

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

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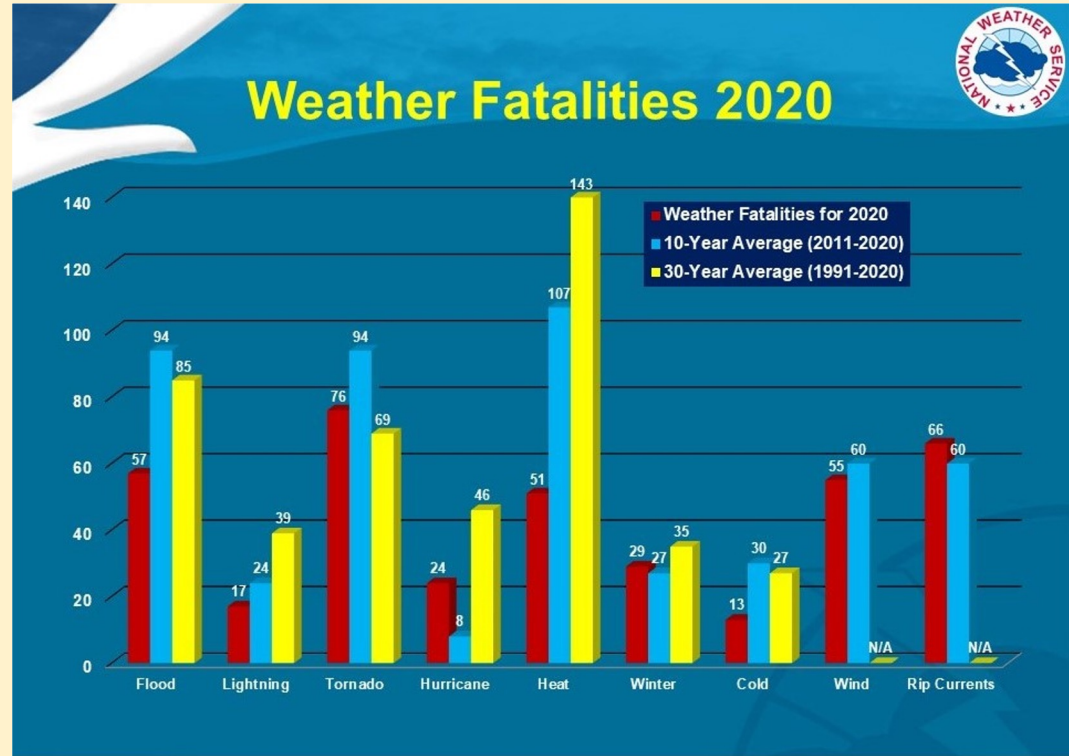
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Laren Reynolds, NWS El Paso

*(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<sup>1</sup> weather phenomena
  - Southern New Mexico's deadliest<sup>2</sup>

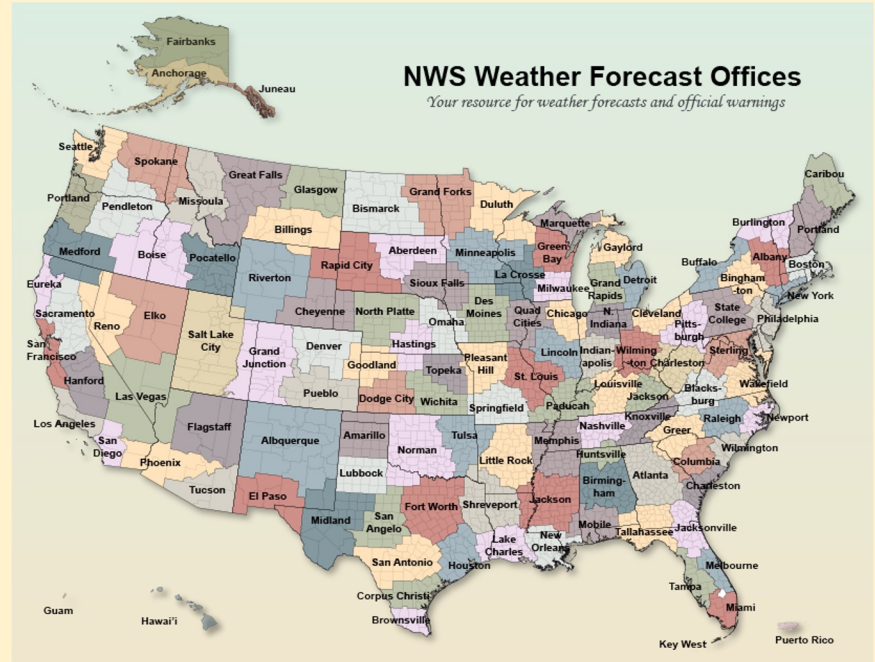


<sup>1</sup>Lader, G., et al., 2016: Blowing Dust and Dust Storms: One of Arizona's Most Underrated Weather Hazards. *NOAA Technical Memorandum NWS-WR 290*.

