

Consortium February 2019



Cliff Mass and David Ovens

Computers Moved and Everything Stable



Some Problems Resolved

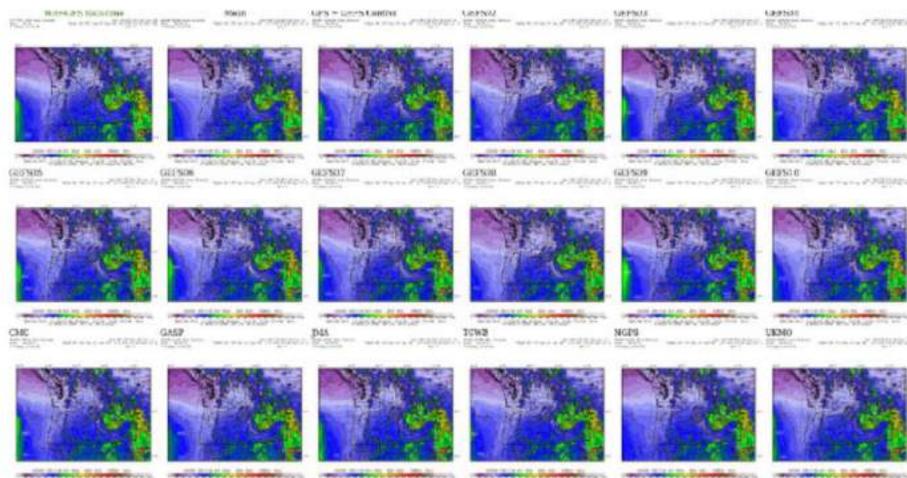
- **Problem Node Fixed and Returned Into Cluster**
- **Government shut-down issues fixed (we lost our feed for the NOAA/NWS RAP grids)**
- **The latter degraded our initial conditions and ability to start with low clouds in eastern WA.**
- **Now back to normal**
- **Fixed and updated the meteogram, time-height, and sounding generators.**

Ensemble Expansion: Initial Stage Complete: Both 0000 and 1200 UTC Cycles Operational

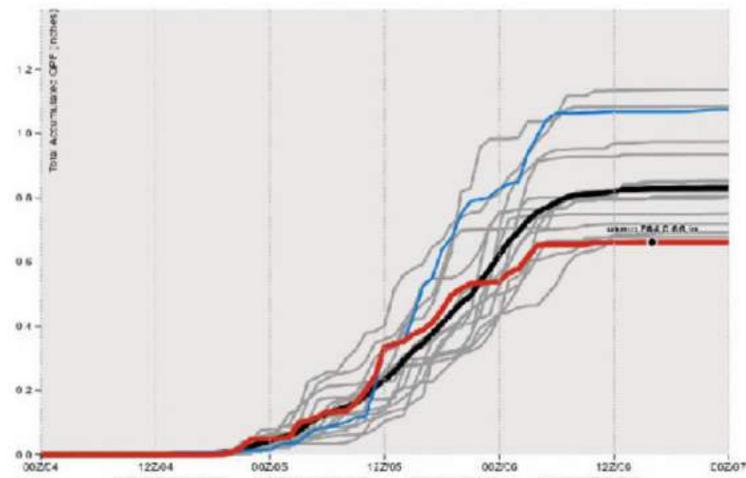
- 4-km deterministic from operational GFS
- 10 members from the GFS ensemble system (GEFS)
- 5 additional members driven by Canadian, UKMET, Australian, Japanese, and Navy Global Models
- All ready by approximately 8 AM, 8 PM

UW High-Resolution Ensemble Forecasts

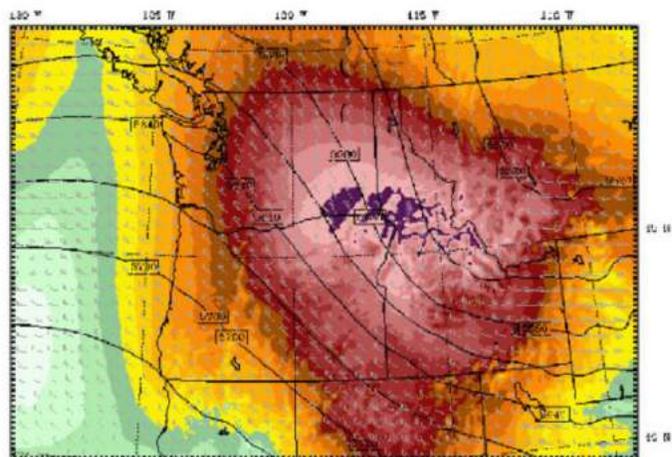
Supported by the [Northwest Modeling Consortium](#). Return to [Main NW Forecast Page](#).



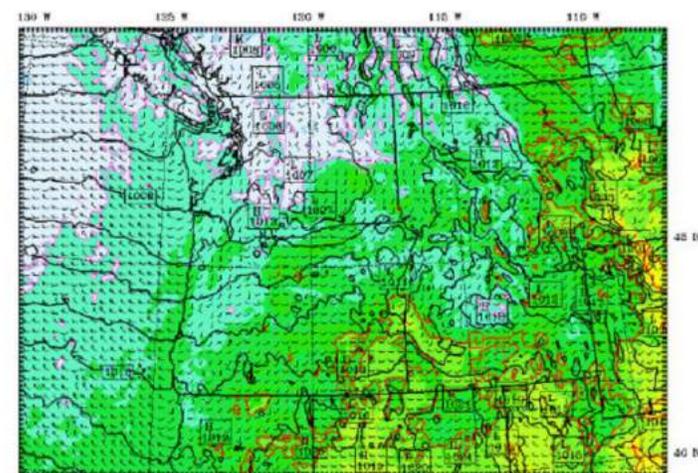
[Show All Plots](#)



[Plumes](#)



[Mean and Spread](#)



[Loop Individual Members](#)

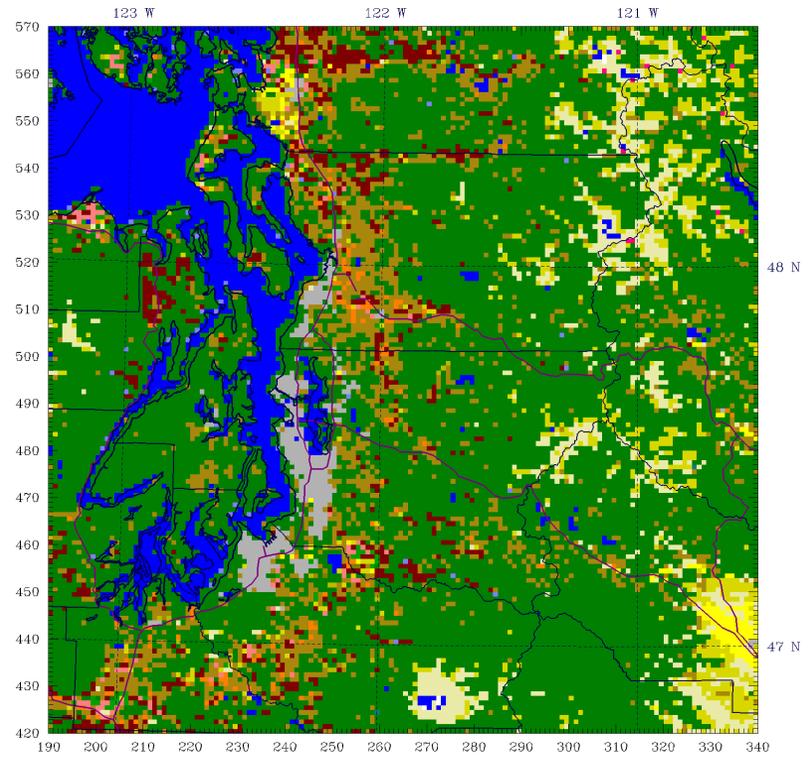
Stage 2: Expansion

- During the next few months, we will add physics uncertainty, using stochastic physics options.
- Will also add a run with more vertical layers.
- Will start with 5 additional runs each cycle.
- Create new, ensemble-based products.

