

Weather and Air Quality: Reflection and Outlook During Smoke Conditions

Presenter: Megan Christiansen
Date: August 7, 2023

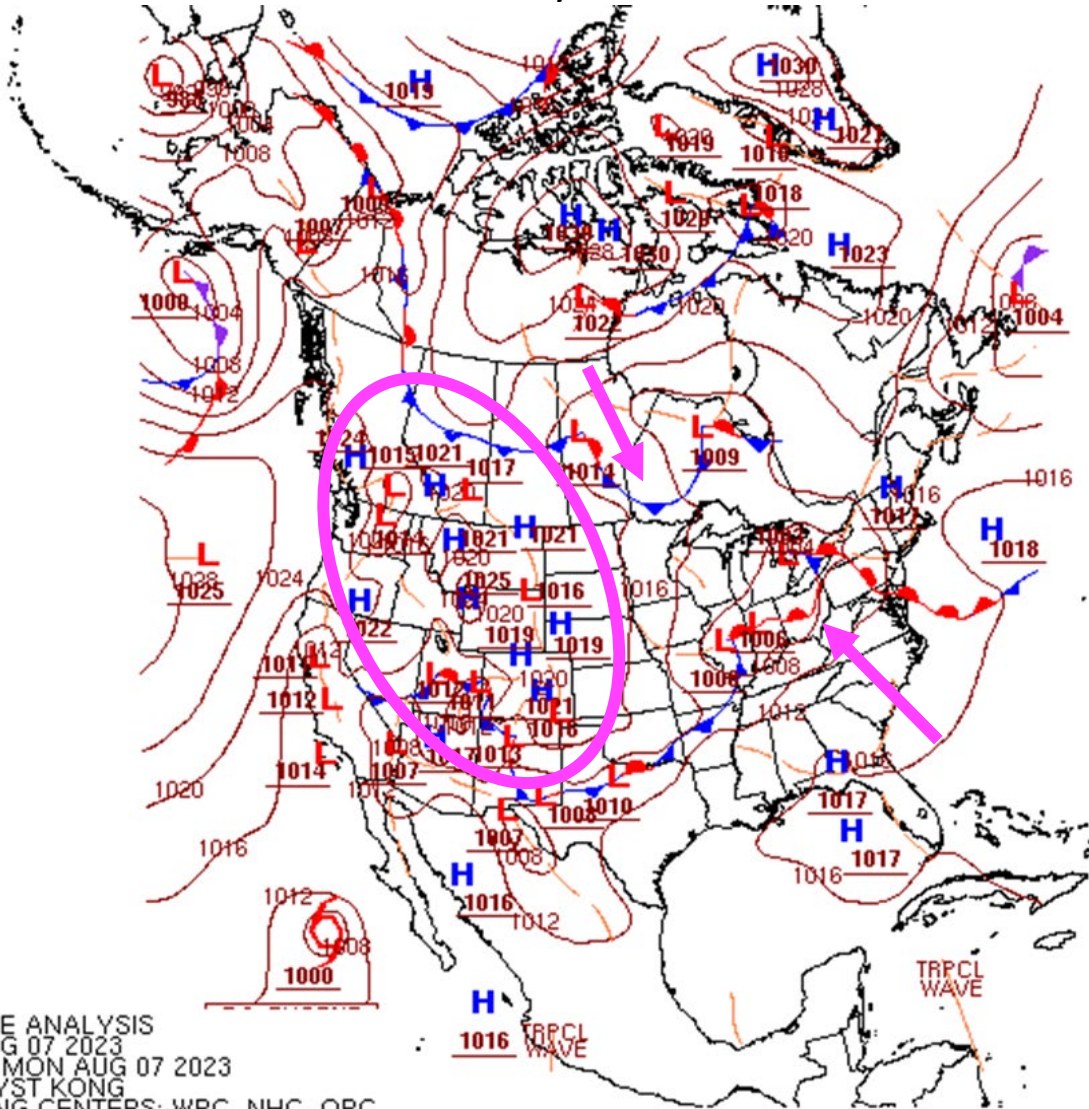


FireAQ is funded by NASA HAQ. We thank NASA GMAO and
NRL for the model data products.

EARTH SCIENCE
APPLIED SCIENCES

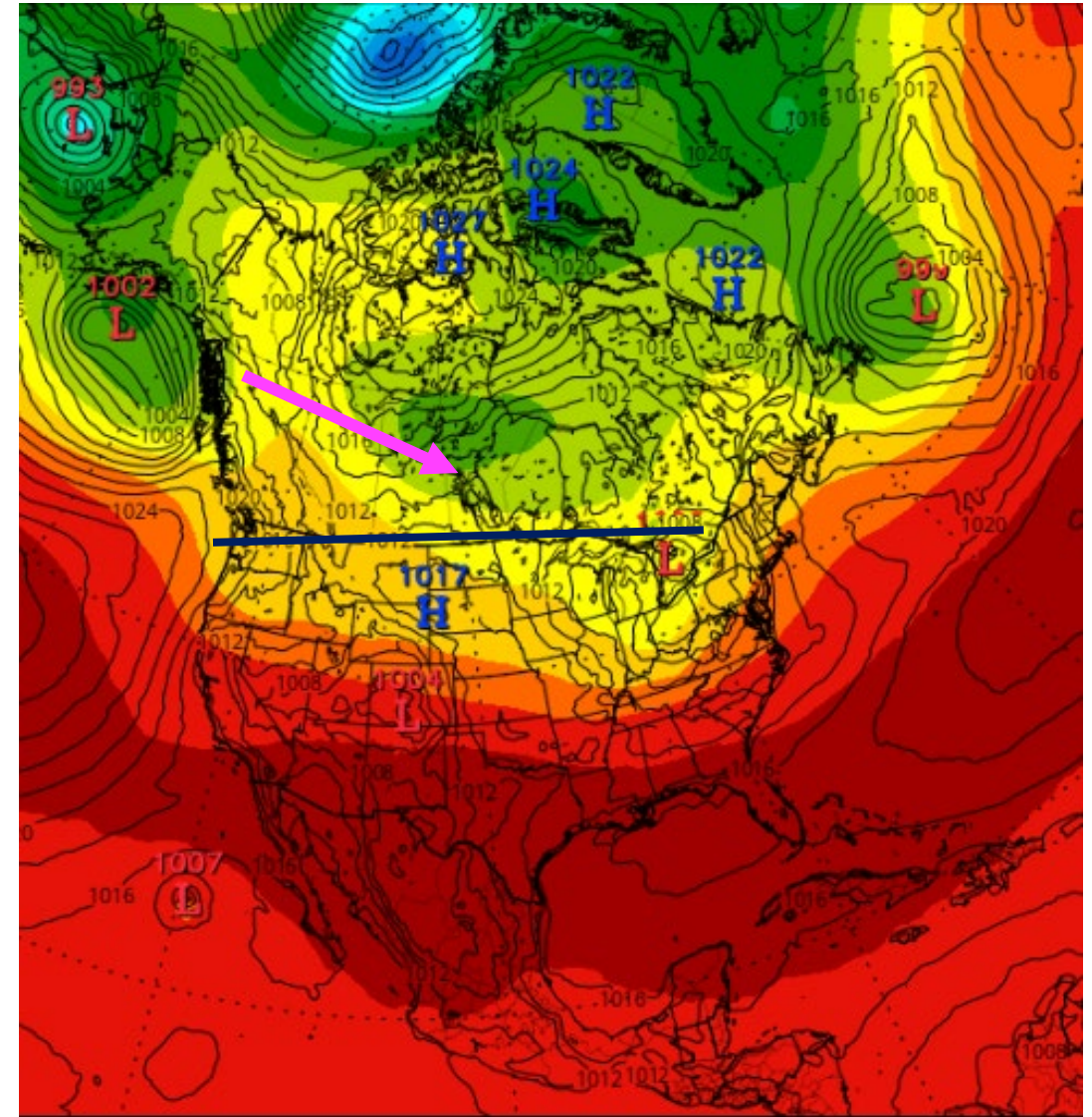
Current Status: August 7, 2023

Surface Analysis



0900Z SURFACE ANALYSIS
DATE: MON AUG 07 2023
ISSUED: 1033Z MON AUG 07 2023
BY WPC ANALYST KONG
COLLABORATING CENTERS: WPC, NHC, OPC

500 mb Contours

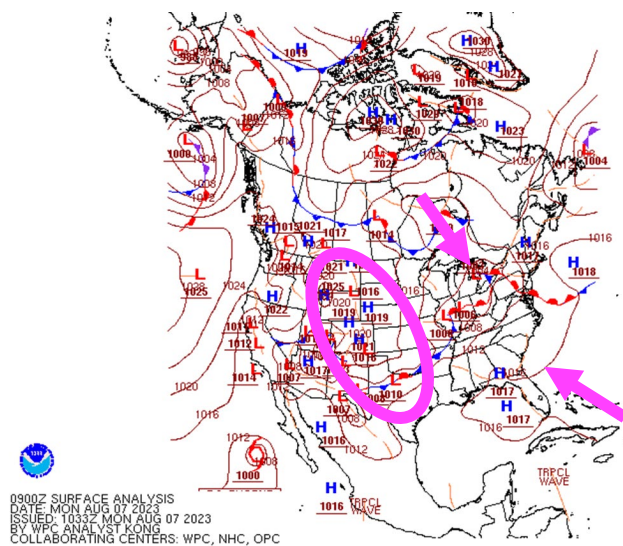


GFS 500mb Geopotential Height (dam) & MSLP (mb)

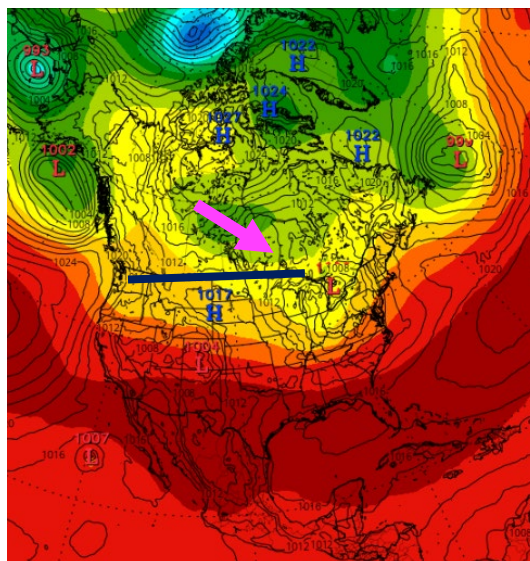
Init: 06z Aug 07 2023 Forecast Hour: [12] valid at 18z Mon, Aug 07 2023

Current Status: August 7, 2023

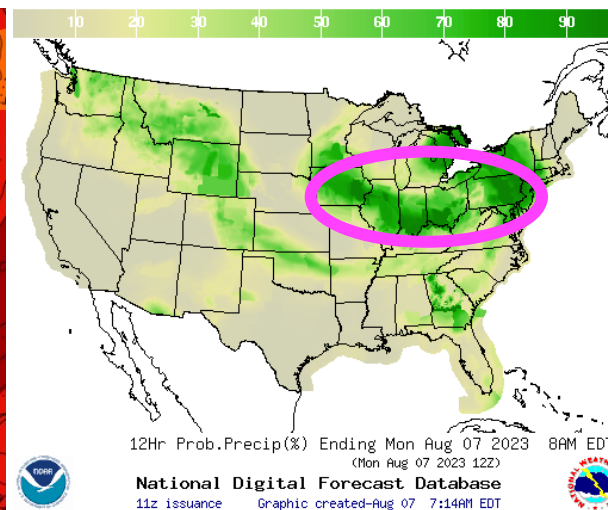
Surface Analysis



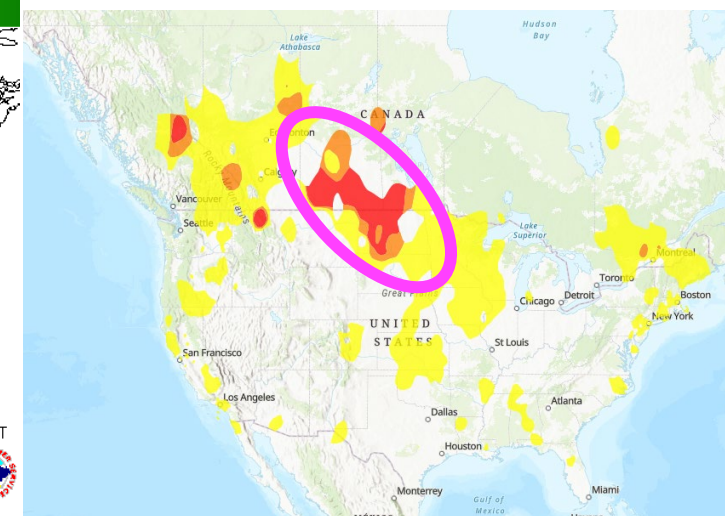
500 mb Contours



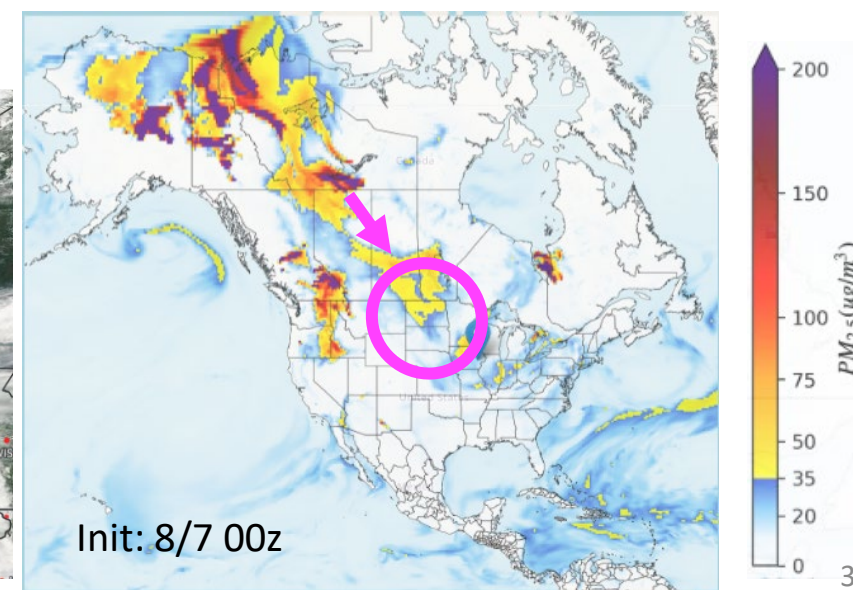
Precip. Prob.



