Consortium Meeting
October 3

Cliff Mass

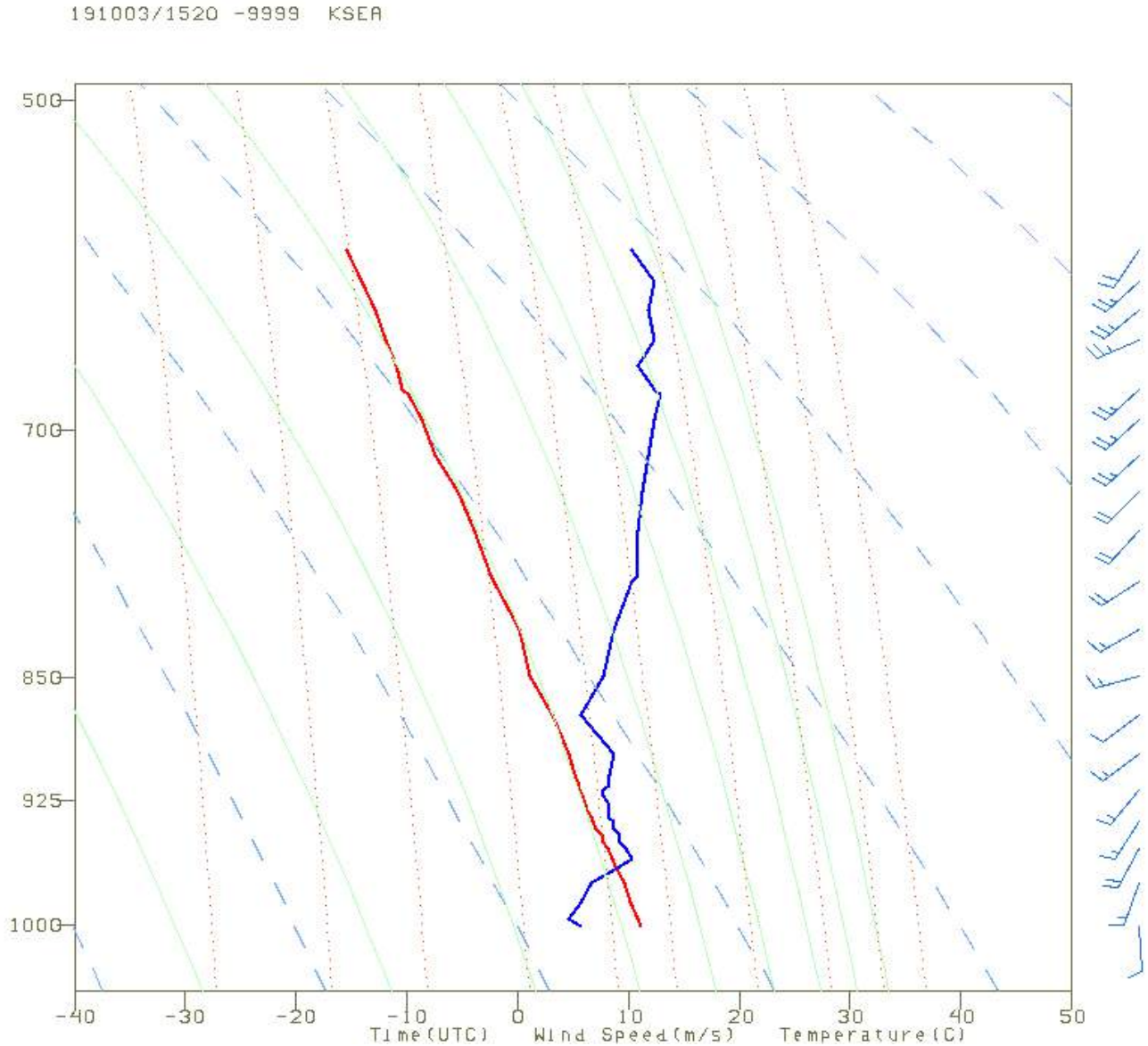
University of Washington

Tasks completed

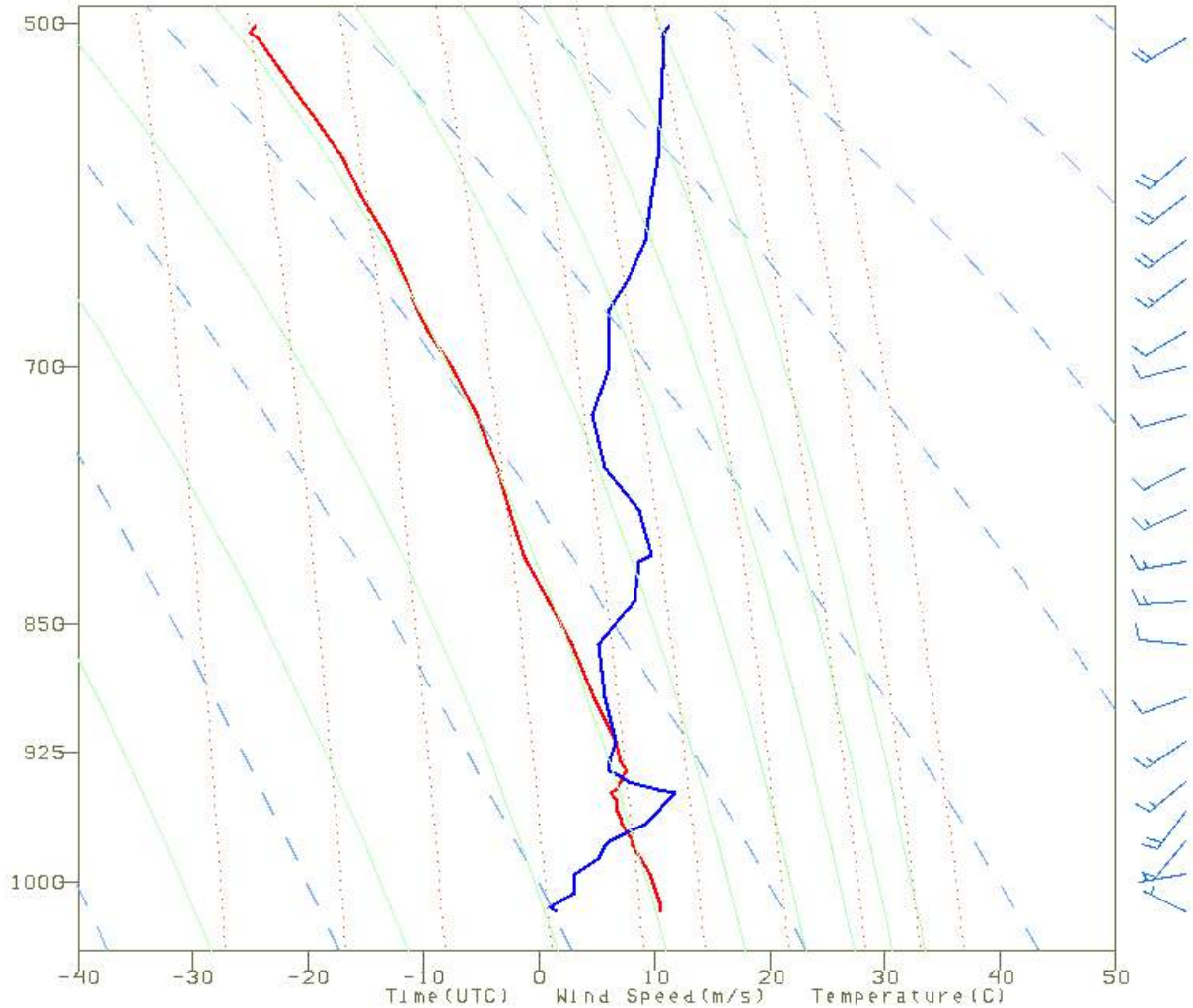
- Smoke system was improved and made more robust…..but not used due to lack of smoke.
- Dave and I attended WRF workshop
- Fixed Intel compiler issue for WRF (4.0.3)
- Rewrote software ensemble plume code so they come out **2.5 hours earlier.**
- Reran August 12-20 2018 4-km cases for Brian Potter to compare smoke vs non-smoke simulations

