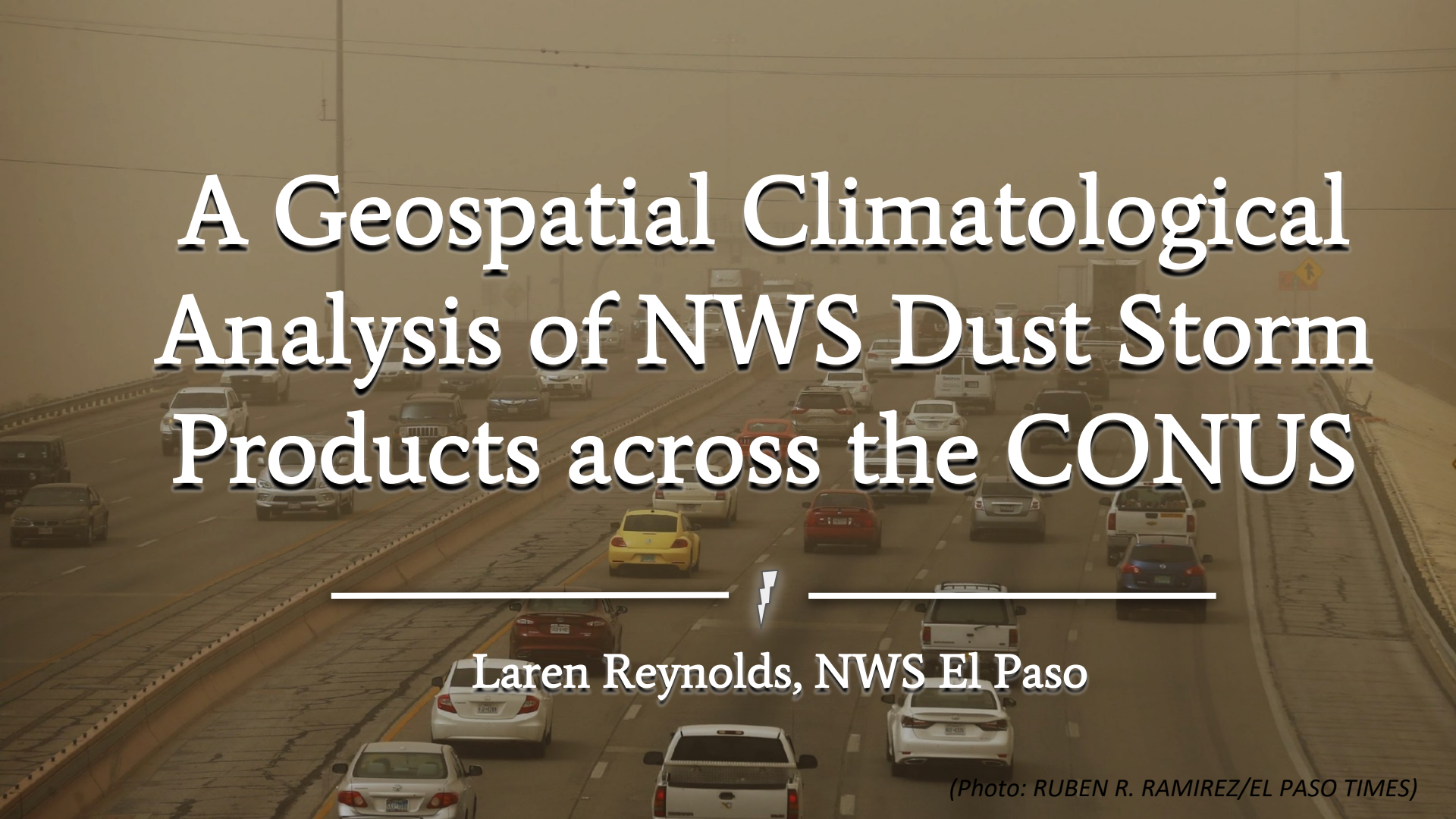
A Geospatial Climatological Analysis of NWS Dust Storm Products across the CONUS

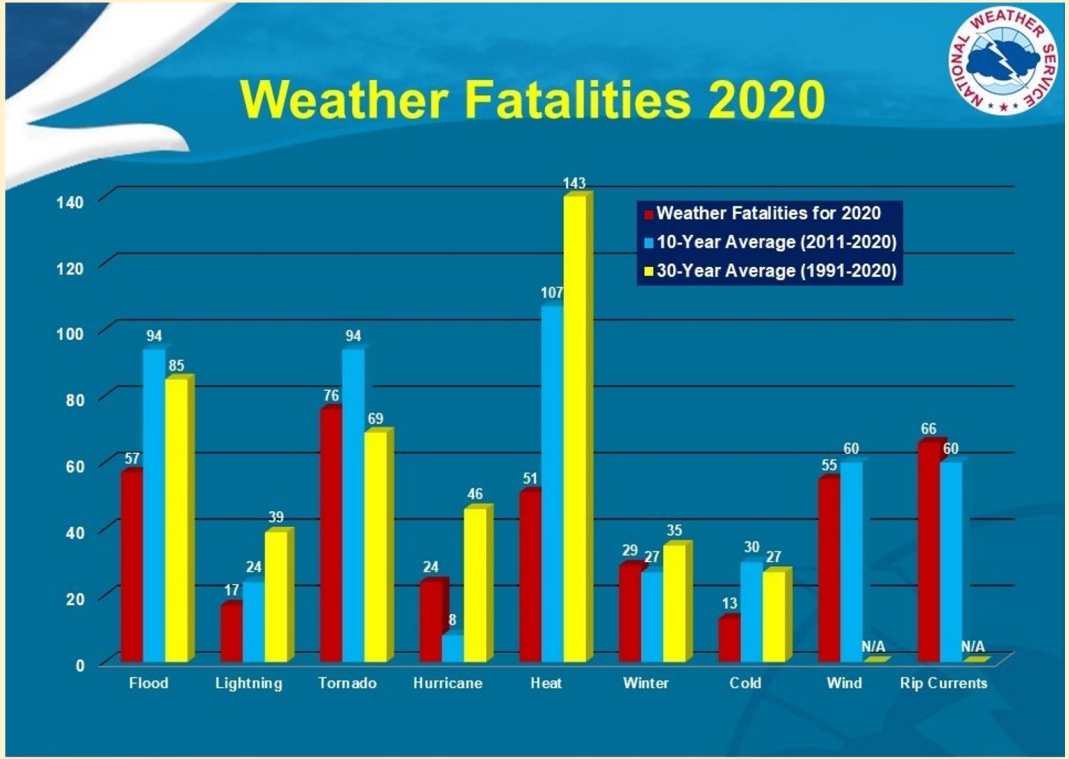
Laren Reynolds, NWS El Paso



(Photo: RUBEN R. RAMIREZ/EL PASO TIMES)

Background & Motivation

- Dust is not one of the top weather fatalities nationally
- However, it's a well known hazard in the Southwest
  - Arizona's 3rd deadliest[1] weather phenomena
  - Southern New Mexico's deadliest[2]

