

## Using NOAA AerosolWatch for Satellite Data Visualization

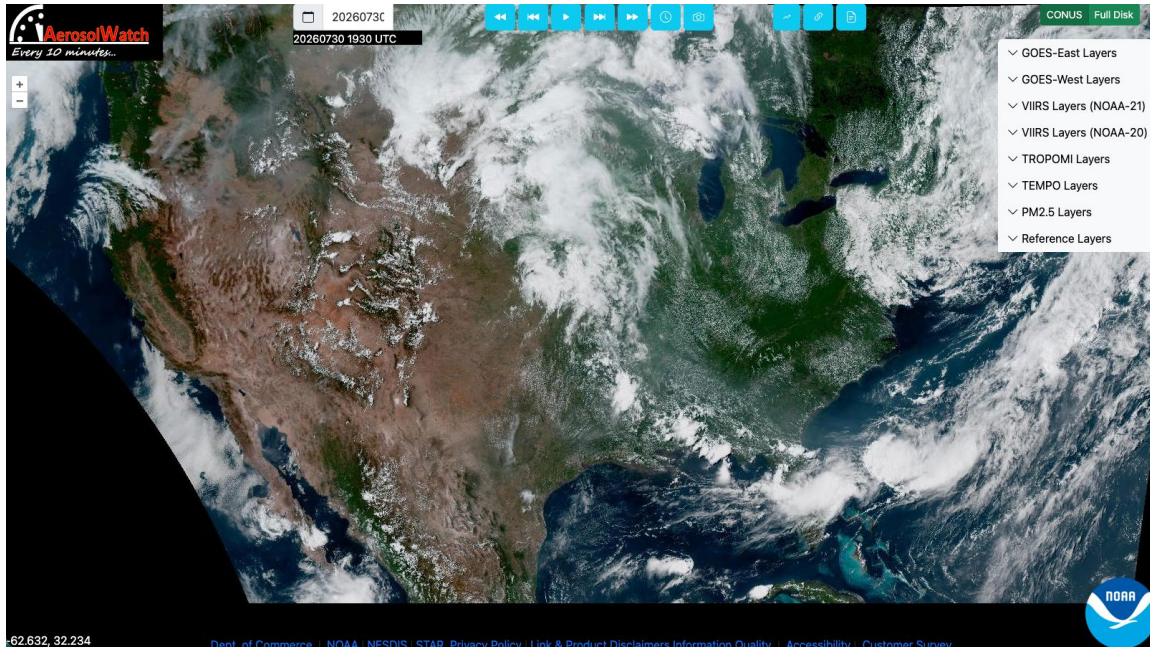
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## Introduction to AerosolWatch

# NOAA AerosolWatch



NOAA AerosolWatch: an interactive web interface for browsing satellite imagery from selected satellites and sensors **focused on aerosol** monitoring.

- Provides geostationary aerosol imagery over **North America**, updated **every 10 minutes**
- **Imagery available in Near Real Time (~1 hour from acquisition)**, supporting wildfire and air quality monitoring
- **Explore, animate, and share.** All in your browser - no software needed.

[Link to AerosolWatch webpage](#)

[Link to AerosolWatch resources](#)





## Case Study: Colorado and Utah June/July 2026 Fires Demo in AerosolWatch

# Demo Overview

[Link to AerosolWatch case study](#)

| Step | Topic                                                           |
|------|-----------------------------------------------------------------|
| 1    | True Color: setting the scene and hourly tracking               |
| 2    | Aerosol in the plume: AOD and composite AOD                     |
| 3    | Smoke tracking: UVAI and Smoke Mask                             |
| 4    | Aerosol height tracking: TEMPO ALH                              |
| 5    | Surface Air Pollution: measured and estimated PM <sub>2.5</sub> |
| 6    | Summary                                                         |



# Satellite Overpass Times for UT/CO

| Satellite | Approx. Local Time July 2026<br>(MDT, UTC-6) |
|-----------|----------------------------------------------|
| TEMPO     | daylight time, every ~1h                     |
| GOES-East | daylight time, every ~5min                   |
| GOES-West | daylight time, every ~5min                   |

# Products Used in this Case Study

| Product                    | Layer Name in Aerosol Watch   |
|----------------------------|-------------------------------|
| True Color (default layer) | GOES-East GeoColor            |
| AOD                        | GOES-East AOD, AOD Composite  |
| Smoke and Dust Mask        | GOES-East Smoke and Dust Mask |
| Smoke and Dust Mask        | TEMPO Smoke and Dust Mask     |
| UVAI                       | TEMPO UVAI                    |
| Aerosol Layer Height       | TEMPO ALH                     |
| PM2.5 from AirNow          | Hourly PM2.5                  |
| PM2.5 from TEMPO-ABI       | Hourly estimated PM2.5        |