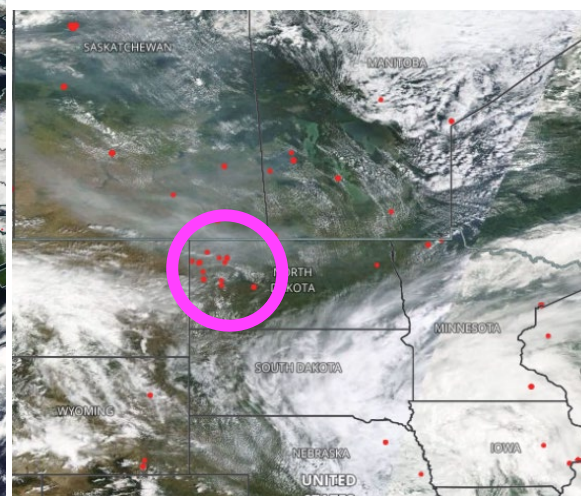
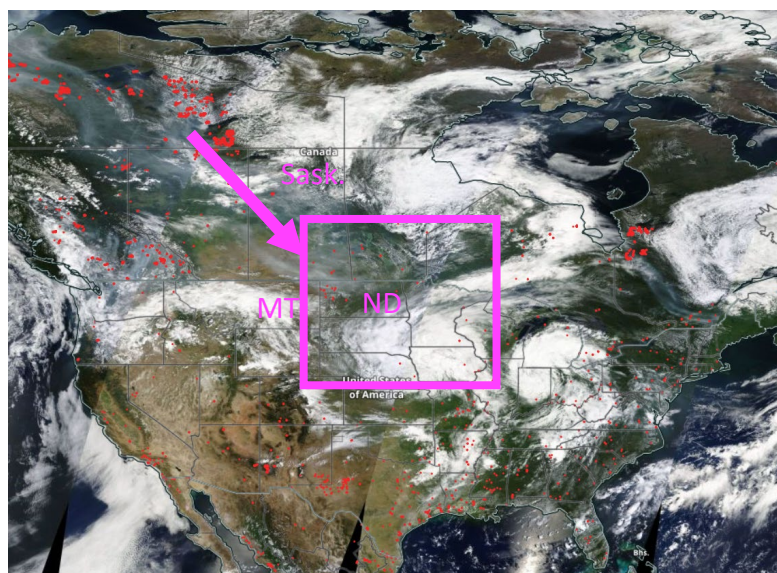
AirNow AQI



GEOS-FP 8/7 16 UTC PM_{2.5}

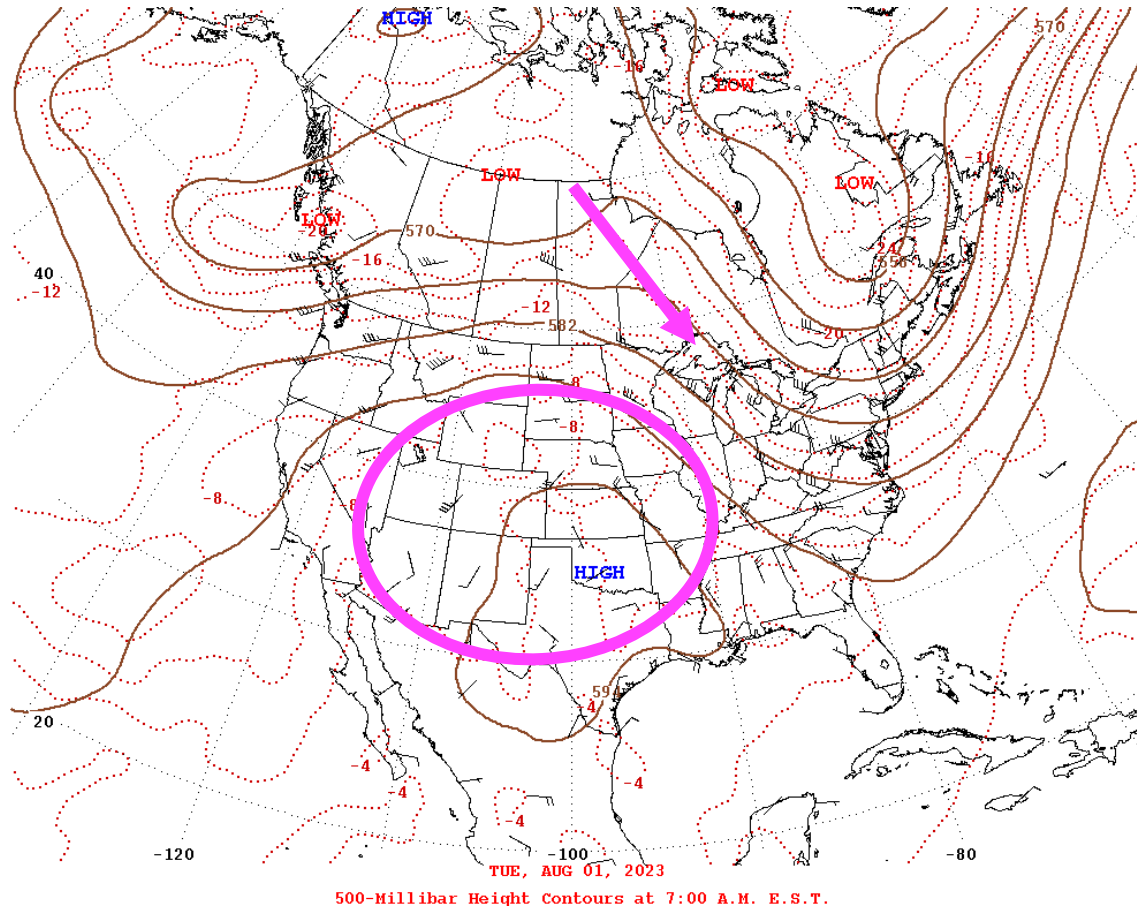


NASA Suomi Fire anomalies (Sun 8/6)

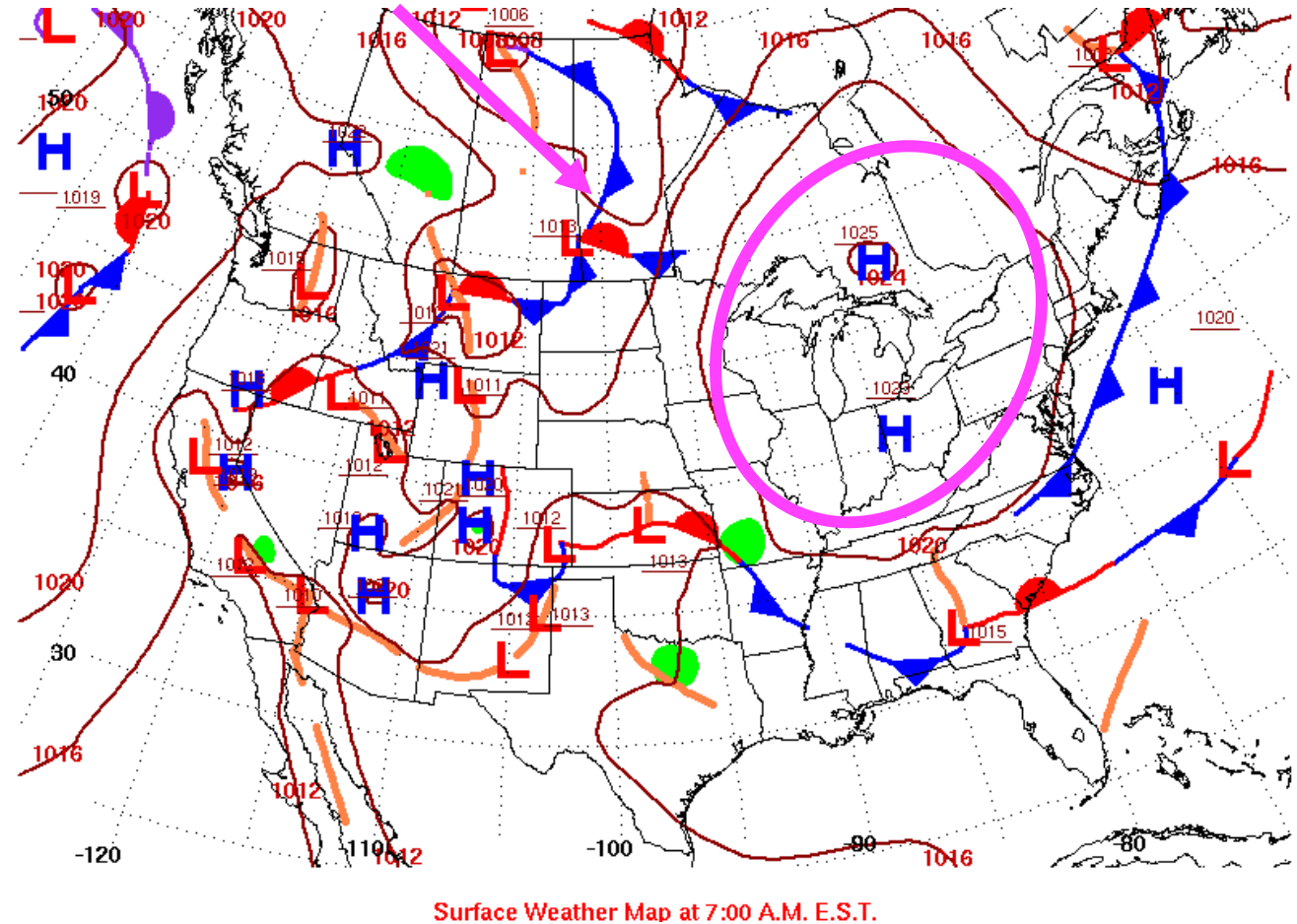


Air Quality Reflection: Tuesday August 1, 2023

500 hPa Contours

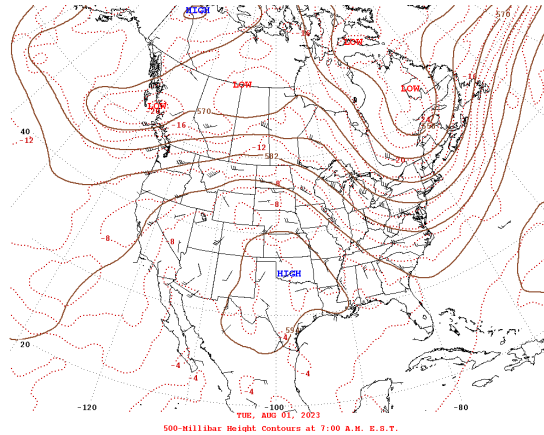


Surface Weather

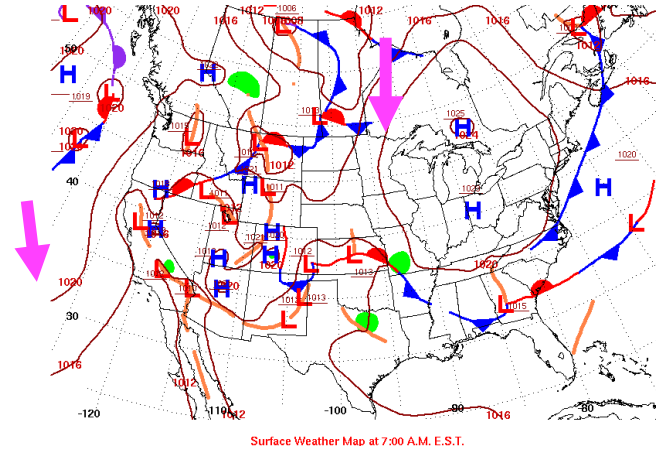


Air Quality Reflection: Tuesday August 1, 2023

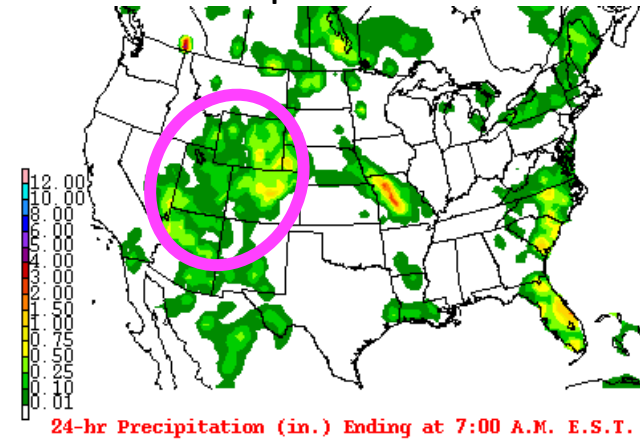
500 hPa Contours



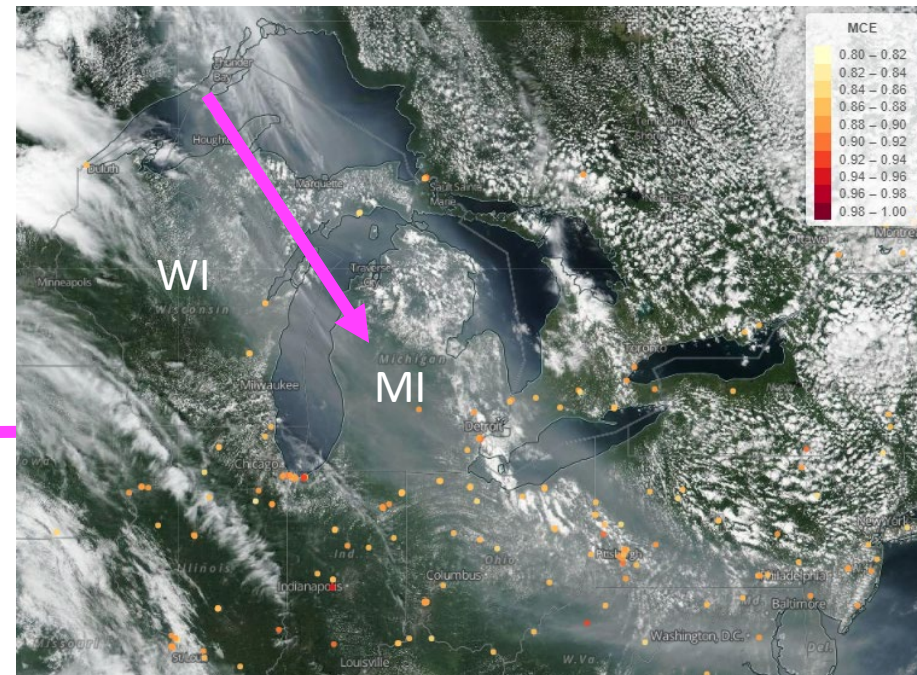
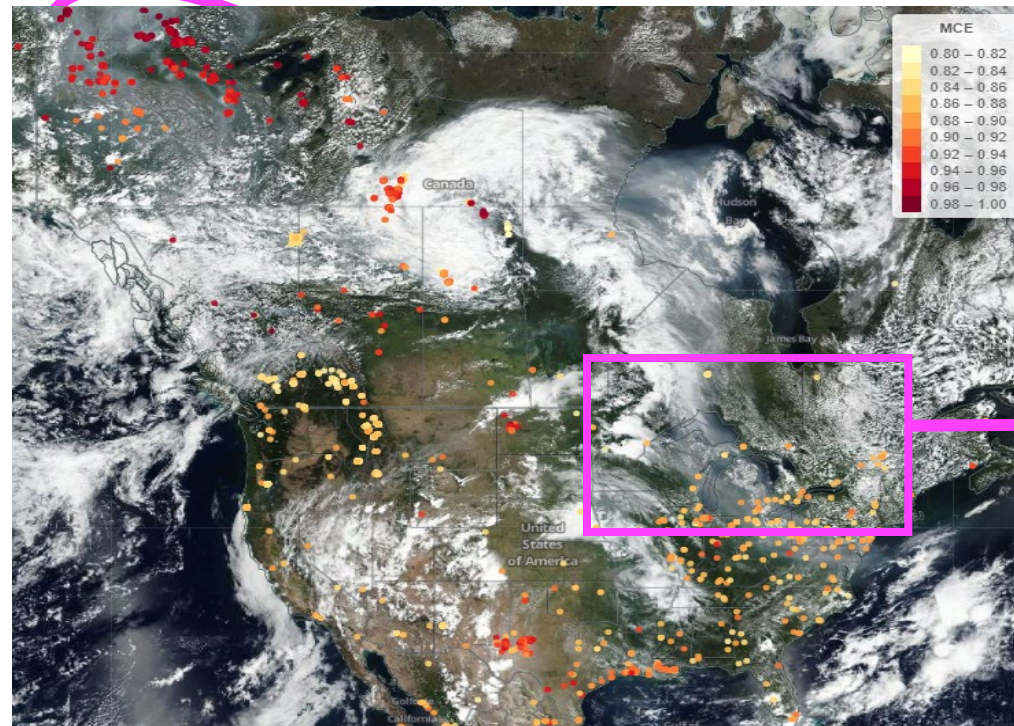
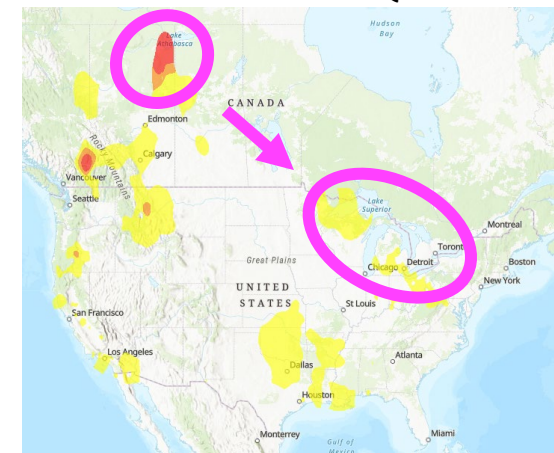
Surface Weather