Tasks Completed

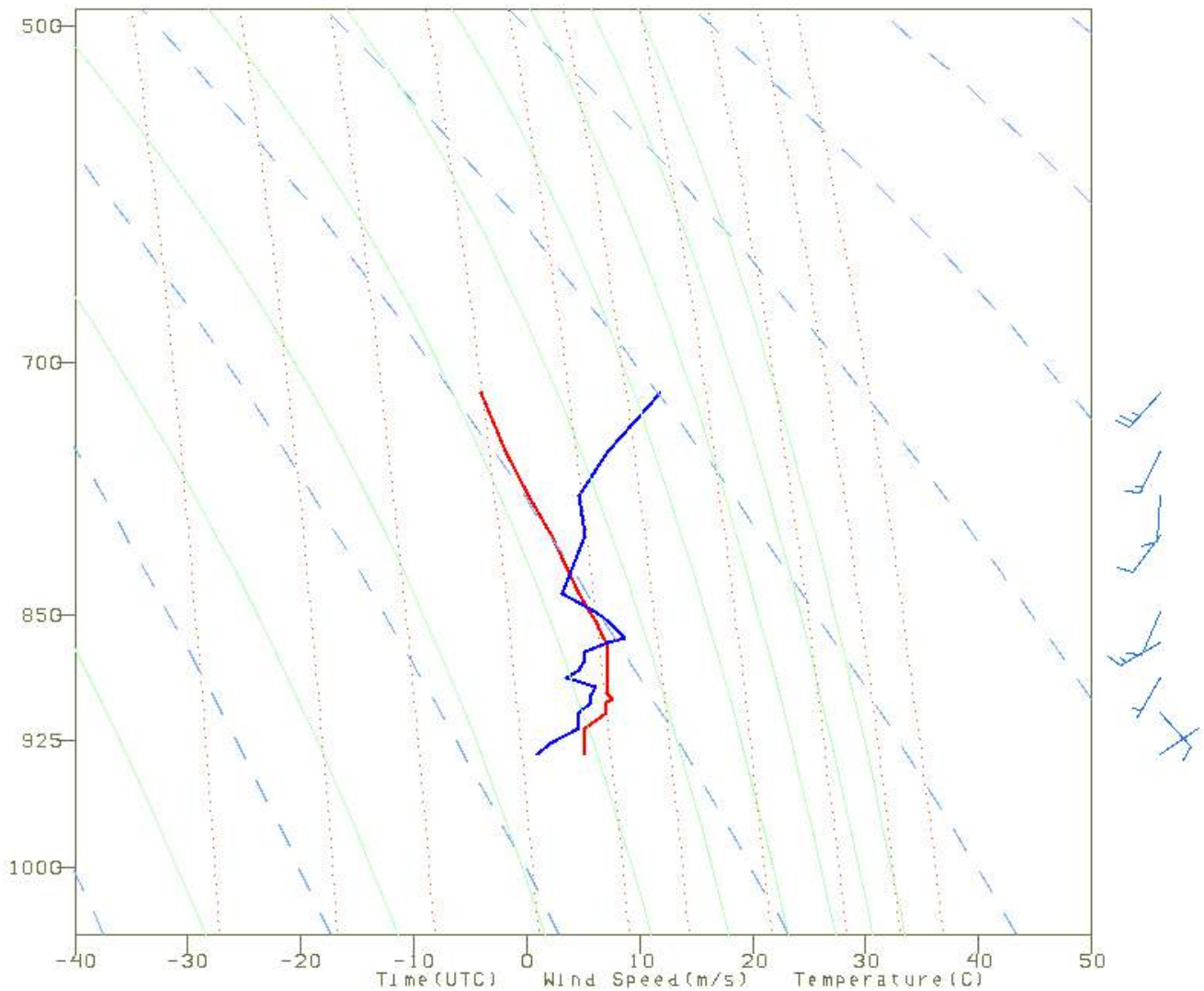
- Added 15 new bufkit sounding, time-height, and meteogram sites for Idaho DEQ .
- Setup and ran a 4-km domain for the entire Western US for Joe Vaughan
- With demise of profiler, now creating sounds using aircraft data for Seattle. Added Portland and Spokane soundings as well.


191003/1520 -9999 KSEA
500
700
850
925
1000
-40
-30
-20
-10
0
10
20
30
40
50
Time(UTC)
Wind Speed(m/s)
Temperature(C)

191003/1457 -9999 KPDX



191003/1424 -9999 KGEG



Plotted Soundings

- These are using the ACARS feed. Could add more major airports if consortium wanted it (e.g., Boise).
- The alternative TAMDAR feed (commuter aircraft) has not been reliable (Panasonic sold it off). Working on that now…that adds more local airports.