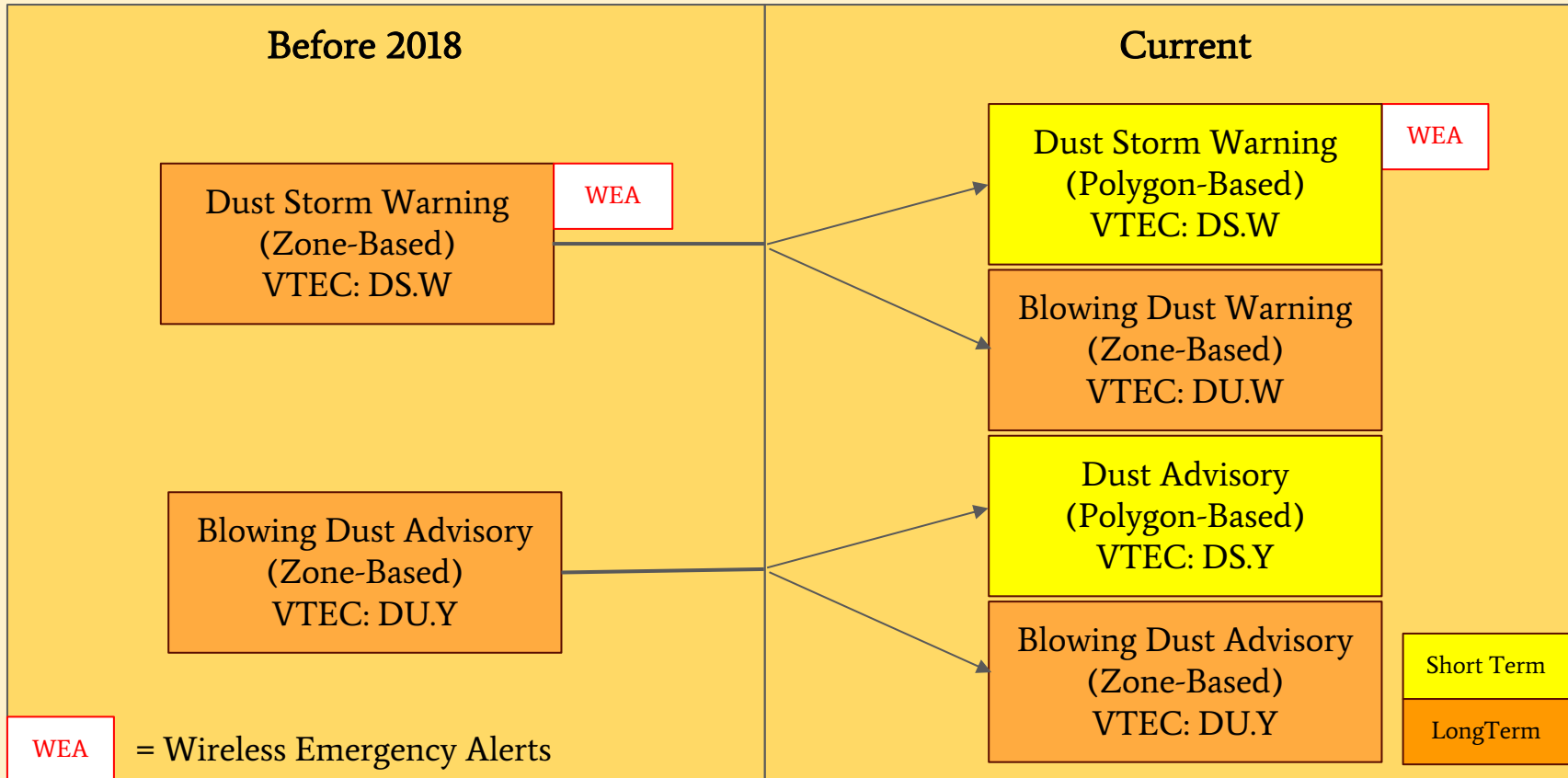
<sup>2</sup>NWS El Paso Storm Data

# Background & Motivation

- How widespread are dust issues across the United States?



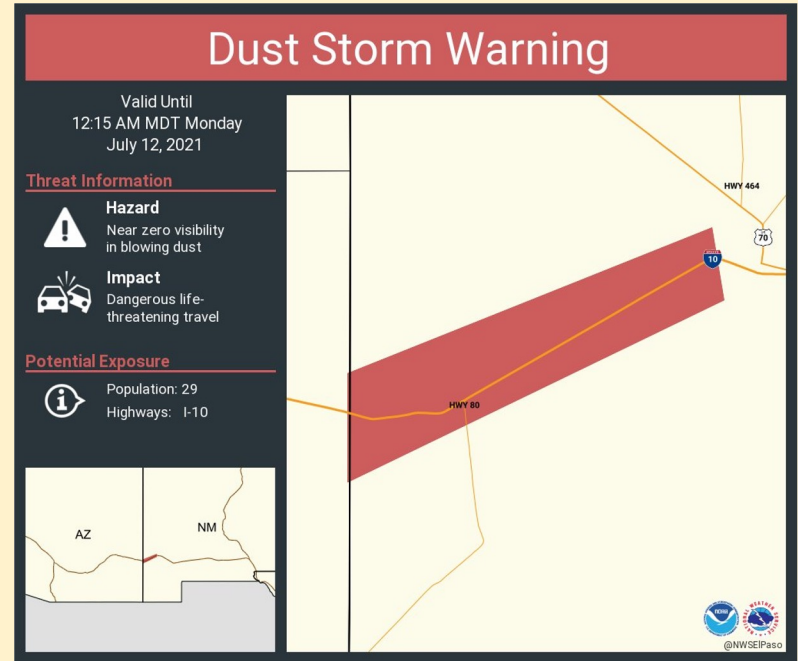
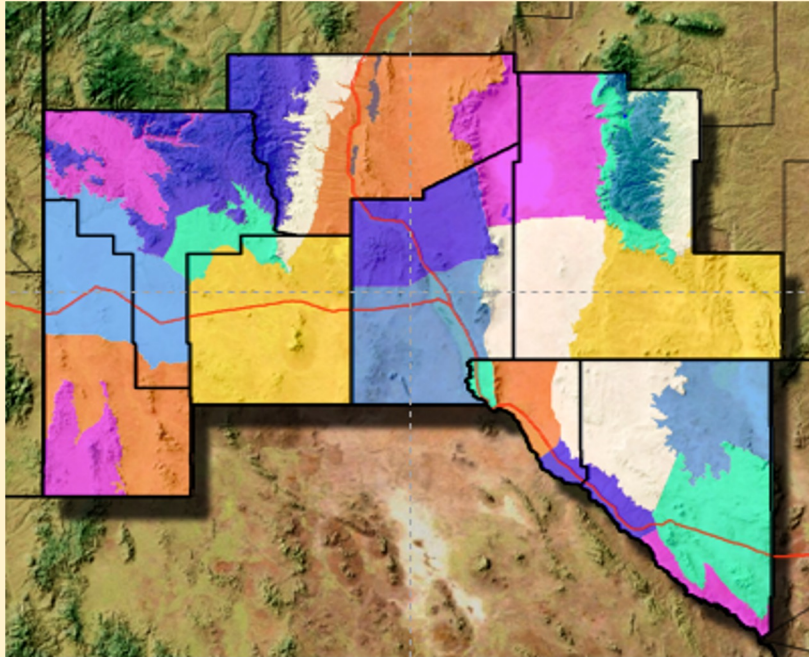
# NWS Dust Product Background





# NWS Dust Product Background

## Zone VS Polygon

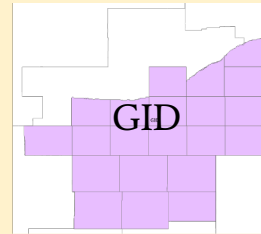


# Methodology

- **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.