Precipitation



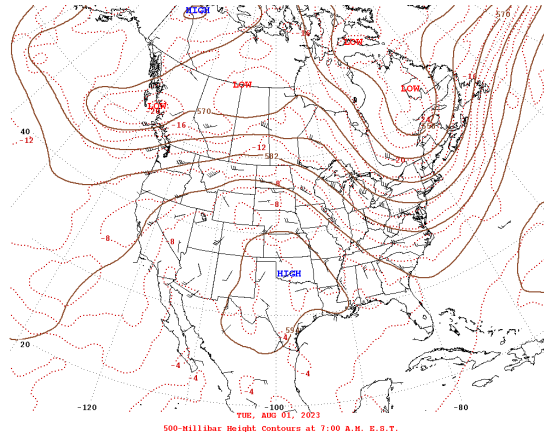
AirNow AQI



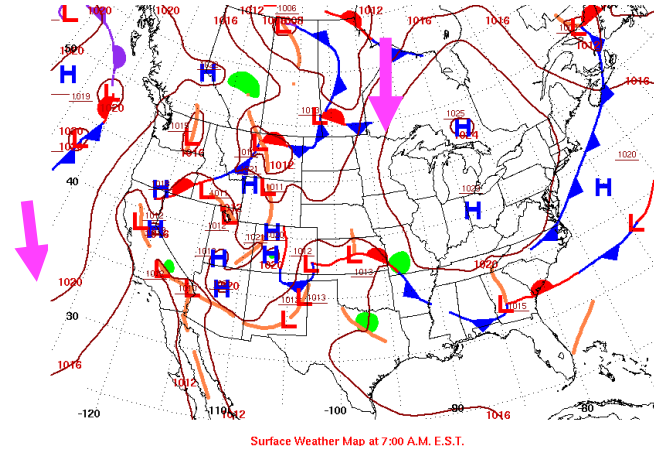
FILDA2 fire anomalies (displaying MCE)

Air Quality Reflection: Tuesday August 1, 2023

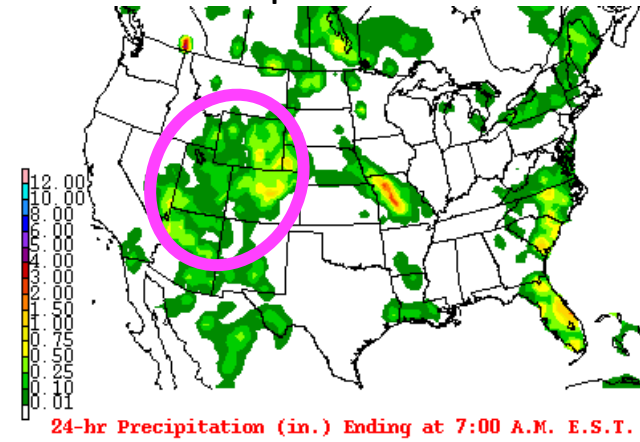
500 hPa Contours



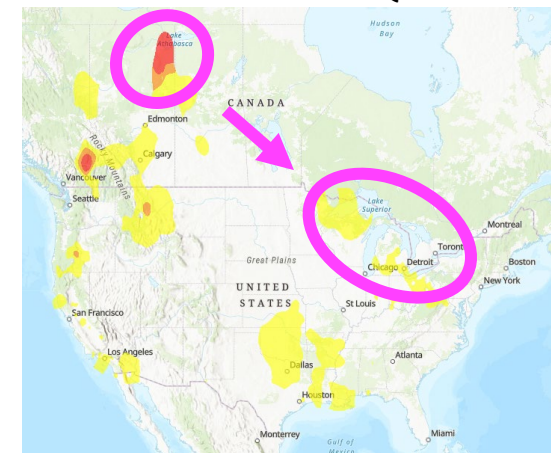
Surface Weather



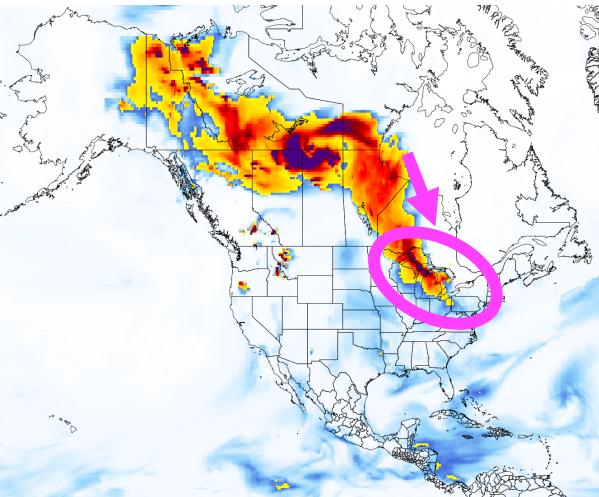
Precipitation



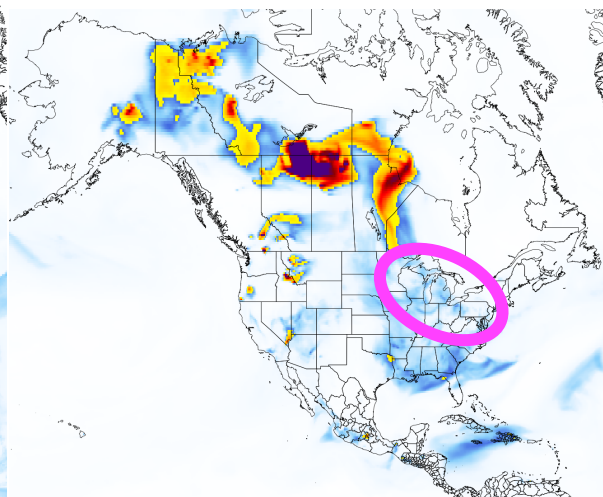
AirNow AQI



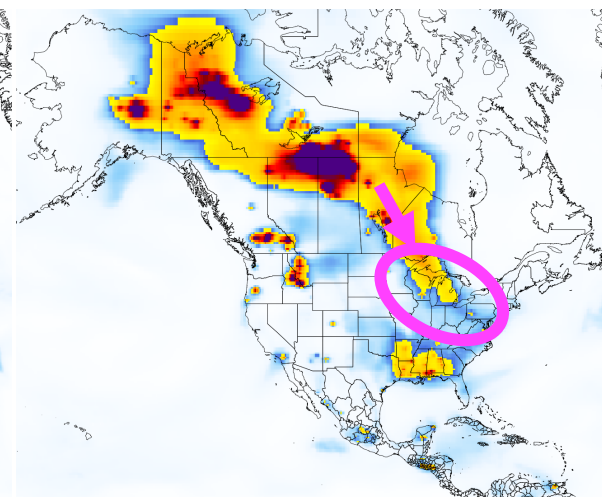
GEOS-FP



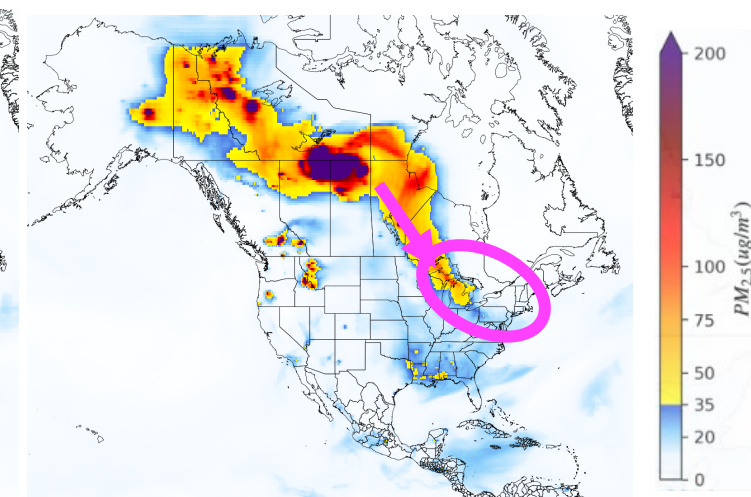
GEOS-CF



NAAPS



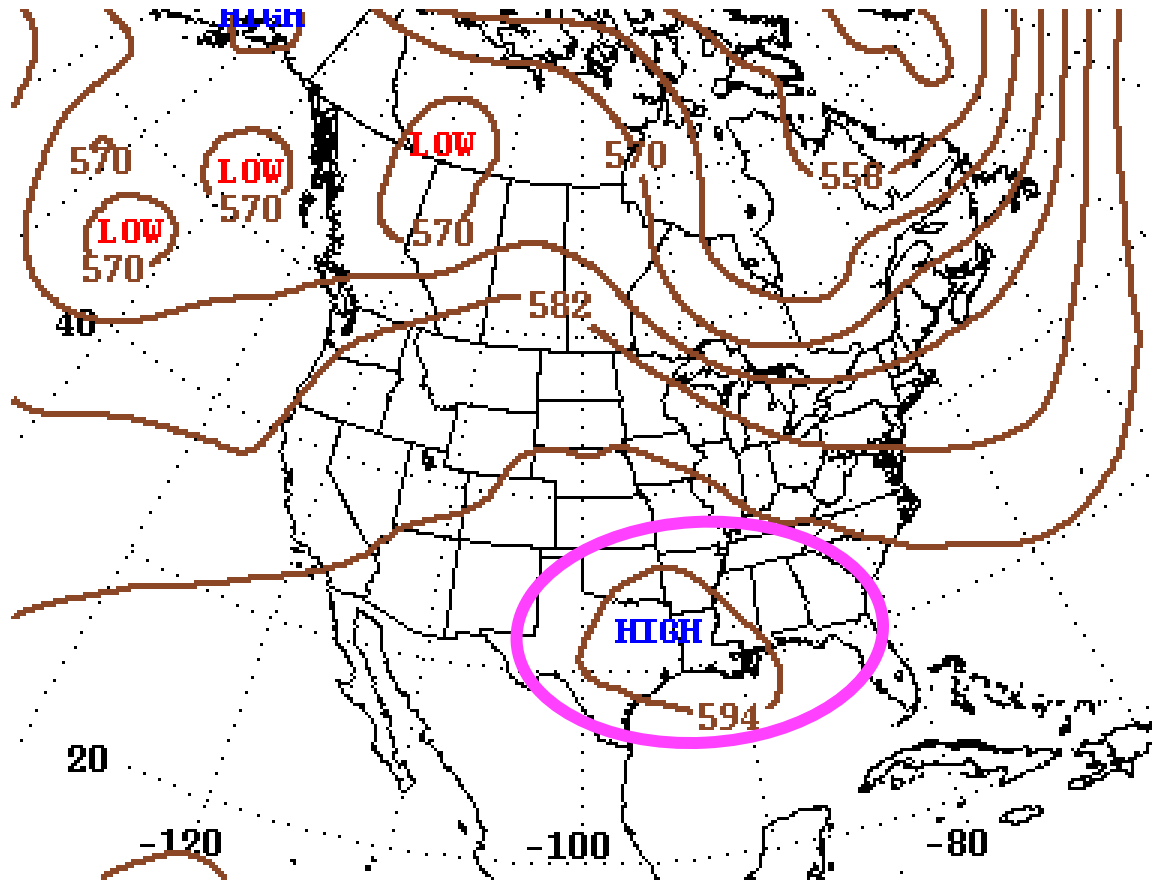
Ensemble



All models: Day 1 of 8/1 initialization

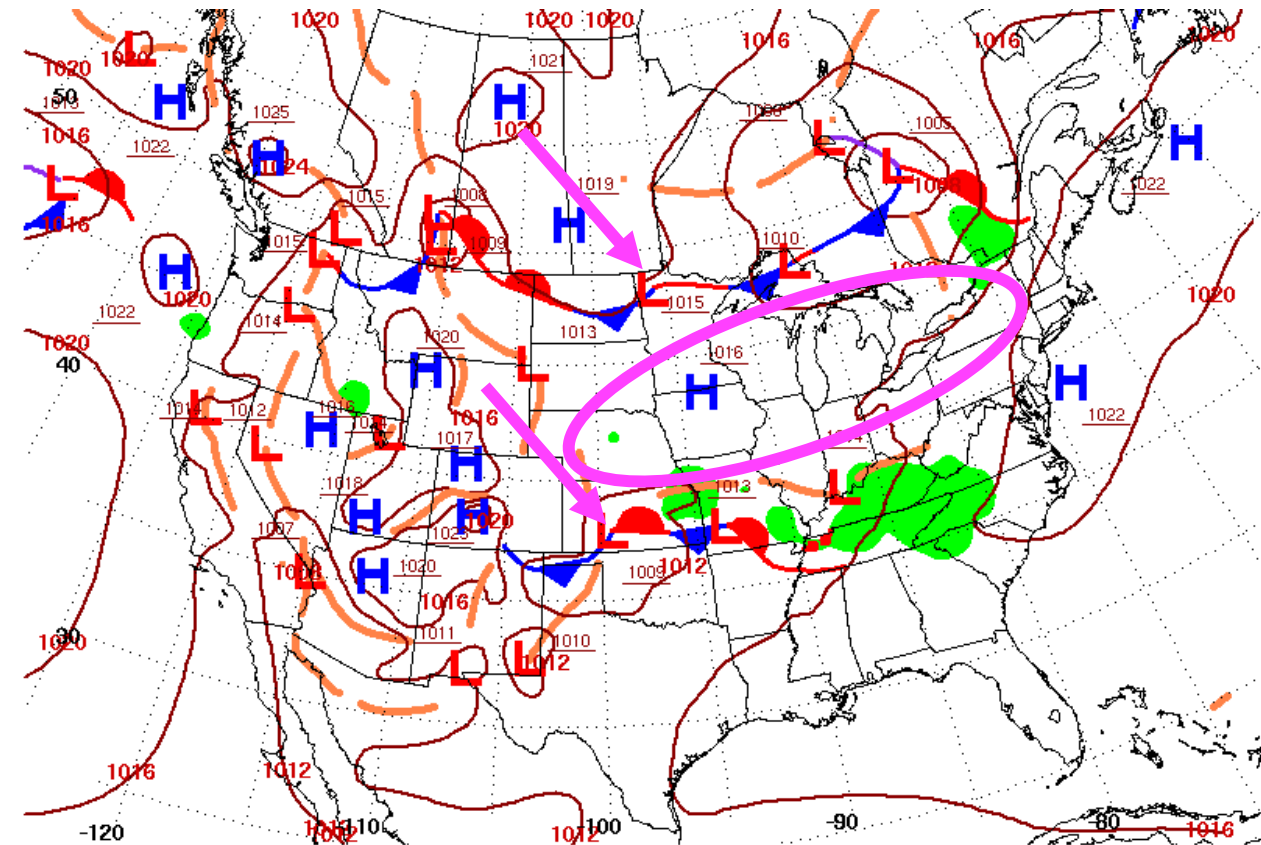
Air Quality Reflection: Thursday August 3, 2023

500 hPa Contours



500-Millibar Height Contour at 7:00 A.M. E.S.T.

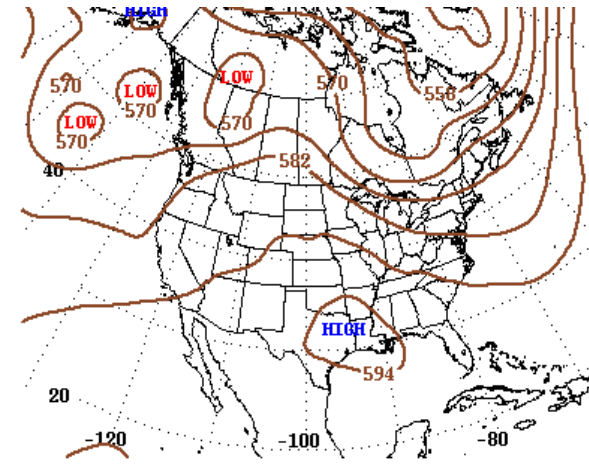
Surface Weather



Surface Weather Map at 7:00 A.M. E.S.T.