The Driving Global Model has Changed from GFS to FV-3 on June 12th

ScienceNews
INDEPENDENT JOURNALISM SINCE 1921

ALL TOPICS LIFE HUMANS EARTH SPACE PHYSICS

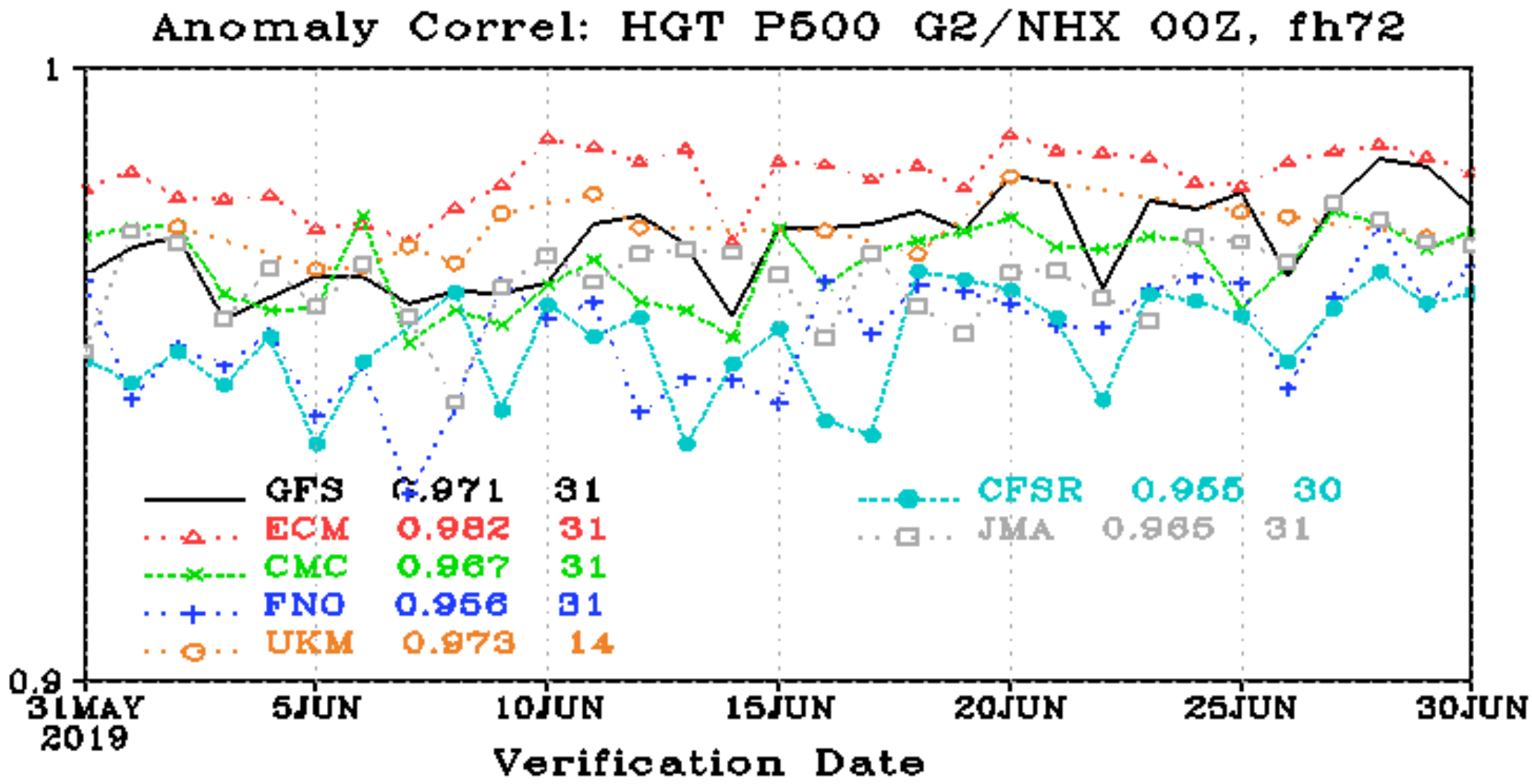
NEWS CLIMATE

The National Weather Service has launched its new U.S. forecasting model

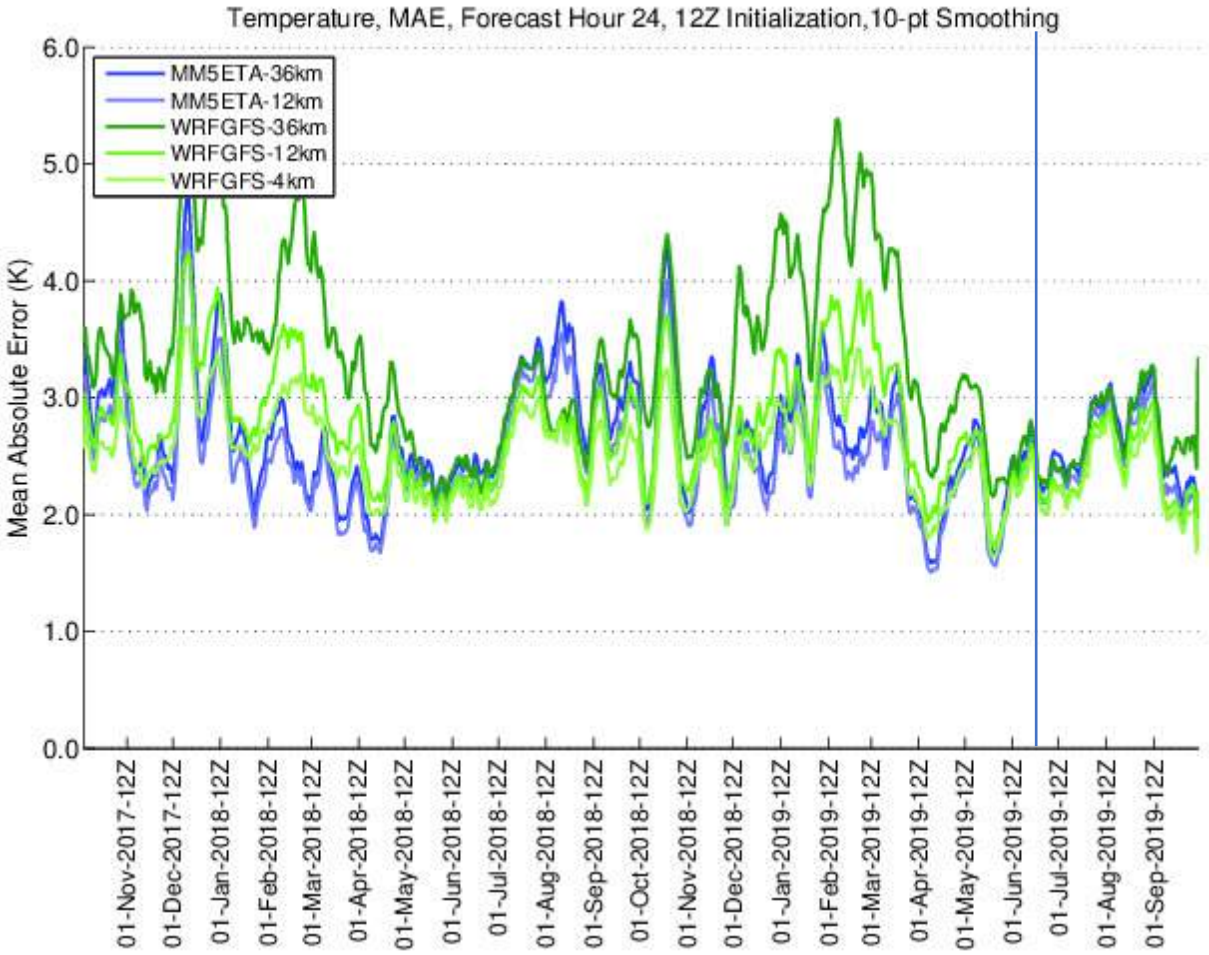
But some scientists worry the tool isn't ready to take center stage

