Operational Considerations for Dust Storm Forecasting

Presentation for Southern Arizona Dust Workshop

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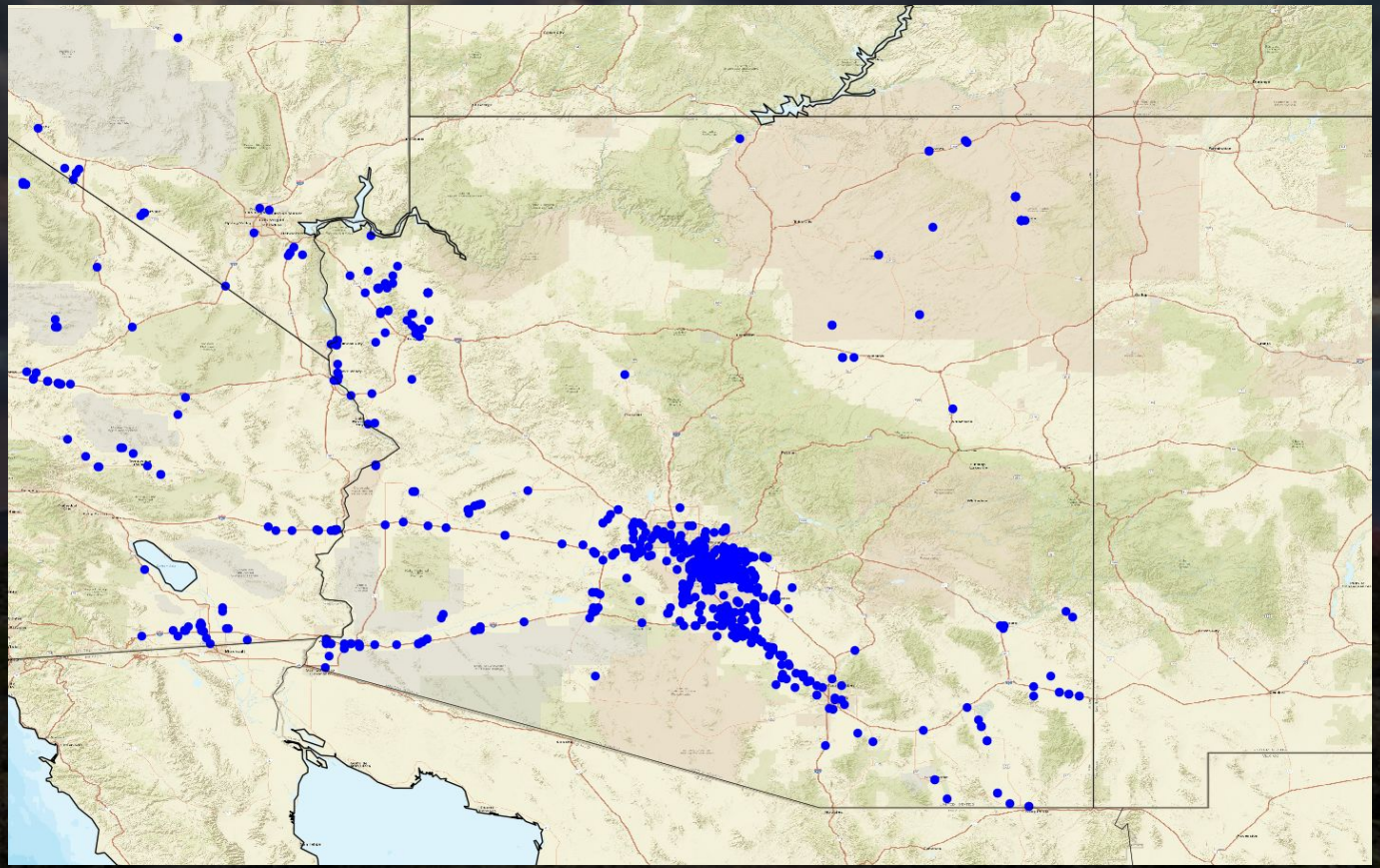
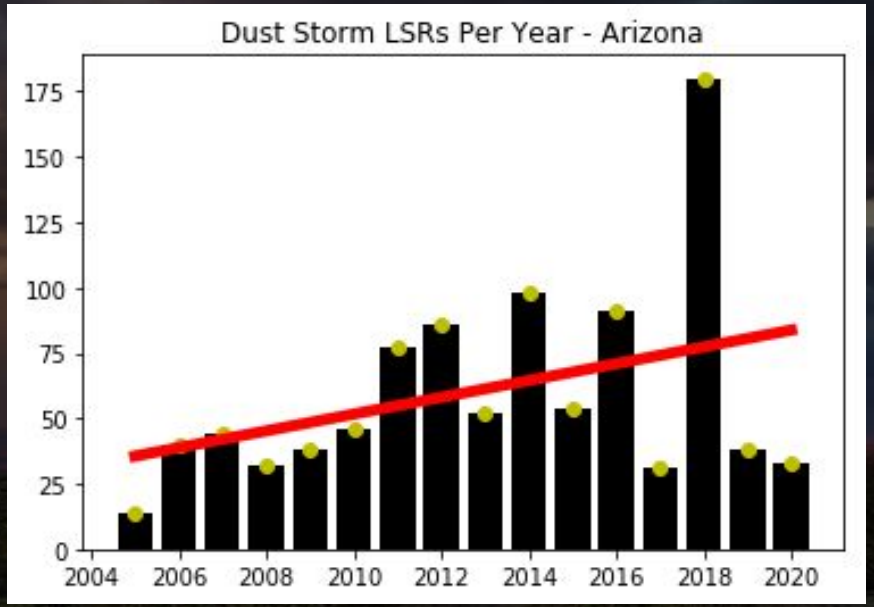
NWS Local Dust Storm Reports AZ-NV-CA (2005-2021)