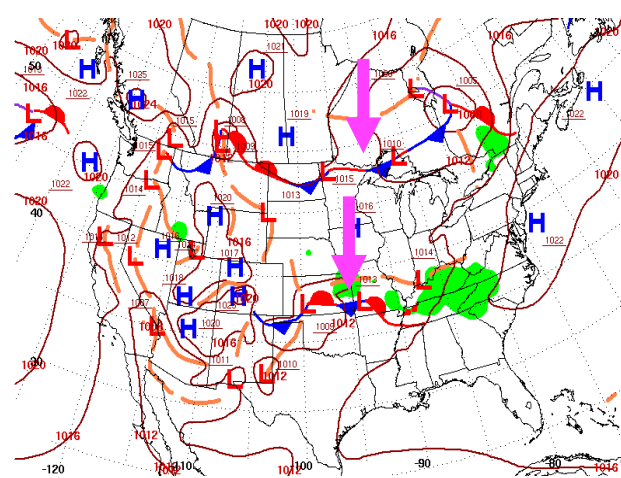
Air Quality Reflection: Thursday August 3, 2023

500 hPa Contours



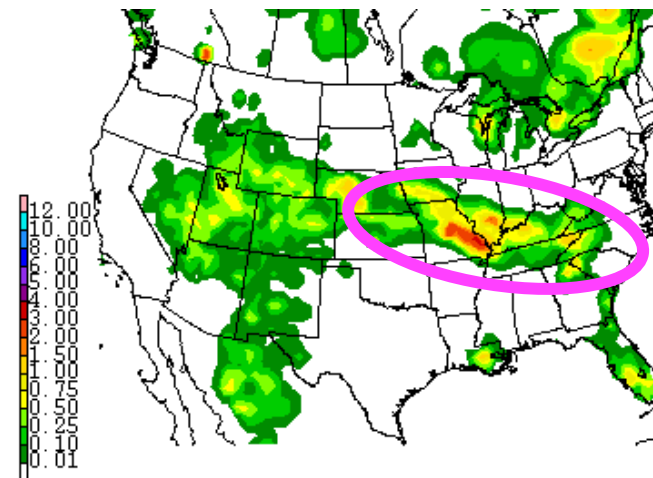
500-Millibar Height Contour at 7:00 A.M. E.S.T.

Surface Weather



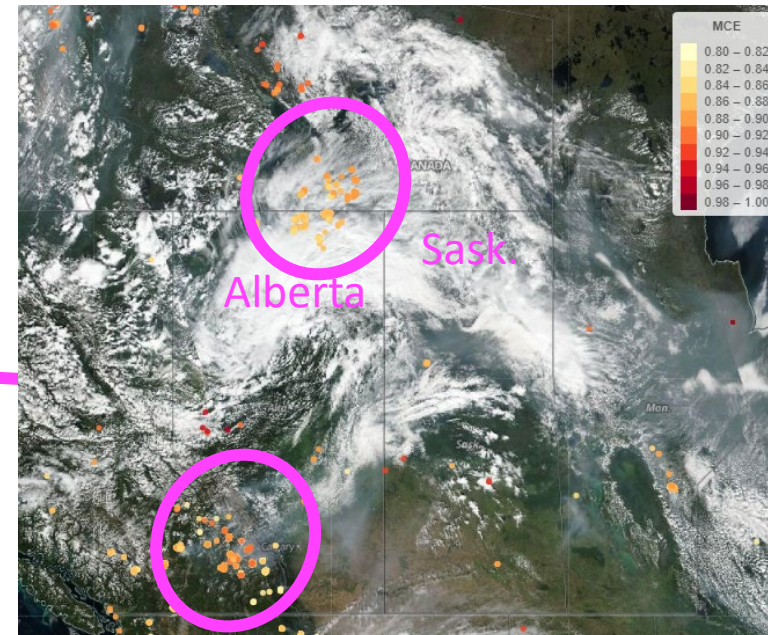
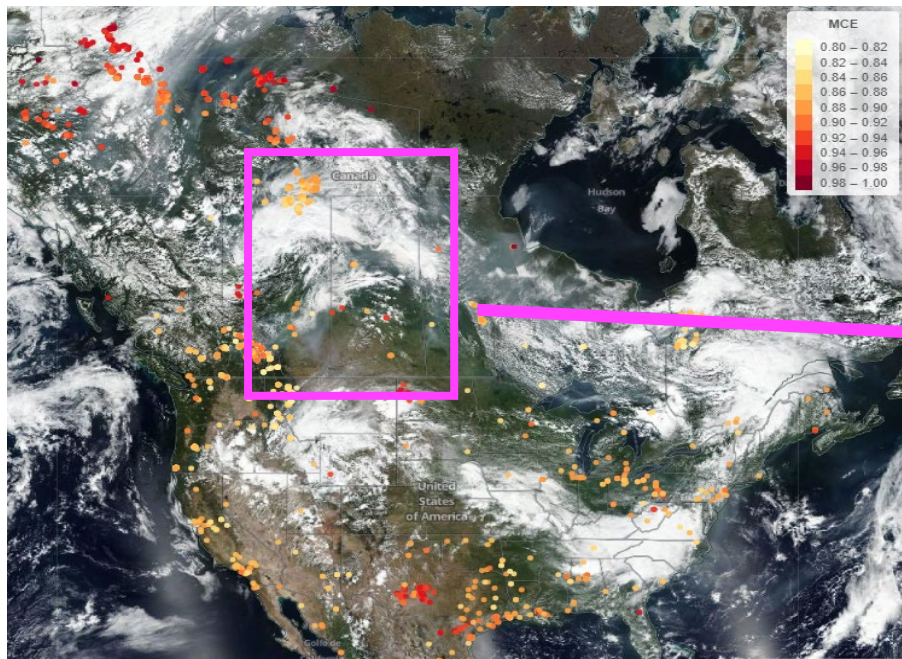
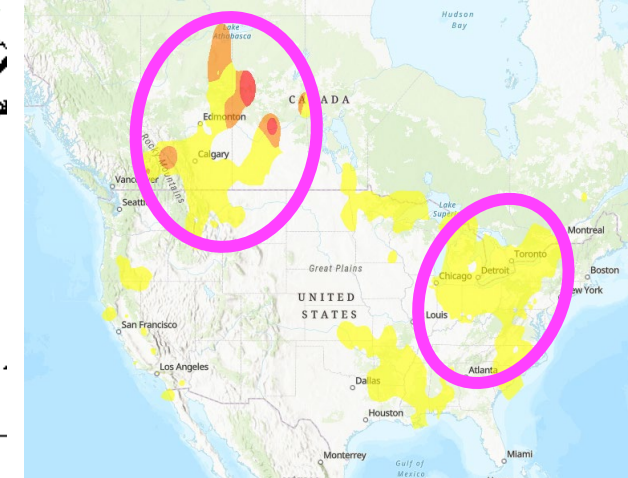
Surface Weather Map at 7:00 A.M. E.S.T.

Precipitation



24-hr Precipitation (in.) Ending at 7:00 A.M. E.S.T.

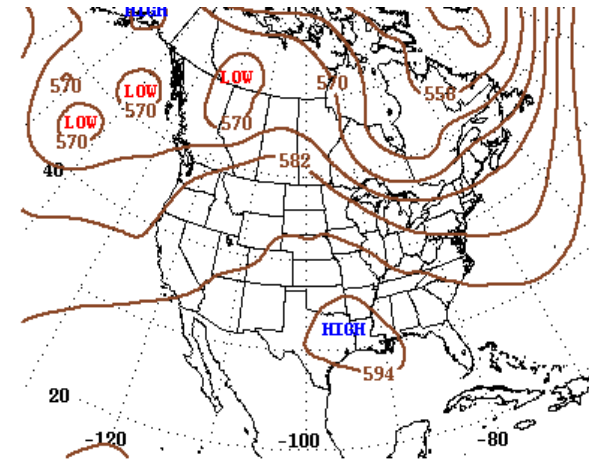
AirNow AQI



FILDA2 fire anomalies (displaying MCE)

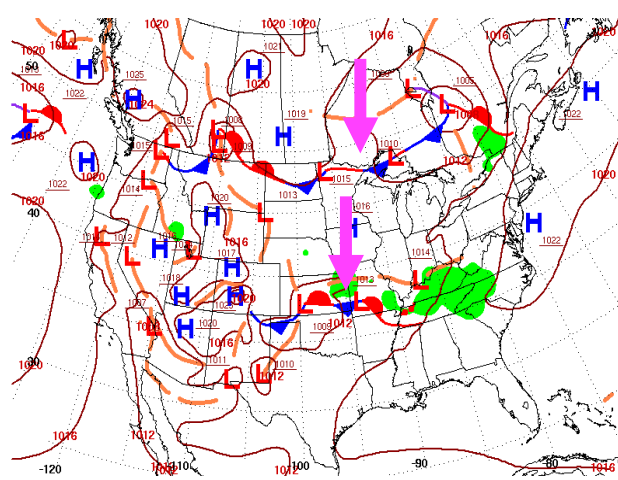
Air Quality Reflection: Thursday August 3, 2023

500 hPa Contours



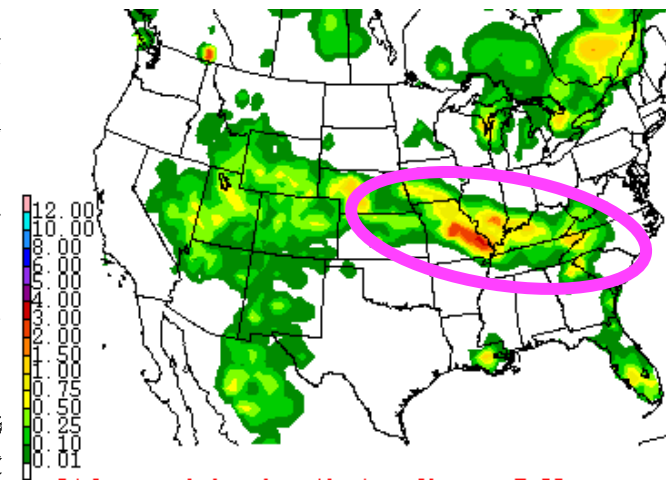
500-Millibar Height Contour at 7:00 A.M. E.S.T.

Surface Weather



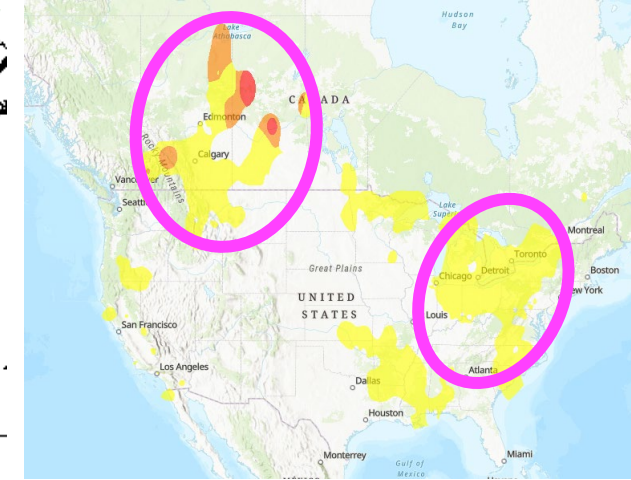
Surface Weather Map at 7:00 A.M. E.S.T.

Precipitation

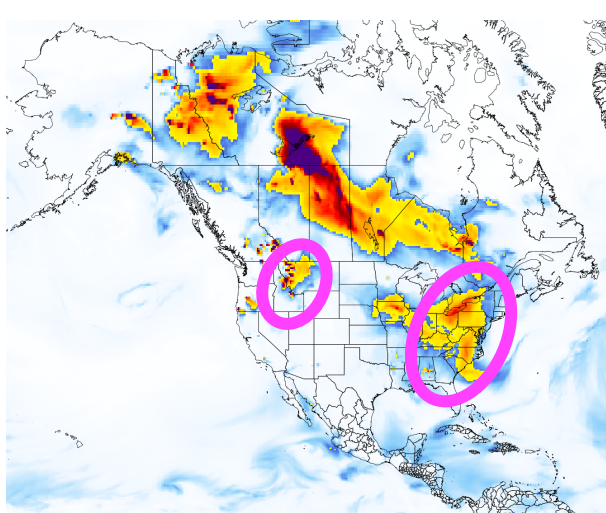


24-hr Precipitation (in.) Ending at 7:00 A.M. E.S.T.

