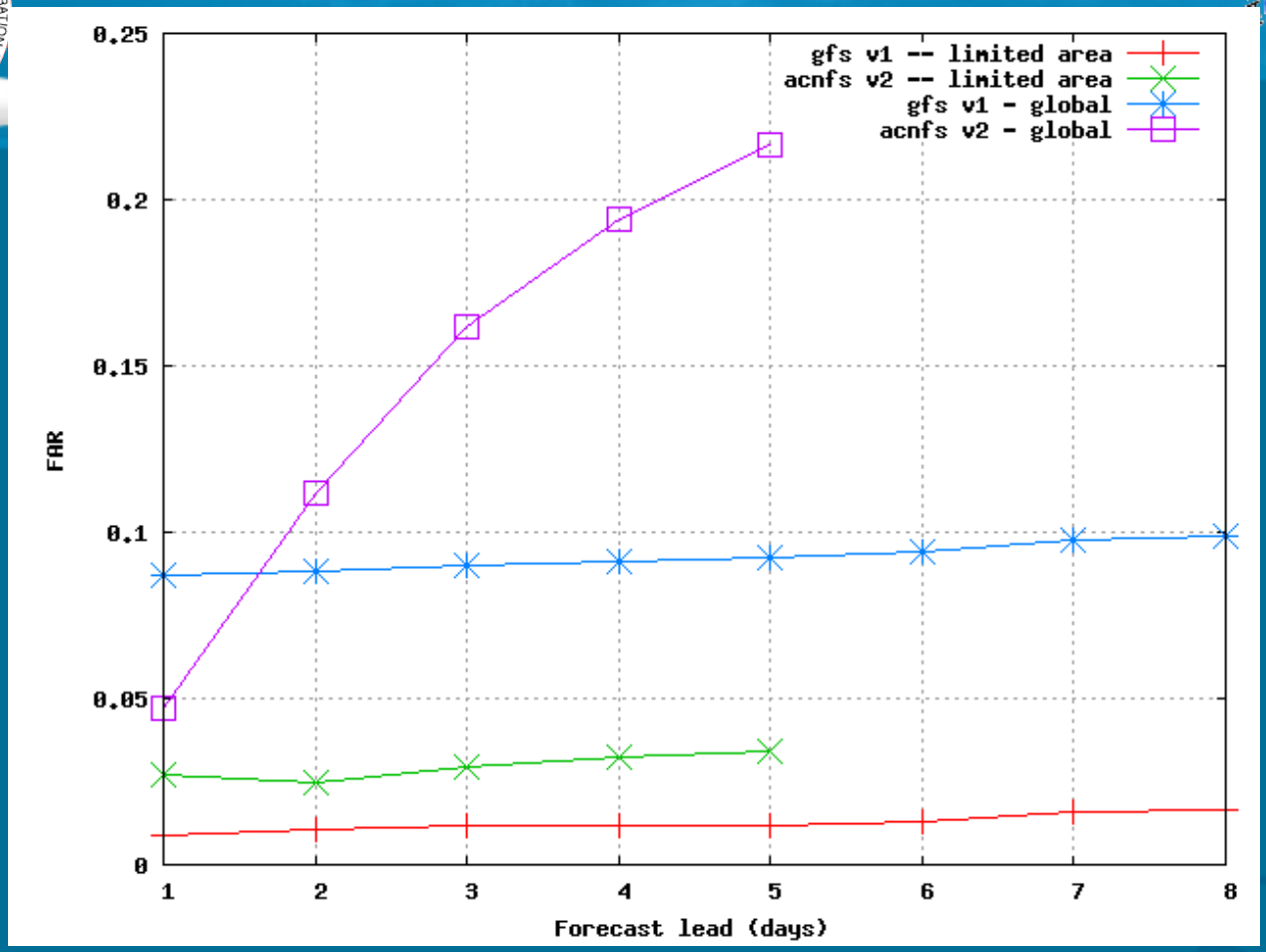
Concentration



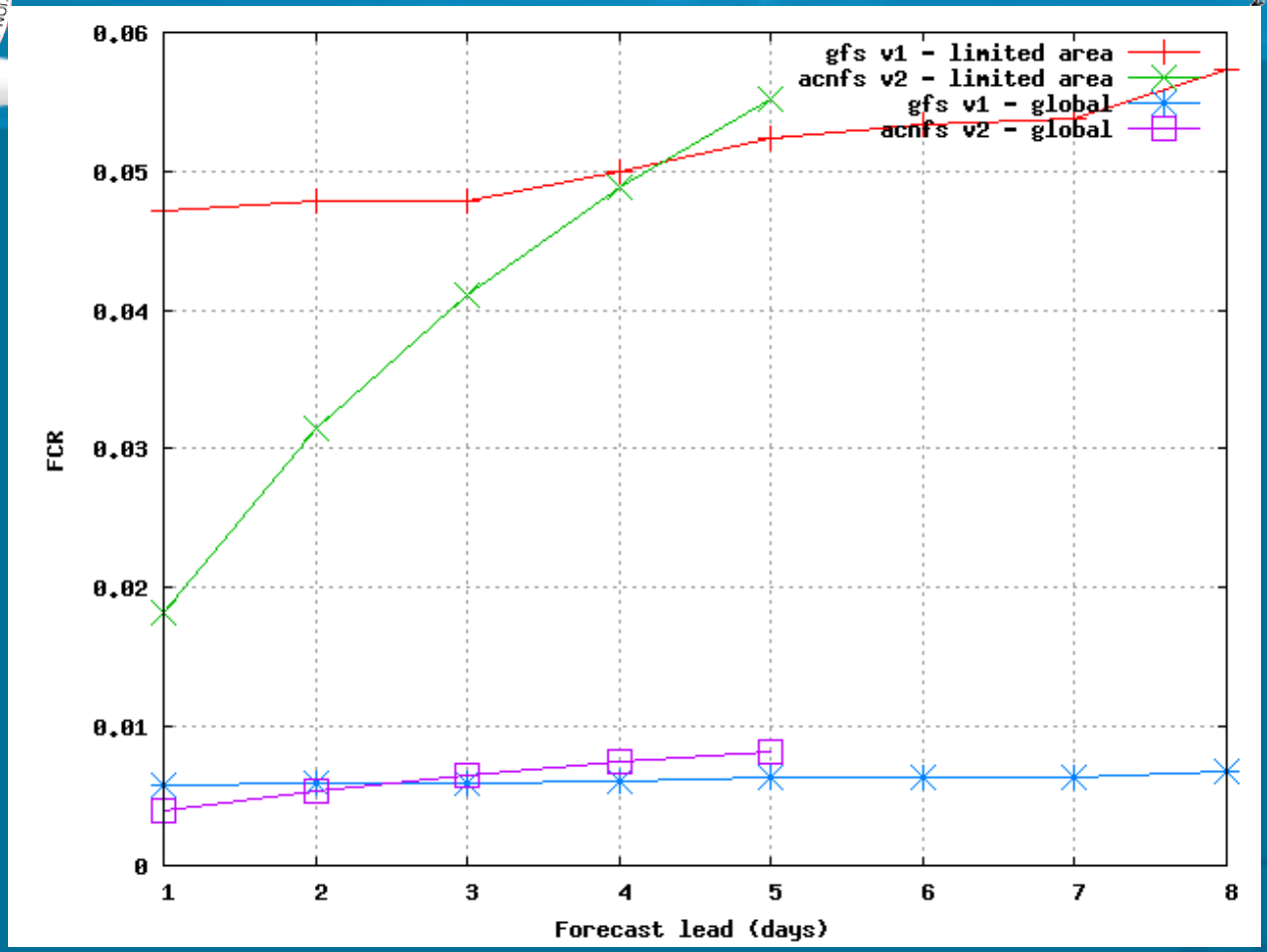

gfs v1 -- limited area
acnfs v2 -- limited area
gfs v1 - global
acnfs v2 - global
rms
Forecast lead (days)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
1
2
3
4
5
6
7
8