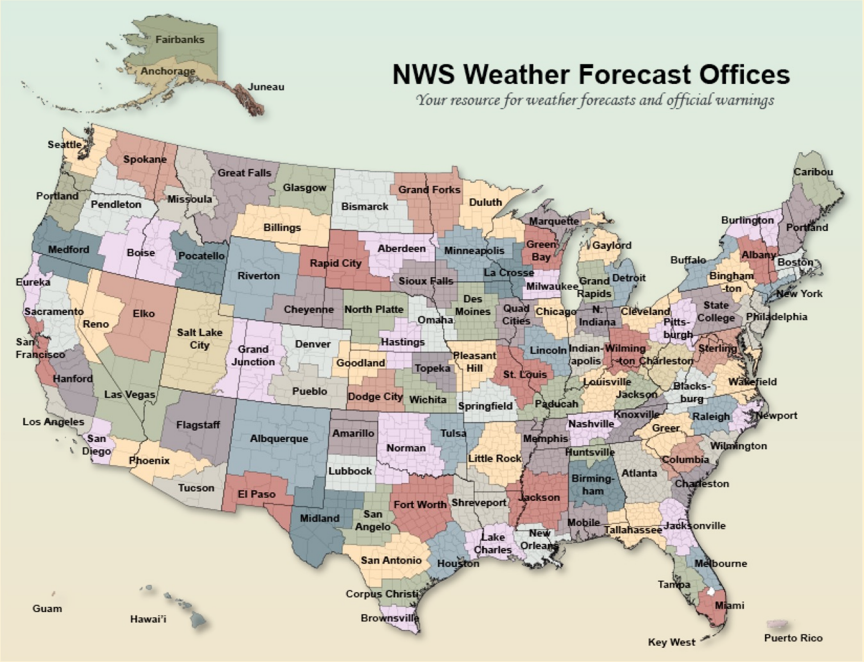


[1]Lader, G., et al., 2016: Blowing Dust and Dust Storms: One of Arizona's Most Underrated Weather Hazards. *NOAA Technical Memorandum NWS-WR 290.*

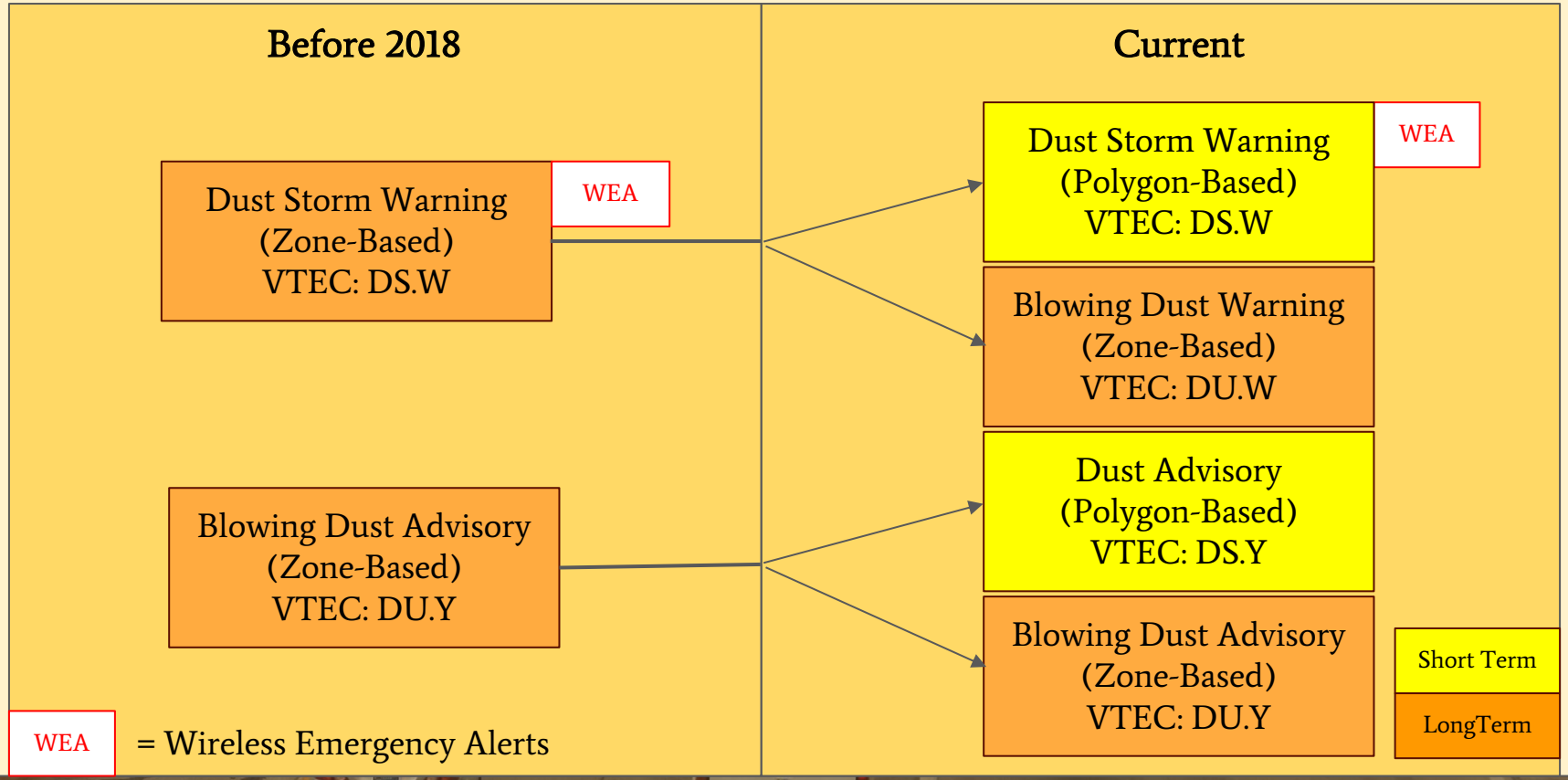
[2] *NWS El Paso Storm Data*

Background & Motivation

- How widespread are dust issues across the United States?

