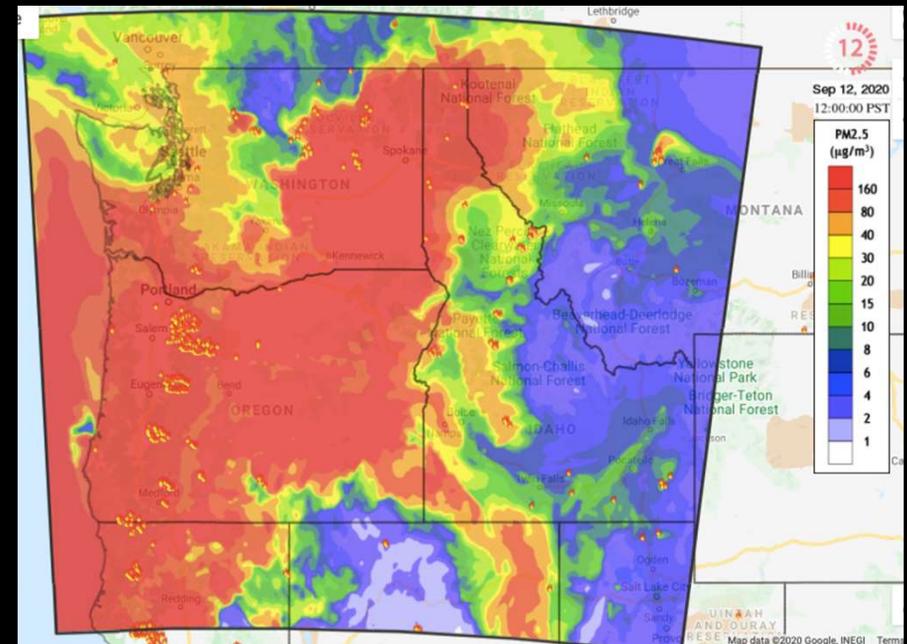


# AIRPACT-5 & AIRPACT-6 UPDATES

Joe Vaughan, WSU  
October 1, 2020  
NW-AIRQUEST

# TOPICS

- System stress testing due to recent wildfires (2-7)
- Toward AIRPACT6 (8-9)



# THE AIRPACT5 SYSTEM UNDERWENT STRESS TESTING DUE TO RECENT WILDFIRES.

- September 2<sup>nd</sup> -- the BlueSky and SMARTFIRE2 system started being problematic (failing) for AIRPACT-5.
- Motivating updating to the new USDA/FS Fire Information System (FIS) and BlueSky Pipeline (BSP). Thanks Susan O'Neill and Stuart Illson!
- AIRPACT5 was running BlueSky w/ SMARTFIRE2 on a dedicated virtual Ubuntu server.
- New FIS & BSP were provided by Susan as a 'Docker container' and required use of Singularity to run in Aeolus.
- With help from Susan and Stuart at FS, and Andrew Bates (sys admin), and with Farren Thorpe's help, we got FIS-BSP running in a few days.
- FIPS codes were being obtained by a network call, which became an issue.