Dust Storm LSRs Per Year in Arizona

2005-2020

- After peaking in 2018, very quiet in 2019 and 2020.



Dust Storm Products

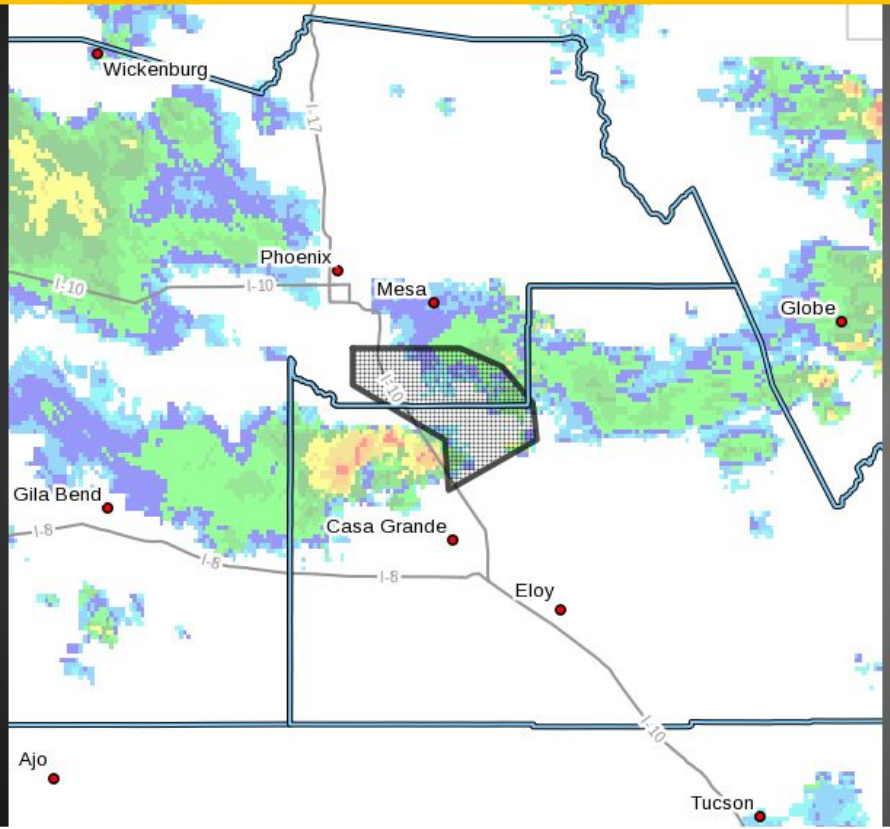
Dust Storm Warnings (polygon based; triggers WEA)
Issued for localized, shorter-lived <= ¼ mile visibility
Typically reserved for haboobs

Blowing Dust Warnings (zone based)
Widespread, longer-lived visibilities <= ¼ mile visibility.