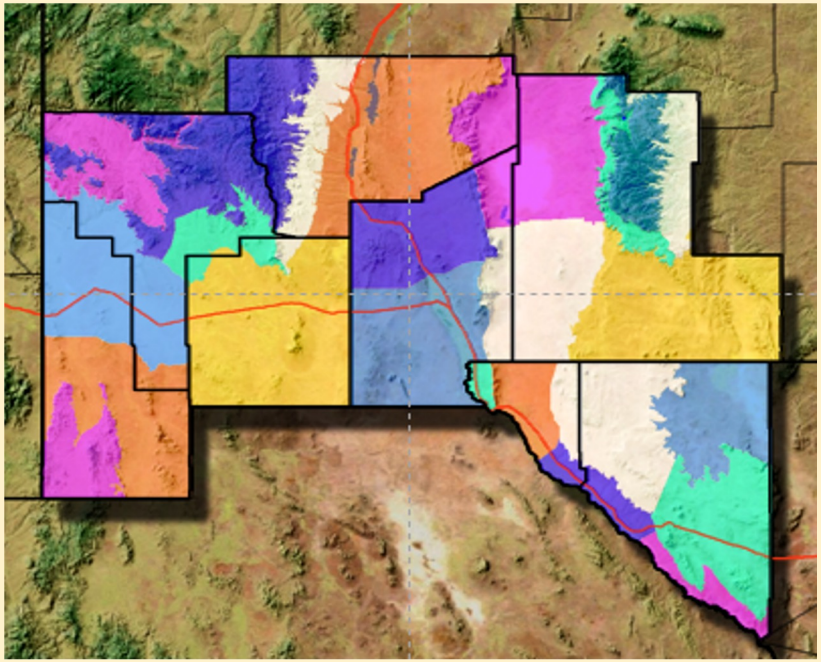


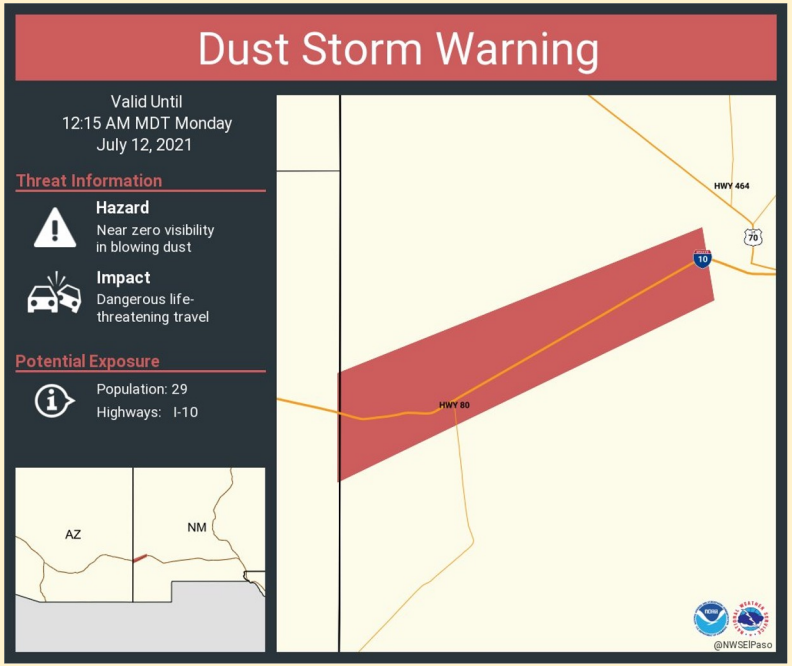
NWS Dust Product Background



NWS Dust Product Background

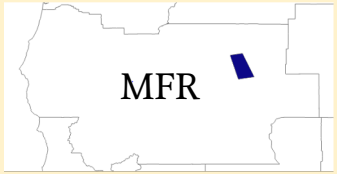
Zone VS Polygon



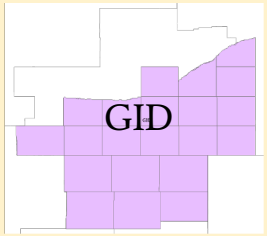


Methodology

- **Dataset:** Archived dust products from Iowa Environmental Dataset
- **Period of study:** Jan. 2006- Dec. 2020
- **Tools:** ArcGIS Pro, Matlab
- **Dust Products Analyzed:** New Dust Storm Warnings (DSW), Blowing Dust Warnings (DUW), Dust Storm Advisories (DSY), Blowing Dust Advisories (DUY)
- **Issues:** Polygon & Zone count. i.e. 1,517 dust products breaks down into 5,244 individual shapefiles evaluated.