# Step 1 – True Color: Setting the Scene

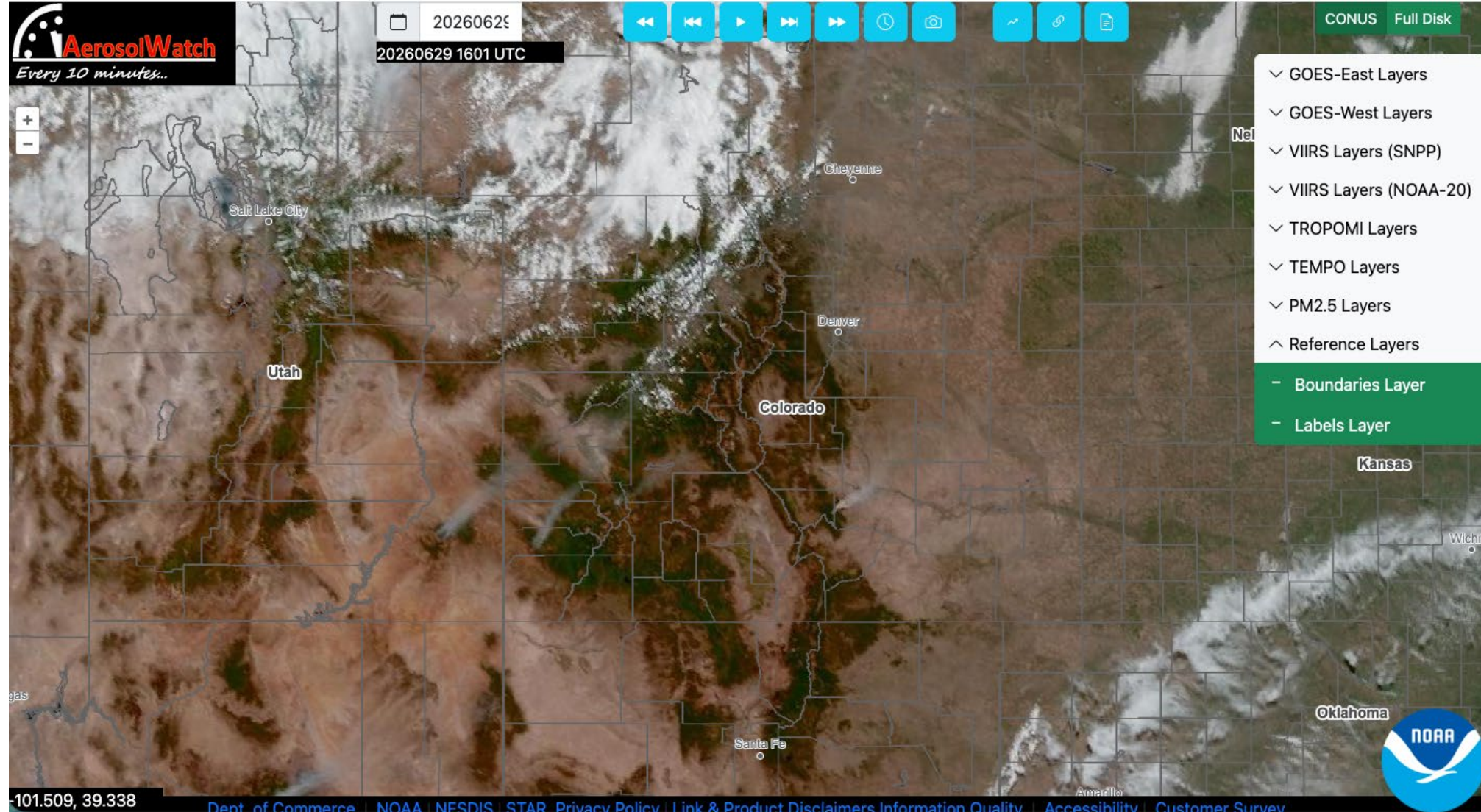
## Actions

1. Keep GOES-East GeoColor layer (default) and select Jun 29 2026 in the time bar on the top
2. Turn on Reference layers, and zoom in Utah/Colorado
3. In the Animation Time Range Selection (clock symbol in the top bar) select animation range from Start time: 13:01 UTC to End Time: 02:01 UTC (~7am-8pm MDT). Animate by clicking play to see the fire plumes evolution during the daytime.

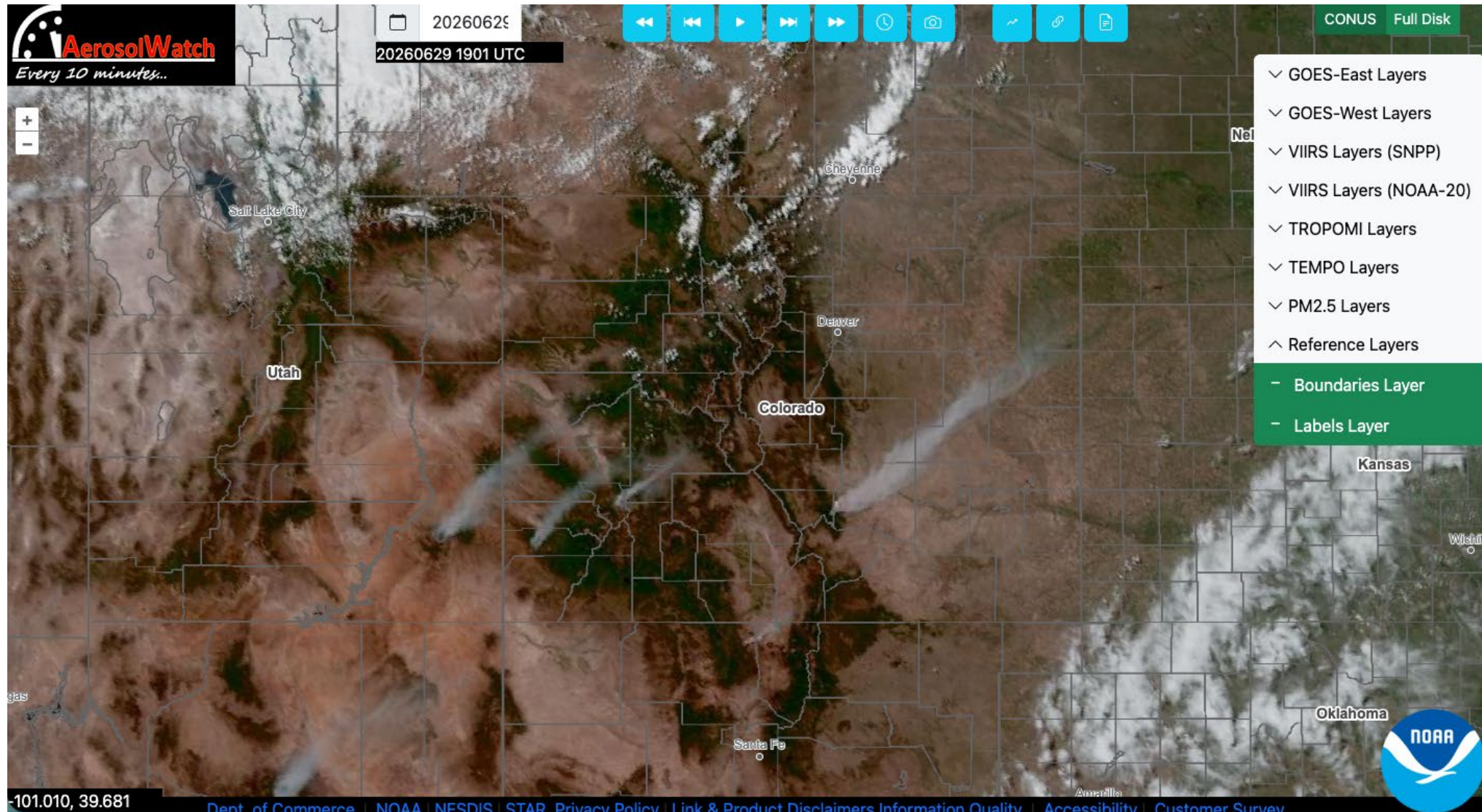
**Note:** Selecting a longer time period needs more memory and takes a longer time to load, so shorten time if the animation is too slow.