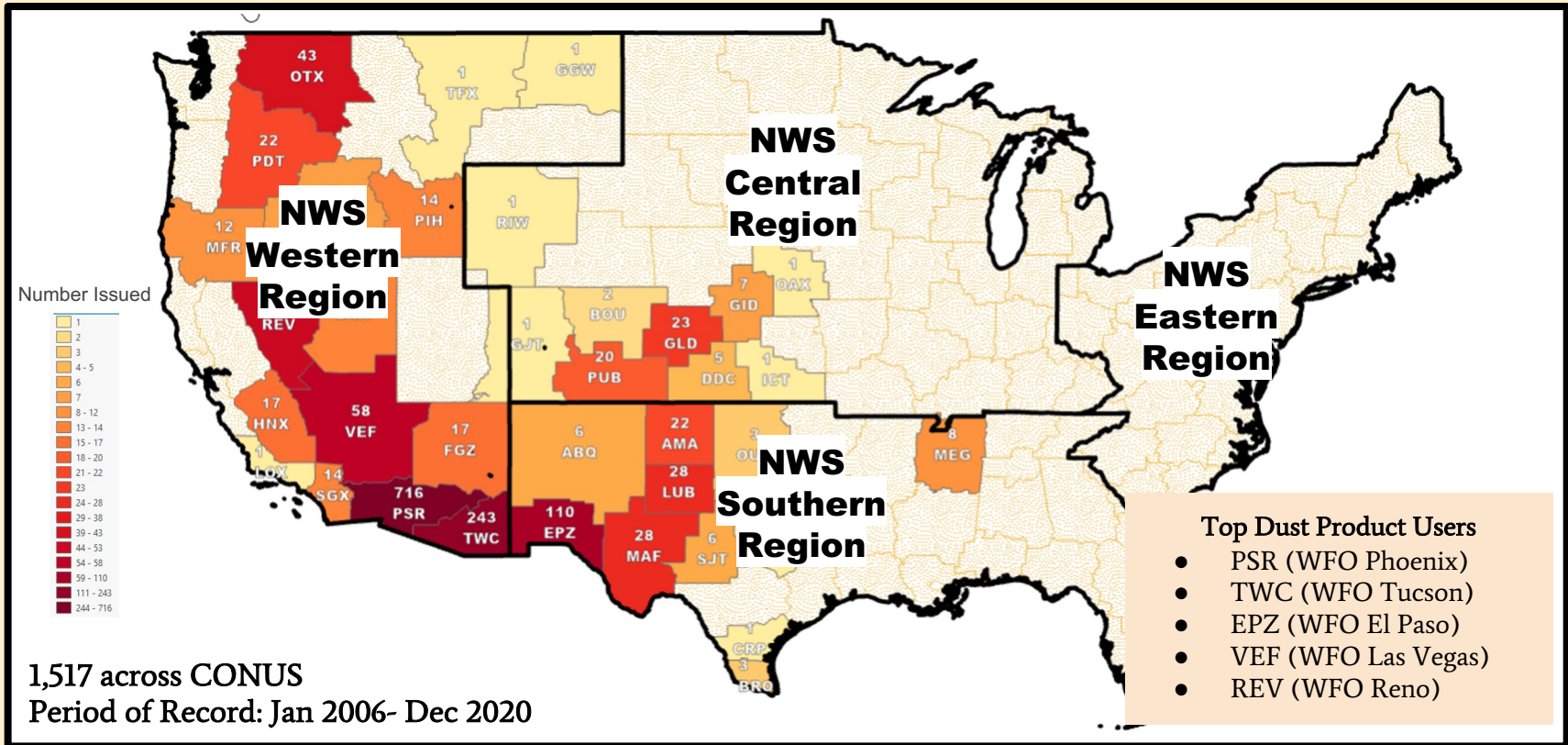


VTEC= 1 advisory issued  
Shapefiles= 1

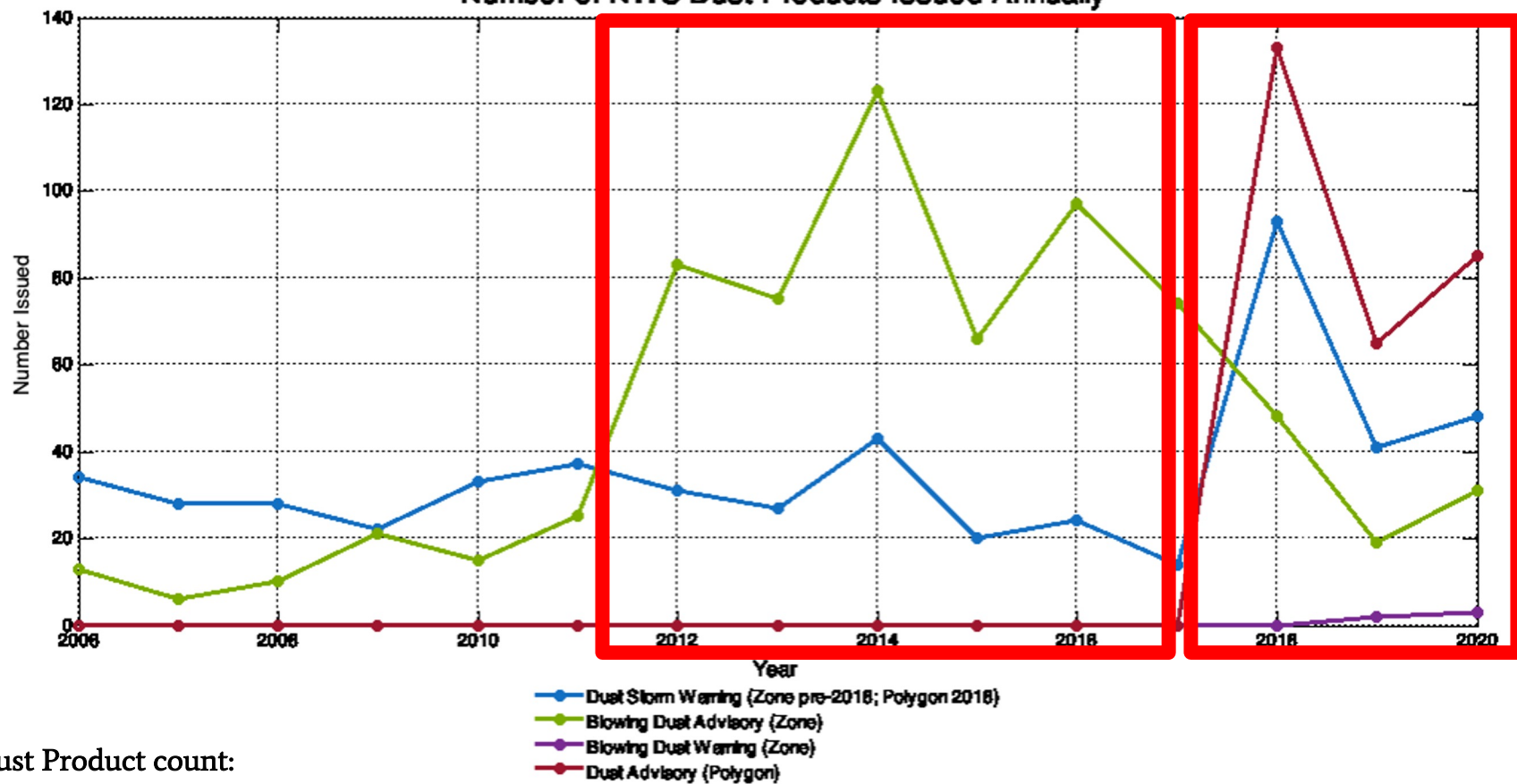


VTEC= 1 advisory issued  