Blowing Dust Advisories (polygon or zone-based)
>¼ mile but < 1 mile

Dust Storm Warning

Saturday, July 14, 2018, 600 pm



Affected Area: far northern Pinal and southeast Maricopa counties

Timing: Until 630 pm.

Winds: Over 40 mph.

Visibility: Below 1/4 mile in blowing dust.

Impacts: Hazardous driving conditions from widespread blowing dust reducing visibility below 1/4 mile at times. Includes I-10 and L-202

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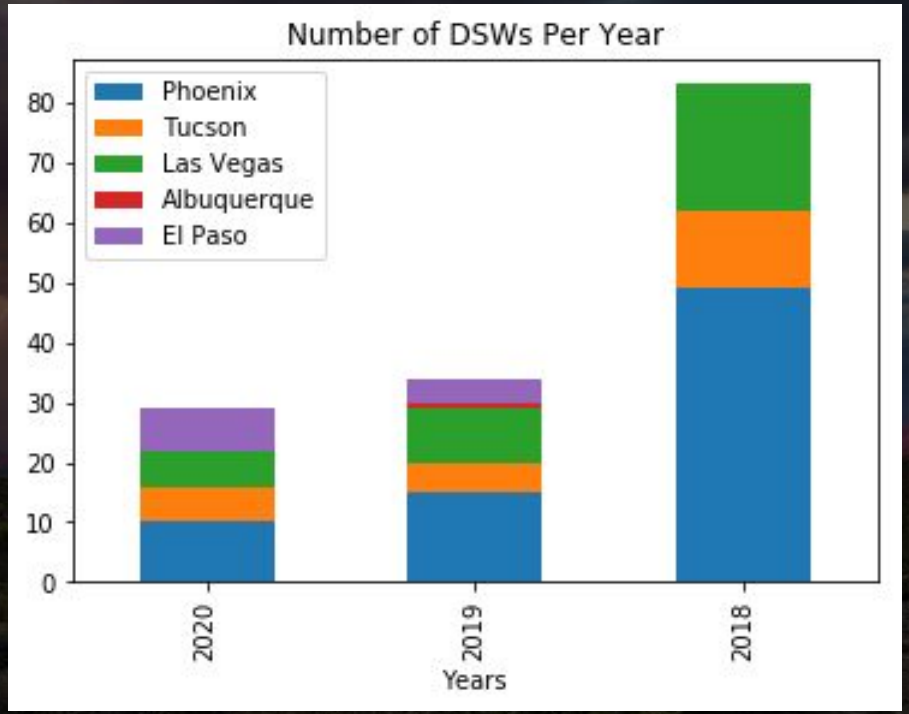
Dust Storm Warning Verification

2018 was busiest year in past 3 for Dust Storm Warnings (83).