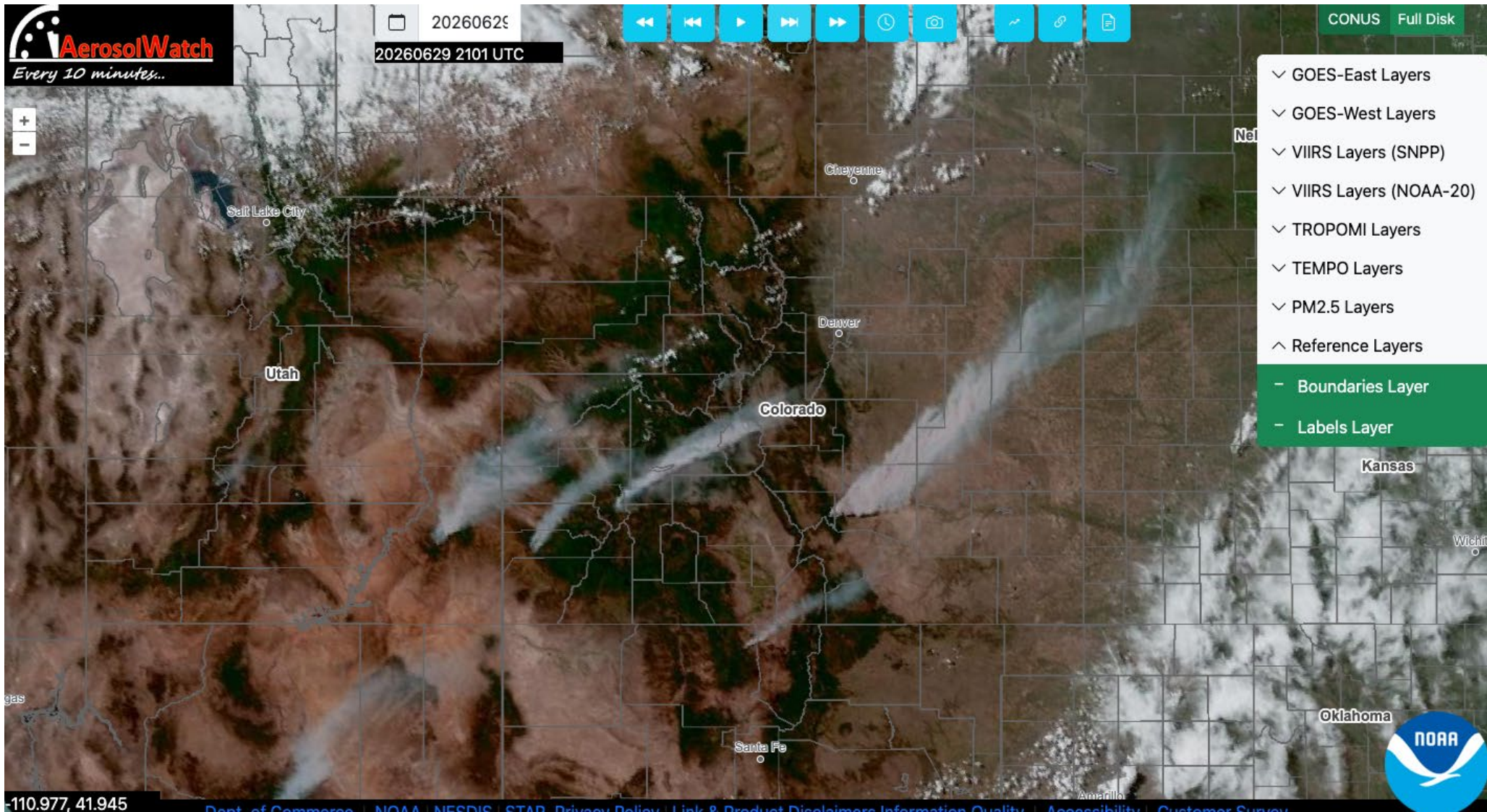
# Step 1 – Product: GOES-East GeoColor 16:01 UTC (10am MDT)



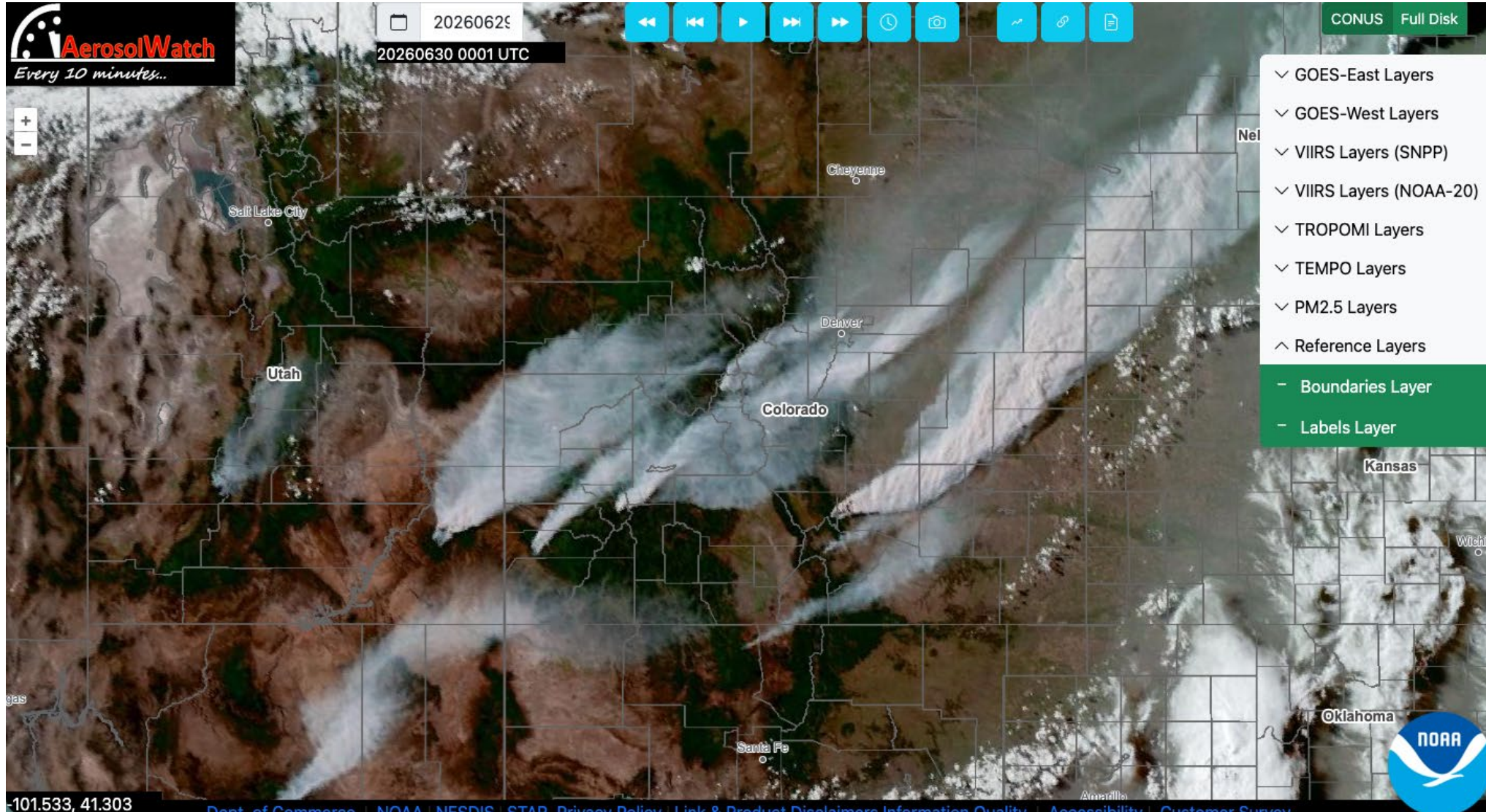
# Step 1 – Product: GOES-East GeoColor 19:01 UTC (1pm MDT)