Shapefiles= 21

# Number of Dust Products Issued by WFO



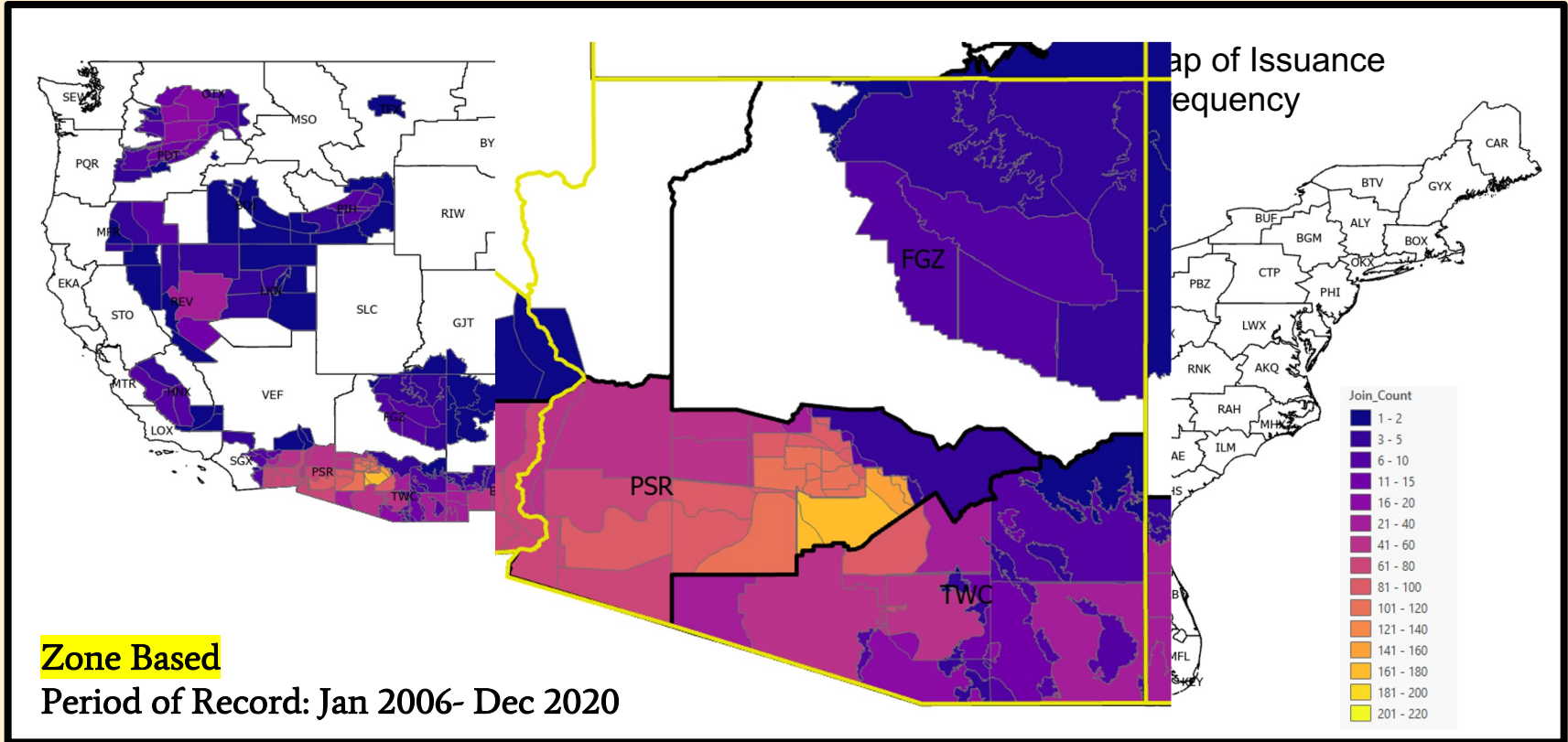
### Number of NWS Dust Products Issued Annually