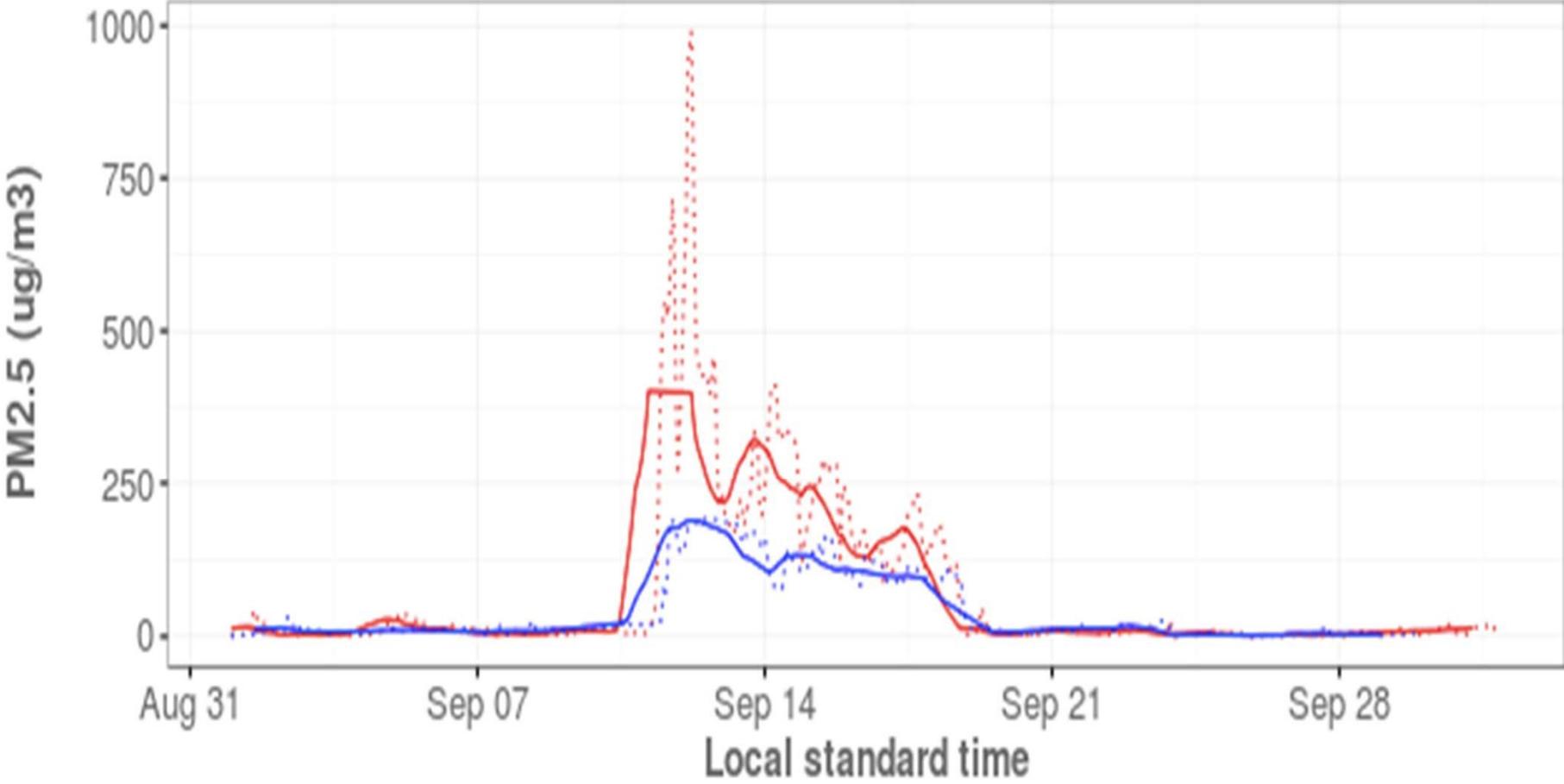
# THE AIRPACT5 SYSTEM UNDERWENT STRESS TESTING DUE TO RECENT WILDFIRES.

- September 9<sup>th</sup> -- fire numbers overwhelmed emissions processing!
- Ran out of time, due to FIPS network call lookups for so many fires running out the clock relative to wall-time resource estimates on the fire emissions job.
- Initially we increased the time request.
- But, as fire numbers continued increasing, fire emissions again failed.
- Farren replaced the FIPS network calls with fixed values and fire emissions no longer ran out of time.
- Farren mentioned (WG) the plan for properly assigning FIPS codes going forward.

# THE AIRPACT5 SYSTEM UNDERWENT STRESS TESTING DUE TO RECENT WILDFIRES.

- Performance charting broke, for Oregon in particular.
- Due to format violations in code extracting AIRPACT values at AIRNow reporting monitoring sites.
- Due to high AIRPACT5 values in PM2.5 and/or other species – essentially a coding bug because -- *who imagined we'd have milligram values of PM2.5?*
- *Von Walden and JKV are just now getting a new script & python code replacement tested.*
- *Will then get performance charting back by rerun the extractions for dates with problems: 9/10 thru 9/17, and 9/21.*
- *Then we'll be able to look at this fire season's AIRPACT performance.*
- *PM2.5 at Dayton, WA approached 1000  $\mu\text{g}/\text{m}^3$  ~ September 10<sup>th</sup>.*

### PM2.5 for Dayton-W Main





# THE AIRPACT5 SYSTEM UNDERWENT STRESS TESTING DUE TO RECENT WILDFIRES.

- Fire location plotting broke.
- Due to Google Earth having a 5 MB size limit for kml files, we exceeded what the backend mapping can handle.
- We may want to implement a procedure to reduce points by combining them until an acceptable size is achieved.
- This is a low priority for now.



# TOWARD AIRPACT6

- VCEA IT is working with the college, department directors, and Facility Operations to facilitate a \$100k plus major adjustment to the power situation to allow the installation of the new HPC infrastructure.
- Initial quotes were acquired in April 2020 and timelines are "pending" due to the bureaucratic process of getting multiple bids and figuring out who will pay for what percentage of it.
- The following equipment has been purchased and is waiting on the power work described in #1:
  - HPC firewall
  - Dual login nodes
  - 7 CPU nodes
  - 3 GPU nodes
  - Storage (recently purchased)



# TOWARD AIRPACT6

AIRPACT6 processes worked up to-date are JPROC, BCON and the old Fire Emissions processing up to, not including, SMOKE point emissions treatment.

Sys Admin Bates wrote Monday 9/29/20:

- The NVIDIA HPC compiler:
  - replaces the Portland Group FORTRAN compiler.
  - will be available on both clusters.
  - is now available for our use and testing!
- This is the first news we've gotten as to this becoming available for testing!
- All FORTRAN codes must be compiled anew for AIRPACT6:
  - MEGAN, CMAQ, and other ancillary post processing codes.



END OF SHOW