Improved Land Use in Model

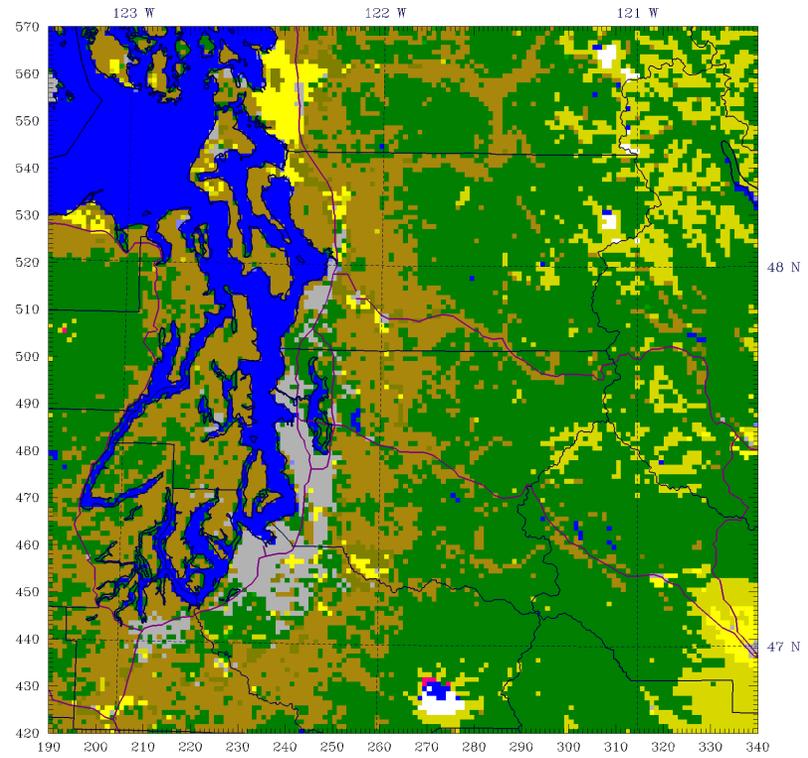
- Moved from 15 arcsecond vs 30 arcsecond, MODIS landuse dataset
- To improve it further, Dave completed some additional manual editing of cells in Western Washington

Old UW Nov16 WRF MODIS 30s Landuse 1.33km Domai Init: 00 UTC Fri 31 Dec 99
Fcst: 0.00 h Valid: 00 UTC Fri 31 Dec 99 (16 PST Thu 30 Dec 99)
Land use category



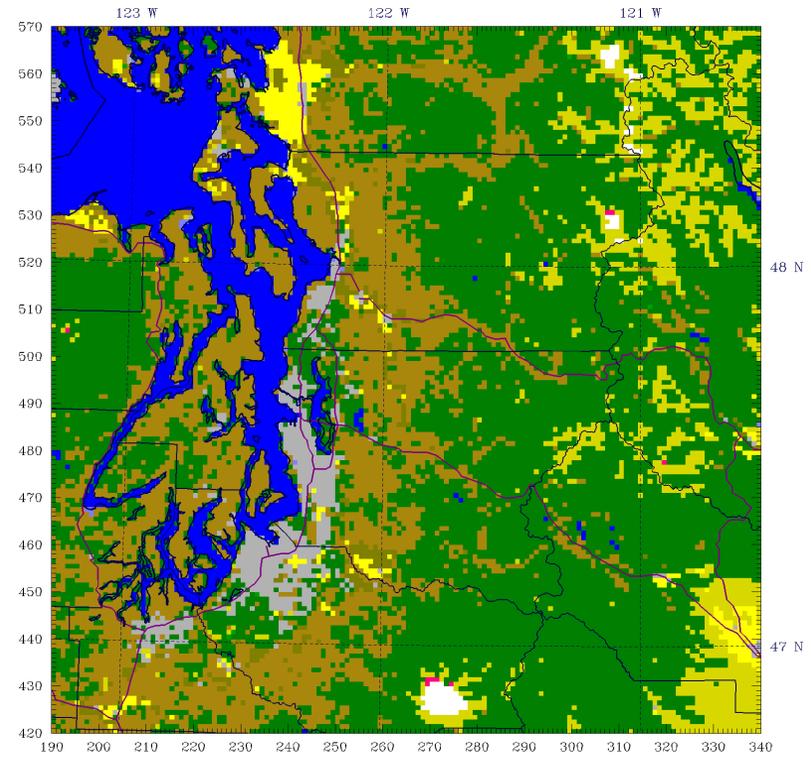
OUTPUT FROM GEOGRID V3.7.1 x = 712, y = 664, 1.3 km

Standard WRF MODIS 15s Landuse 1.33km Domain Init: 00 UTC Fri 31 Dec 99
Fcst: 0.00 h Valid: 00 UTC Fri 31 Dec 99 (16 PST Thu 30 Dec 99)
Land use category



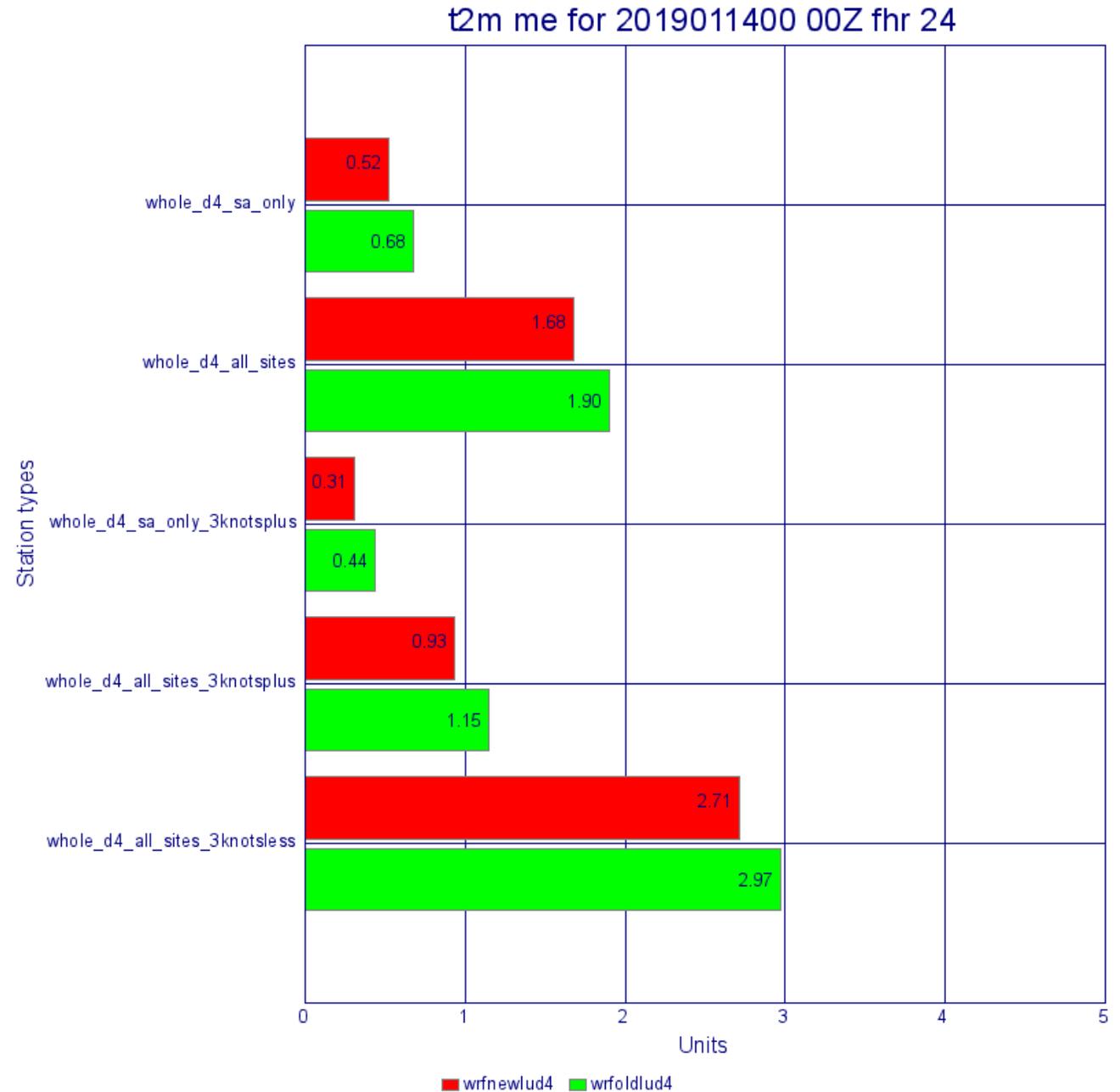
OUTPUT FROM GEOGRID V3.9.0.1 x = 712, y = 664, 1.3 km