# Step 1 – Product: GOES-East GeoColor 21:01 UTC (3pm MDT)



# Step 1 – Product: GOES-East GeoColor 00:01 UTC (6pm MDT)



## Step 2 – AOD: Aerosols in the Plume

### Actions

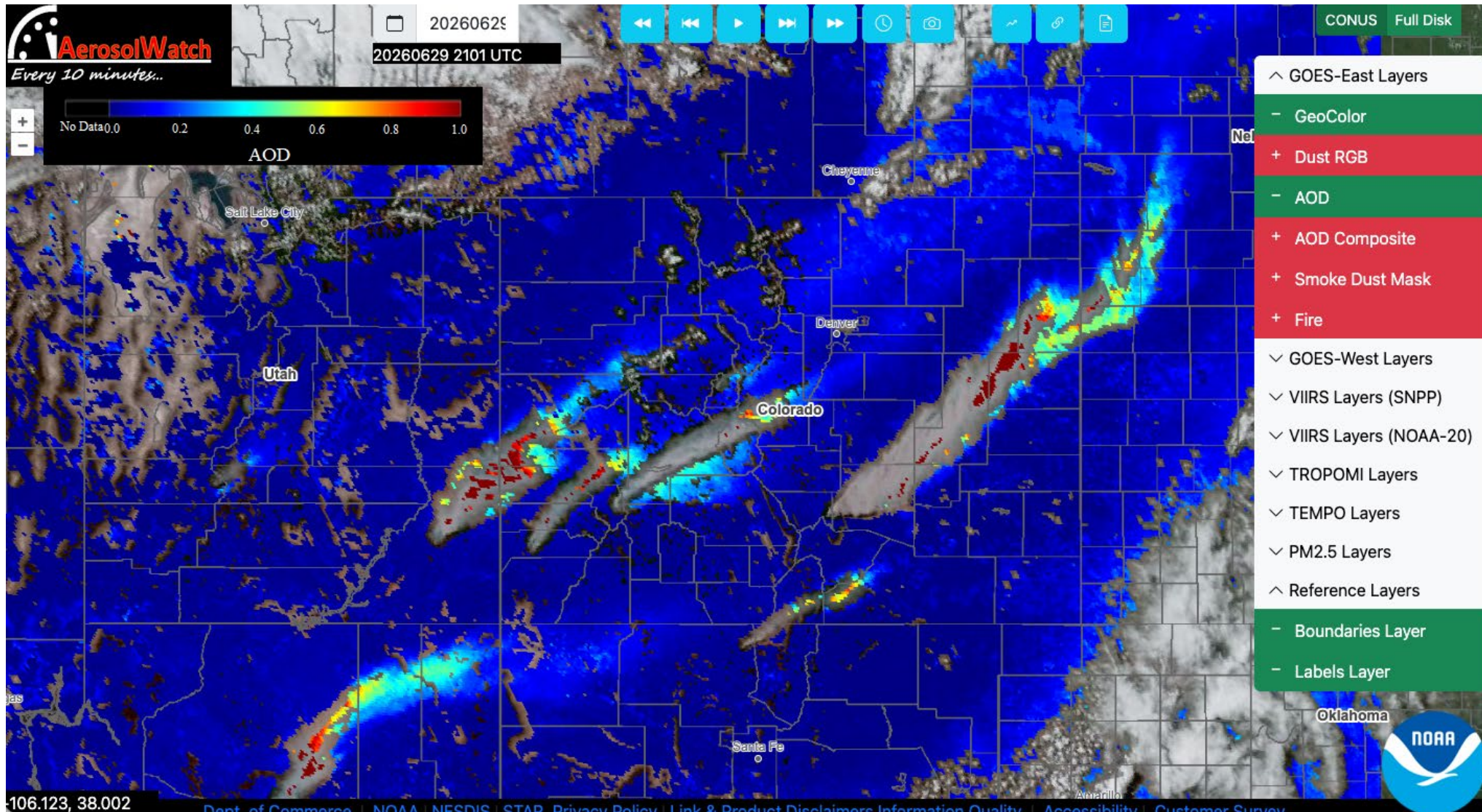
1. Stop animation and navigate to time 21:01 UTC (3pm MDT).
2. Toggle on GOES-East AOD to see aerosol presence over the fires, and advance timestep to see the evolution. You can also animate if you want.
3. Toggle off GOES-East AOD and toggle on GOES-East AOD Composite for comparison.

### Notes:

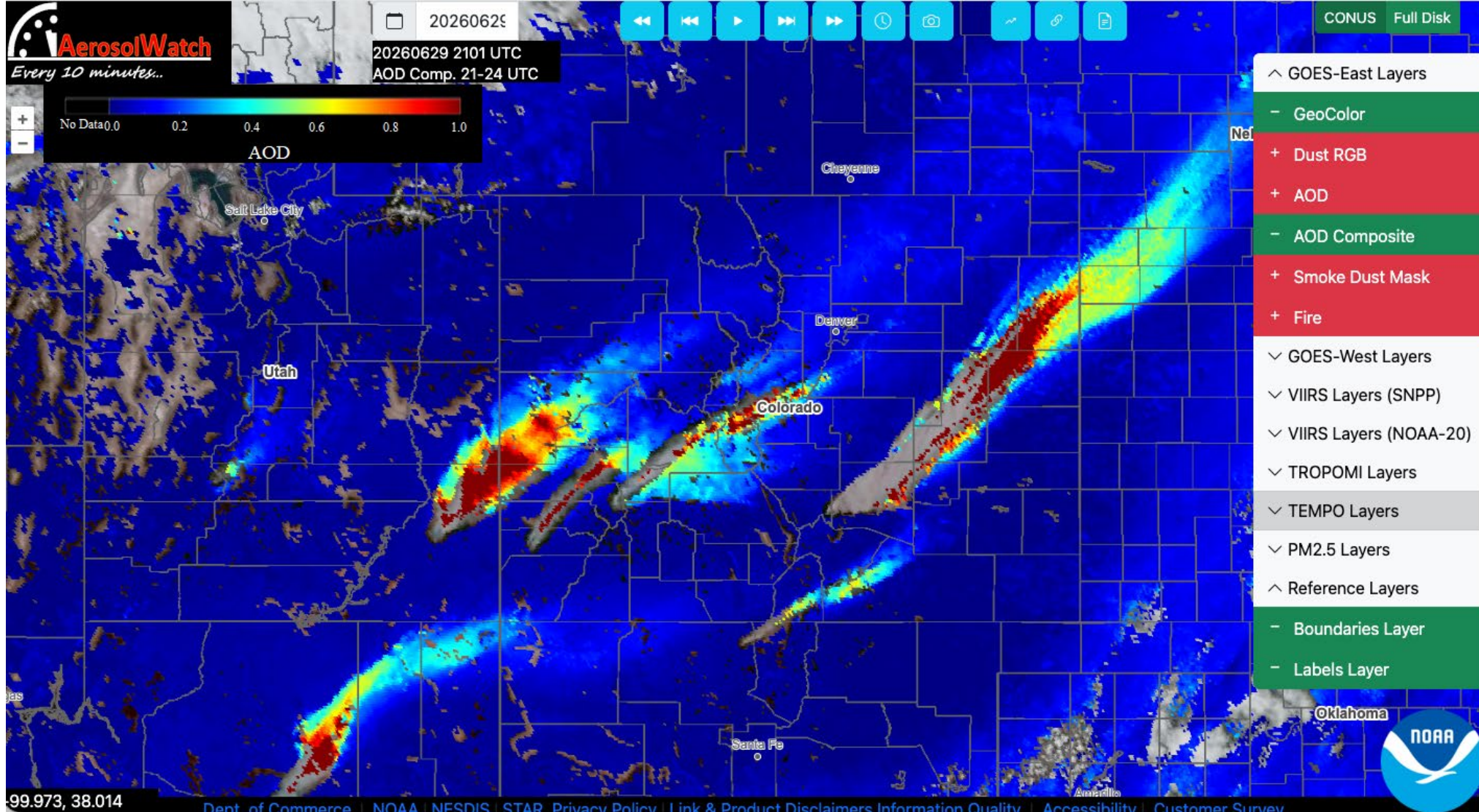
- Gaps in AOD occur over the dense fire plumes, where thick smoke is misclassified as cloud and retrievals are withheld.
- The AOD Composite offers less temporal resolution (3h vs 10 min) but more AOD retrieval coverage compared to just the AOD product itself.