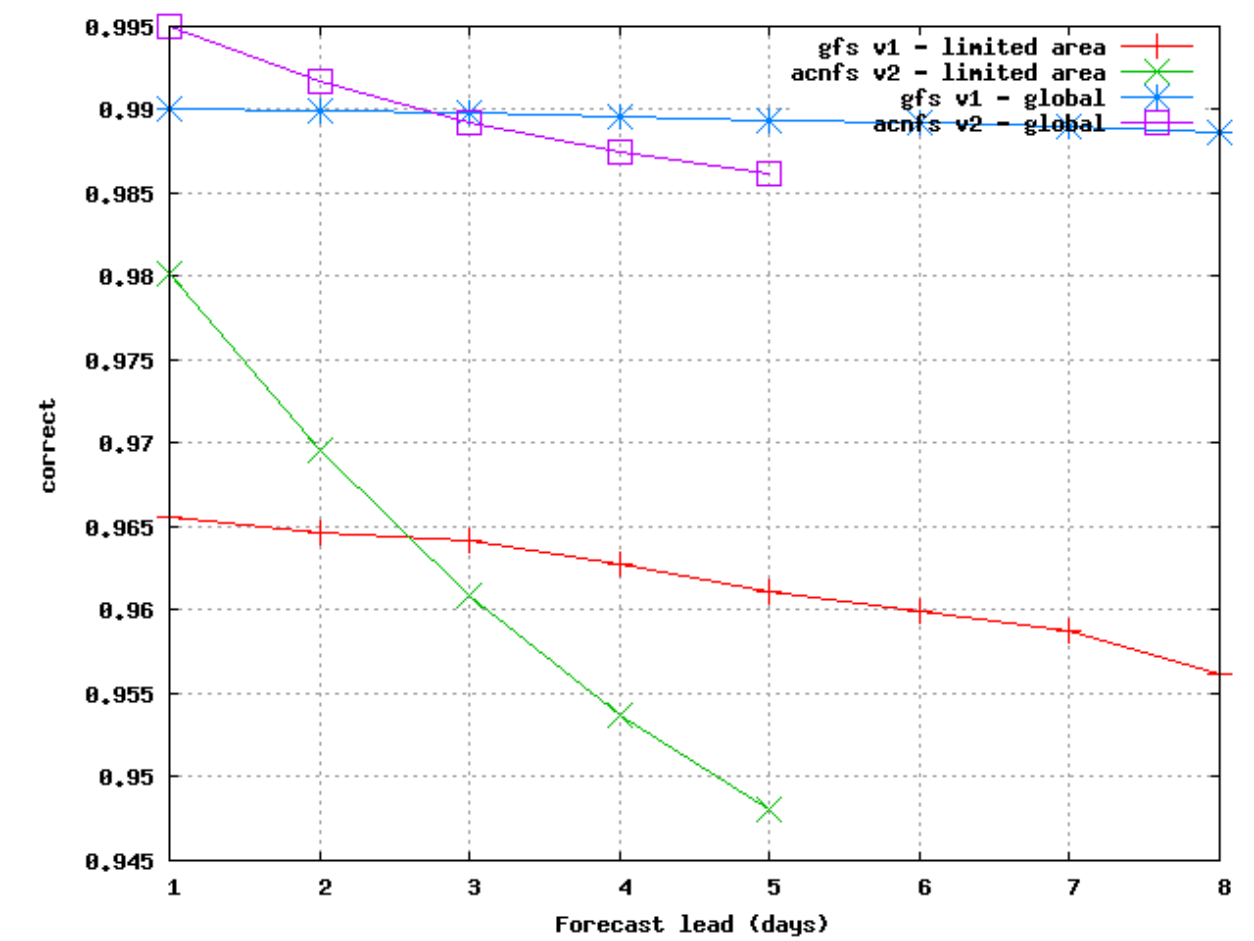
Probability of Detection



False Alarm Rate



False Confidence Rate


gfs v1 - limited area
acnfs v2 - limited area
gfs v1 - global
acnfs v2 - global
correct
0.995
0.99
0.985
0.98
0.975
0.97
0.965
0.96
0.955
0.95
0.945
1
2
3
4
5
6
7
8
Forecast lead (days)