Final UW Nov16 WRF MODIS 15s Landuse 1.33km Dom Init: 00 UTC Fri 31 Dec 99
Fcst: 0.00 h Valid: 00 UTC Fri 31 Dec 99 (16 PST Thu 30 Dec 99)
Land use category

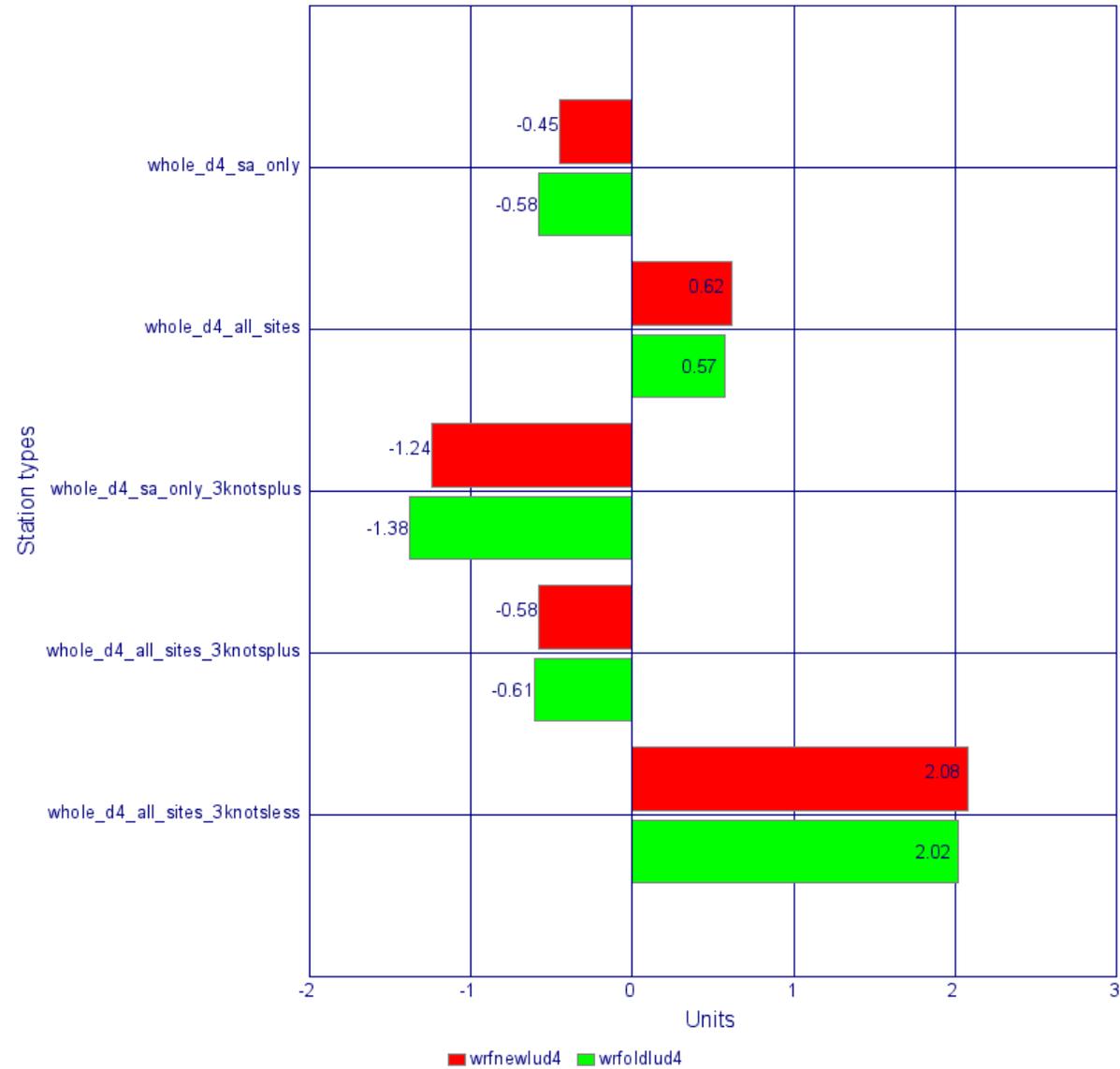


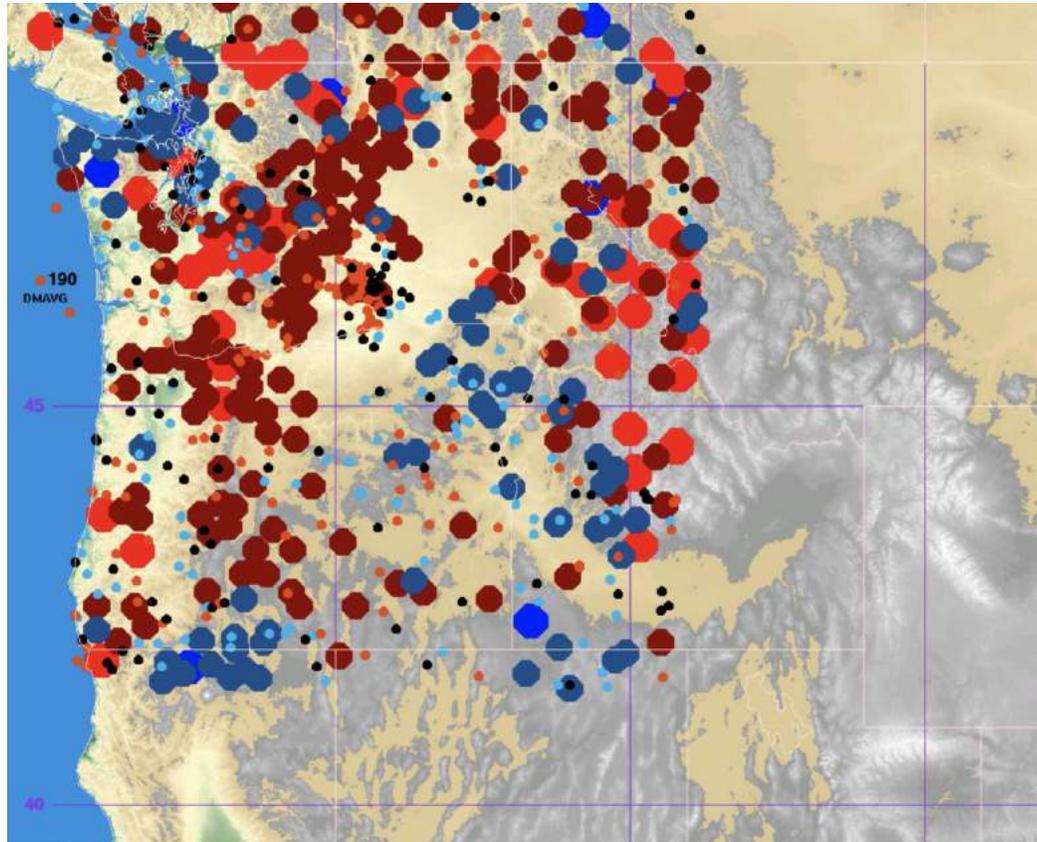
OUTPUT FROM GEOGRID V3.9.0.1 x = 712, y = 664, 1.3 km