## Step 2 – Products: GOES-East AOD 21:01 UTC (3pm MDT)



## Step 2 – Products: GOES-East AOD Composite 21:01 UTC (3pm MDT)



## Step 3 – Smoke Tracking

### Actions

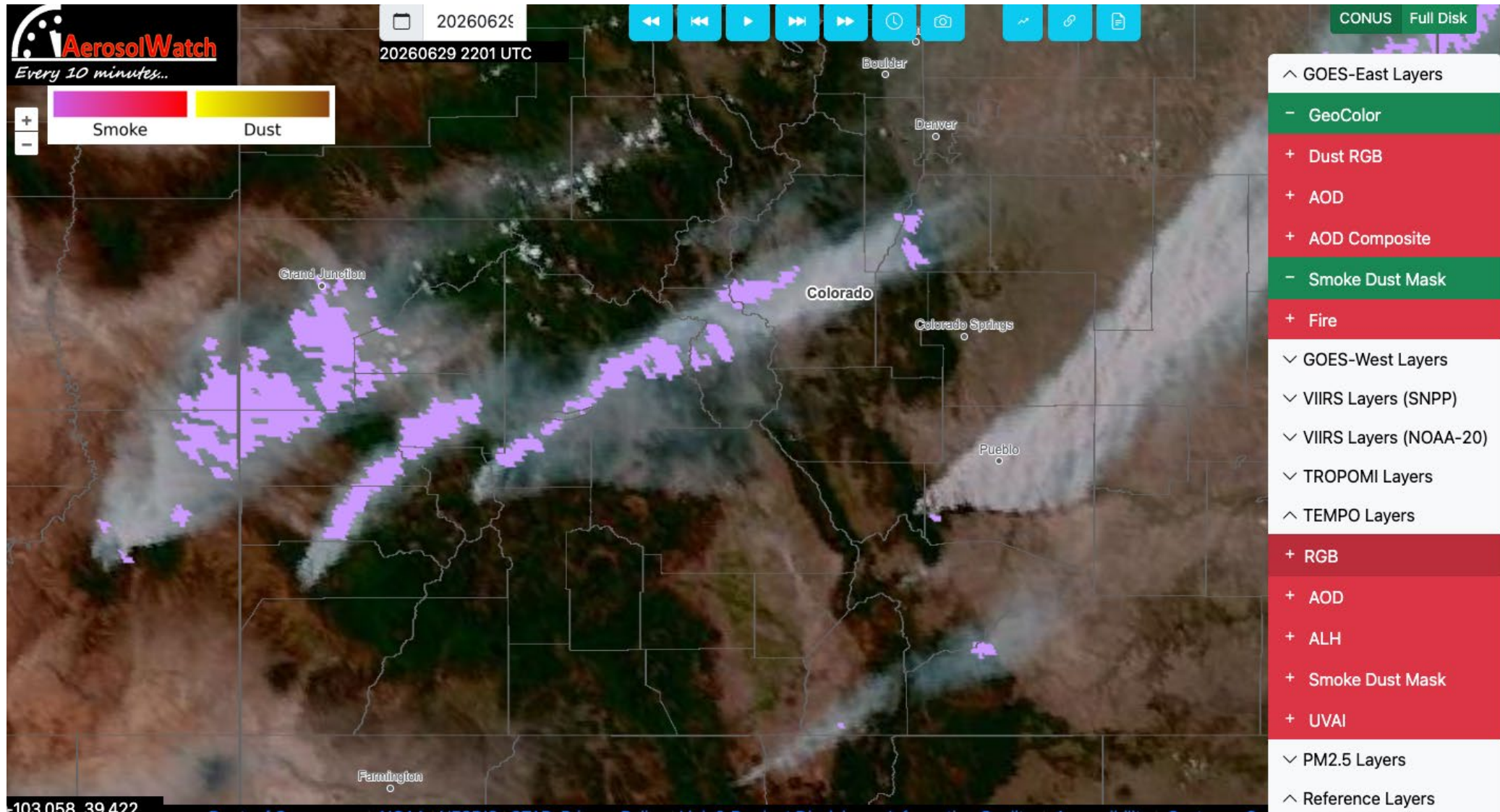
1. Toggle off AOD layers.
2. Toggle on the GOES-East Smoke and Dust Mask, and advance time/animate to see smoke tracking.
3. Repeat for TEMPO Smoke and Dust Mask layer.
4. Repeat for TEMPO UVAI layer.