Dust Product count:  
1,517 across CONUS

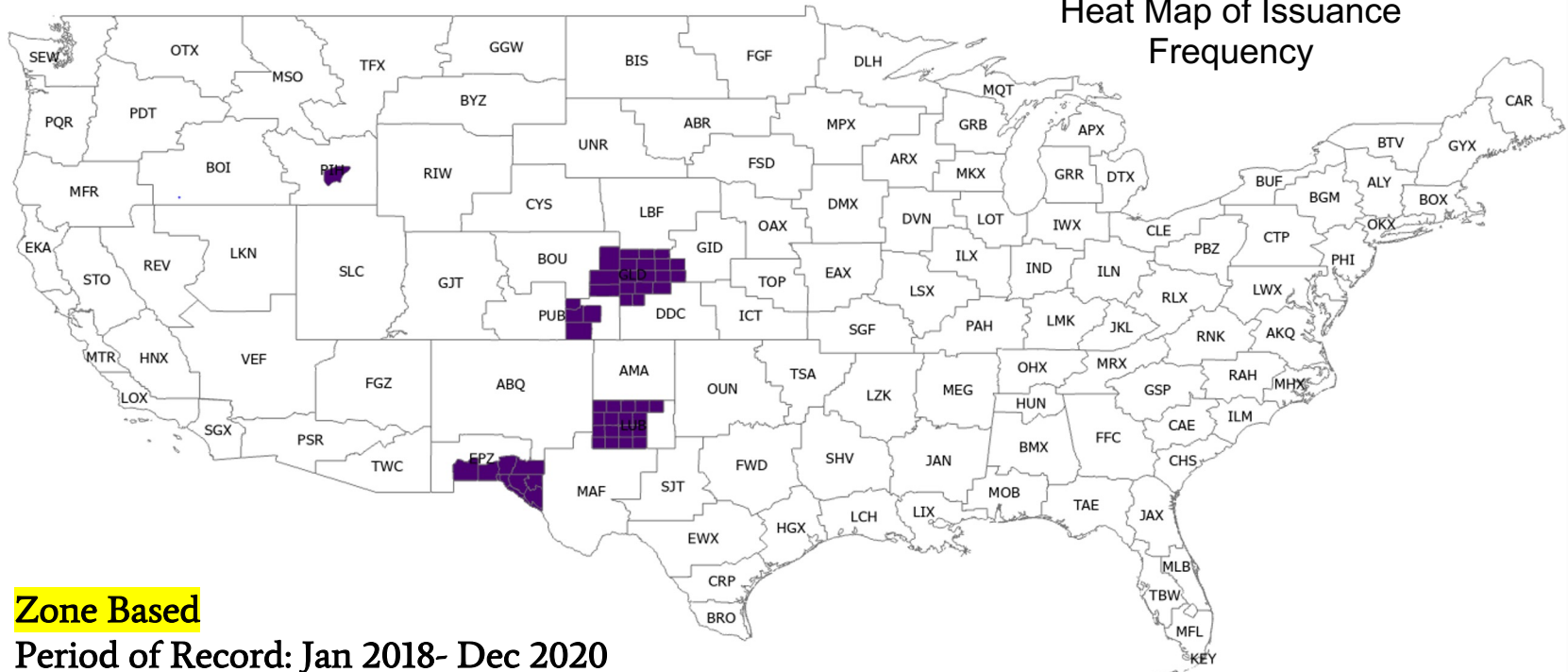


# Blowing Dust Advisory: DUY



# Blowing Dust Warning: DUW

Heat Map of Issuance Frequency

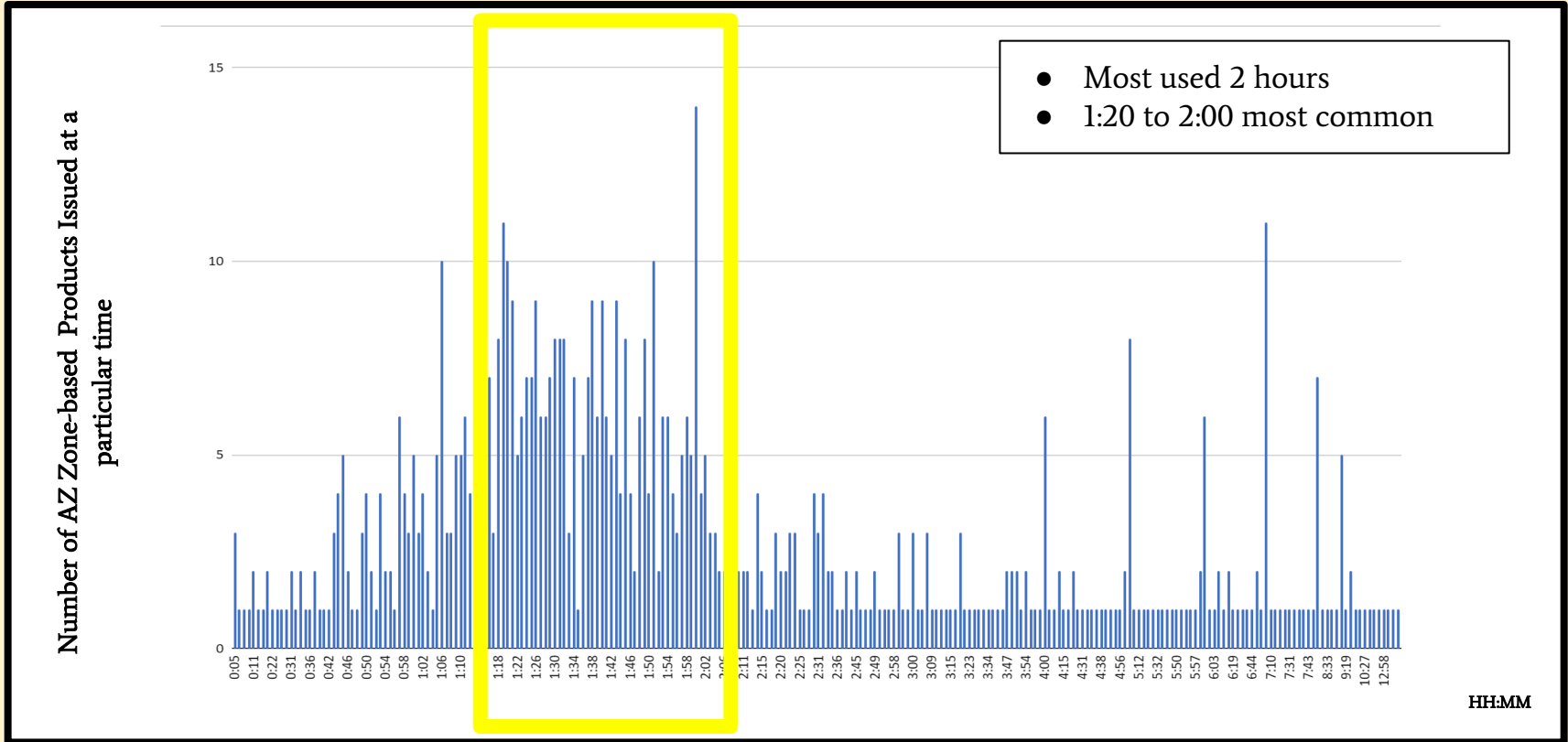