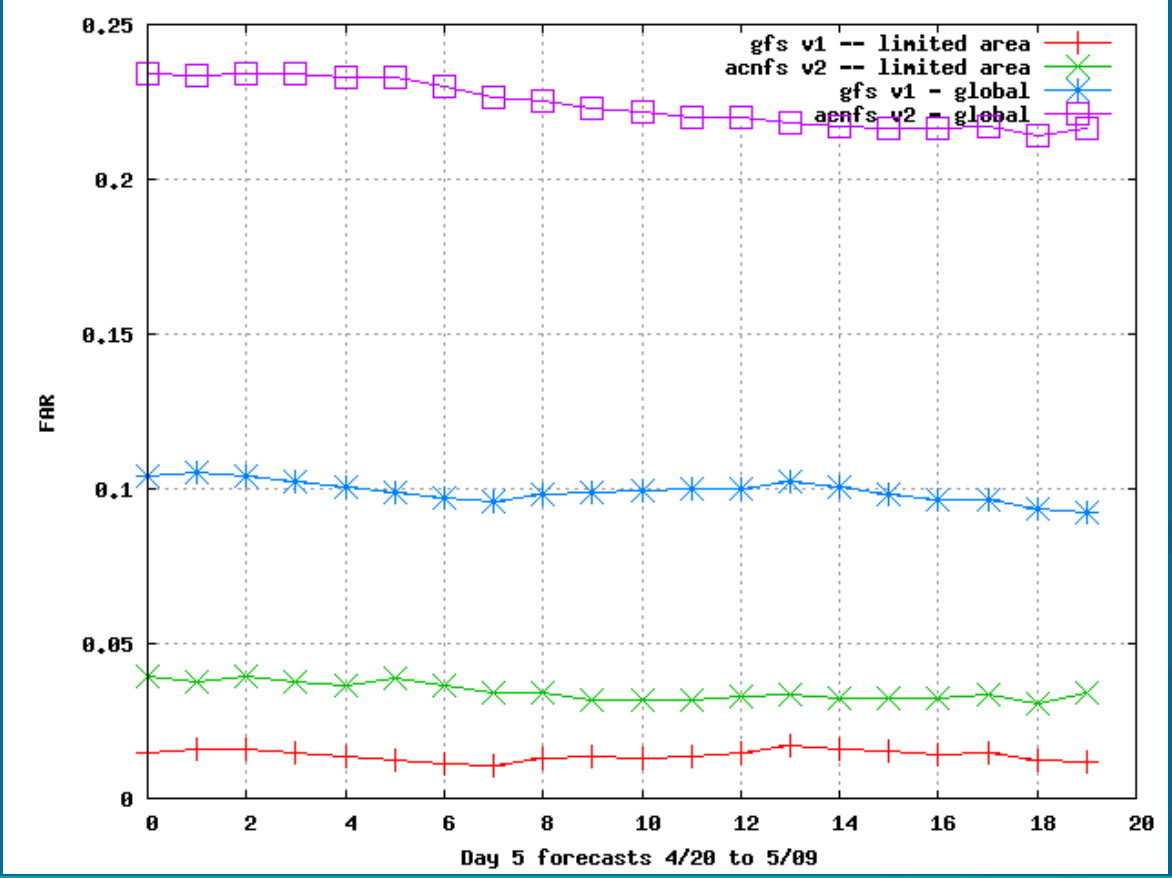
% Correct

http://polar.ncep.noaa.gov/develop/icemodel/

icemodel

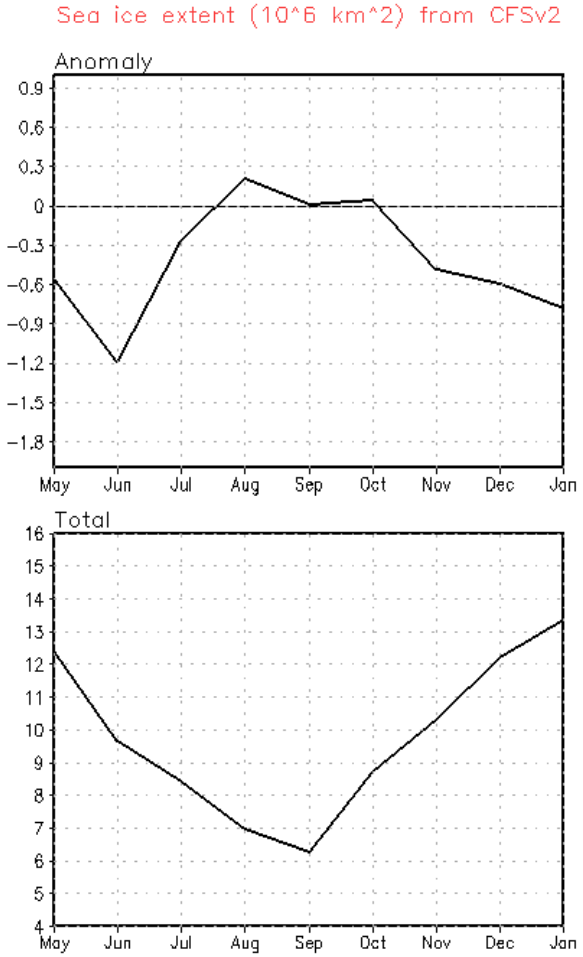
nansen

http://polar.ncep.noaa.gov/mmab/papers/tn314/



Wang:
NWS/NCEP/CPC

Initial conditions: 28Apr2014-7May2014
Last update: Fri May 9 2014



Wu:
Prefix: 5.44
Postfix*: 4.66

Keeping Ice'S Simplicity

- ESMF
- NEMS
- NUOPC

Code

- Static
- Nansen Rule
- Free Drift
- Rheology

Dynamics

- None
- Virtual Slab
- Some Categories
- Thickness distribution

Thermodynamics