Does Improve Land use Improve Forecasts? One Case

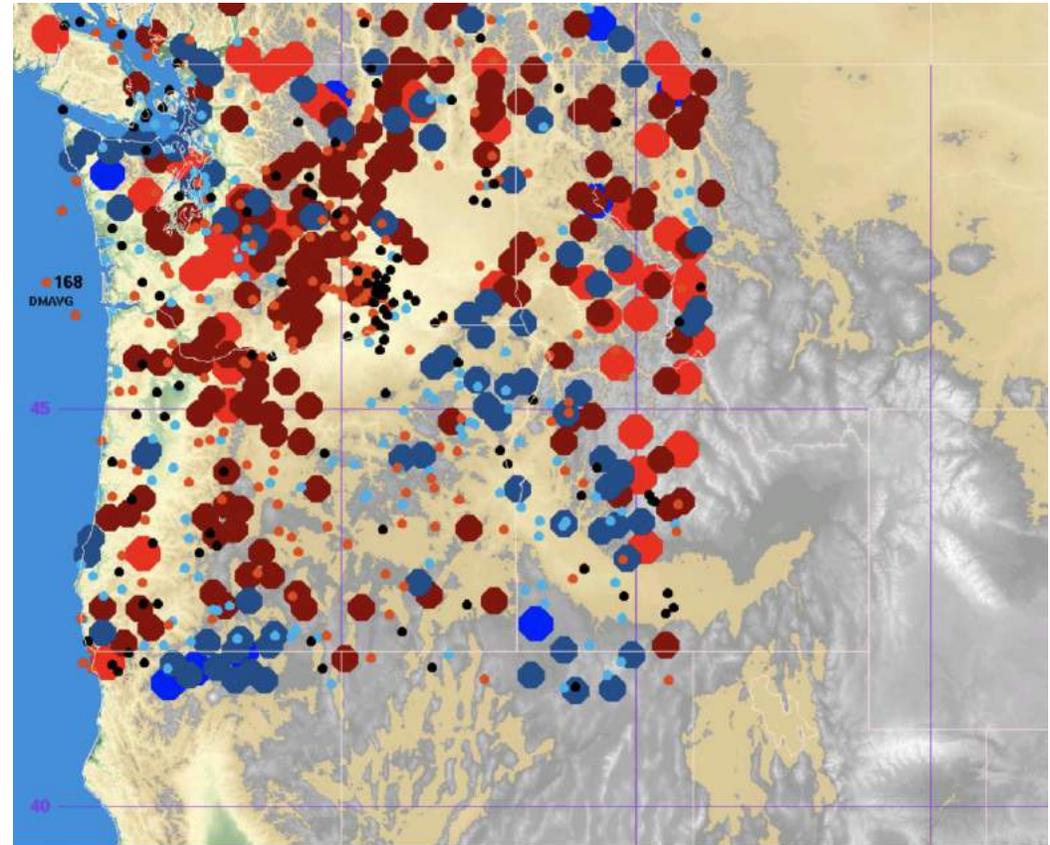


wsp10m me for 2019011400 00Z fhr 24



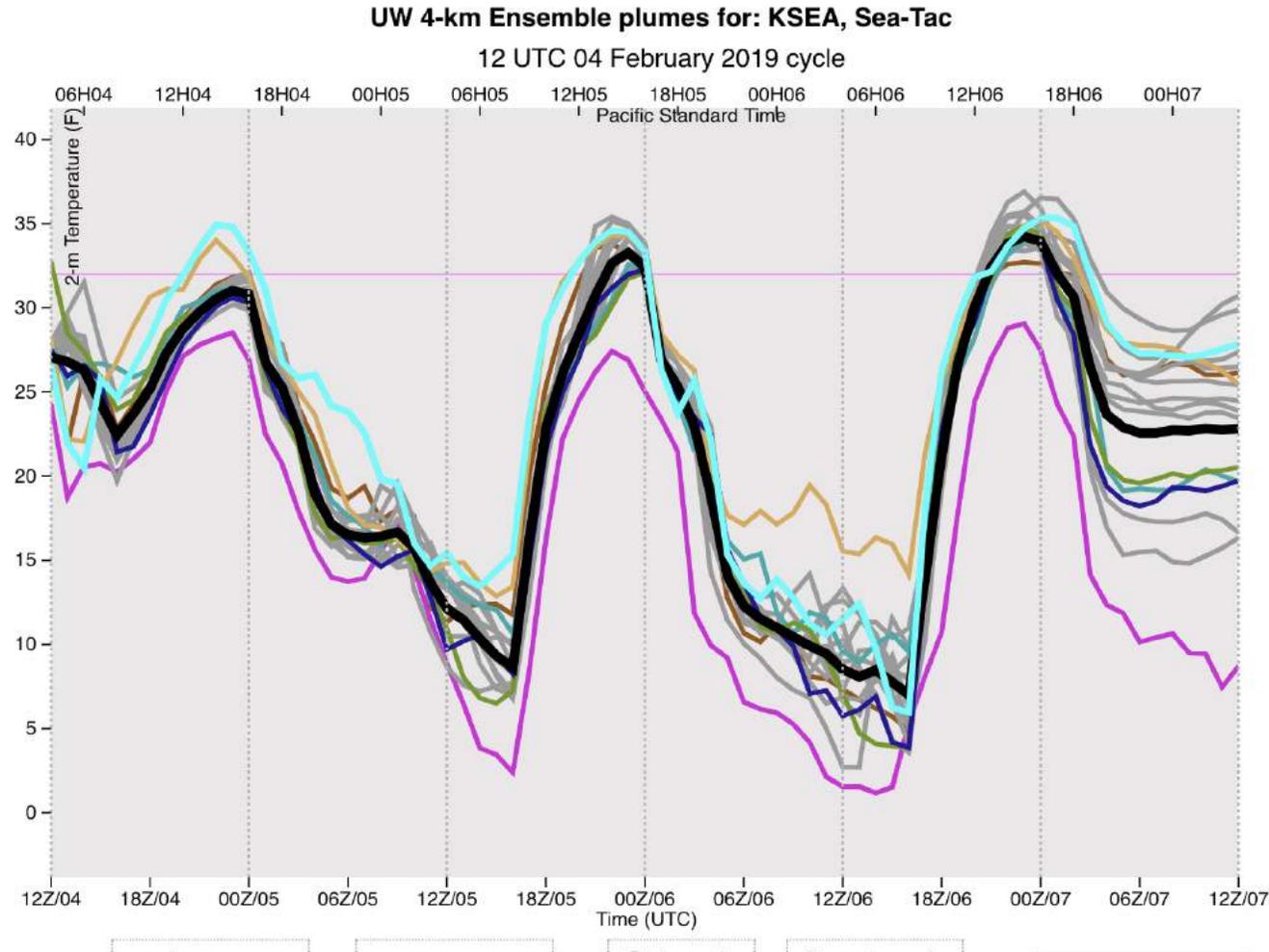


WRFOLDLU 12-km 2m Bias I00Z/F24 2019011400

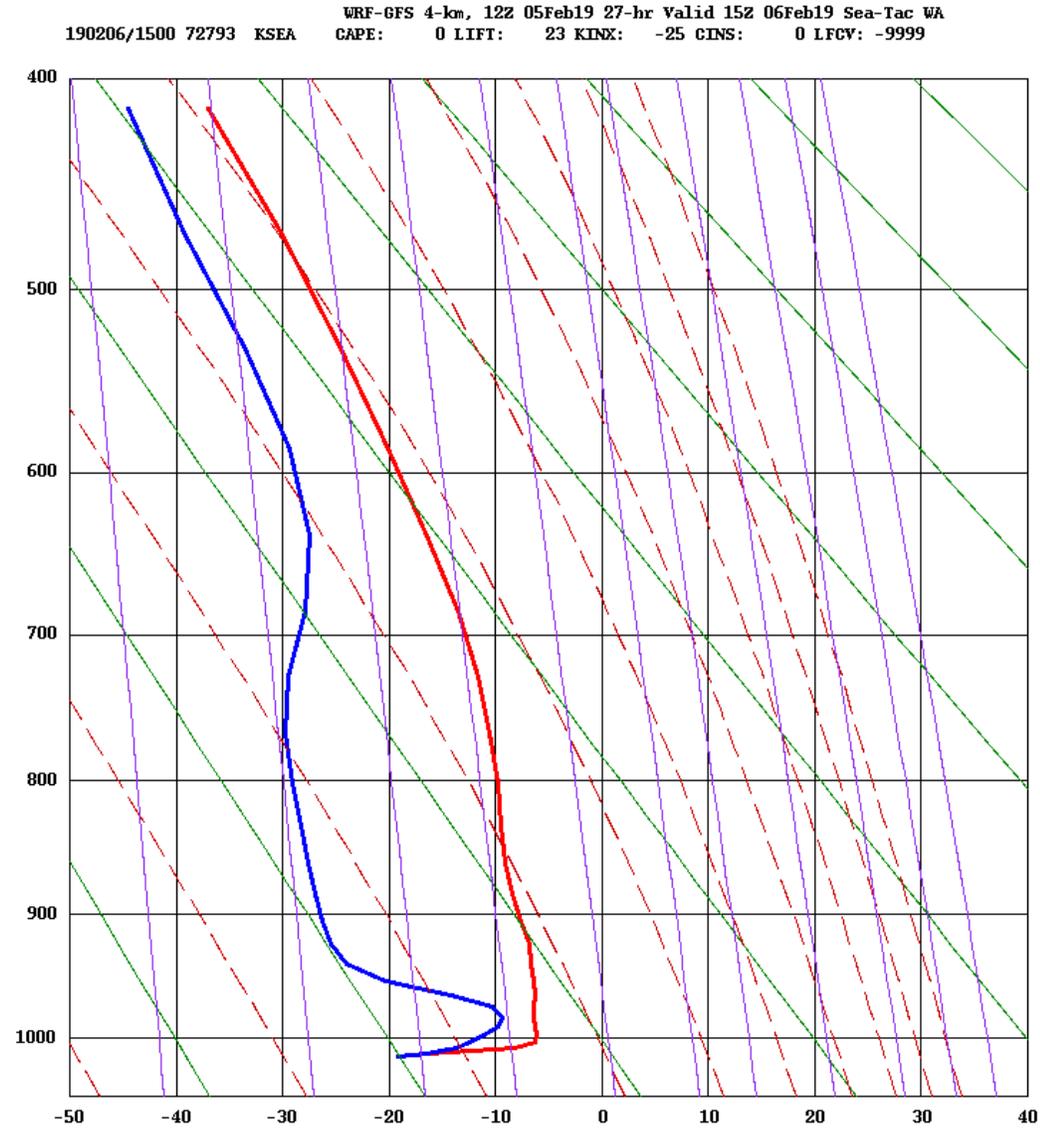


WRFNEWLU 12-km 2m Bias I00Z/F24 2019011400