**Zone Based**

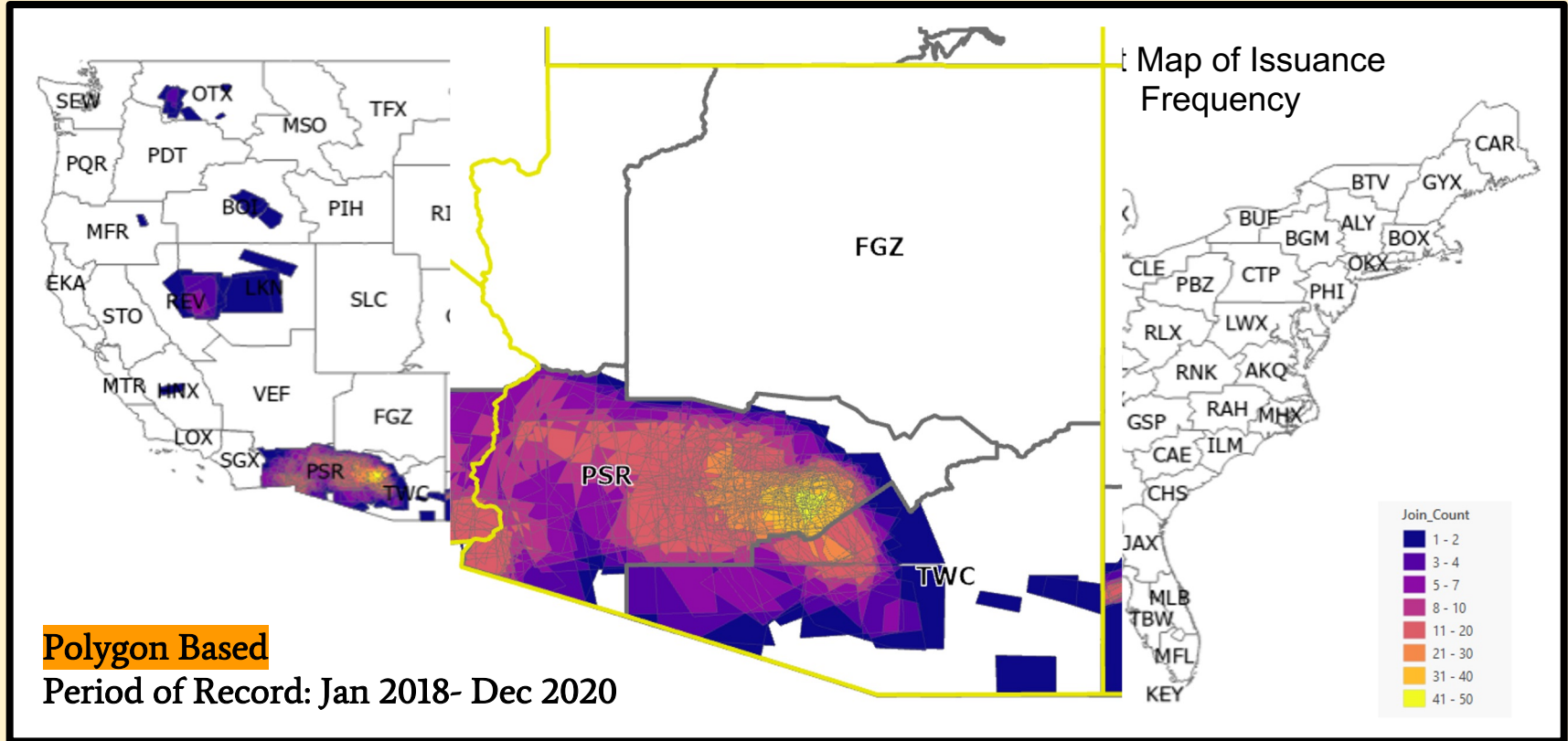
Period of Record: Jan 2018- Dec 2020

# Duration of AZ Zone-based Dust Products

AZ Offices | At issuance time | 95% represented

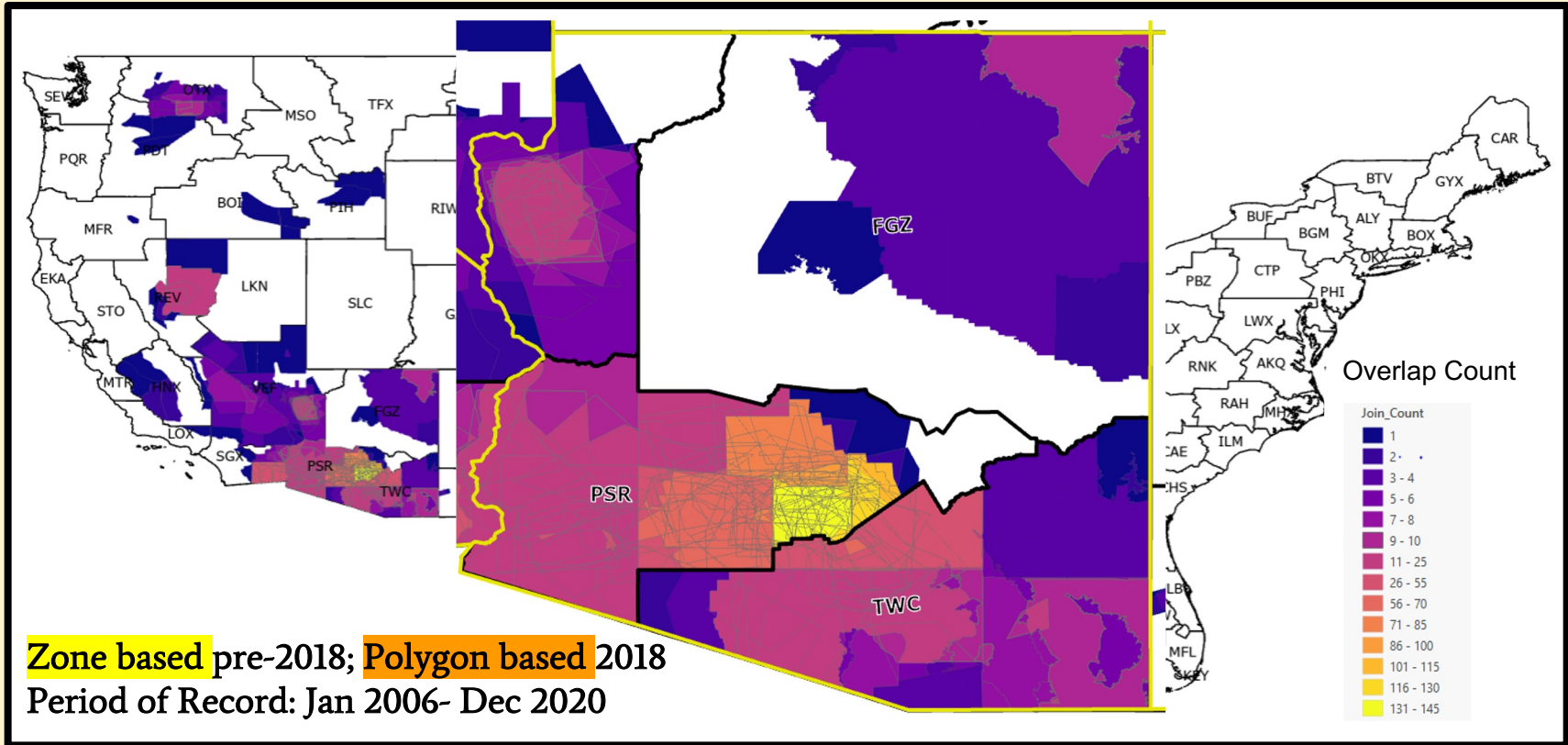