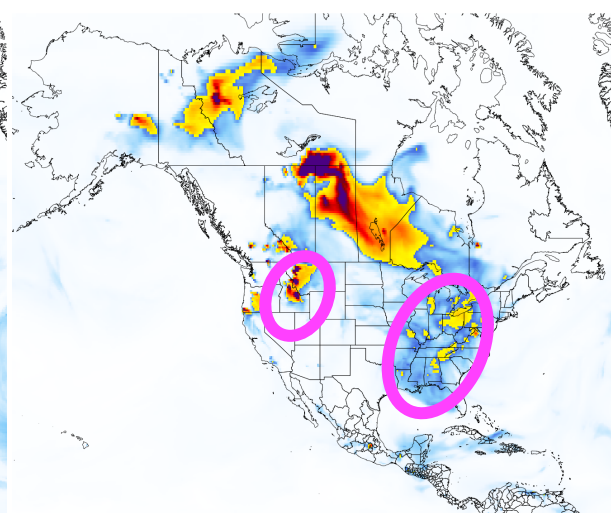
AirNow AQI



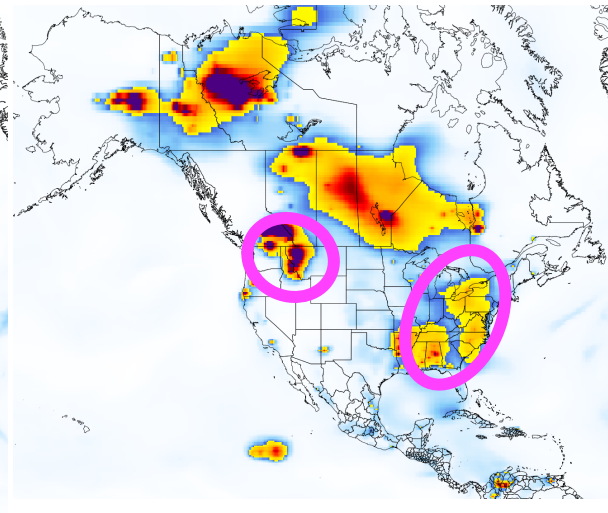
GEOS-FP



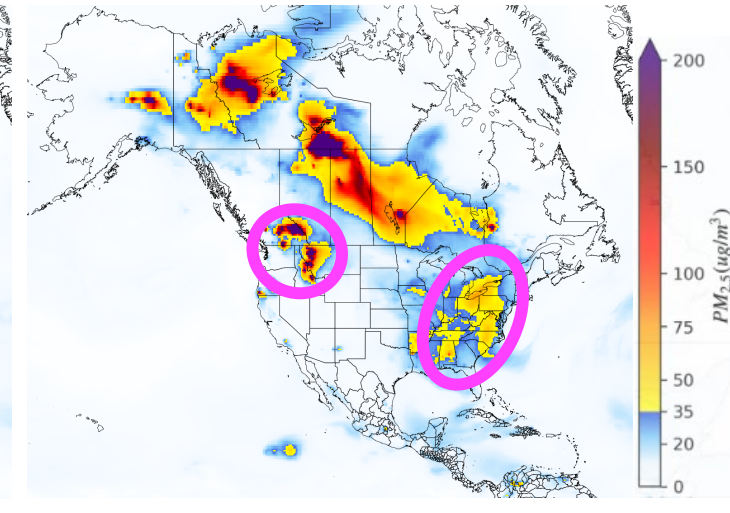
GEOS-CF



NAAPS



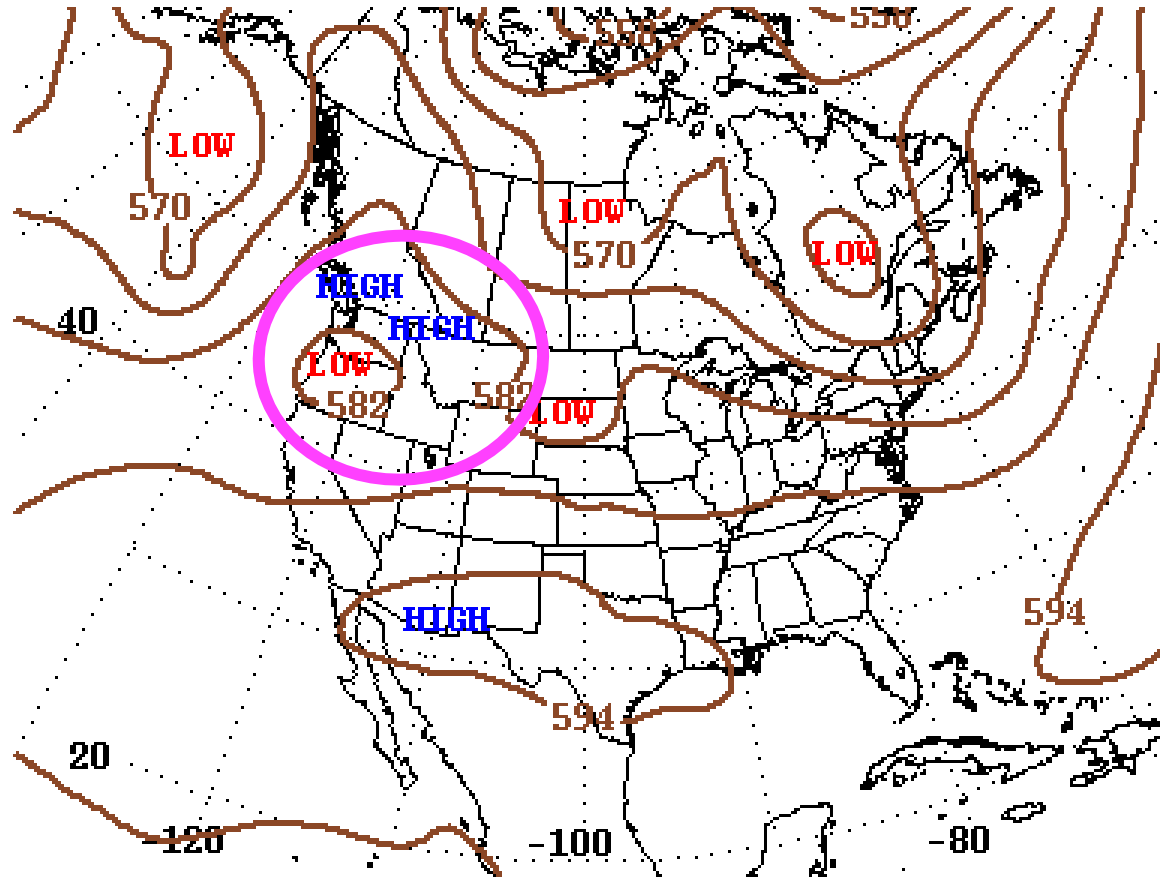
Ensemble



All models: Day 1 of 8/3 initialization

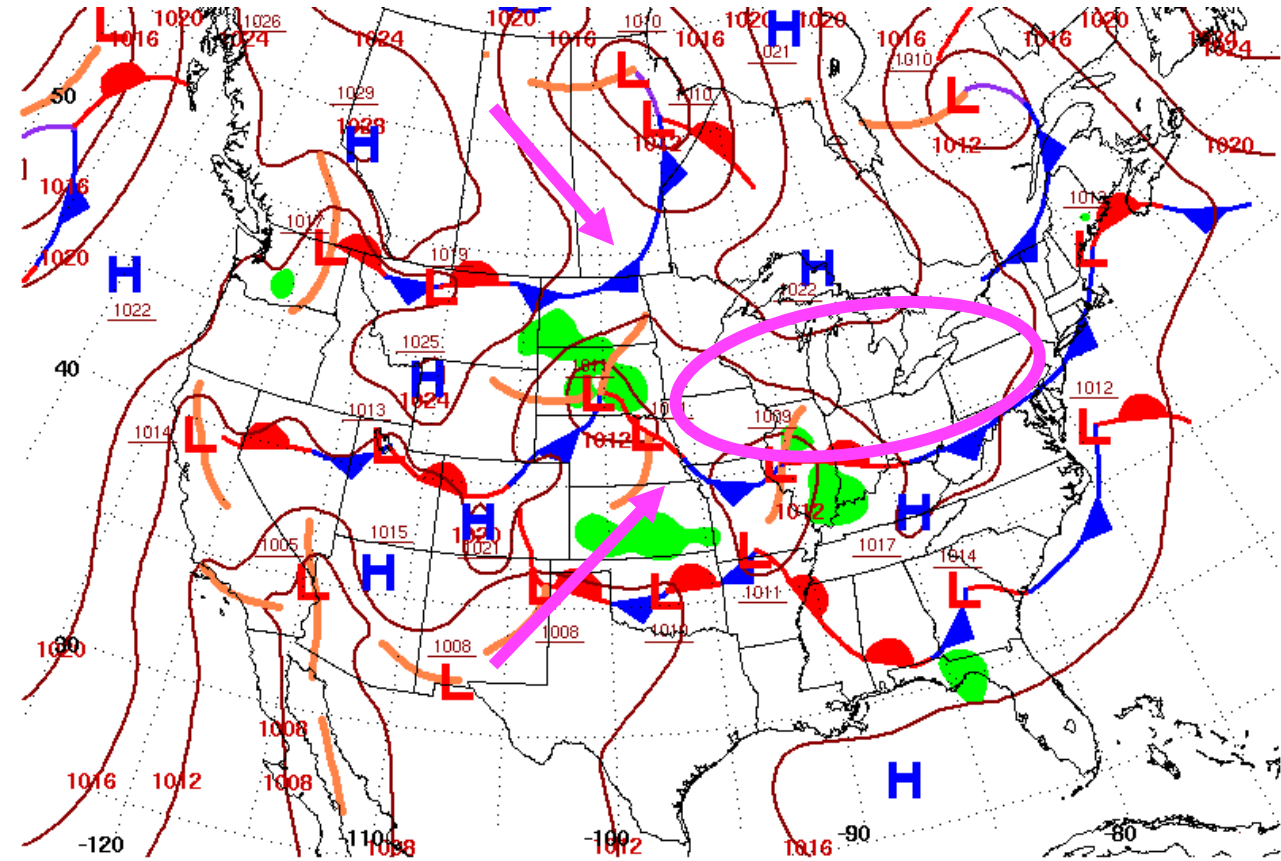
Air Quality Reflection: Saturday August 5, 2023

500 hPa Contours



500-Millibar Height Contour at 7:00 A.M. E.S.T.

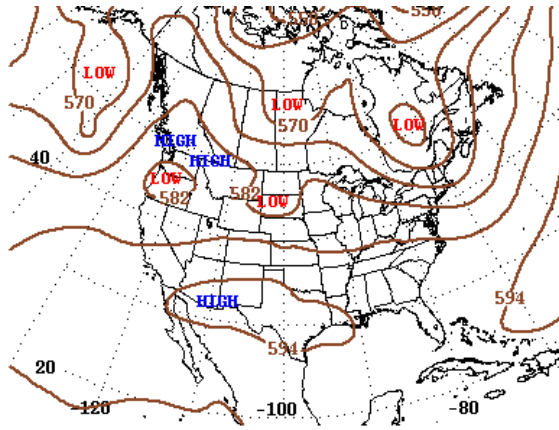
Surface Weather



Surface Weather Map at 7:00 A.M. E.S.T.

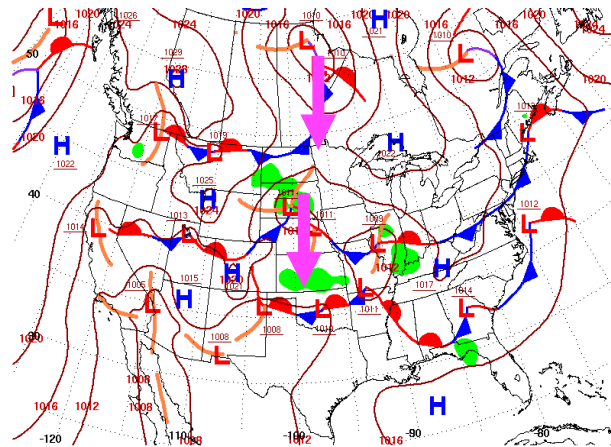
Air Quality Reflection: Saturday August 5, 2023

500 hPa Contours



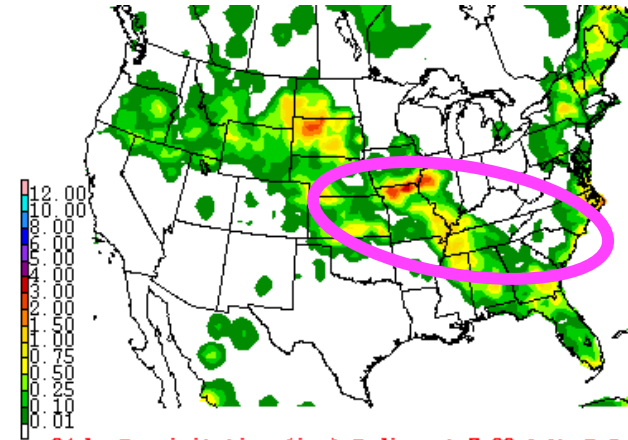
500-Millibar Height Contour at 7:00 A.M. E.S.T.

Surface Weather



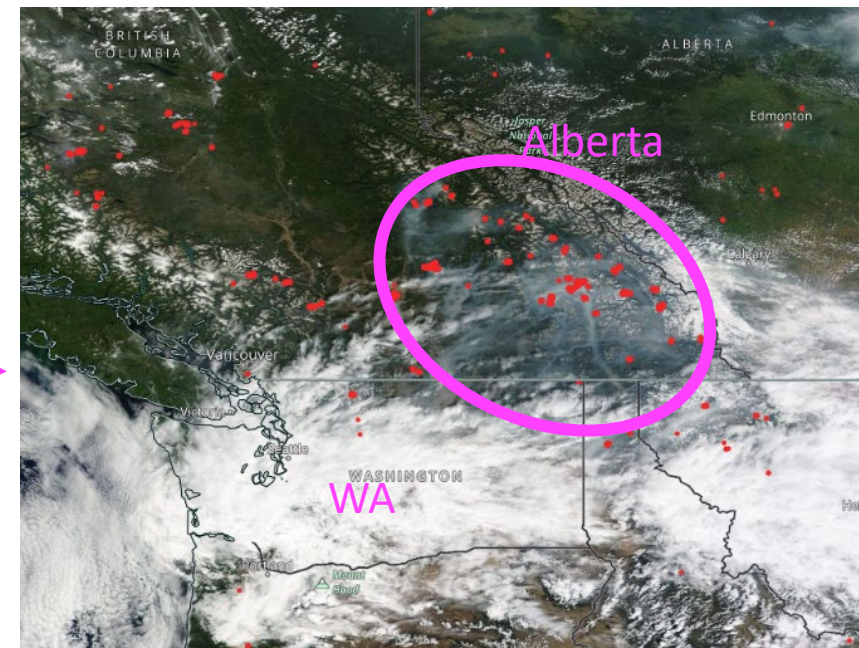
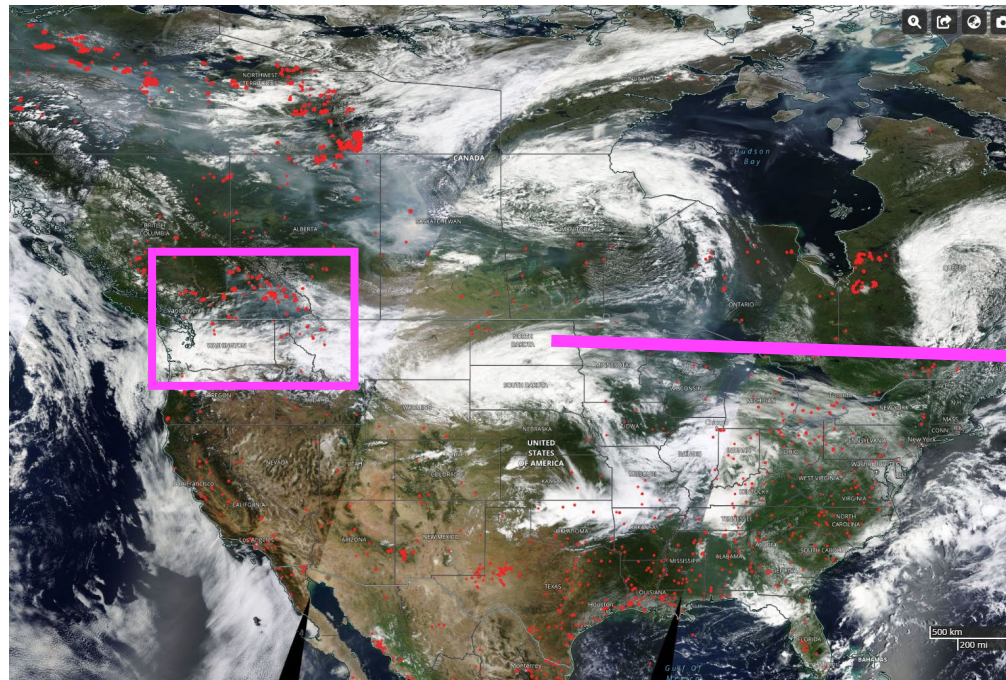
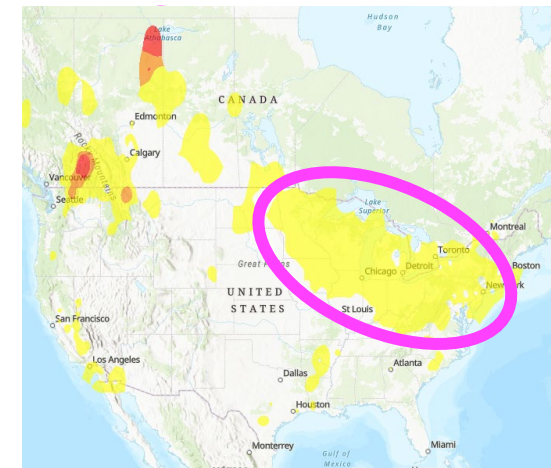
Surface Weather Map at 7:00 A.M. E.S.T.

Precipitation



24-hr Precipitation (in.) Ending at 7:00 A.M. E.S.T

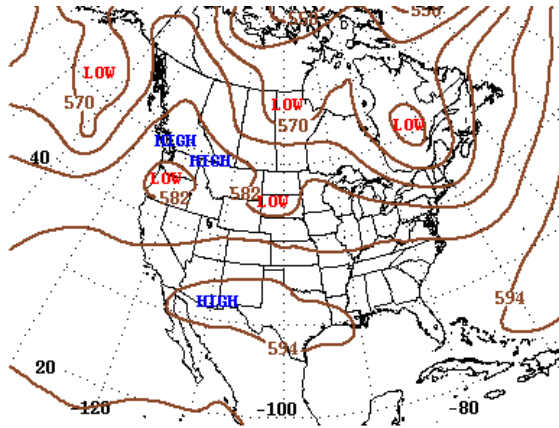
AirNow AQI



NASA Worldview Suomi Fire Anomalies

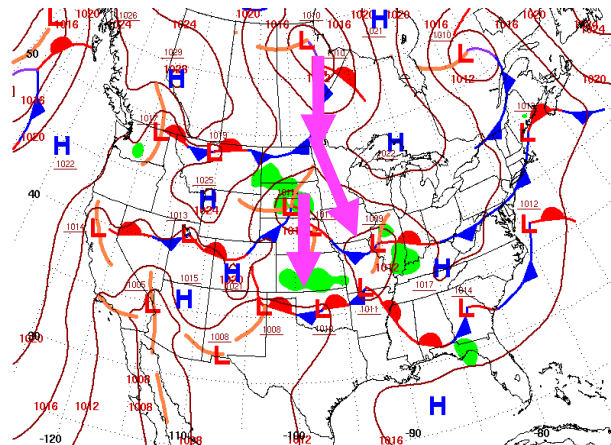
Air Quality Reflection: Saturday August 5, 2023

500 hPa Contours



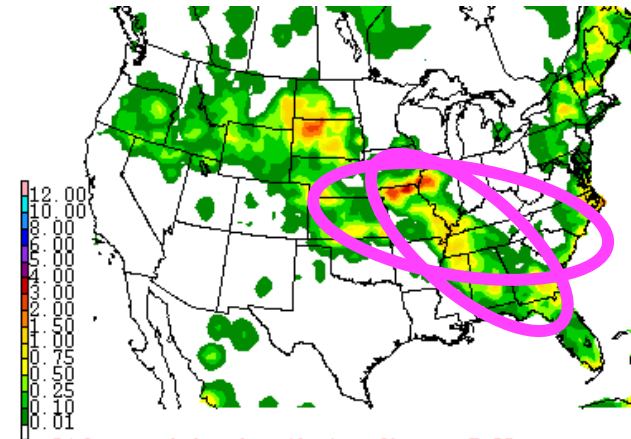
500-Millibar Height Contour at 7:00 A.M. E.S.T.