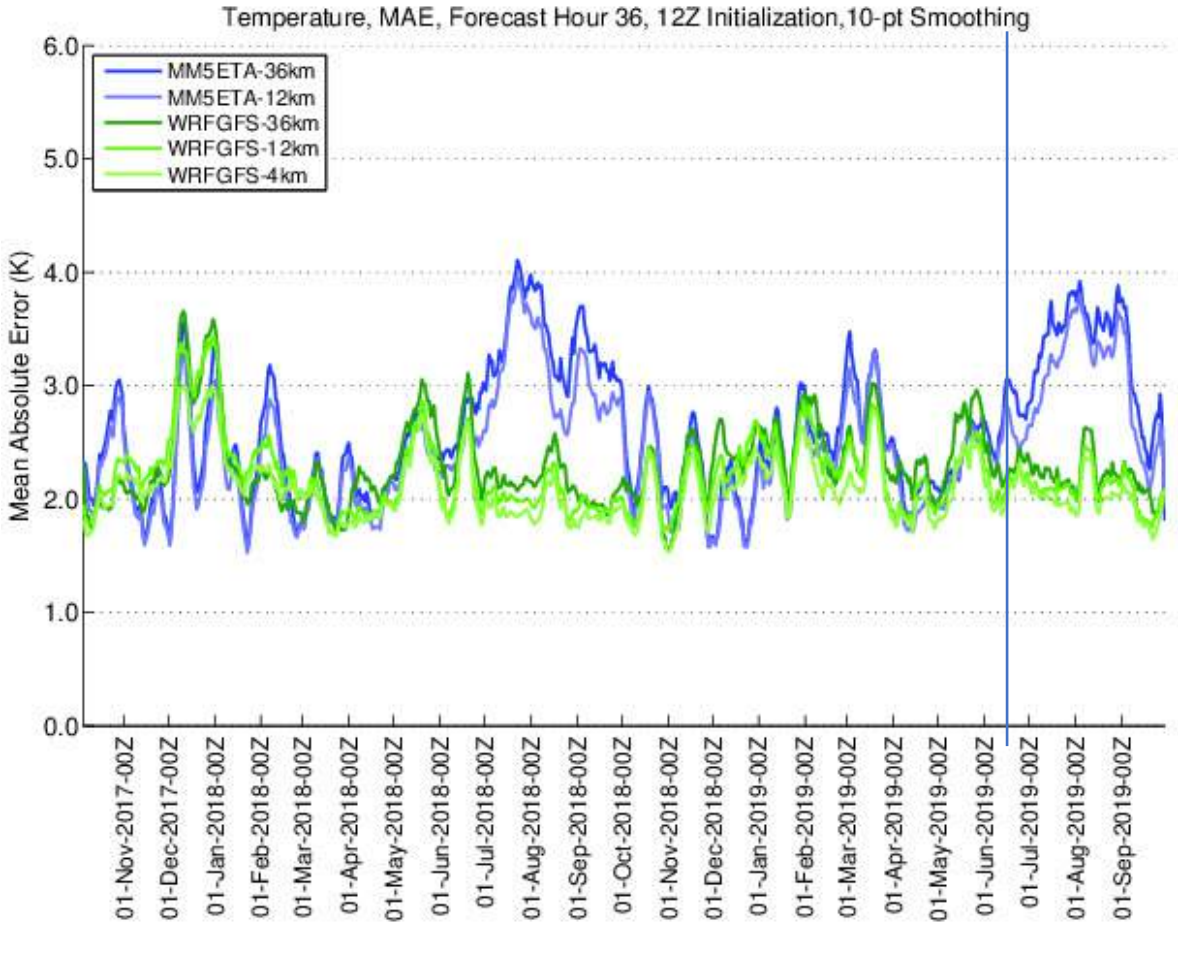
Implications for us

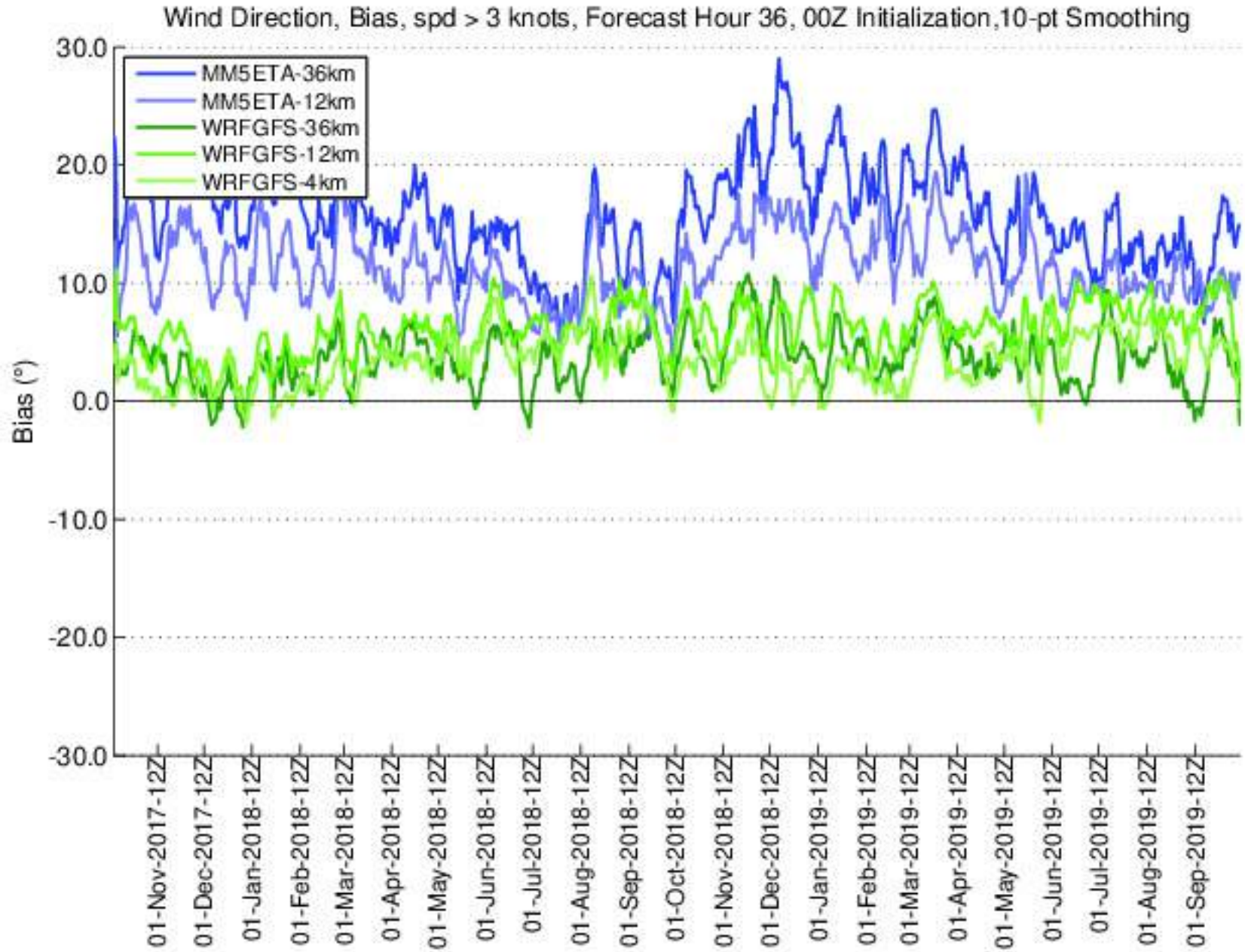
- **Better microphysics**
- **Same effective resolution, but now a grid versus spectral model**
- **Slight improvement in verification scores…same data assimilation system.**
- **Dave had to deal with some issues on the transition…including communications/grid issues….but quickly got on top of it.**


Anomaly Correl: HGT P500 G2/NHX 00Z, fh72
1
0.9
GFS 0.971 31
ECM 0.982 31
CMC 0.967 31
FNO 0.956 31
UKM 0.973 14
CFSR 0.955 30
JMA 0.965 31
31MAY
2019
5JUN
10JUN
15JUN
20JUN
25JUN
30JUN
Verification Date

