Operational Considerations for Dust Storm Forecasting

Presentation for Southern Arizona Dust Workshop

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Dust Storm Products

- **Dust Storm Warnings (polygon based; triggers WEA)**
  Issued for localized, shorter-lived $\leq \frac{1}{4}$ mile visibility
  Typically reserved for haboobs

- **Blowing Dust Warnings (zone based)**
  Widespread, longer-lived visibilities $\leq \frac{1}{4}$ mile visibility.

- **Blowing Dust Advisories (polygon or zone-based)**
  $>\frac{1}{4}$ 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
2018 was busiest year in past 3 for Dust Storm Warnings (83).

NWS Phoenix issues most per year, followed by Las Vegas and Tucson.
For 5 southwestern NWS offices (PSR, TWC, EPZ, ABQ, VEF), DSWs verify roughly 33-50% per year.

Reporting practices vary by office
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
NWS receives ADOT dust sensor visibility notifications

ADOT radar installed near I-10 and Picacho.

ADOT and NWS coordinate extensively during monsoon.
99%+ of dust-generating area (AZ-NV-CA) in drought

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

Too Many Products & Product Types

Headline Confusion
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

Key Message: We Don’t Want to Introduce a New Third Term!

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
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 $\leq 35$ knot (40 mph) gusts

Concurrent SVRs and DSWs

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**Dust Storms at PHX with Wind Gusts $\leq 35$ 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

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**10/2/2010 Radar Study of Observed Dust Storm Locations (3+ Reports) from 2010-2019**

Courtesy Jaret Rogers and Sam Meltzer