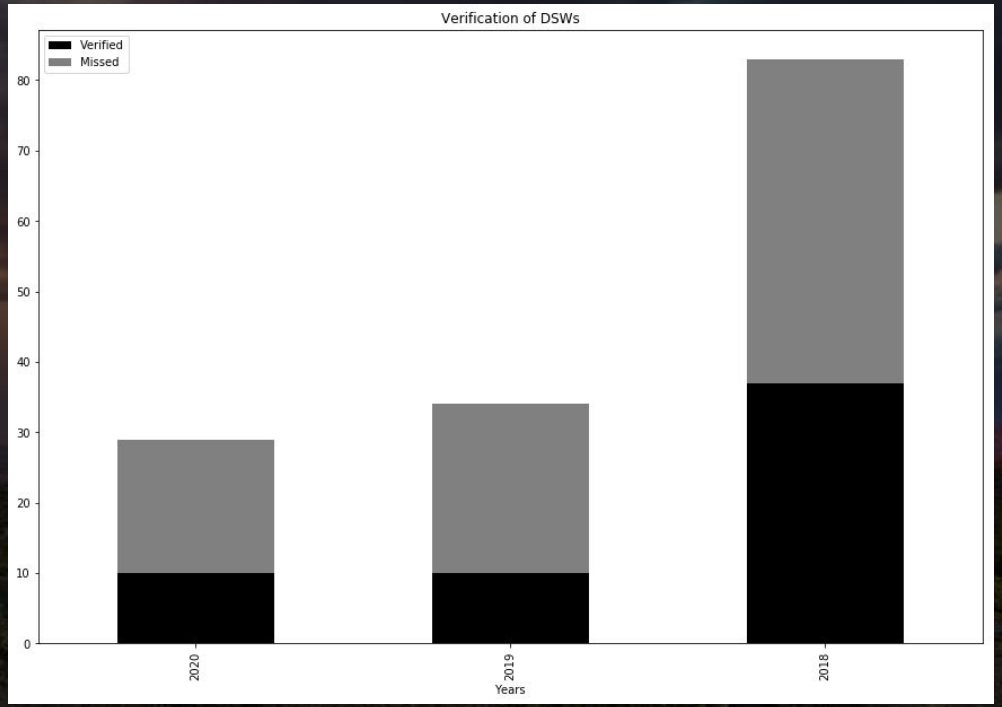
NWS Phoenix issues most per year, followed by Las Vegas and Tucson



Dust Storm Warning Verification - Reports Verified

For 5 southwestern NWS offices (PSR, TWC, EPZ, ABQ, VEF), DSWs verify roughly 33-50% per year.