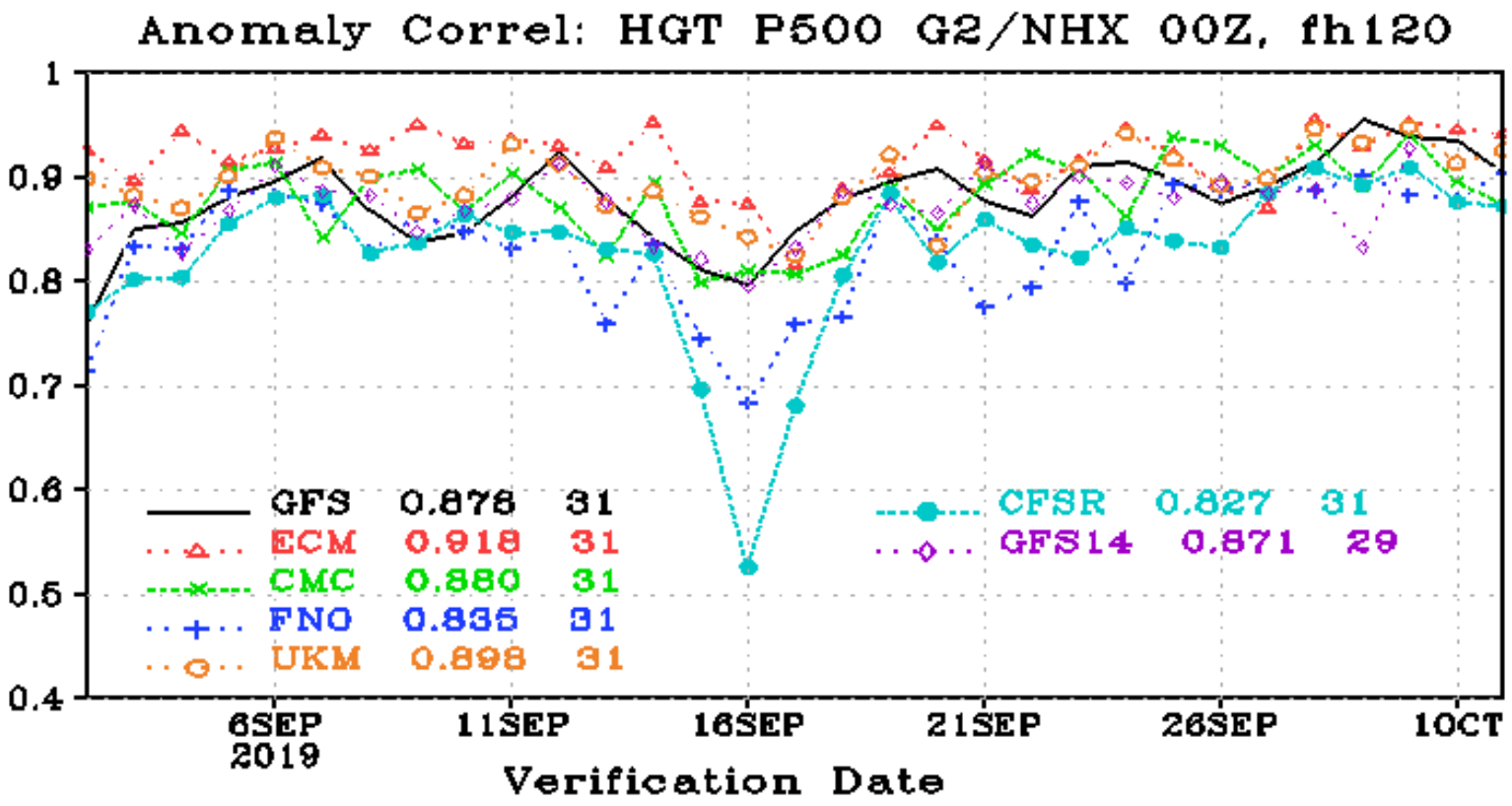
No Apparent Damage



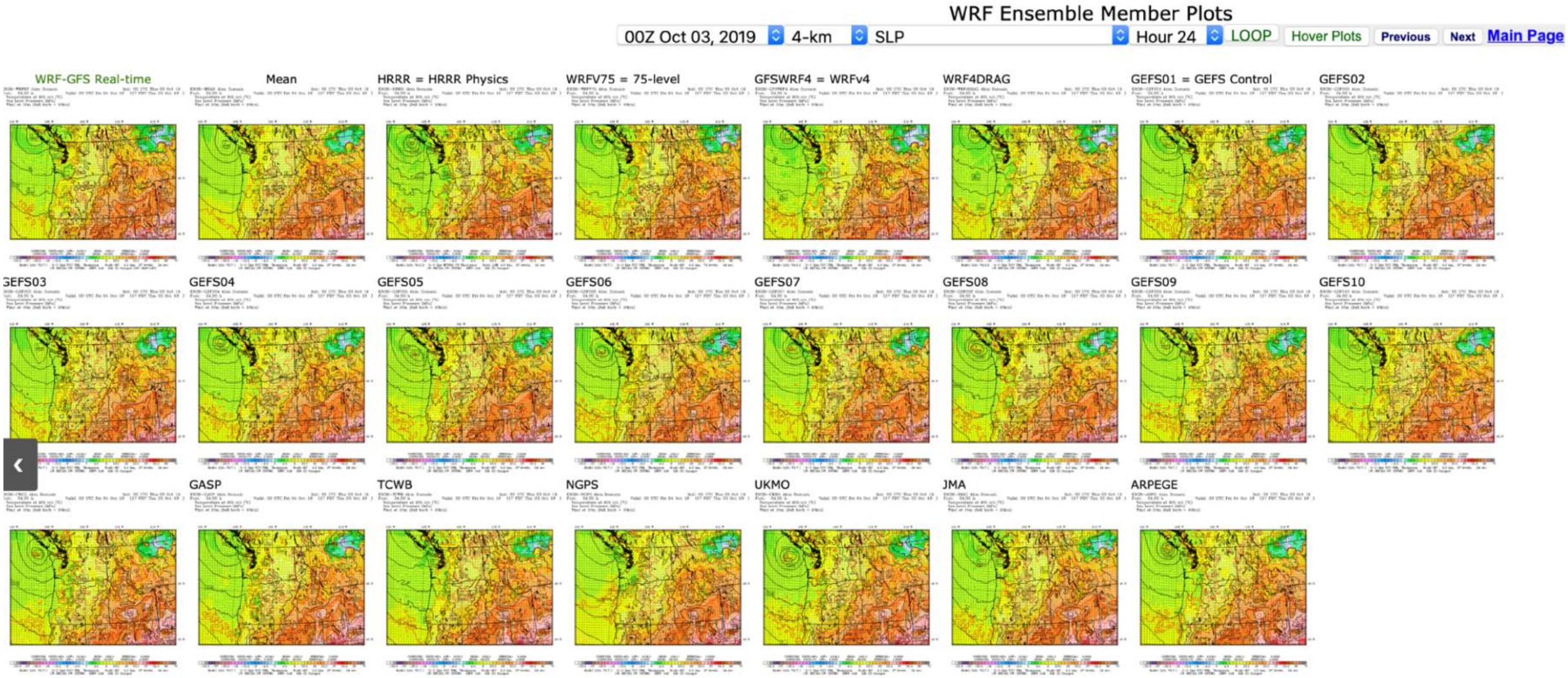



Wind Direction, Bias, spd > 3 knots, Forecast Hour 36, 00Z Initialization,10-pt Smoothing
MM5ETA-36km
MM5ETA-12km
WRFGFS-36km
WRFGFS-12km
WRFGFS-4km
Bias (°)
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
01-Nov-2017-12Z
01-Dec-2017-12Z
01-Jan-2018-12Z
01-Feb-2018-12Z
01-Mar-2018-12Z
01-Apr-2018-12Z
01-May-2018-12Z
01-Jun-2018-12Z
01-Jul-2018-12Z
01-Aug-2018-12Z
01-Sep-2018-12Z
01-Oct-2018-12Z
01-Nov-2018-12Z
01-Dec-2018-12Z
01-Jan-2019-12Z
01-Feb-2019-12Z
01-Mar-2019-12Z
01-Apr-2019-12Z
01-May-2019-12Z
01-Jun-2019-12Z
01-Jul-2019-12Z
01-Aug-2019-12Z
01-Sep-2019-12Z

Latest


Anomaly Correl: HGT P500 G2/NHX 00Z, fh120
1
0.9
0.8
0.7
0.6
0.5
0.4
GFS 0.878 31
ECM 0.918 31
CMC 0.880 31
FNO 0.835 31
UKM 0.898 31
CFSR 0.827 31
GFS14 0.871 29
6SEP
2019
11SEP
16SEP
21SEP
26SEP
10CT
Verification Date