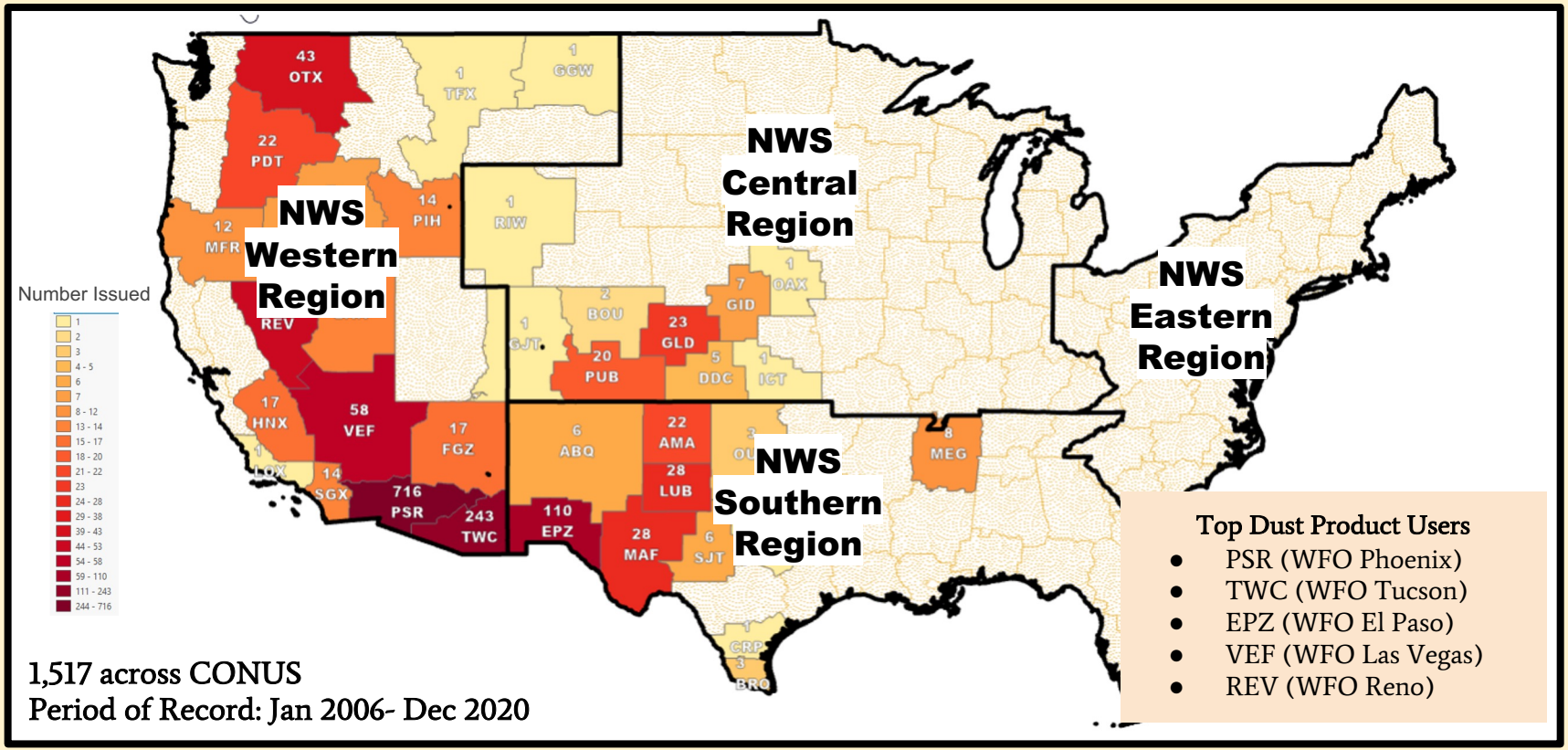


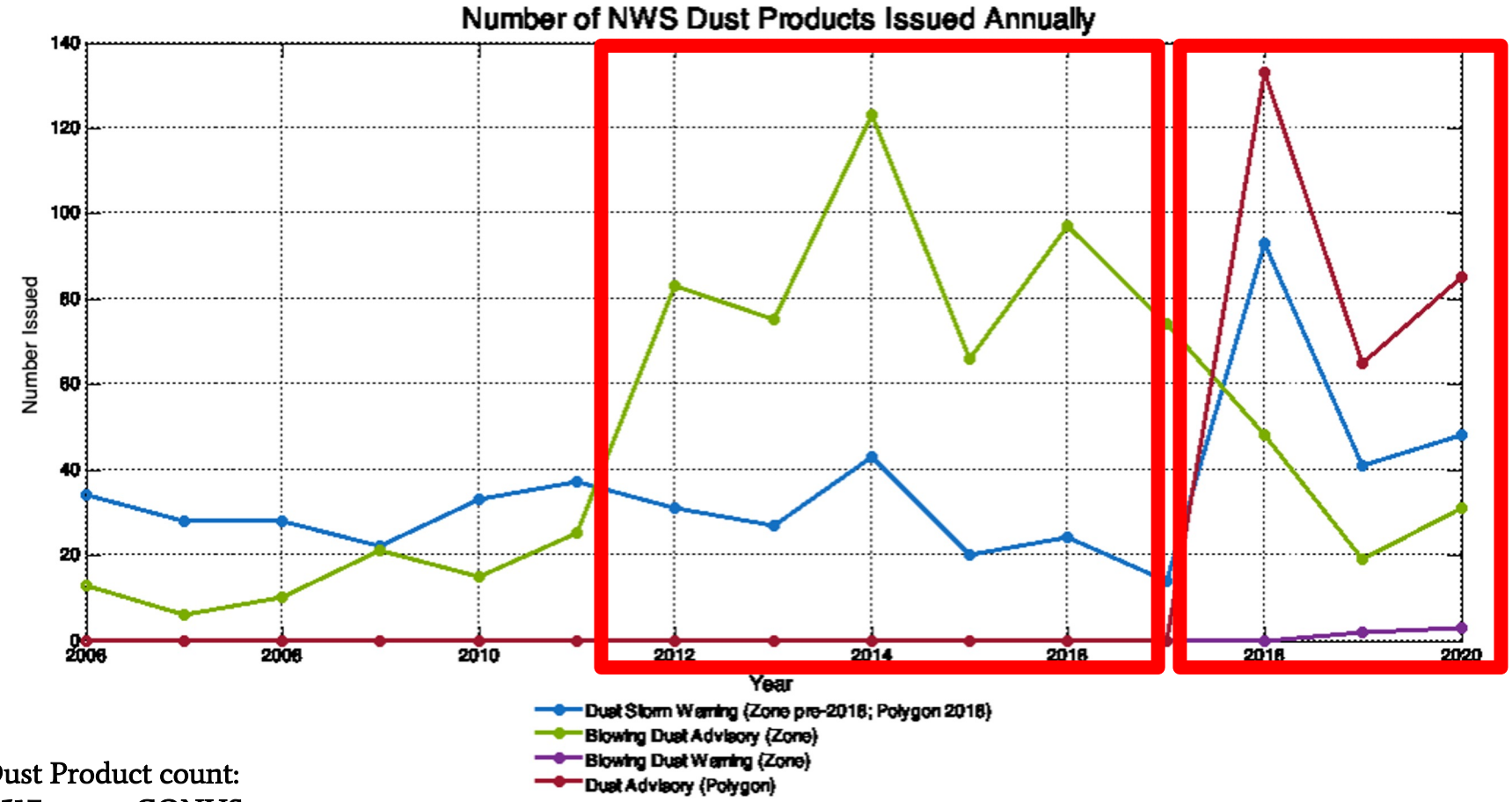
VTEC= 1 advisory issued
Shapefiles= 1



VTEC= 1 advisory issued
Shapefiles= 21

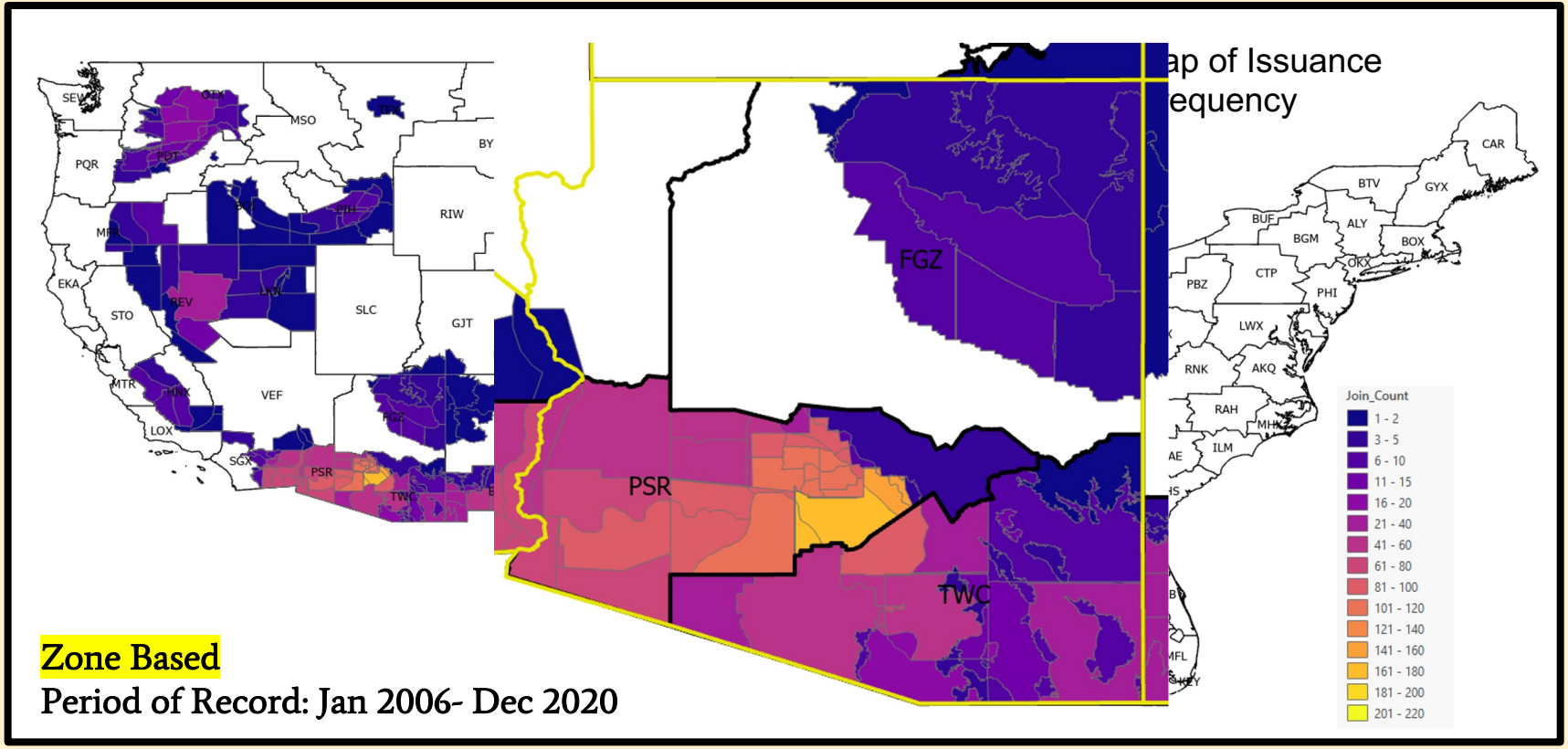
Number of Dust Products Issued by WFO





Dust Product count:
1,517 across CONUS

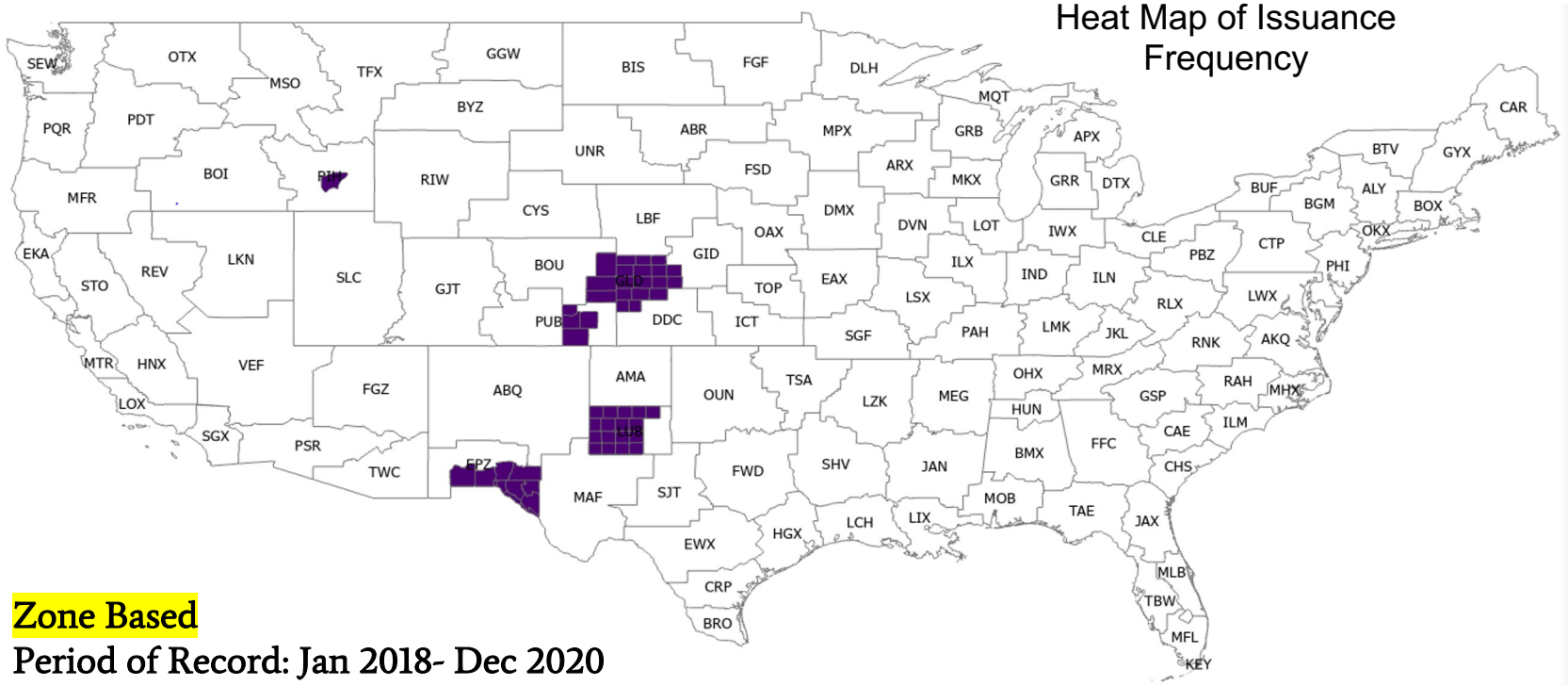