### Notes:

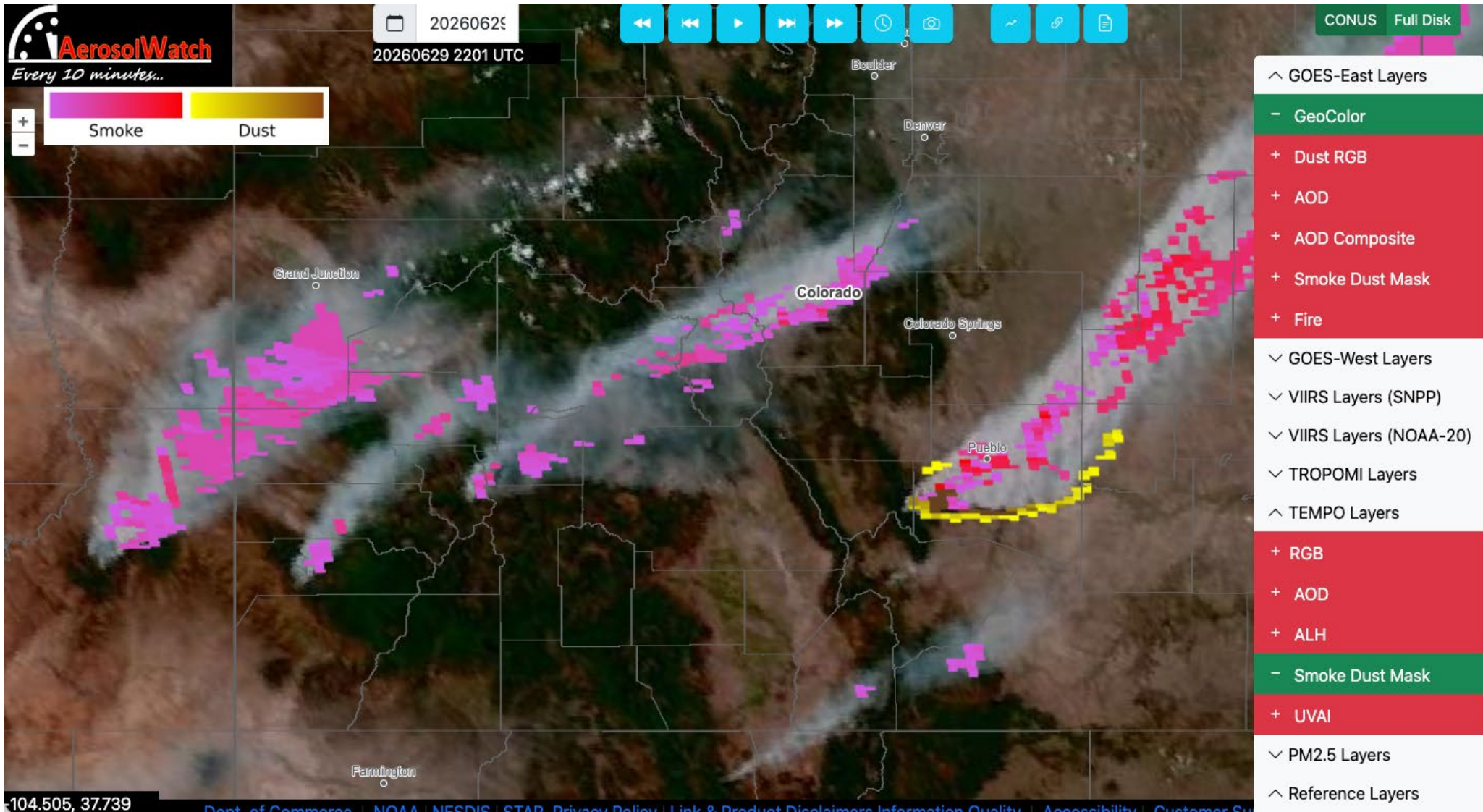
- Gaps in the Smoke and Dust Mask occur over dense fire plumes, where thick smoke is misclassified as cloud, as seen with the Aspen Acres fire plume. Because UVAI is insensitive to cloud presence, it can provide better detection coverage over these plumes.
- The TEMPO Smoke and Dust Mask detects some dust at the edge of the Aspen Acres fire plume. While wind-driven fires in semi-arid regions can entrain significant dust, this may also be a false signal, since the retrieval is less accurate over arid and semi-arid regions due to bright underlying surfaces.



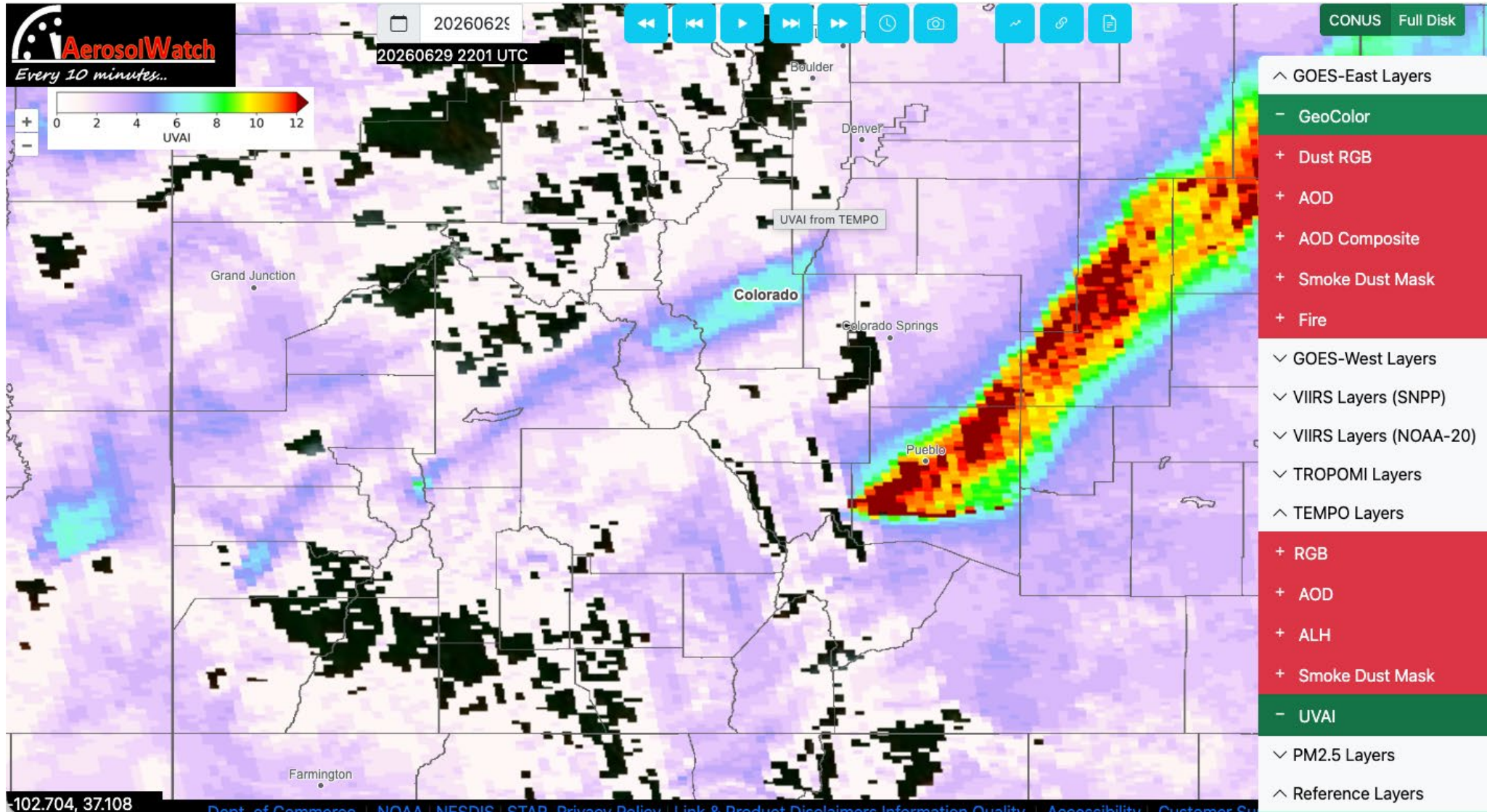
## Step 3 – Products: GOES-East Smoke and Dust Mask 22:01 UTC (4pm MDT)