Reporting practices vary by office

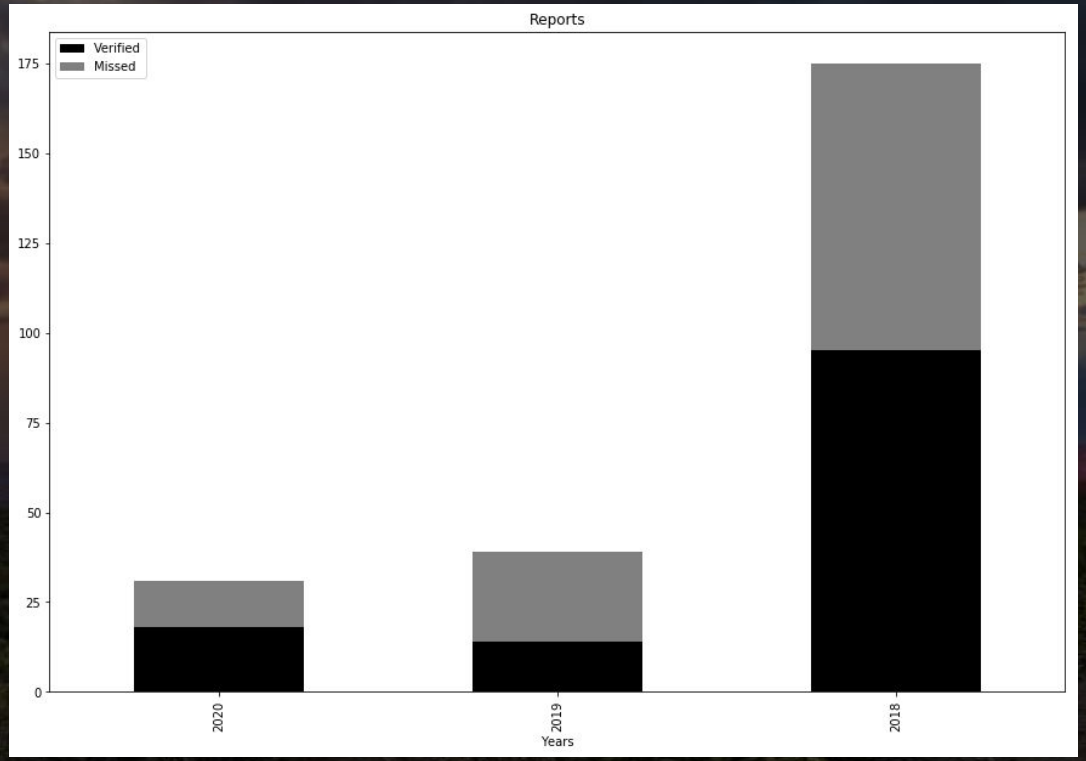


Dust Storm Warning Verification - Reports Warned

Number of reports captured by a DSW varies from year to year (35-60%).

Average lead times (first event) range from 16-32 min for PSR, VEF, and TWC:

- 26-38 min average lead times for all events



Dust Storm Warning Initiatives with ADOT

NWS receives ADOT dust sensor visibility notifications

ADOT radar installed near I-10 and Picacho.

ADOT and NWS coordinate extensively during monsoon.

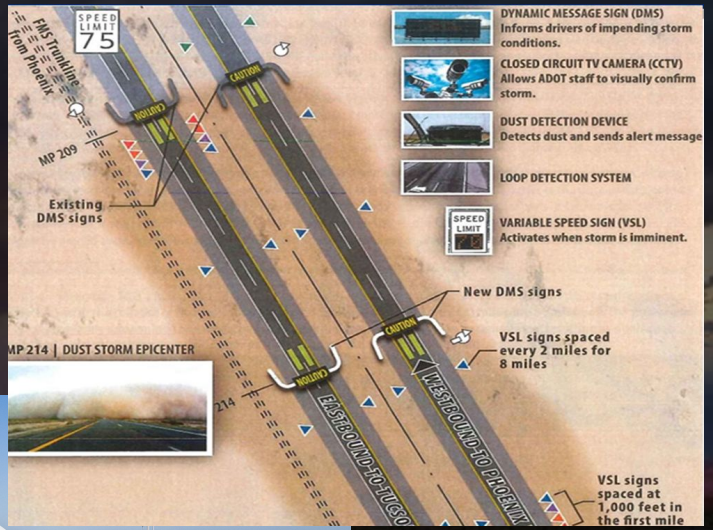
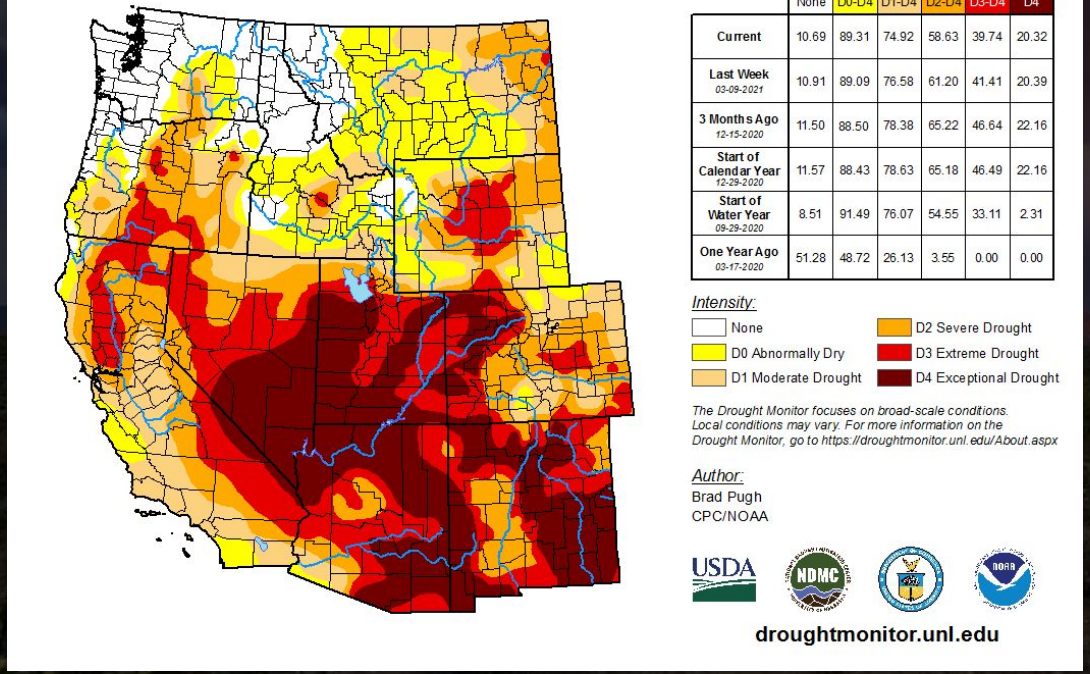