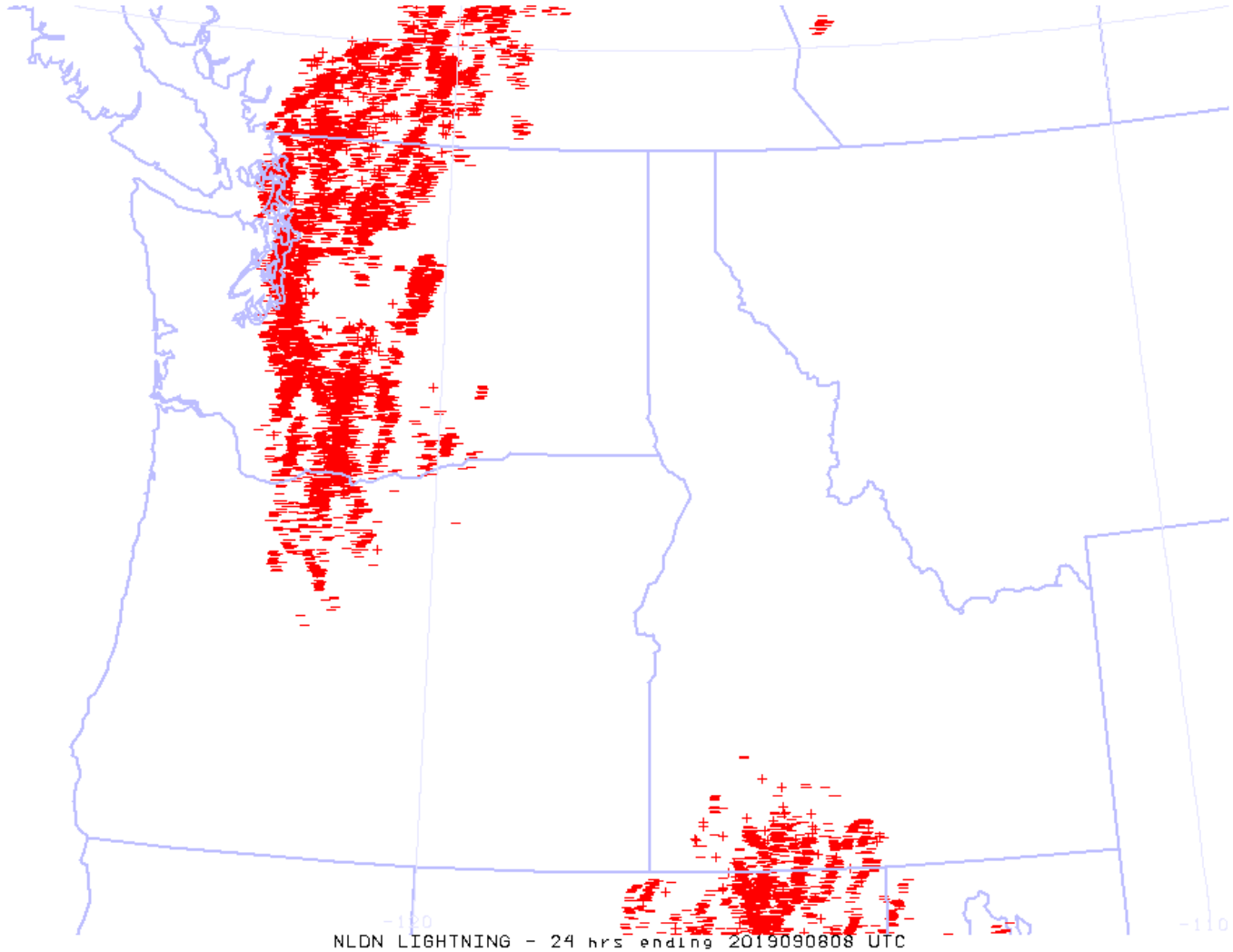
Ensemble System Improvements and Hardening



Added Arpege (French) and Model Variations in the Spring

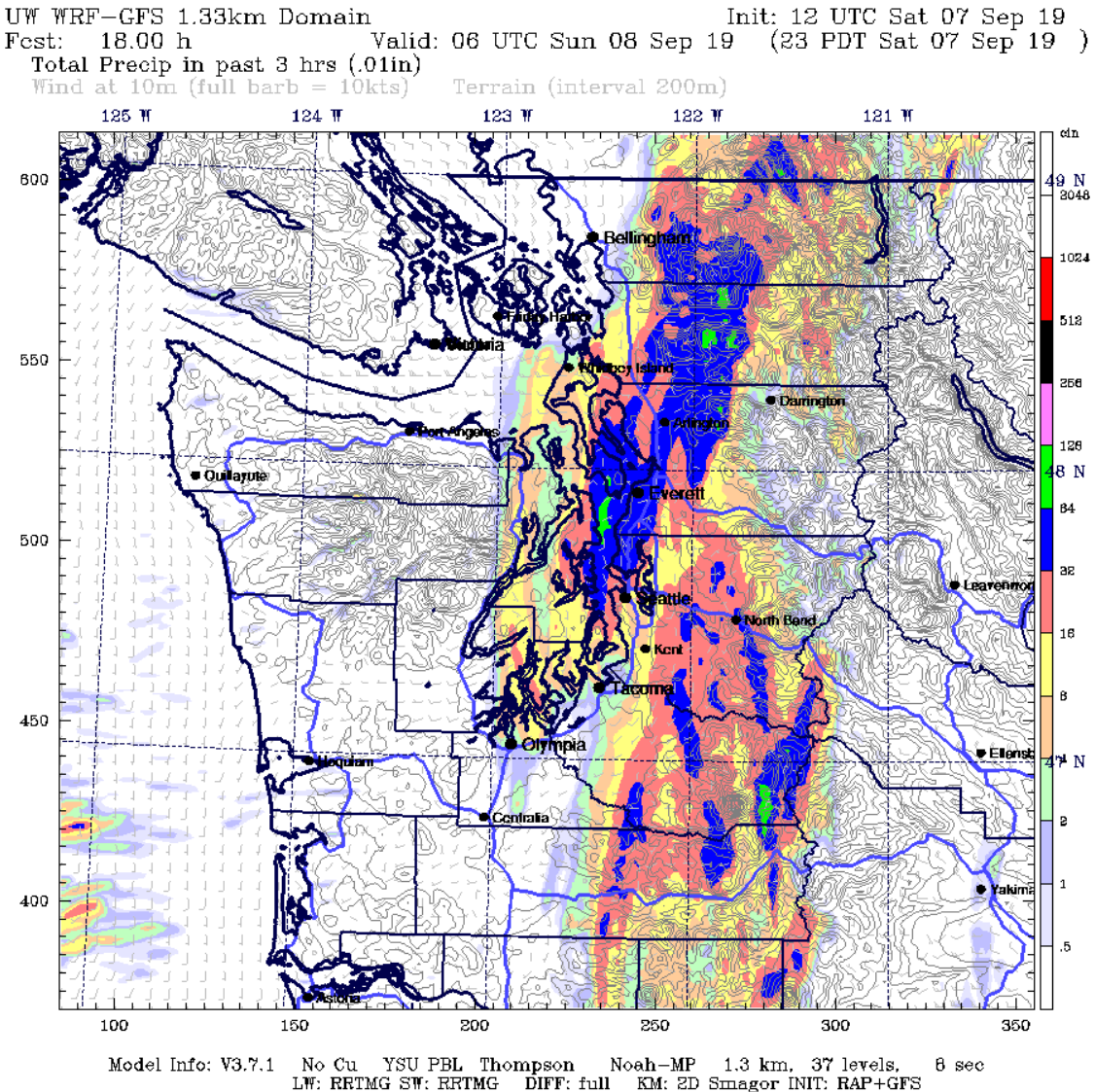
- **Dave has hardened up the code and now the ensembles are highly reliable.**
- **Adding two more this week. Adding an additional boundary layer scheme (ACME/Pleim) and an additional microphysics scheme (P3)**
- **If we want more ensembles, need more nodes.**
- **If new head node with lots of RAM-disks could speed up processing by roughly 30 minutes.**