We got a problem that needs to be fixed: too intense inversions and too cold over snow in western WA during the morning



Will diagnose
and fix this
issue asap



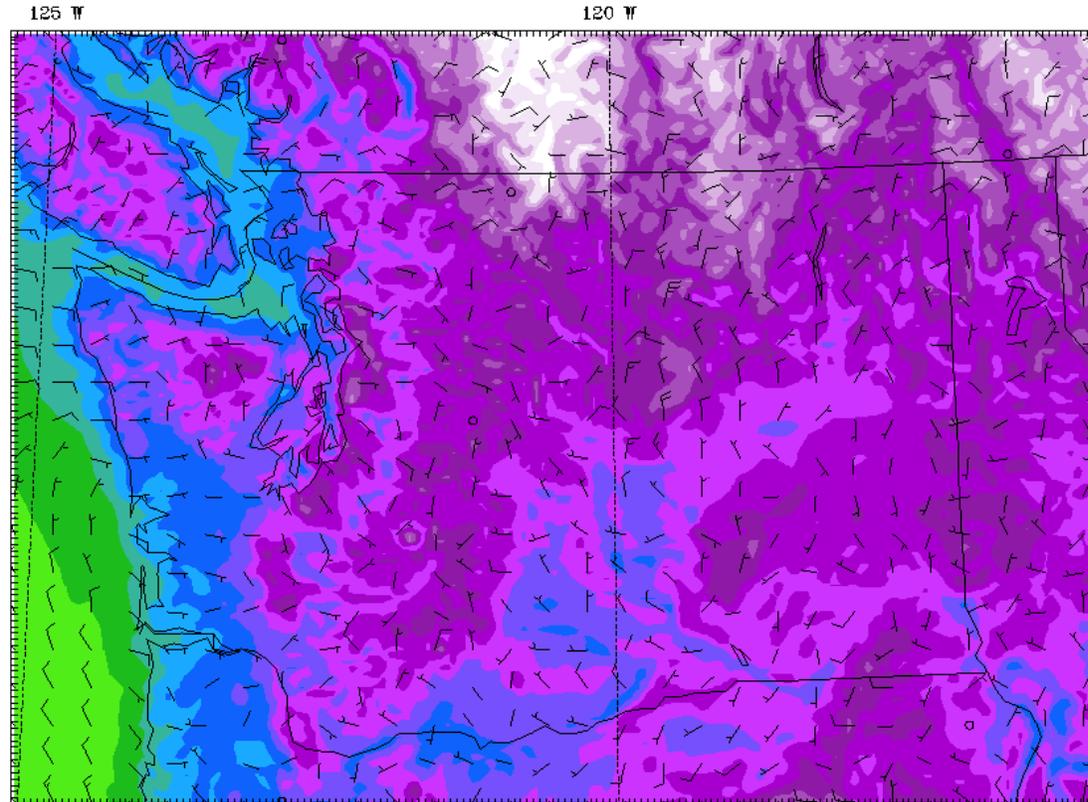
UW WRF-GFS 4km Domain

Init: 12 UTC Tue 05 Feb 19

Fcst: 3 h

Valid: 15 UTC Tue 05 Feb 19 (07 PST Tue 05 Feb 19)