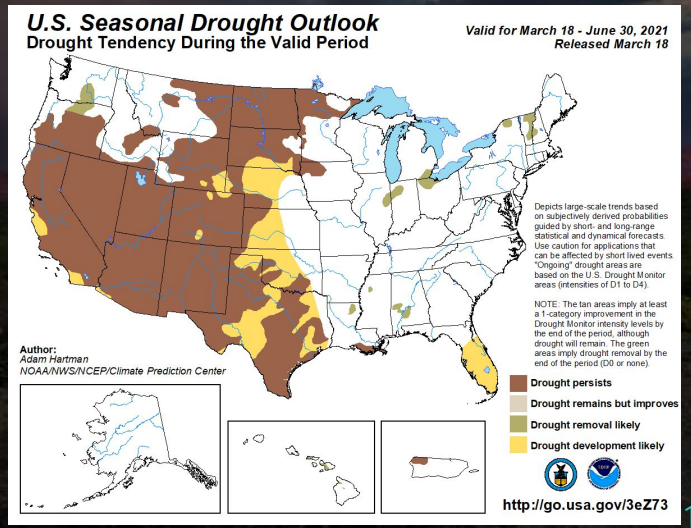

Photo courtesy ADOT

Current Drought Monitor and Outlook

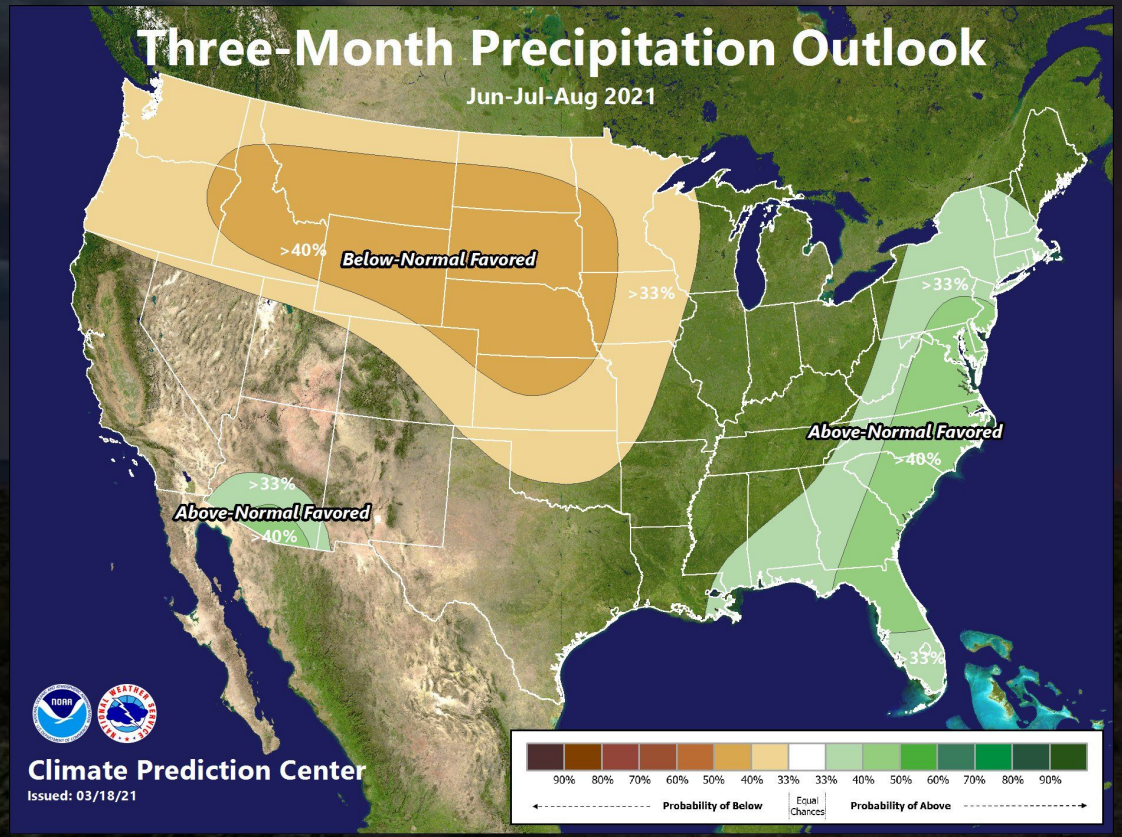


99%+ of dust-generating area (AZ-NV-CA) in drought

- Similar to 2018 (more D3-D4) with drought persisting