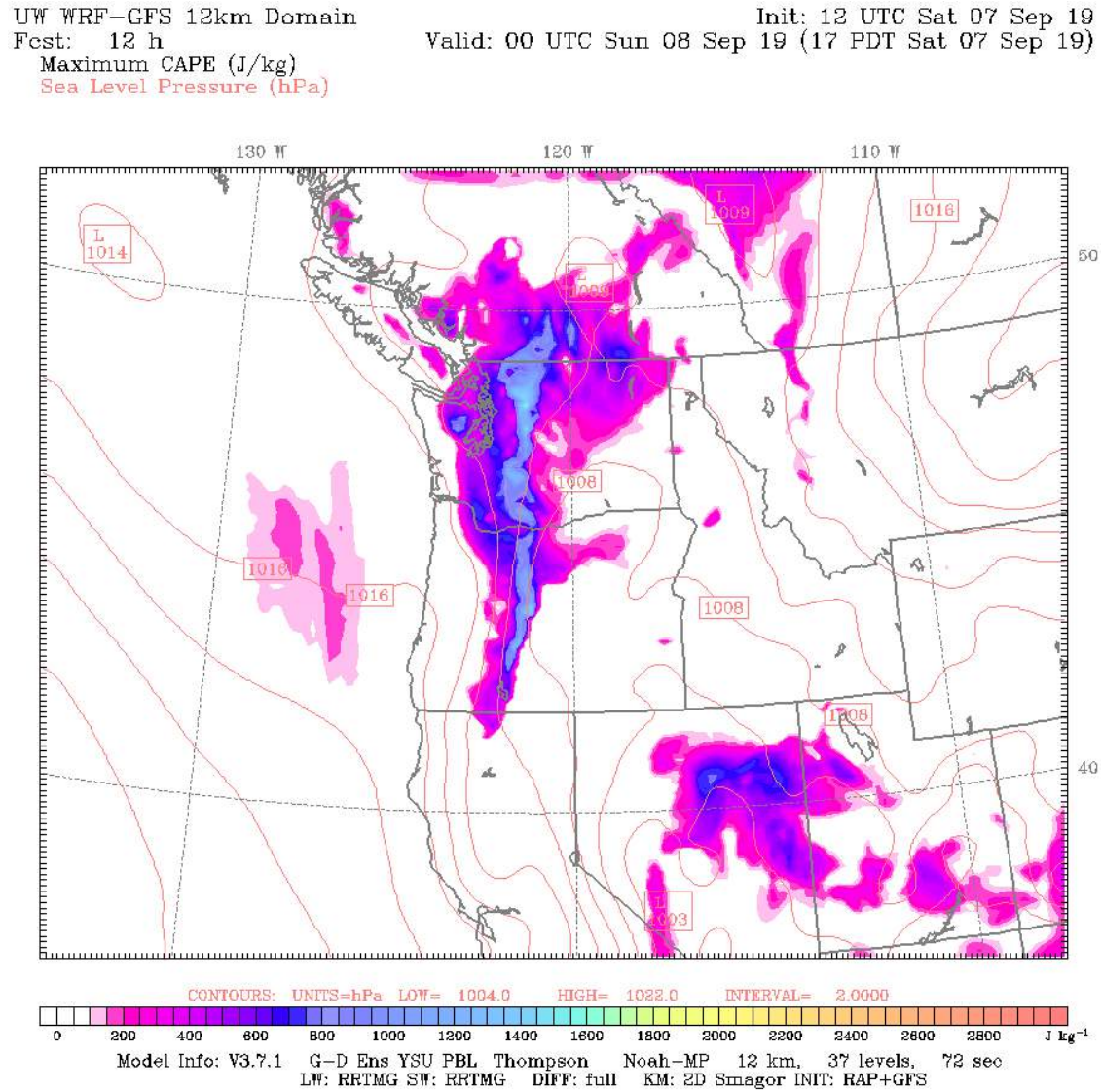
The ensemble system can be very useful: example the Sept 7 thunderstorms over Puget Sound


NLDN LIGHTNING - 24 hrs ending 2019090808 UTC

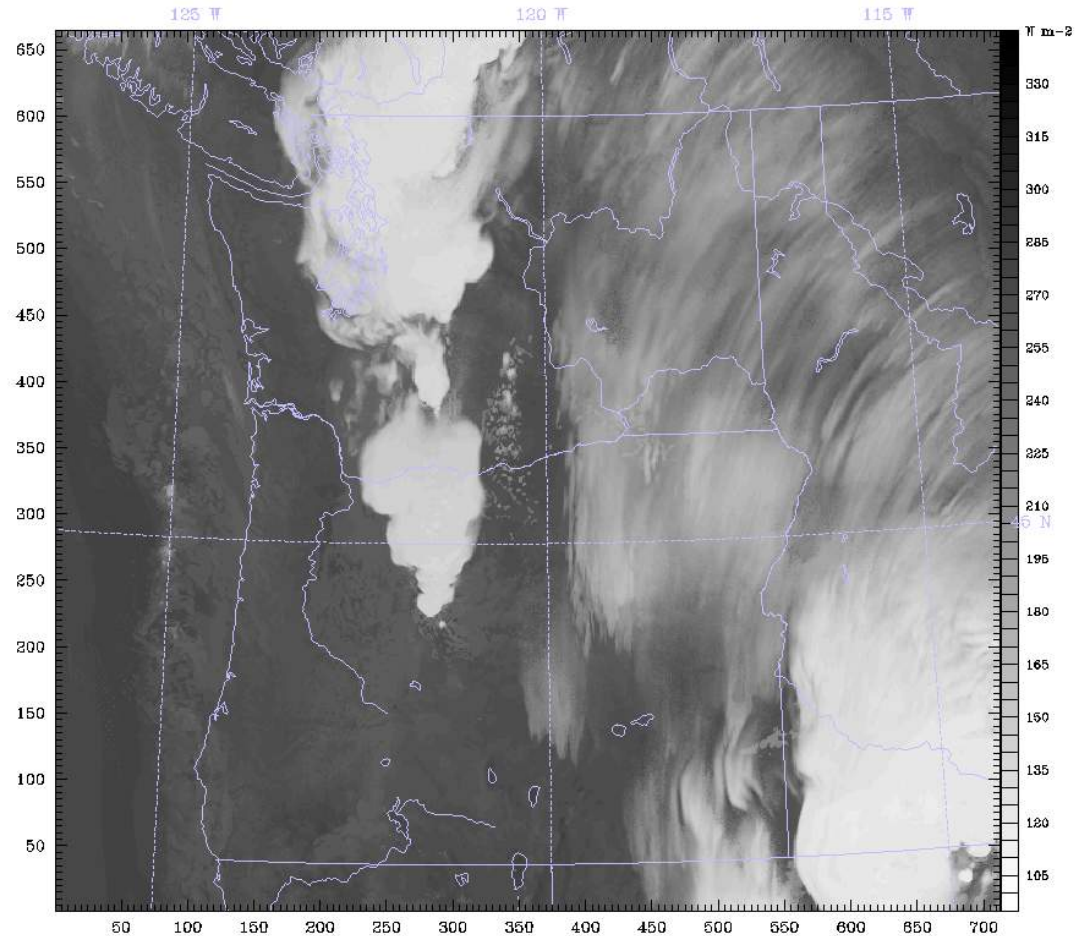
NWS Forecasts and Models Were Poor—held the convection on the mountains