2m Temperature (°F) ----- 10m Wind (full barb = 10kts)



BARB VECTORS: FULL BARB = 10 kts



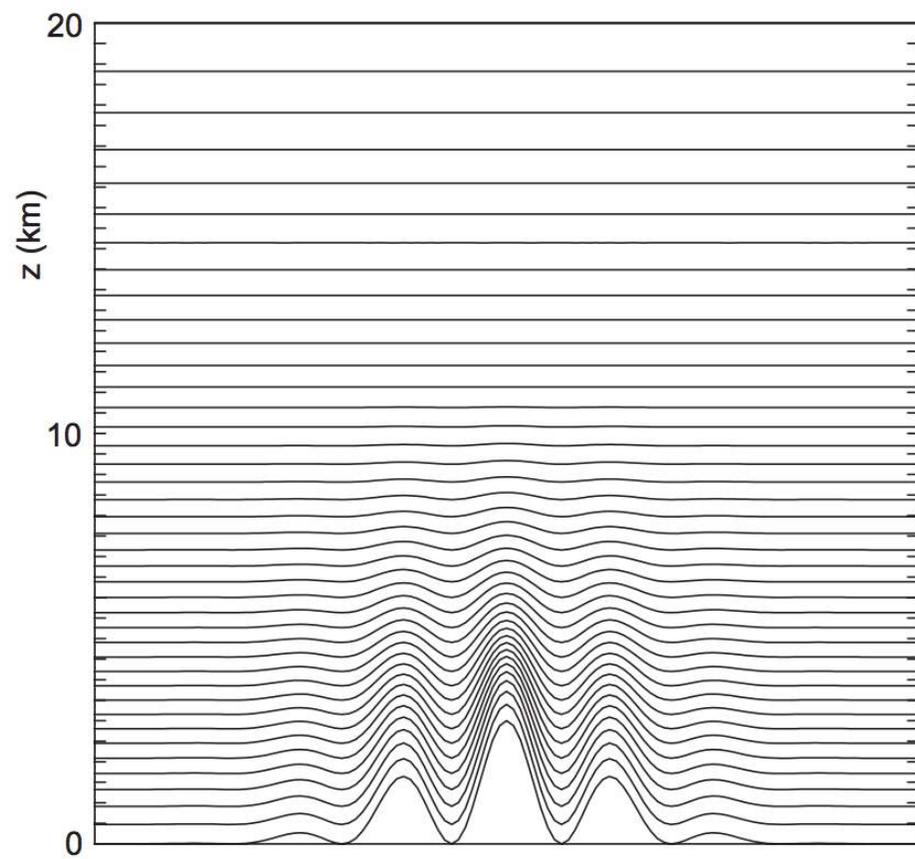
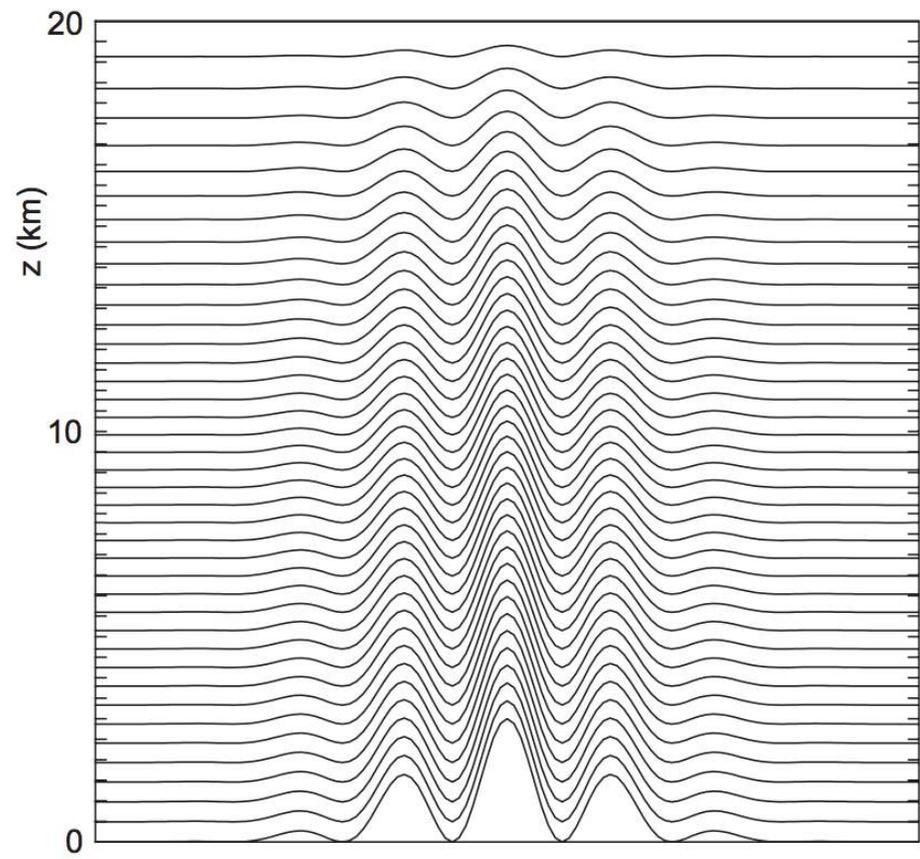
Model Info: V3.7.1 G-D Ens YSU PBL Thompson Noah-MP 4.0 km, 37 levels, 24 sec
LW: RRTMG SW: RRTMG DIFF: full KM: ED Smagor INIT: RAP+GFS