Surface Weather



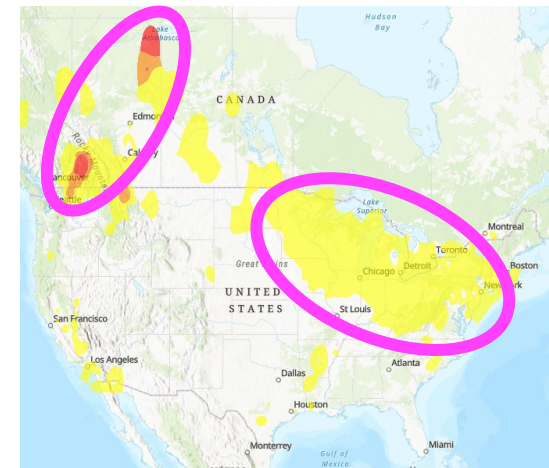
Surface Weather Map at 7:00 A.M. E.S.T.

Precipitation

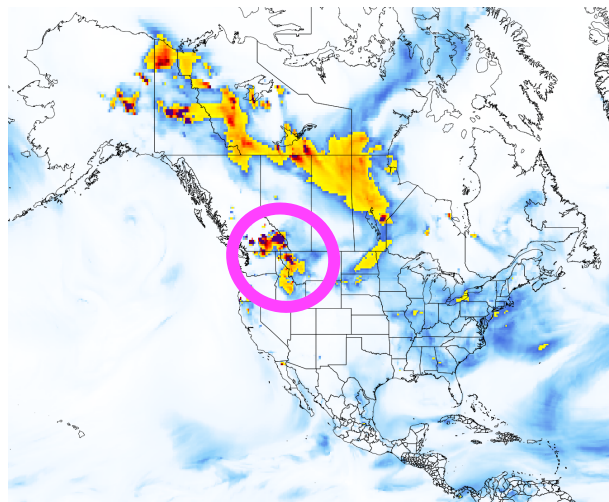


24-hr Precipitation (in.) Ending at 7:00 A.M. E.S.T

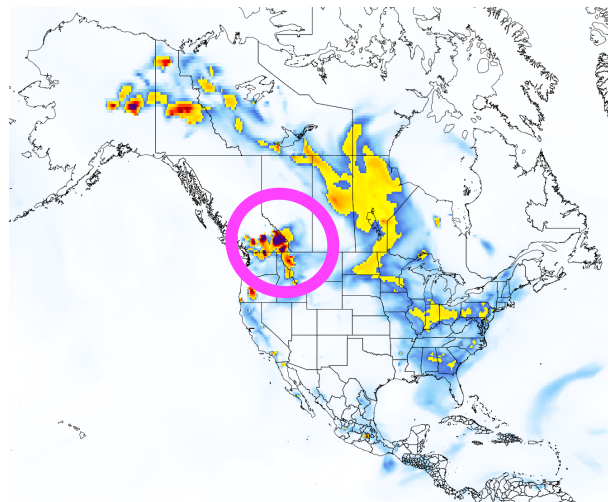
AirNow AQI



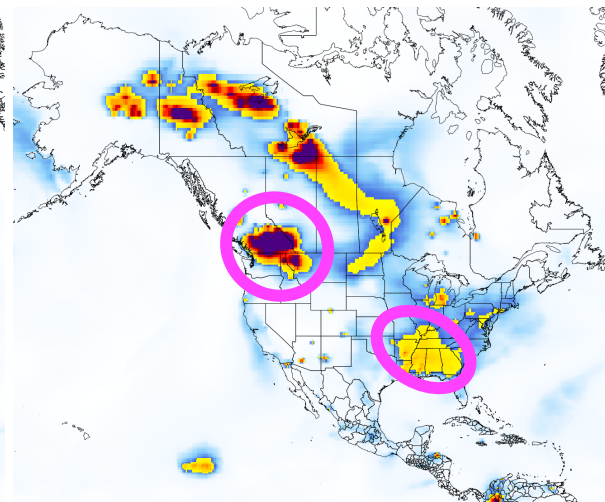
GEOS-FP



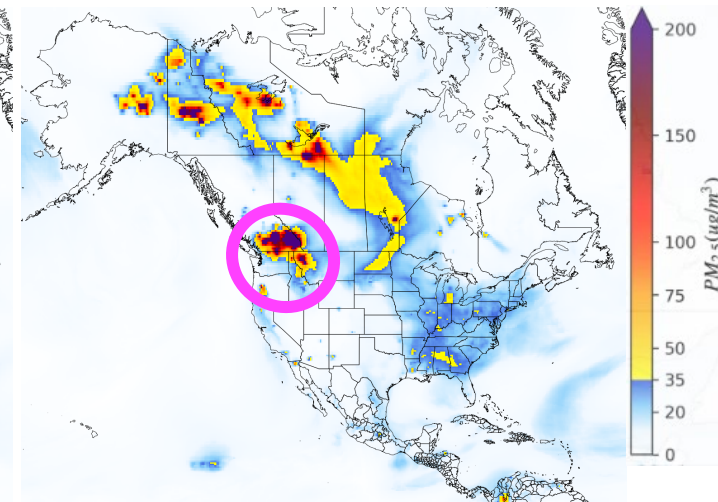
GEOS-CF



NAAPS



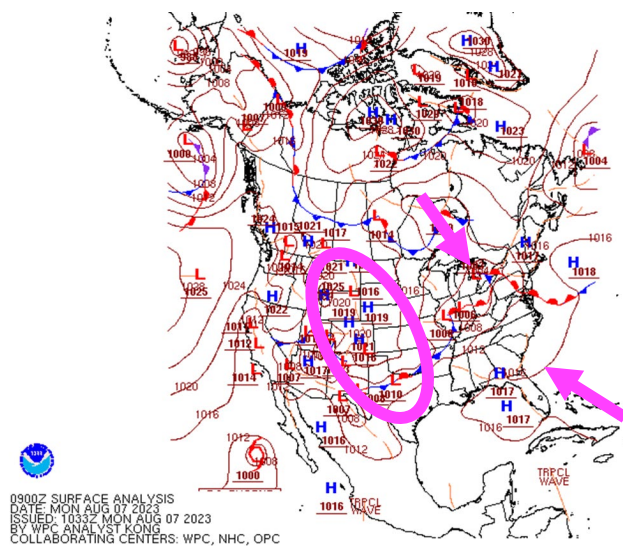
Ensemble



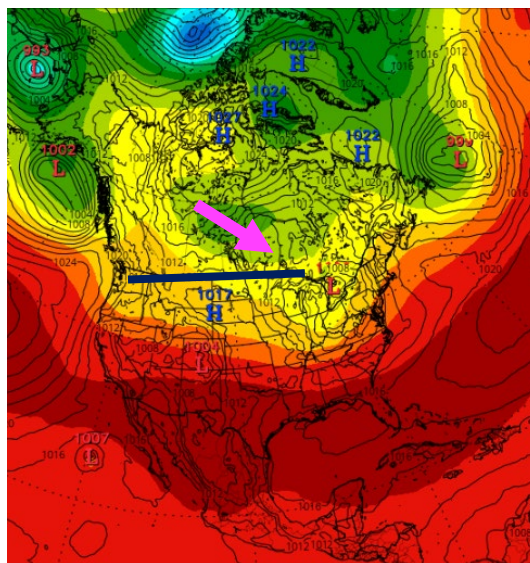
All models: Day 1 of 8/5 initialization

Current Status: August 7, 2023

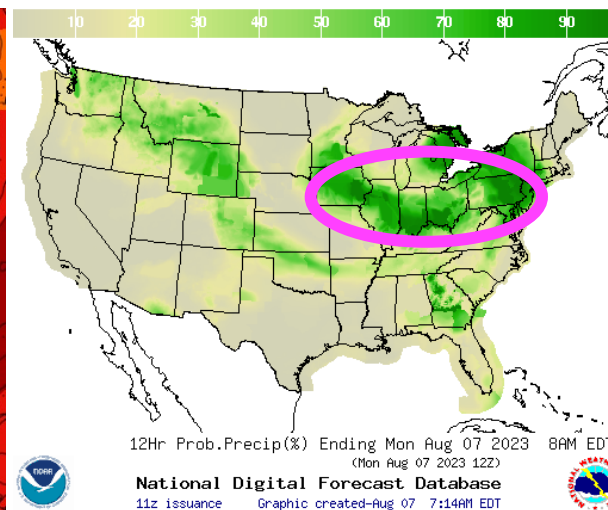
Surface Analysis



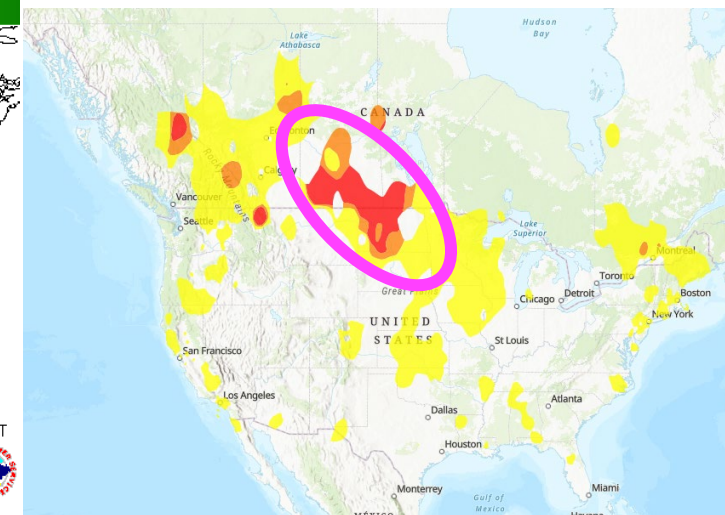
500 mb Contours



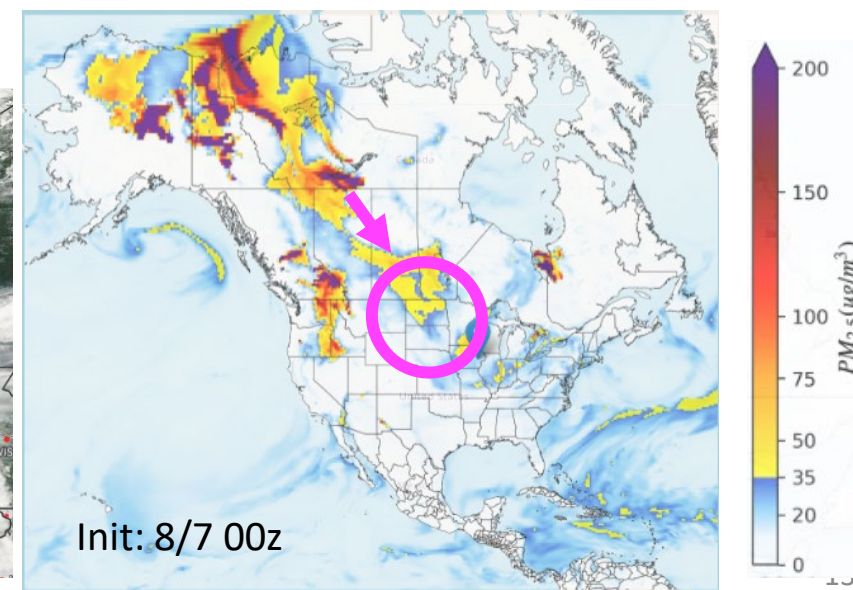
Precip. Prob.



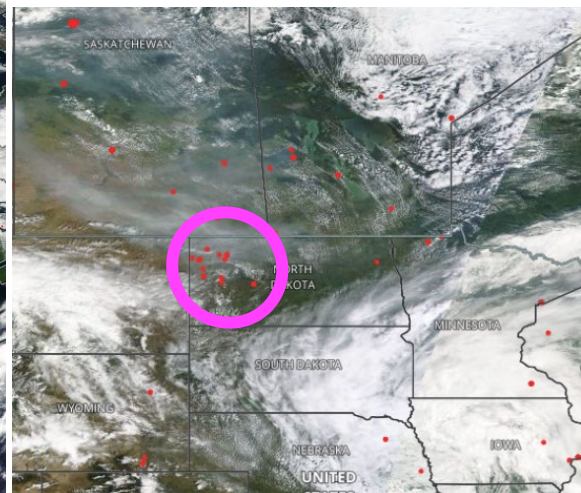
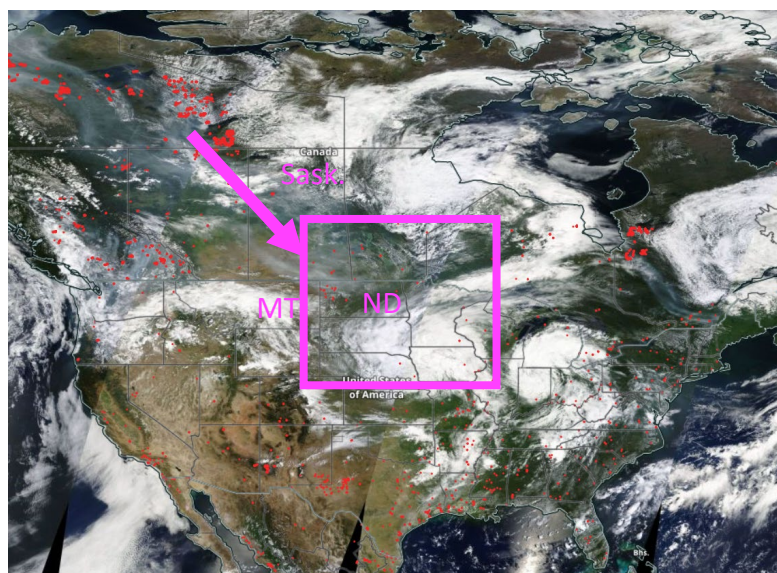
AirNow AQI



GEOS-FP 8/7 16 UTC PM_{2.5}



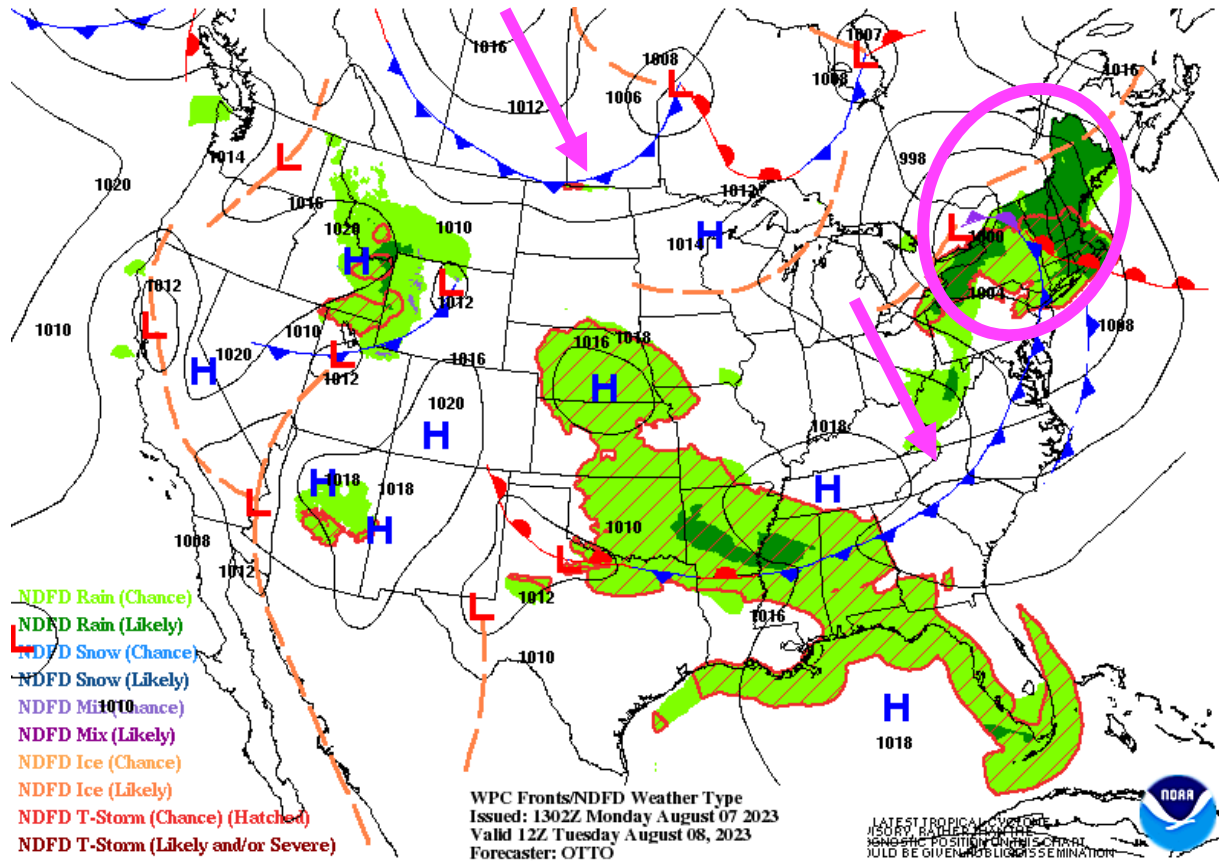
NASA Suomi Fire anomalies (Sun 8/6)