But our system did very well



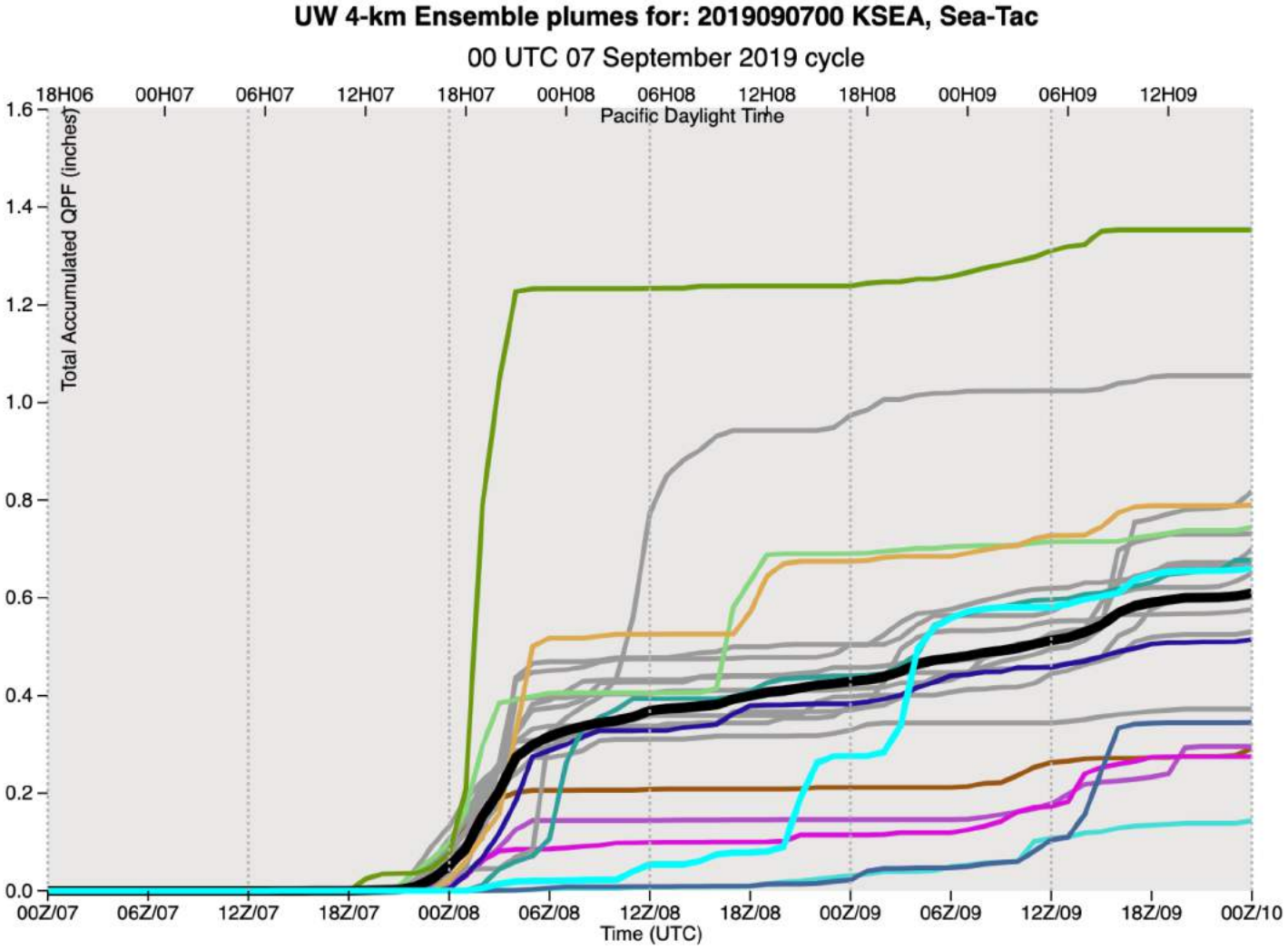


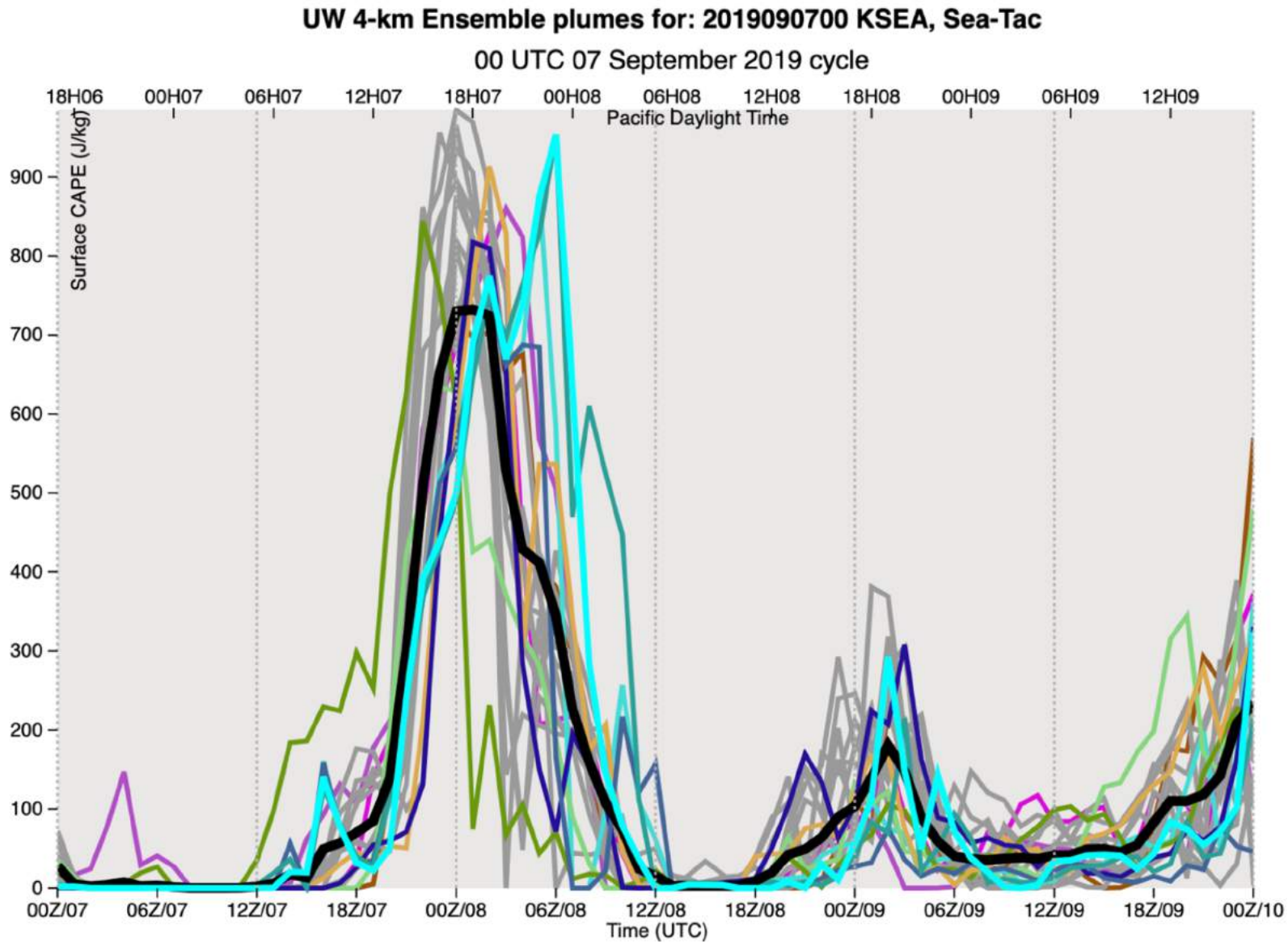
UW WRF-GFS 1.33km Domain Init: 12 UTC Sat 07 Sep 19
Fcst: 18.00 h Valid: 06 UTC Sun 08 Sep 19 (23 PDT Sat 07 Sep 19)
Outgoing Longwave Radiation (W m-2)



Model Info: V3.7.1 No Cu YSU PBL Thompson Noah-MP 1.3 km, 37 levels, 8 sec
LW: RRTMG SW: RRTMG DIFF: full KM: 2D Smagor INIT: RAP+GFS

Ensembles Were Spectacular




UW 4-km Ensemble plumes for: 2019090700 KSEA, Sea-Tac
00 UTC 07 September 2019 cycle
18H06
00H07
06H07
12H07
18H07
00H08
06H08
12H08
18H08
00H09
06H09
12H09
Pacific Daylight Time
Surface CAPE (J/kg)
900
800
700
600
500
400
300
200
100
0
00Z/07
06Z/07
12Z/07
18Z/07
00Z/08
06Z/08
12Z/08
18Z/08
00Z/09
06Z/09
12Z/09
18Z/09
00Z/10
Time (UTC)

Some Things to Do

- Calibrated probabilistic guidance from ensembles (BMA, Machine Learning)
- Upgrade some graphics (e.g., cross sections)
- Upgrade model verification (e.g., cloud base using ceilometer, cloud tops from GOES, cloud top species—GOES).
- Try to get TAMDAR to be reliable.
- More ensembles and faster if we can get computers.