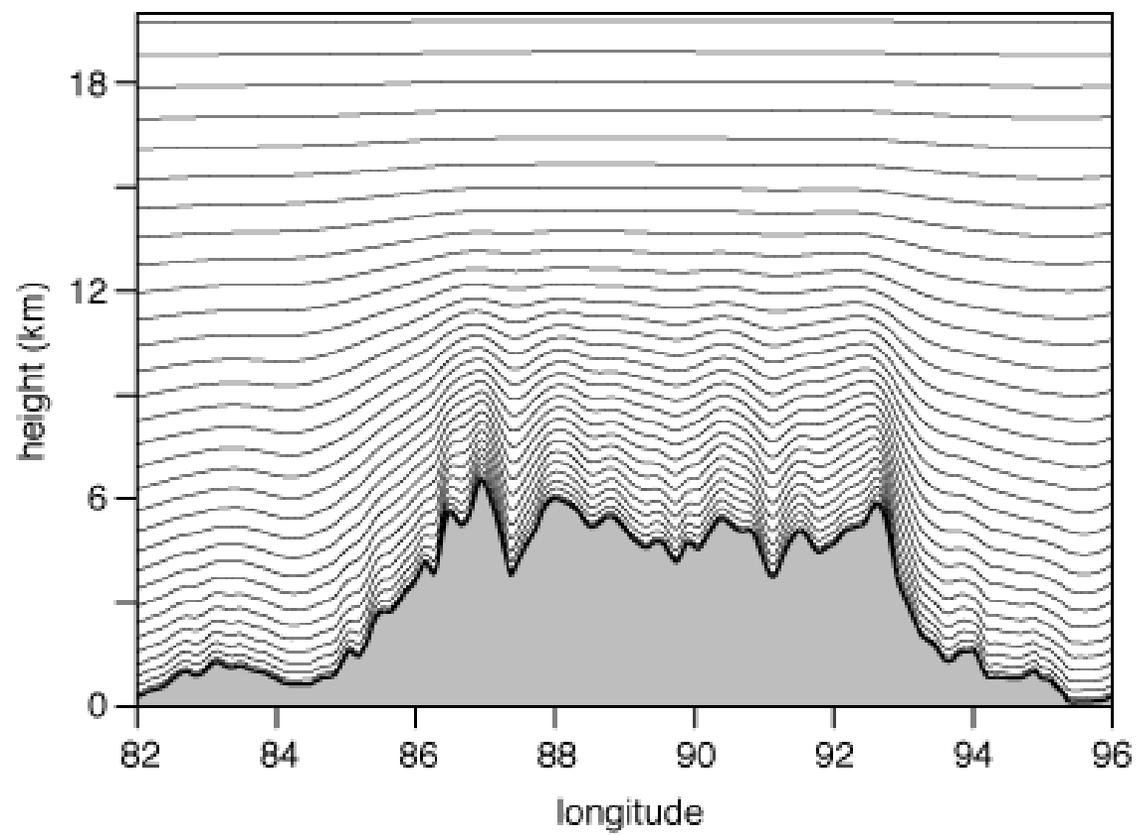
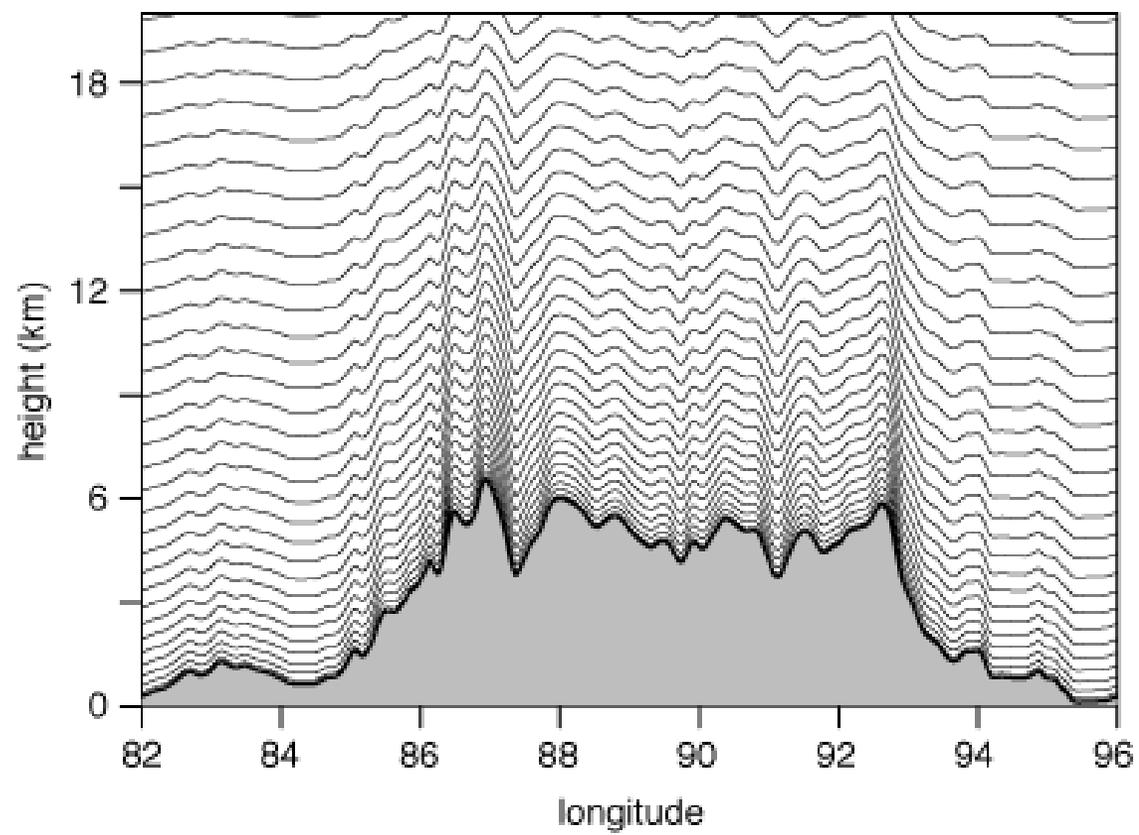
Major Model Update

- Move from 3.7.1 to 4.0.3
 - Lots of bug fixes and improvements
 - Is about 5% faster
- Change to hybrid vertical coordinate system
 - Less spurious upper tropospheric noise

WRF Hybrid Coordinate System

- The previous sigma-p vertical coordinate distorts surfaces above terrain.
- Can produce upper tropospheric noise,
- The hybrid system flattens out the surfaces aloft, damping the orographic signal.



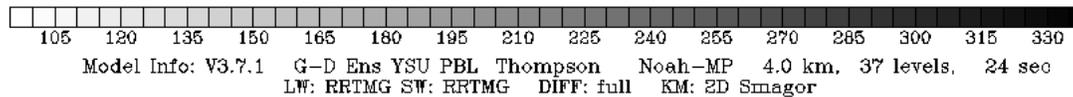
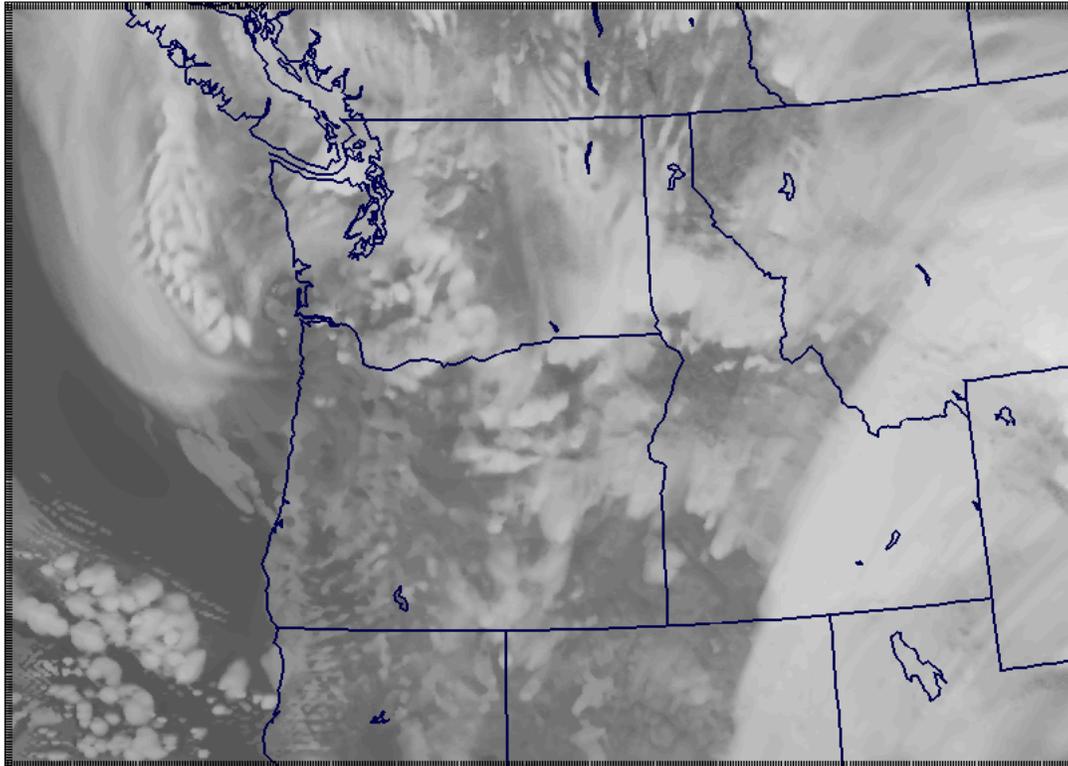