# Dust Advisory: DSY





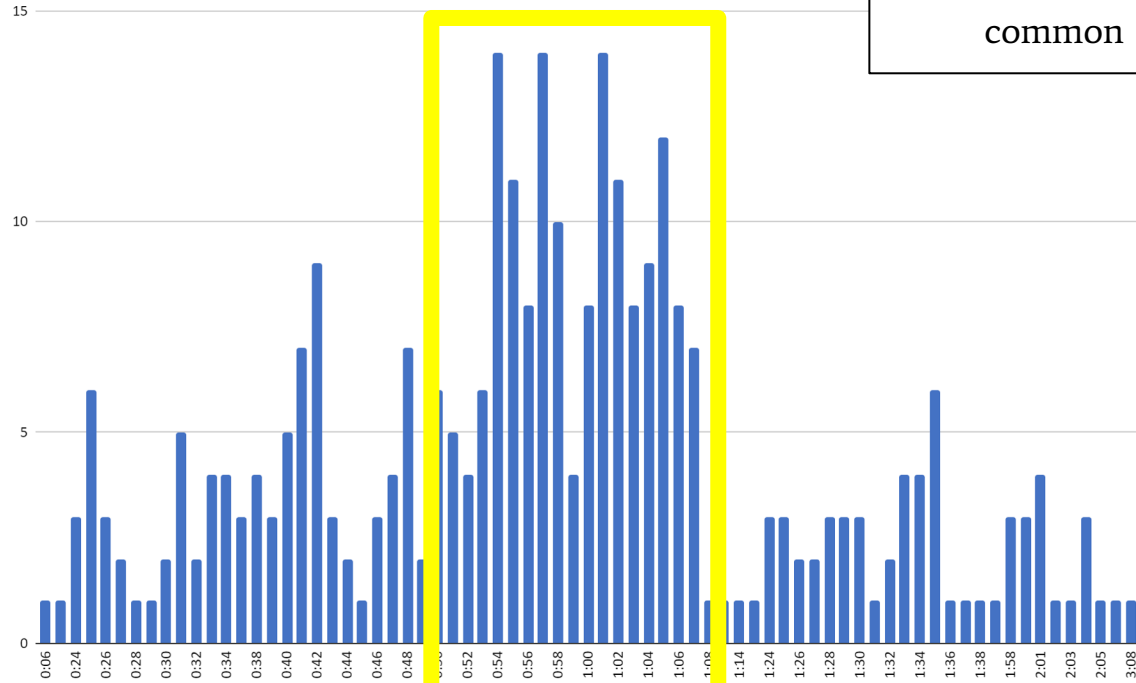
# Dust Storm Warning: DSW



# Duration of AZ Polygon-based Dust Products

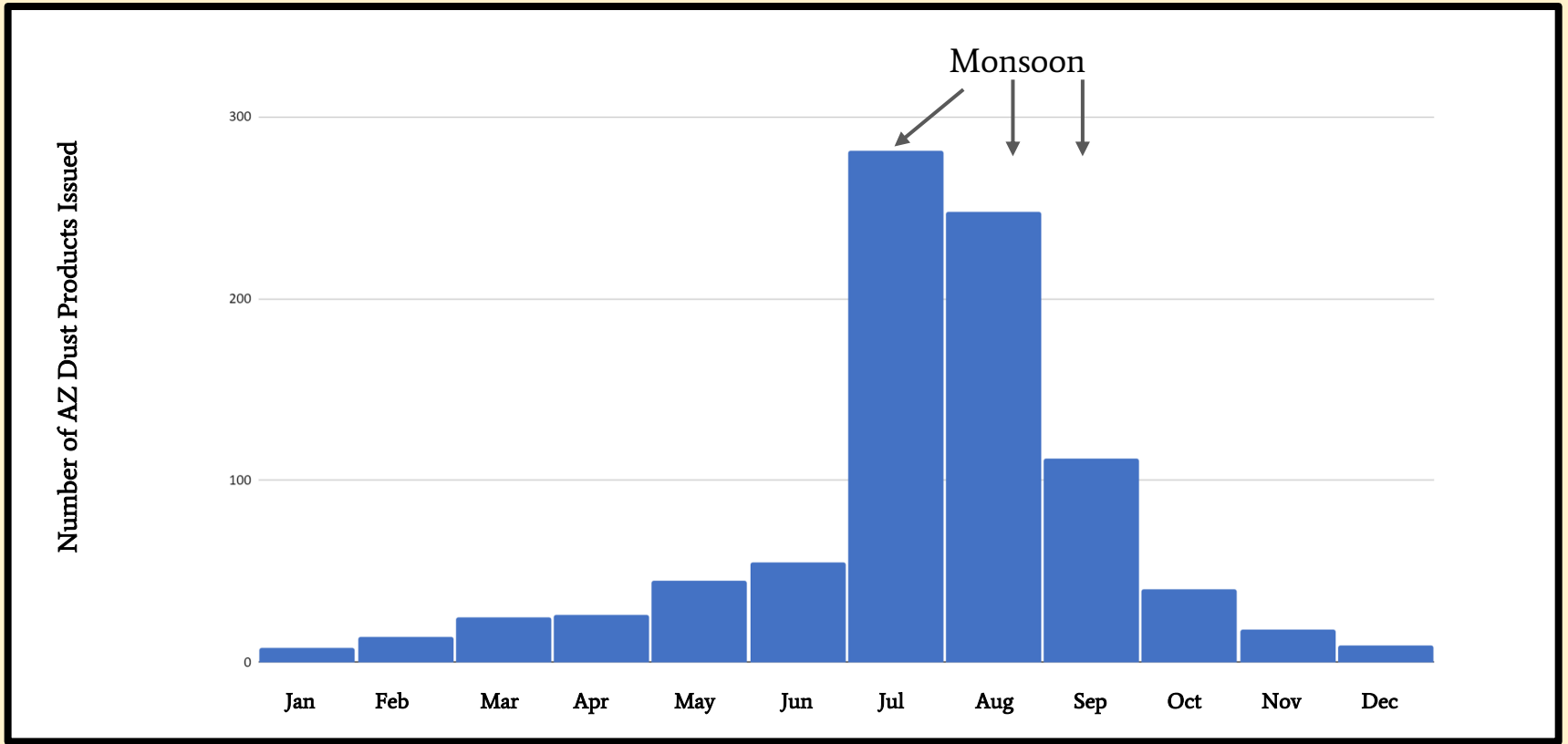
At issuance time | AZ Offices Only