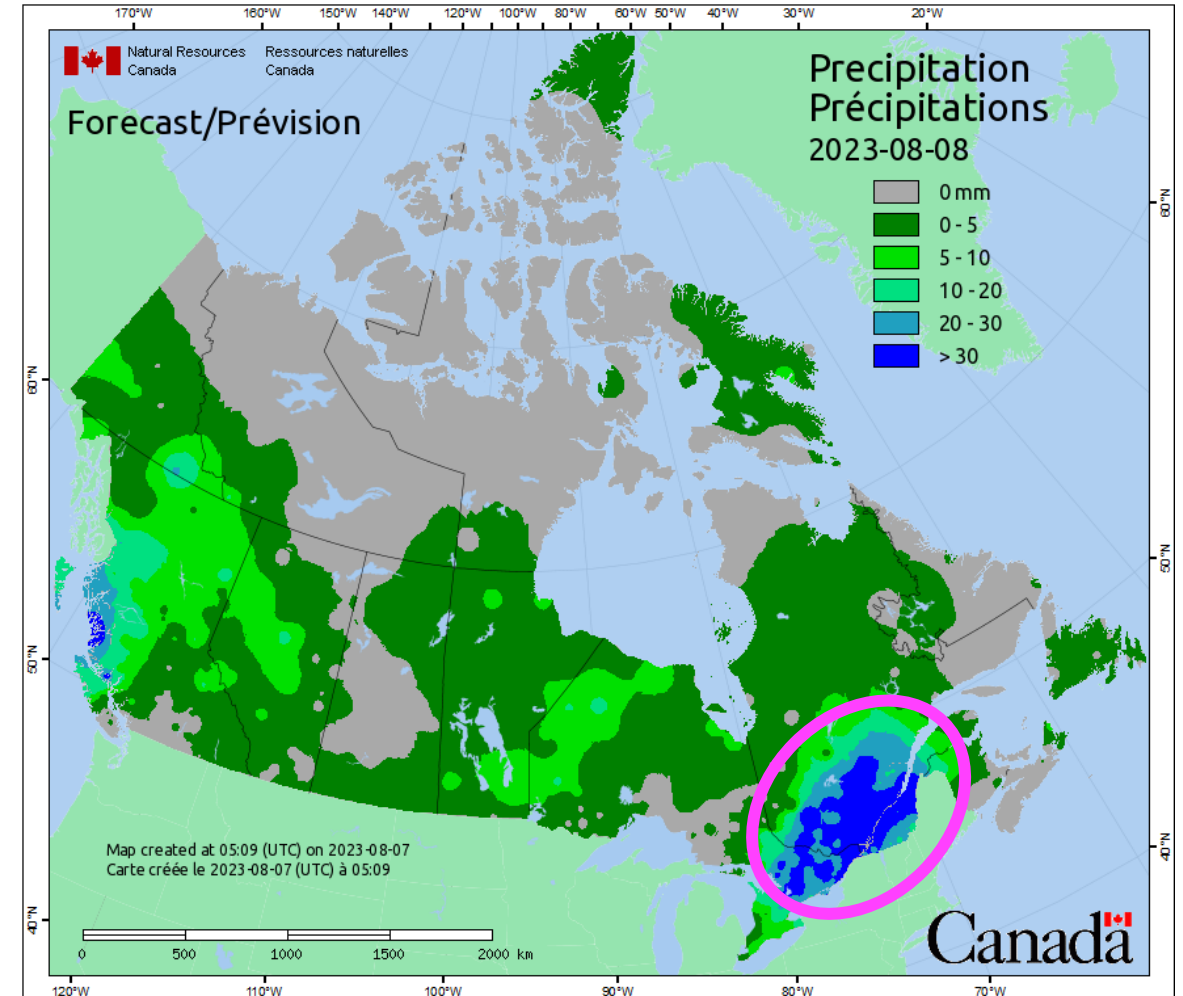
Outlook: Short Range (1–3 days)

Surface Forecast (**Tuesday 8/8**)

US NWS Forecast

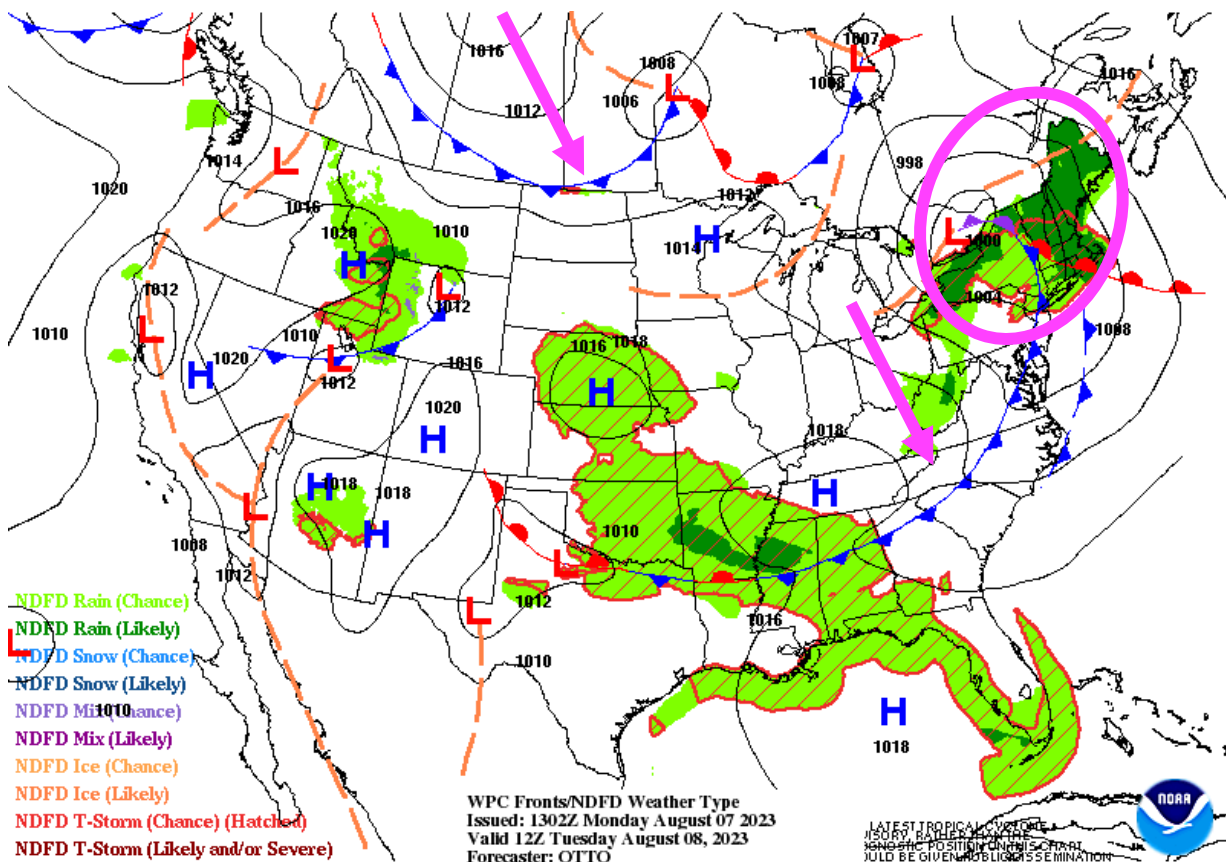


Environment Canada Forecast



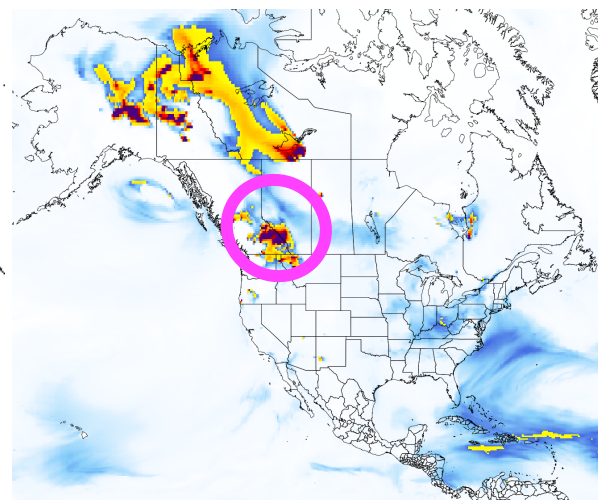
Outlook: Short Range (1–3 days)

Surface Forecast (Tuesday 8/8)

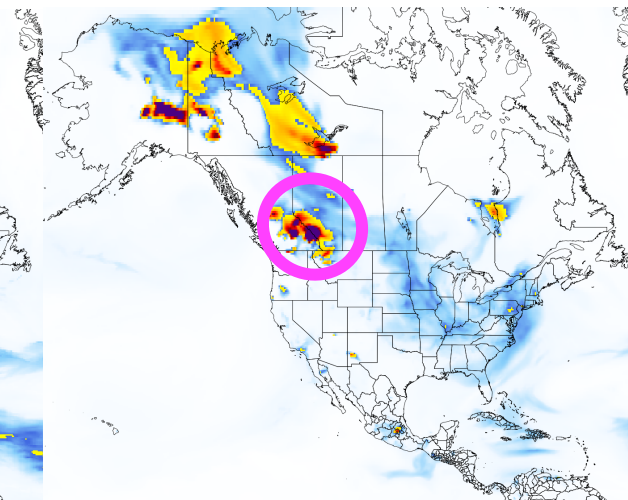


Model Means $PM_{2.5}$ (Tues 8/8)

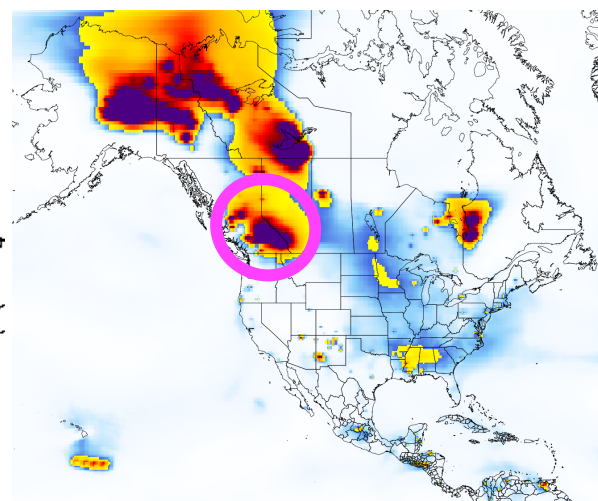
GEOS-FP



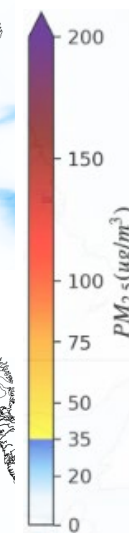
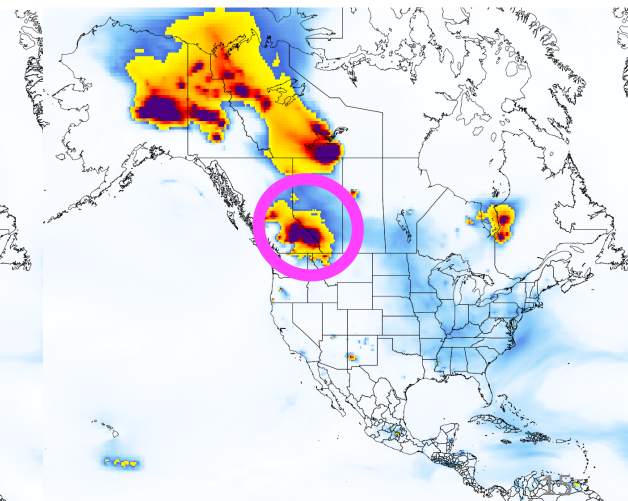
GEOS-CF



NAAPS



Ensemble

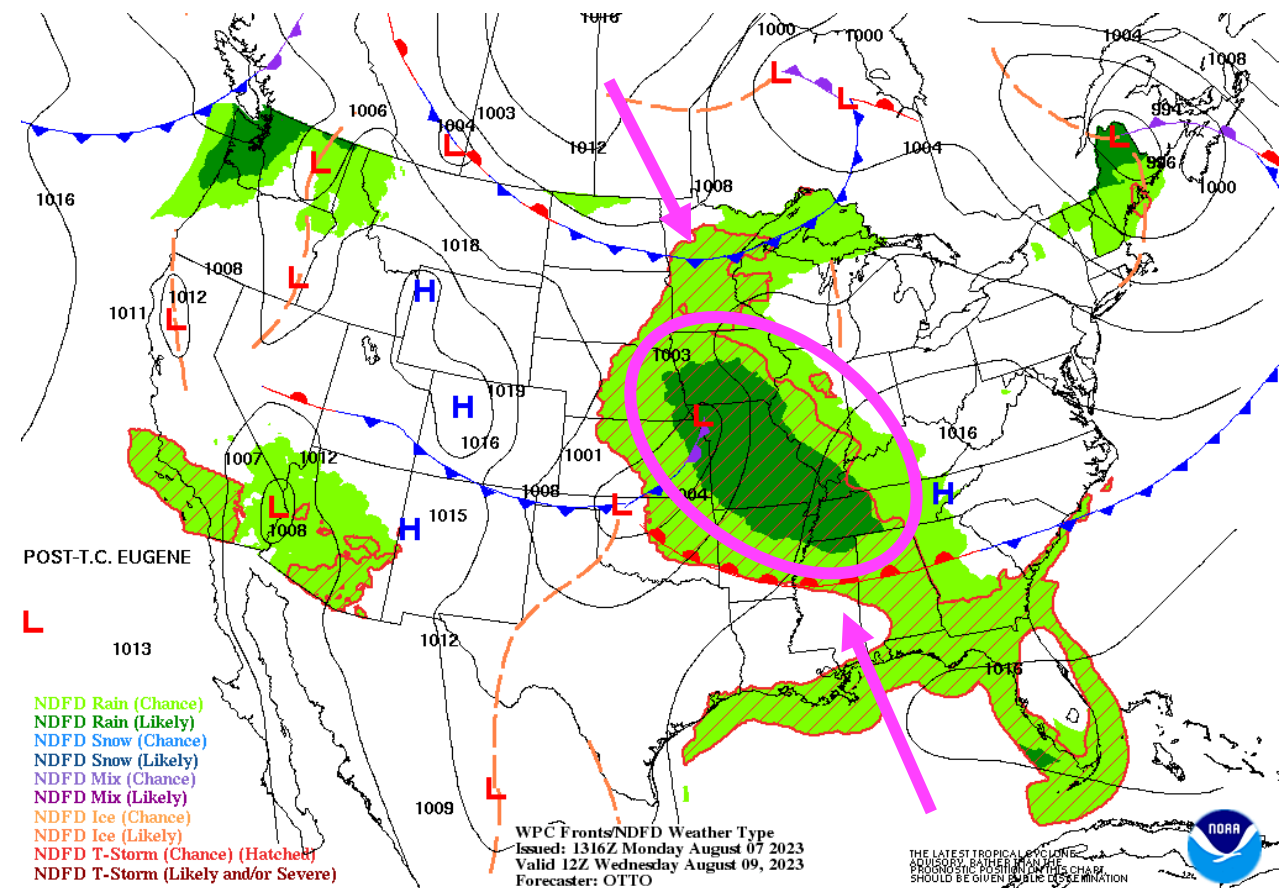


Day 3 of 8/6 initialization

Outlook: Short Range (1–3 days)