3.7.1 versus 4.03

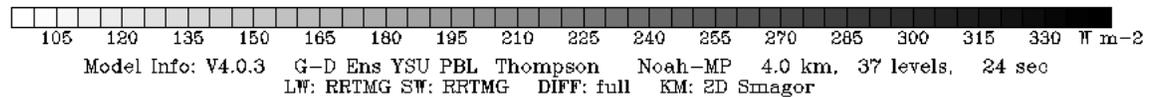
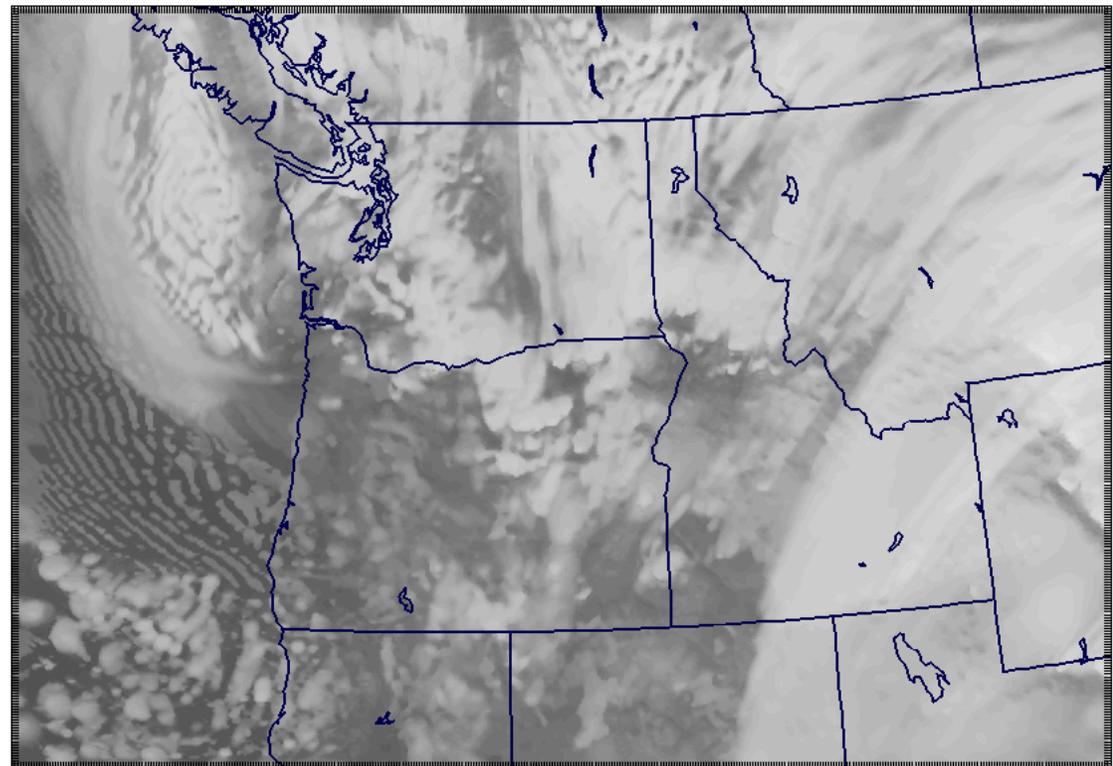
- 3.7.1 is now 3 years behind
- We tested 3.8 and 3.9 extensively and there was no significant improvements.
- Now testing 4.0.3 extensively with the new hybrid coordinate system.
- If it is at least at good and at least as stable, we should probably switch, at the very least for the speed-up potential

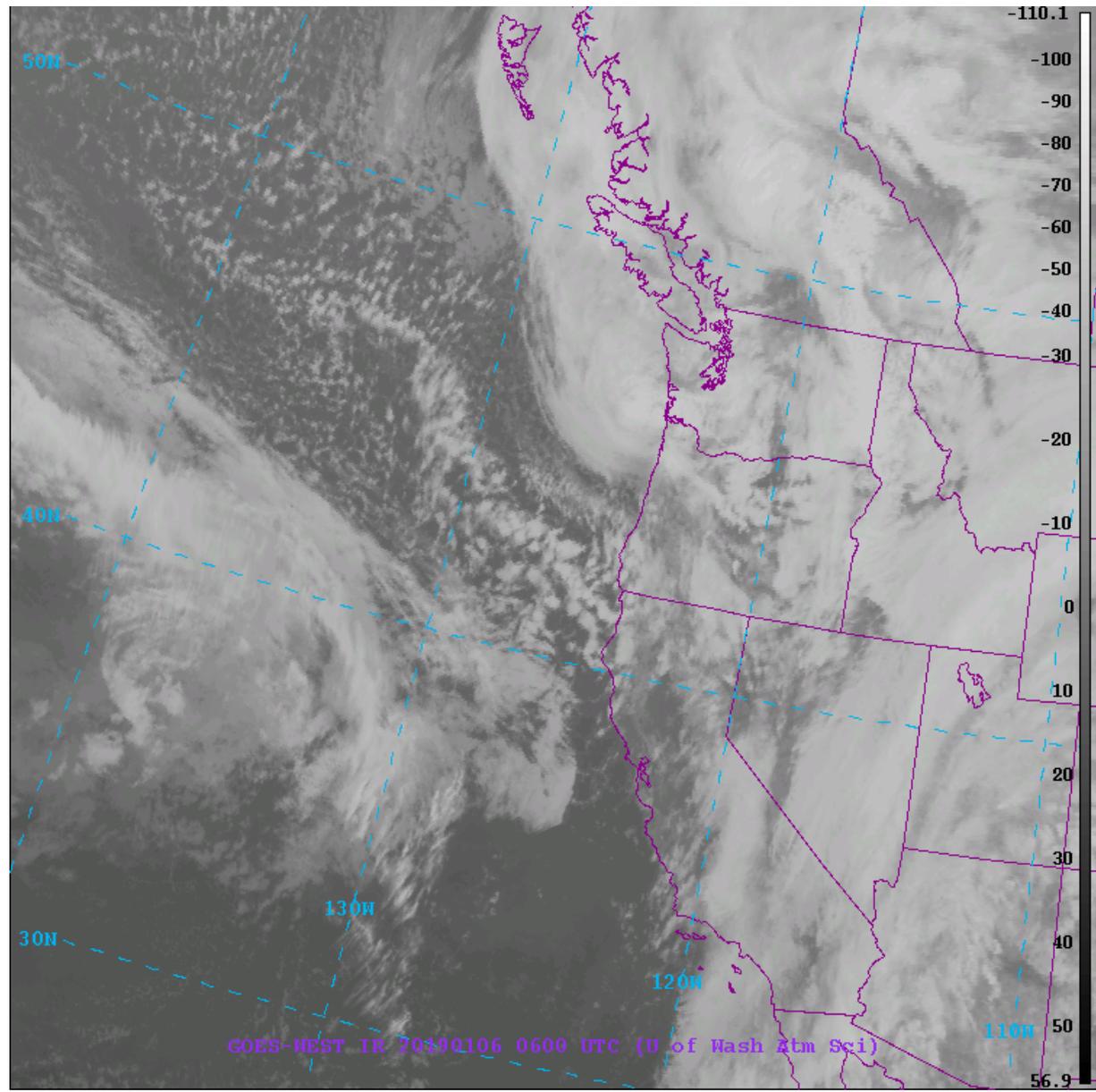
Convection Seems to Be Revved Up More

3.7.1



4.0.3





The End