Number of AZ Polygon-based Products Issued at a particular time



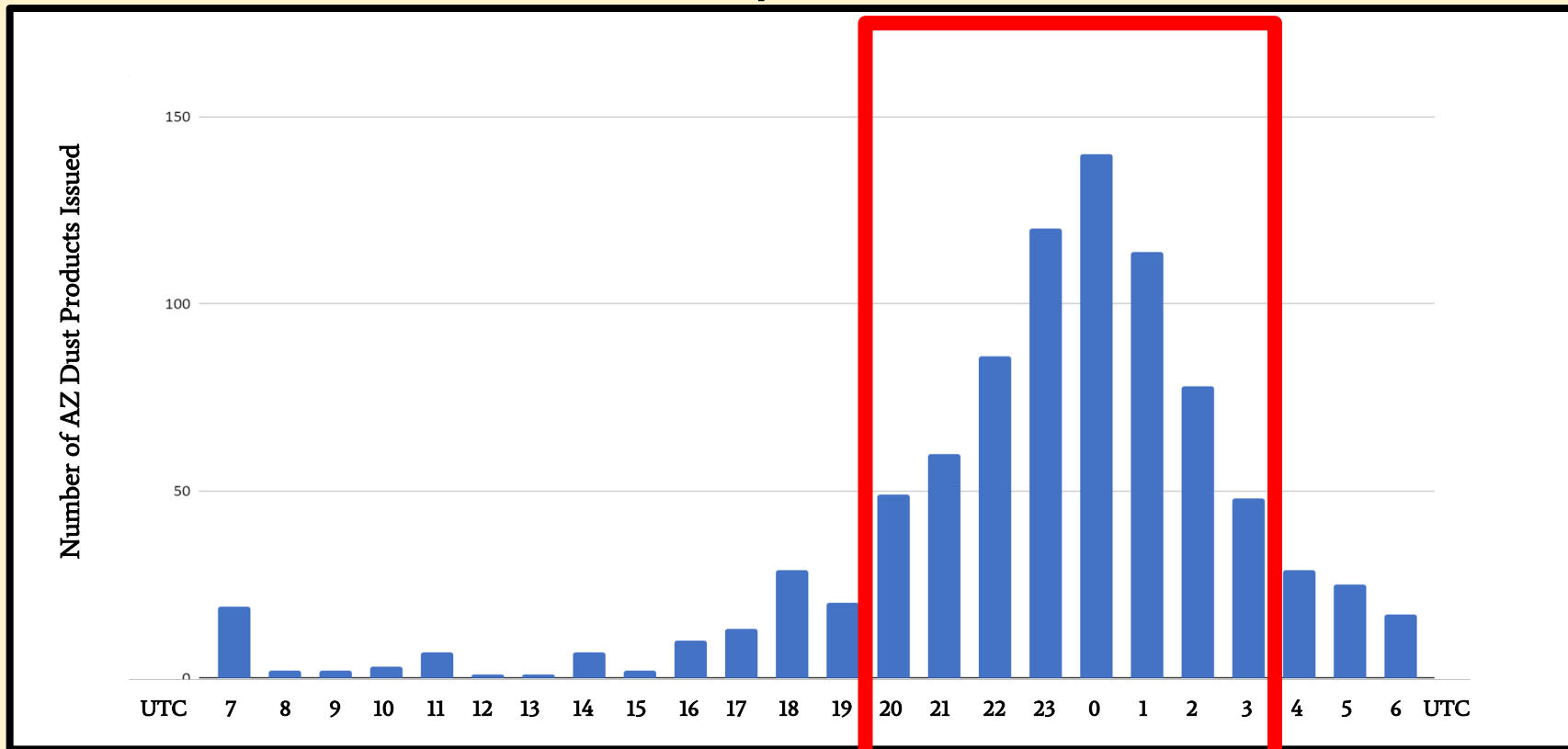
● 00:50 to 1:10 most common

# 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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