Surface Forecast (**Wednesday 8/9**)

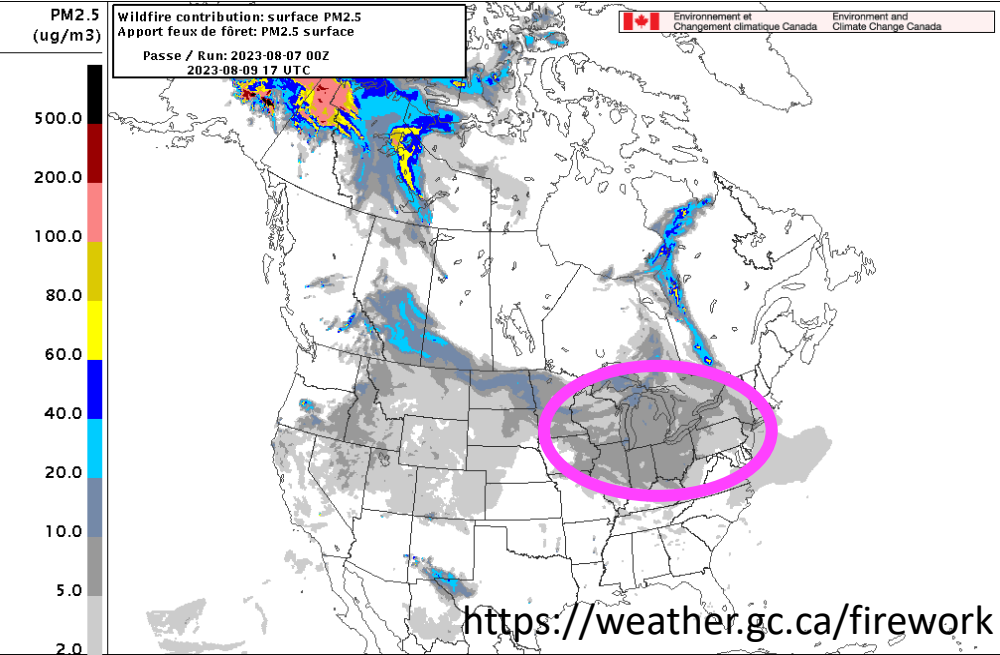
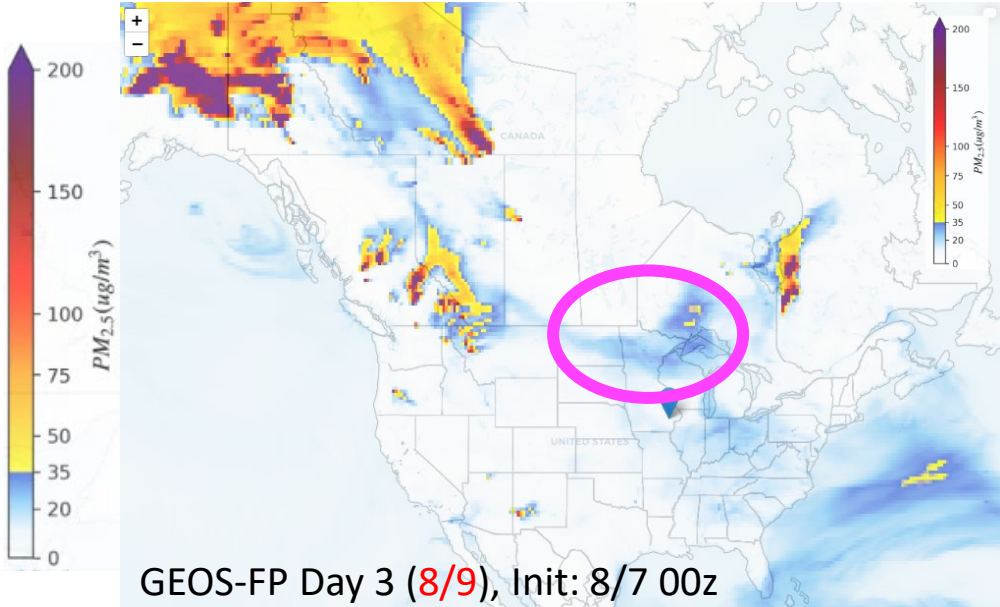
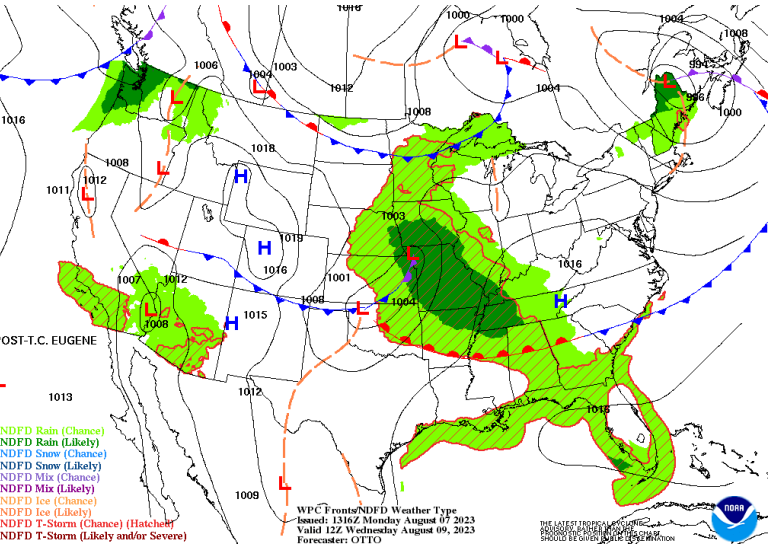
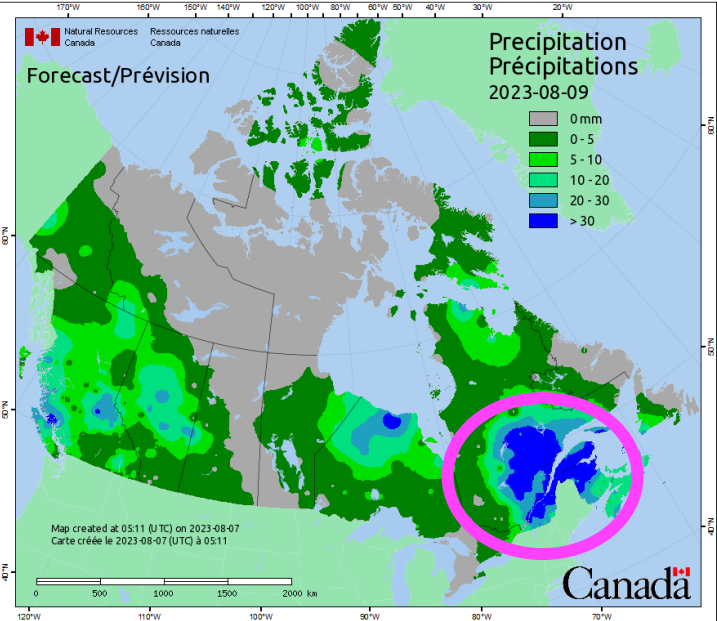
US NWS Forecast



Outlook: Short Range (1–3 days)

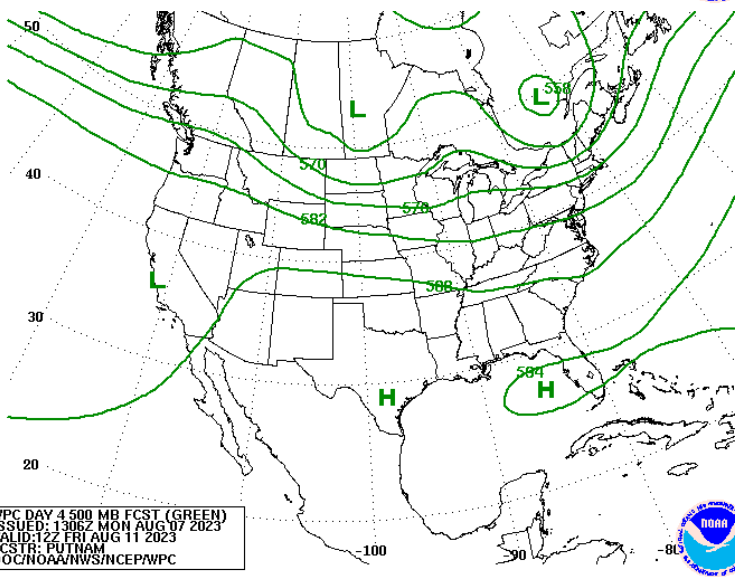
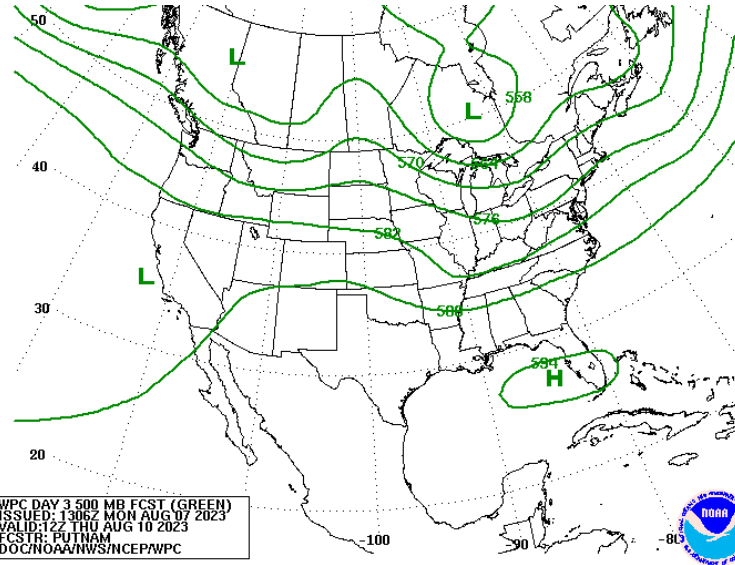
Surface Forecast

(Wednesday 8/9)

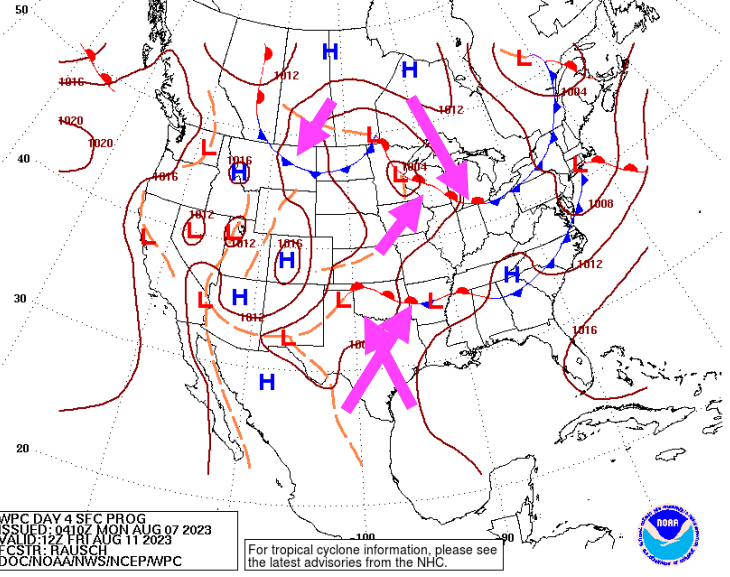
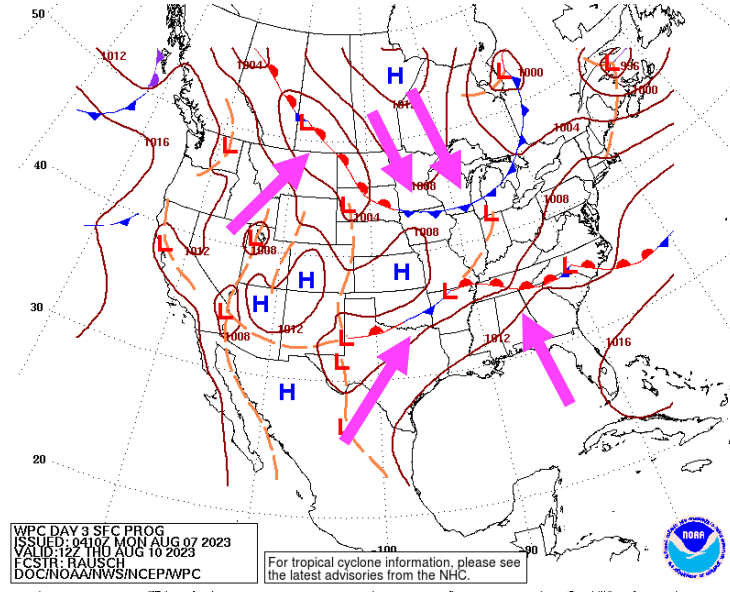


Outlook: Medium Range

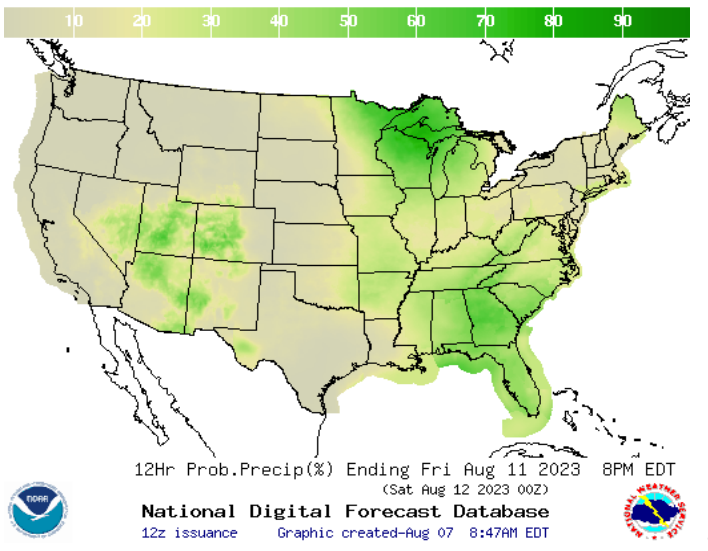
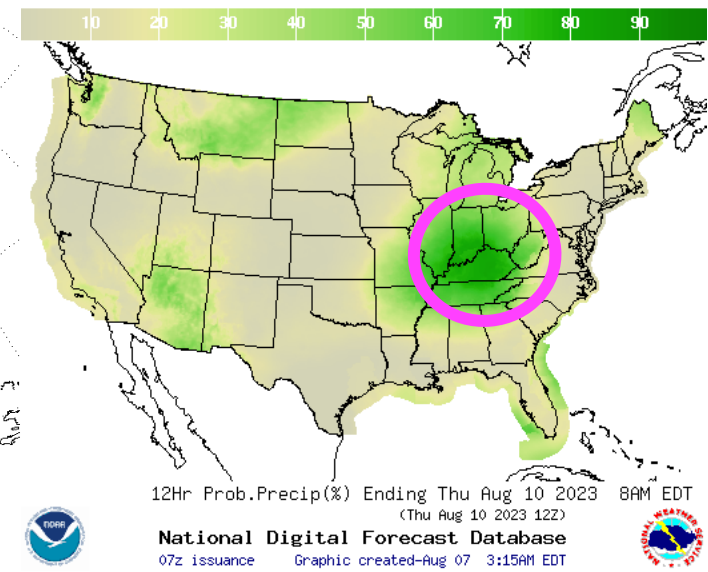
500 hPa Contours



Sea Level



Precip Prob.



Thursday
8/10

Friday
8/11

Summary

Monday : Active fires in North Dakota (local) and transport from Canadian fires impacting air quality in North Dakota and moderately in north-central US.

M → W : Cold front sets up along southern Canada coupled with fair weather could promote smoke transport from North Dakota fires into central US on Tuesday. Wednesday rain ahead of a southern warm front in Central US could dampen transport and help improve the air quality.

Th → F : Keep an eye on the transition from cold to warm fronts may push back on smoke transport from Canada into the northern US.

AirNow AQI