Blowing Dust Advisory: DUY



Zone Based

Period of Record: Jan 2006- Dec 2020

Blowing Dust Warning: DUW

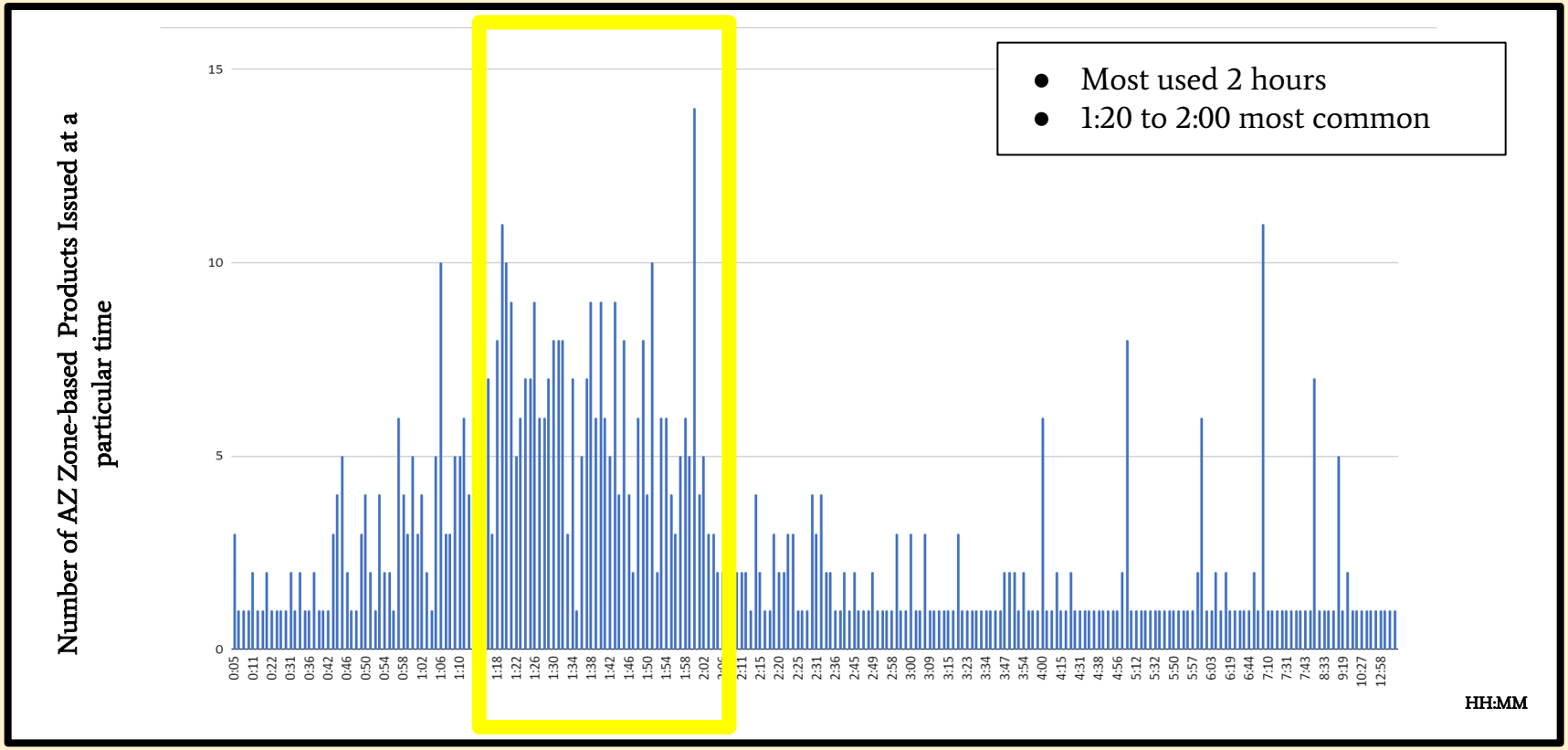


Zone Based

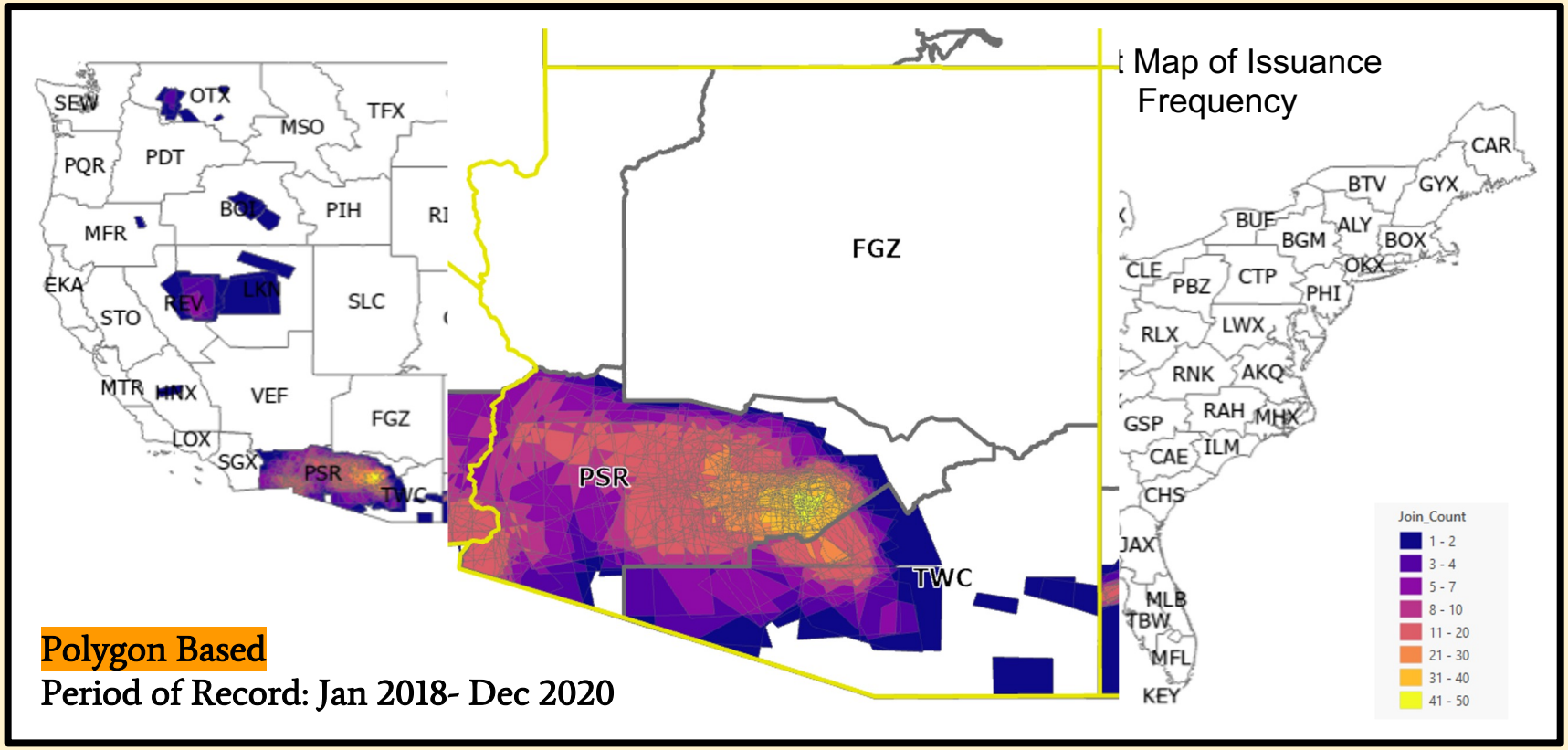
Period of Record: Jan 2018- Dec 2020

Duration of AZ Zone-based Dust Products

AZ Offices | At issuance time | 95% represented