## Step 3 – Products: TEMPO Smoke and Dust Mask 22:01 UTC (4pm MDT)



## Step 3 – Products: TEMPO UVAI 22:01 UTC (4pm MDT)



## Step 4 – Aerosol Height Tracking: TEMPO ALH

### Actions

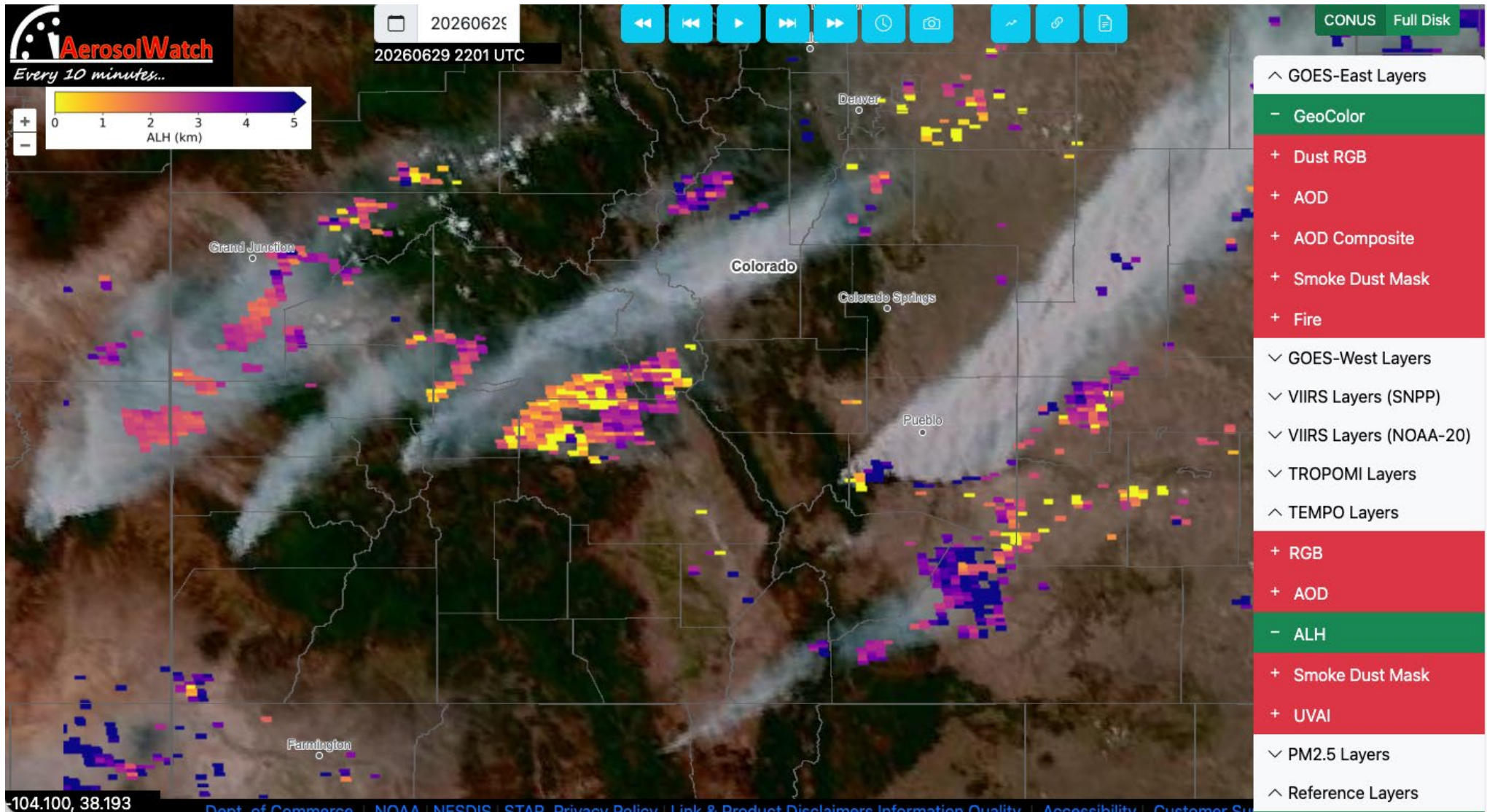
1. Toggle off TEMPO UVAI layer.
2. Toggle on the TEMPO Aerosol Layer Height ALH layer, and advance time/animate to see aerosol height tracking.

### Notes:

- ALH can help determine whether aerosols are lofted above the boundary layer or are low enough to potentially degrade surface air quality.



## Step 4 – Products: TEMPO ALH 22:01 UTC (4pm MDT)



## Step 5 – Surface Air Pollution: Measured and Estimated PM<sub>2.5</sub>

### Actions

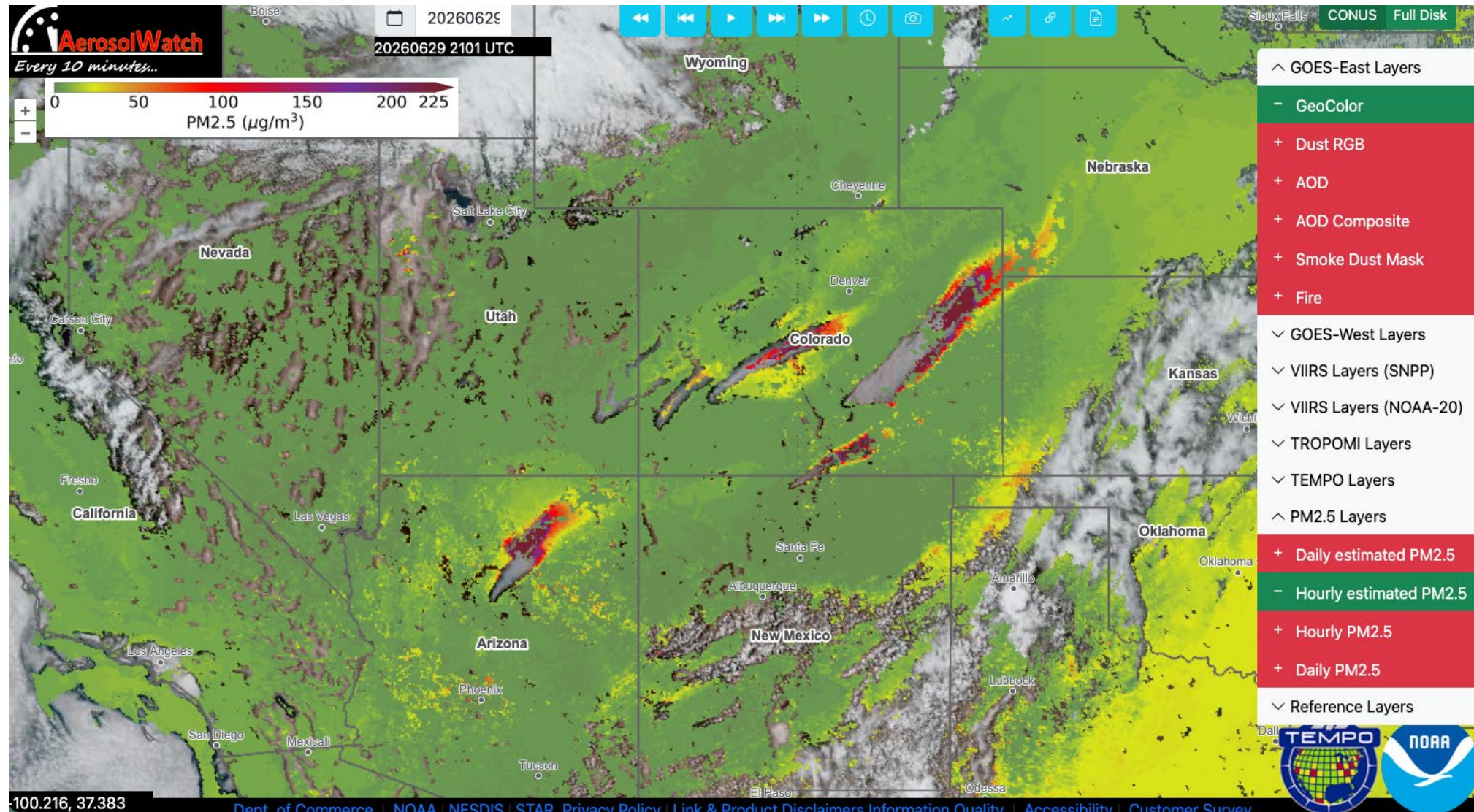
1. Toggle off TEMPO ALH layer.
2. Toggle on the PM2.5 Layers: Hourly estimated PM<sub>2.5</sub> and advance time/animate to see aerosol surface pollution tracking.
3. Toggle on the PM2.5 Layers: Hourly PM<sub>2.5</sub> to overlay on the estimated PM<sub>2.5</sub> the PM<sub>2.5</sub> measured by AirNow monitors.