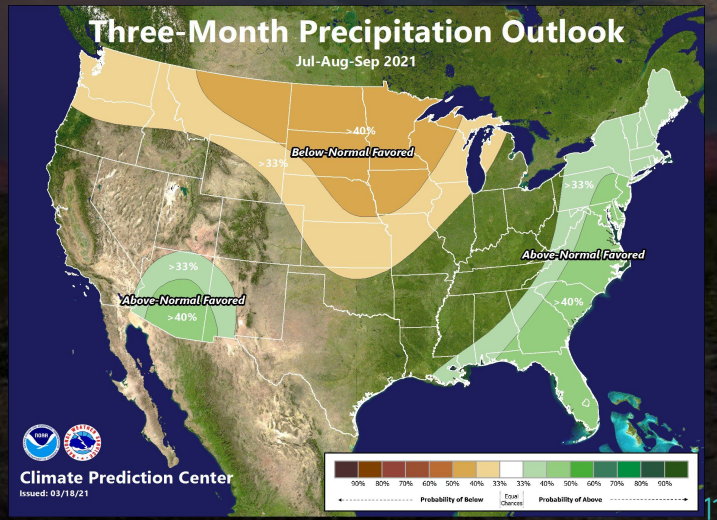


CPC Precipitation Outlooks for 2021 Monsoon

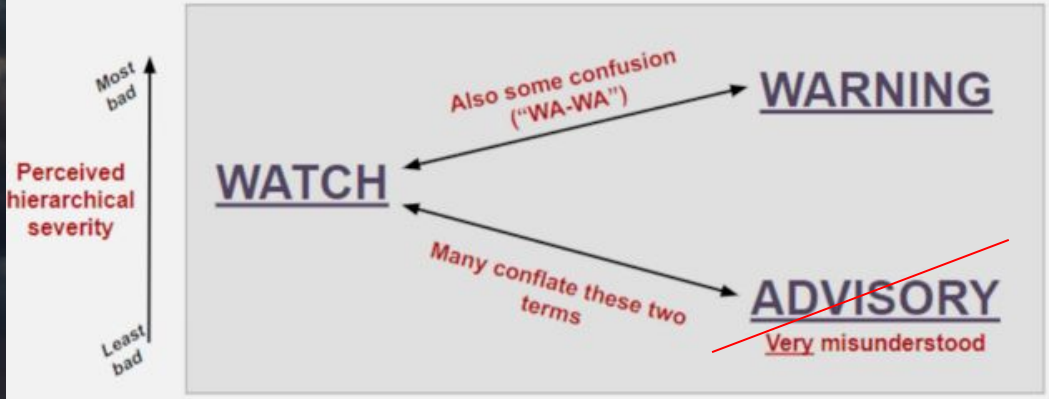


Odds slightly tilted towards above normal precipitation

- Earlier onset than last 2 years and/or more t-storms?