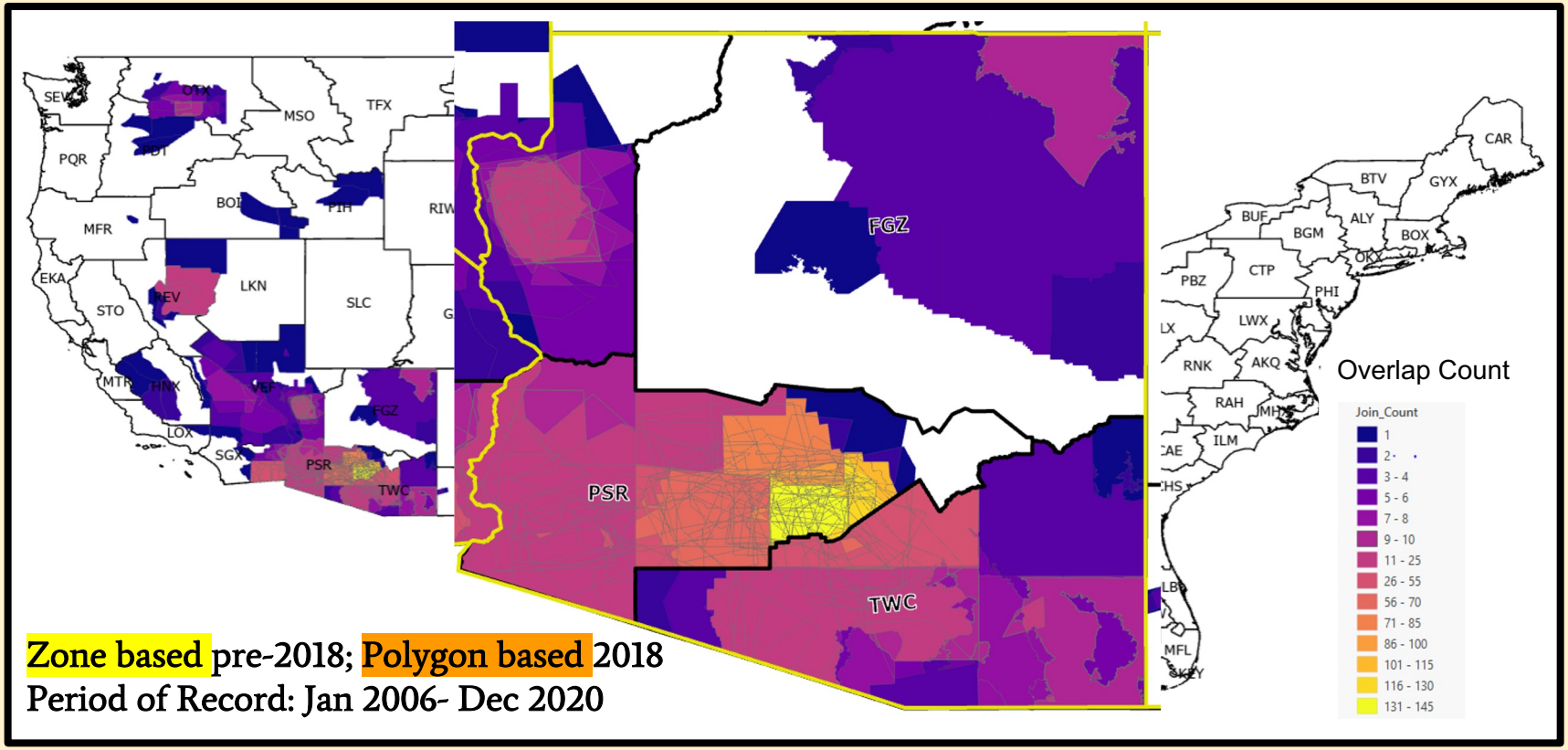
Dust Advisory: DSY



Polygon Based

Period of Record: Jan 2018- Dec 2020

Dust Storm Warning: DSW

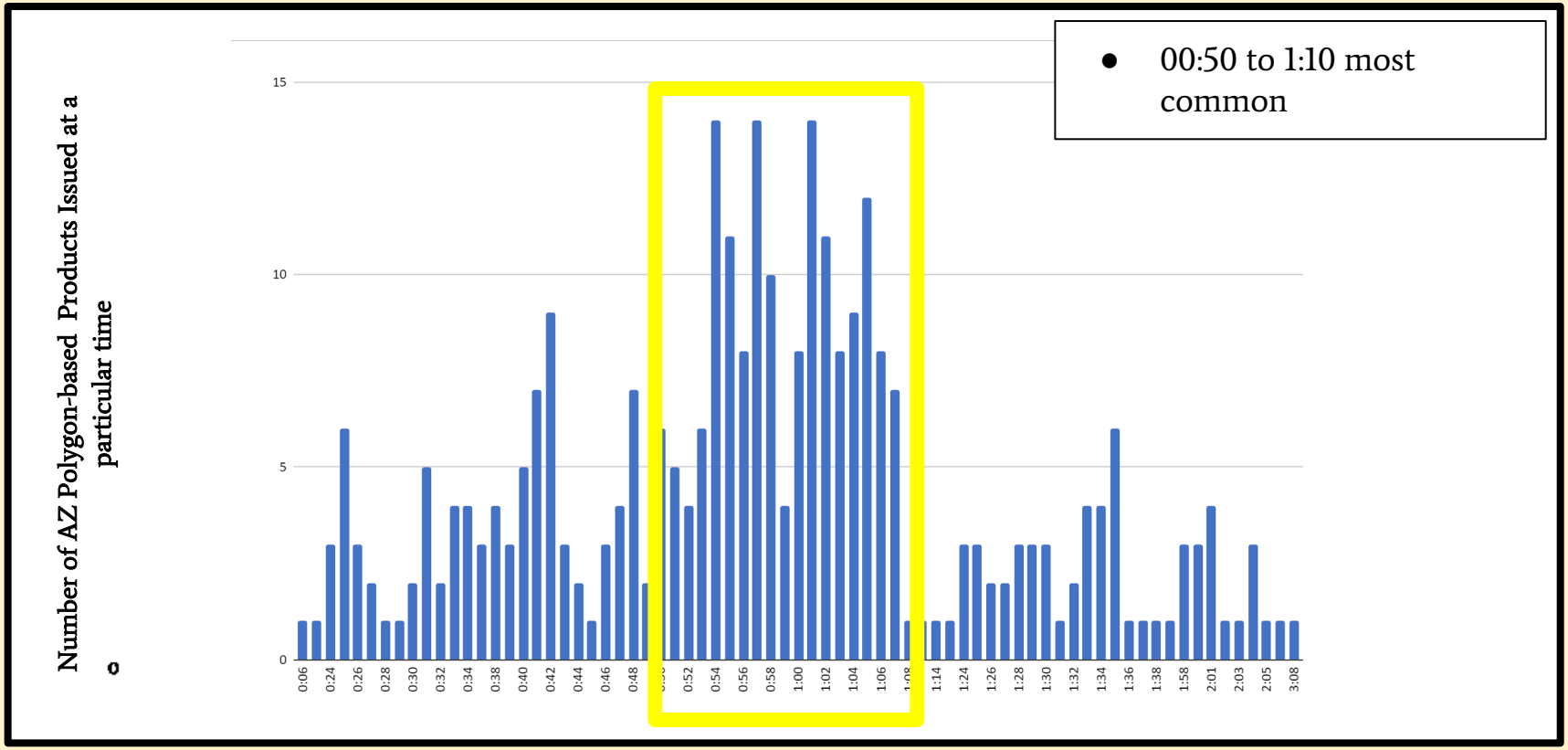


Zone based pre-2018; Polygon based 2018

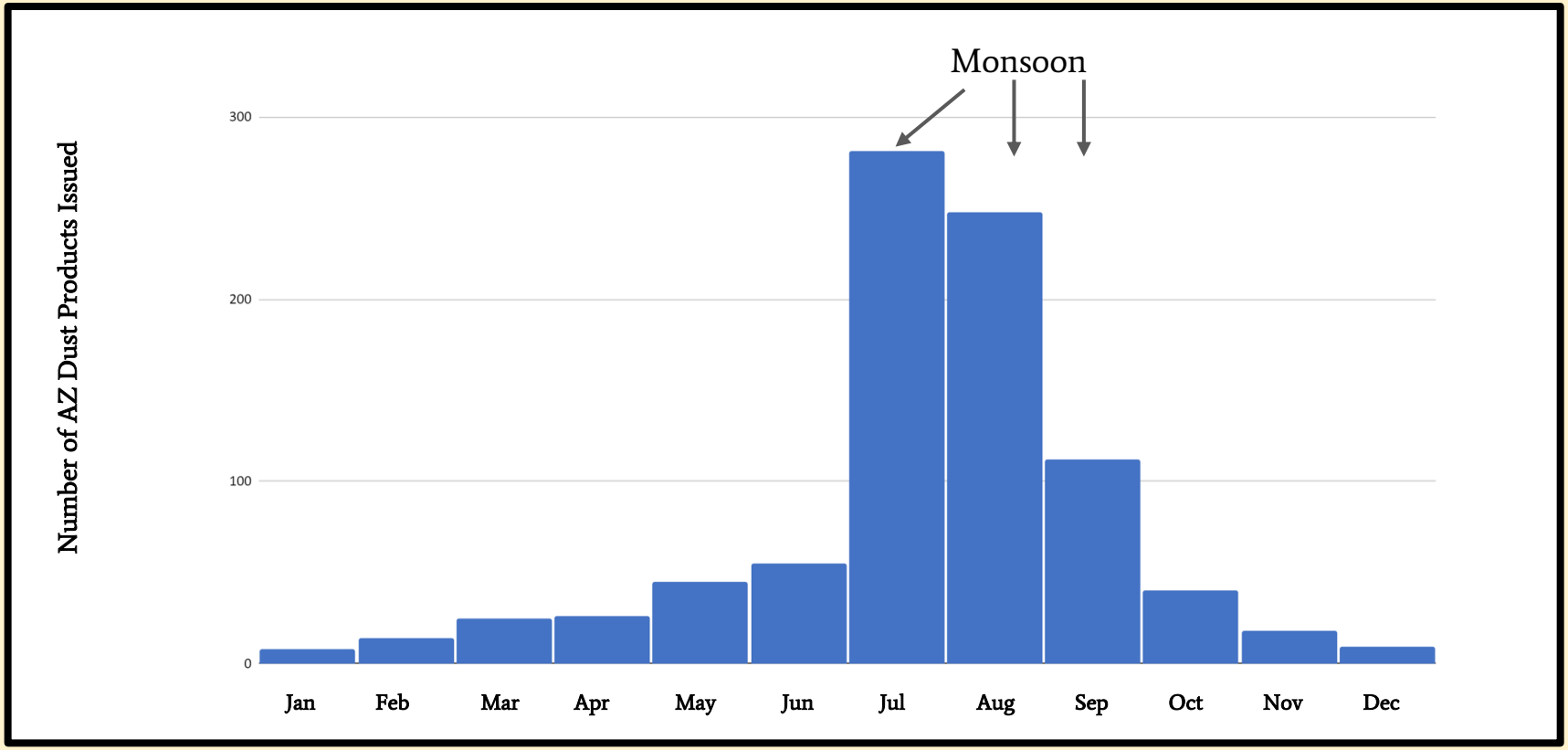
Period of Record: Jan 2006- Dec 2020

Duration of AZ Polygon-based Dust Products