### Notes:

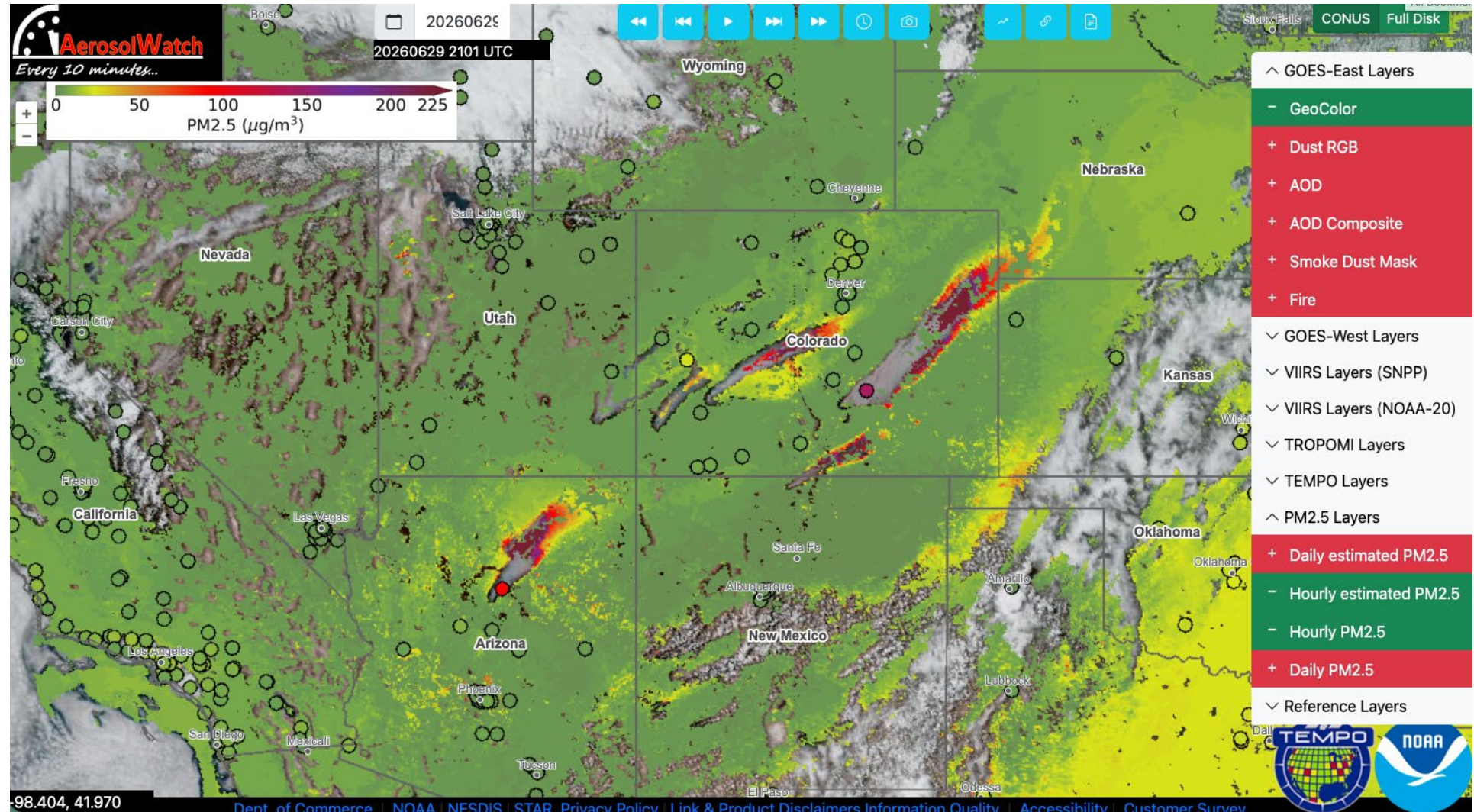
- You can repeat this with Daily PM<sub>2.5</sub> layers which will give the average PM<sub>2.5</sub> for the whole day.



## Step 5 – Products: Hourly Estimated PM<sub>2.5</sub> 21:01 UTC (3pm MDT)



# Step 5 – Products: Hourly Estimated PM<sub>2.5</sub> (TEMPO-ABI derived), and Hourly PM<sub>2.5</sub> (AirNow, circles) 21:01 UTC (3pm MDT)



# Summary

- Utah and Colorado fires of June/July 2026 are detectable in near real time (NRT) and at high temporal resolution using NOAA satellite products within hours of ignition.
- True Color layers can track the smoke plumes evolution NRT, and the Smoke (and Dust) Mask can enable rapid plume detection.
- AOD tracks smoke column loading, though thick smoke can be misclassified as cloud, causing retrieval gaps. TEMPO UVAI hourly product provides a robust way for tracking the aerosol plume where AOD is not retrieved.
- TEMPO Aerosol Layer Height (ALH) can be a useful proxy for assessing whether aerosols may impact surface air quality.
- Satellite-derived hourly  $PM_{2.5}$  complements AirNow measurements where surface monitors are unavailable, providing more complete spatial coverage and enabling tracking of surface air pollution throughout the day.





**Thank You!**