Future Changes to Advisories (as early as 2024)



Current NWS WWA System

Headline Confusion

Too Many Products & Product Types

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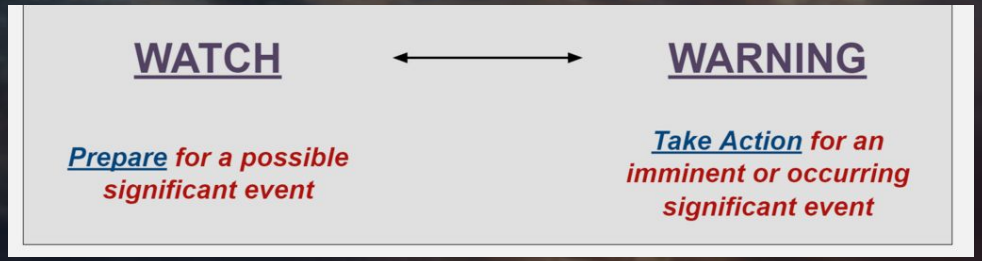

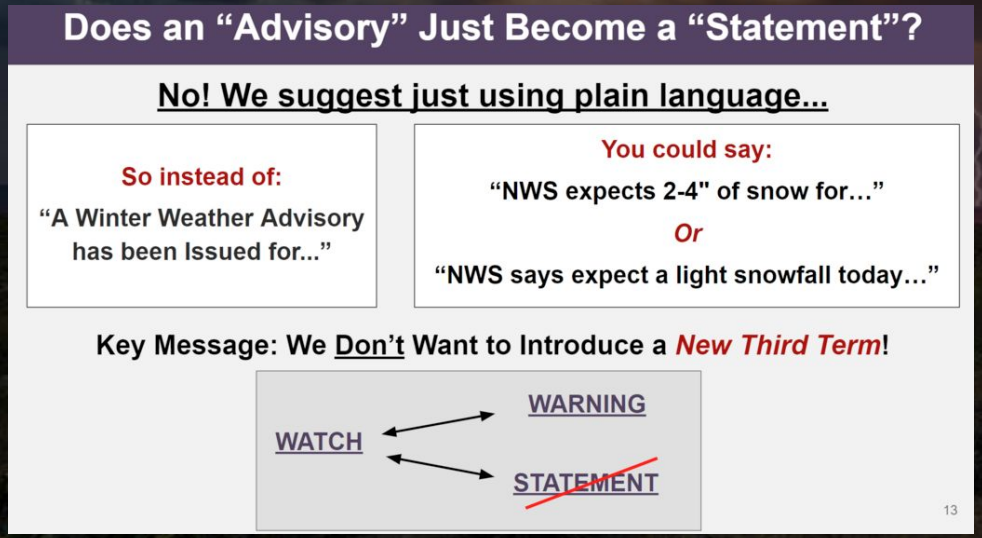

NWS searching for ways to simplify messaging, including eliminating the "advisory" term

Plain-language statements or other solutions will replace:

- Blowing Dust Advisories
- Dust Advisories
- Wind Advisories

Seeking feedback over next few years to handle these changes

NWS Phoenix Contact Information

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Save the Date!
Monsoon Awareness Week
June 13-19, 2021

Operational Considerations (PHX Example)

Issuing warnings for point locations challenging:

- Airport Weather Warning (AWW) verification for dust storms not as good as wind

Issuing DSWs (or AWWs) for rare (4-5 yr ARI) dust storms with ≤ 35 knot (40 mph) gusts

Concurrent SVRs and DSWs

Dust Storms at PHX with Wind Gusts ≤ 35 knots:	
1974-09-13 22:00:00	35.0 (at wind criteria)
1977-07-11 03:15:00	35.0 (at wind criteria)
1980-07-24 02:30:00	29.0
1982-07-23 02:42:00	34.0
1983-08-14 01:34:00	35.0 (at wind criteria)
1984-07-07 01:16:00	29.0
1991-06-06 01:00:00	33.0
1997-08-29 01:56:00	26.0
2003-07-16 03:48:00	35.0 (at wind criteria)
2009-07-19 02:09:00	19.0
2011-07-06 03:12:00	33.0
2013-07-21 17:17:00	25.0
2016-08-22 00:43:00	30.0
2020-08-16 01:56:00	27.0