At issuance time | AZ Offices Only

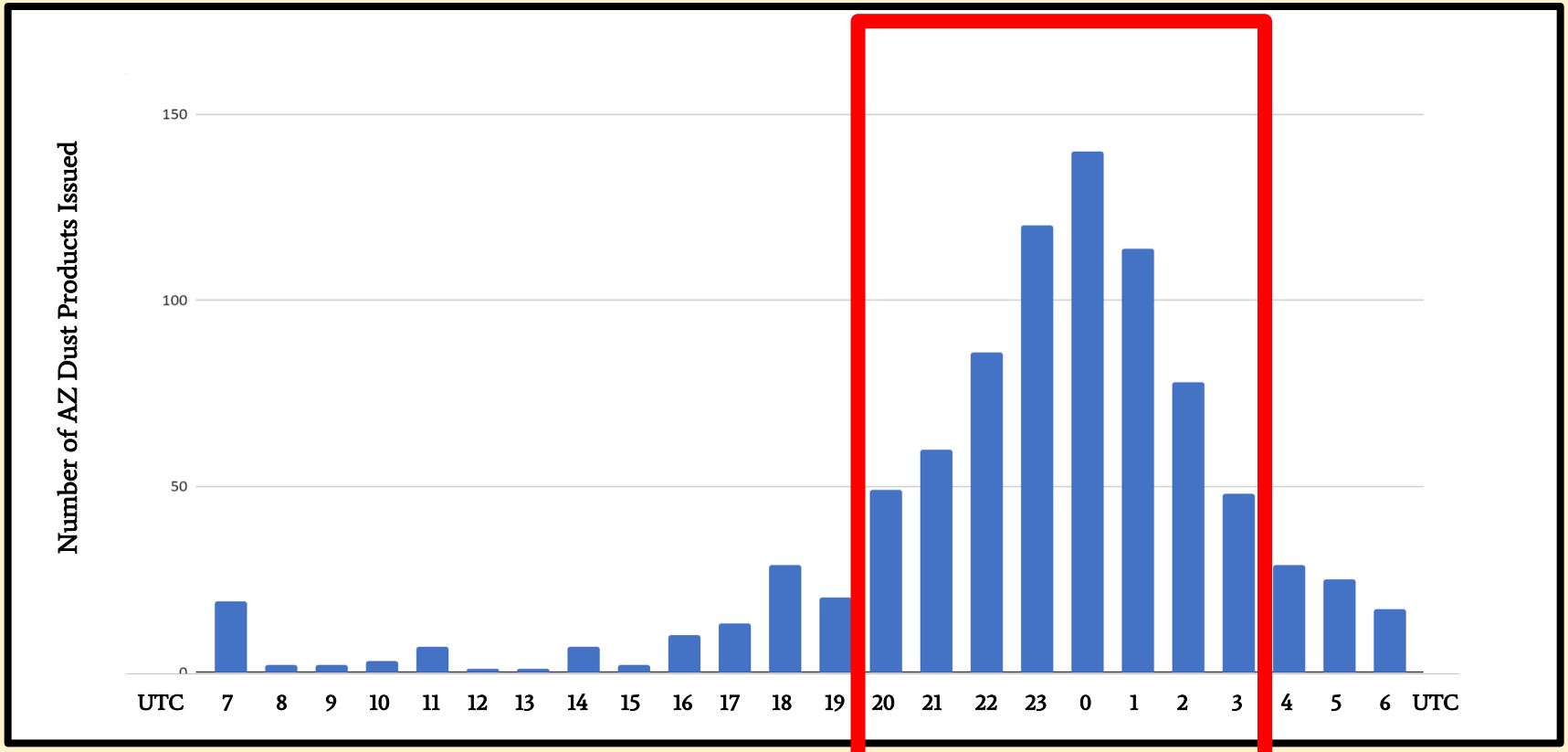


Monthly Distribution of AZ Dust Products



Diurnal Frequency of AZ Dust Products

(Time dust product was issued)



Conclusion

- Over 1500 dust products analyzed
- 36 WFOs have historically issued dust products
- Span 3 NWS Regions
- AZ office account for 68% of the dust products during period of study
- AZ Offices ramp up use of dust products during the monsoon
- Product usage depends on office philosophy and WFO/Regional best practices
- Dust issues expand past the American Southwest

Thank you!

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