



Green



# Polygon Dust Storm Warnings

Ken Waters  
National Weather Service, Phoenix  
March 5, 2019



# History

- 2006: NWS began issuing Dust Storm Warnings
- 2011: NWS Phoenix issued “Local Dust Storm Warnings” for short period (2 months)
- 2011: “Massive” dust storm occurs in Arizona, followed by many large-scale storms that summer
- 2012: WEA cell phone alerts implemented
- 2017: NWS Phoenix redesigns public zones
- 2018: New Polygon Dust Storm Warnings implemented

# History

- Dust storm warnings issued by National Weather Service since 2006

WVUS75 KPSR 142142  
NPWPSR

URGENT - WEATHER MESSAGE  
NATIONAL WEATHER SERVICE PHOENIX AZ  
242 PM MST FRI APR 14 2006

AZZ020-025-026-142300-  
/O.NEW.KPSR.DS.W.0001.060414T2142Z-060414T2300Z/  
/O.CON.KPSR.WI.Y.0010.000000T0000Z-060415T0400Z/  
LOWER COLORADO RIVER VALLEY AZ-YUMA/MARTINEZ LAKE AND VICINITY-  
SOUTHWEST DESERTS-  
INCLUDING THE CITIES OF...EHRENBERG...PARKER...SAN LUIS...  
SOMERTON...YUMA...FORTUNA FOOTHILLS...DATELAND...TACNA...WELLTON  
242 PM MST FRI APR 14 2006

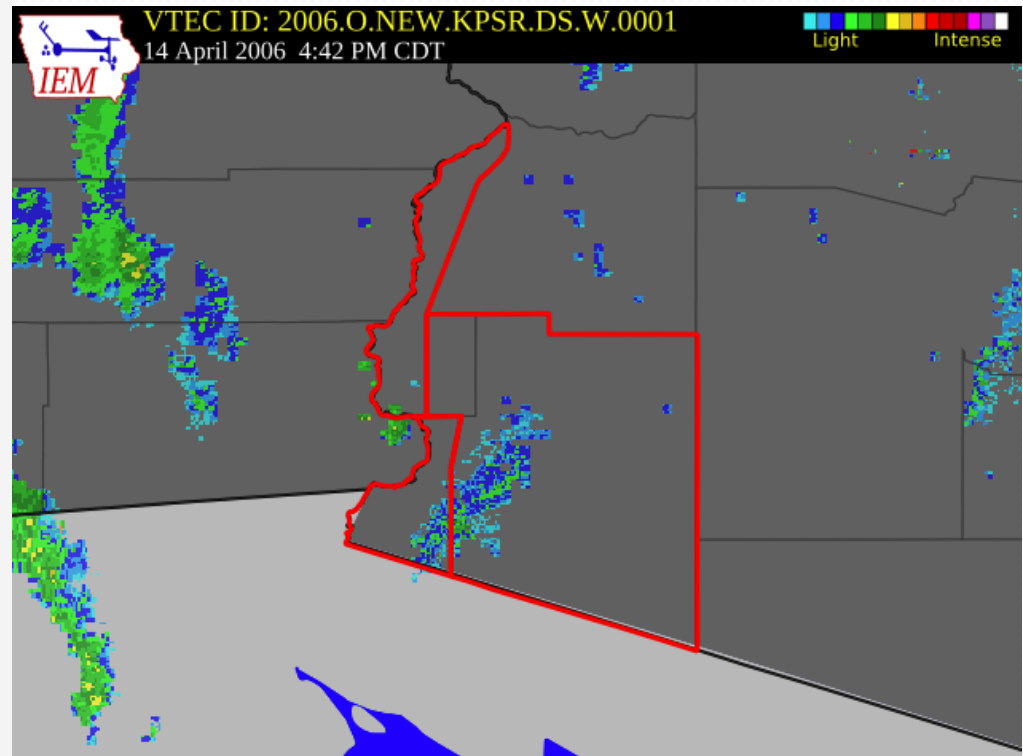
...DUST STORM WARNING IN EFFECT UNTIL 4 PM MST THIS AFTERNOON...  
...WIND ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING...

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A DUST STORM  
WARNING IN EFFECT UNTIL 4 PM FOR THE LOWER COLORADO RIVER VALLEY  
...SOUTH OF BLYTHE...AND WESTERN PORTIONS OF YUMA COUNTY WEST OF  
TACA.

A WIND ADVISORY REMAINS IN EFFECT UNTIL 9 PM MST THIS EVENING.

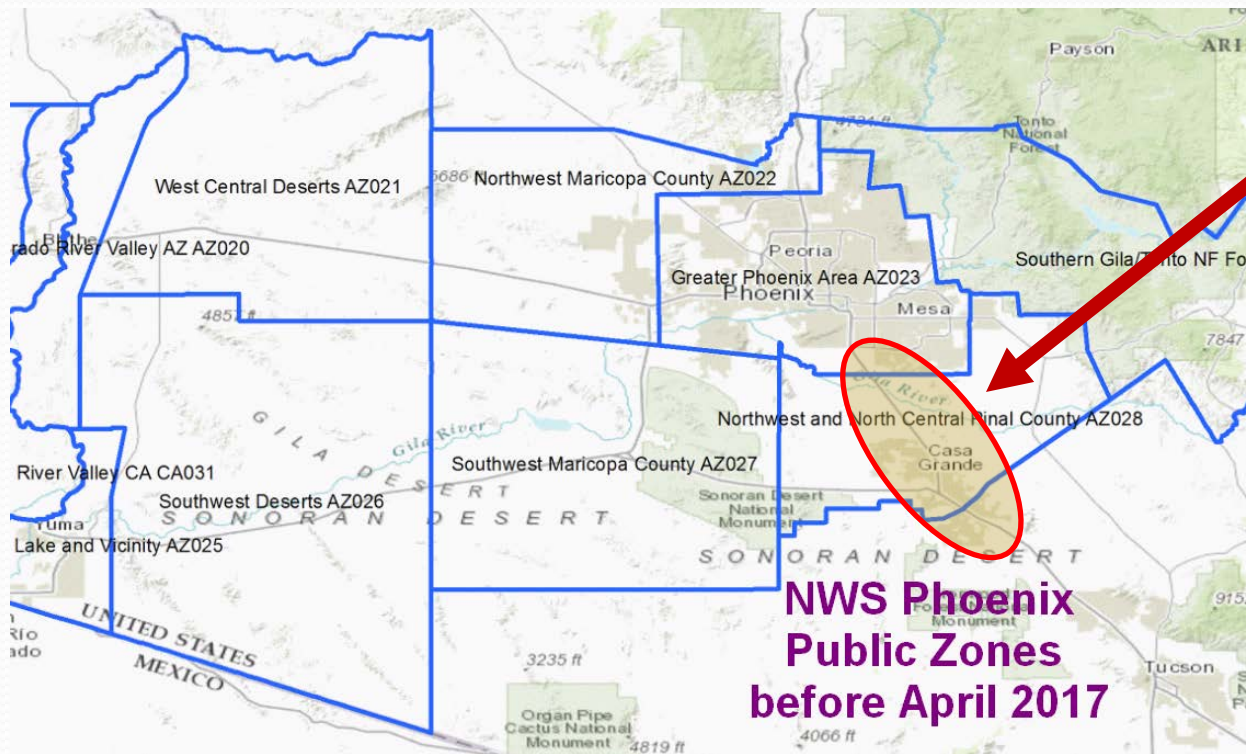
STRONG WINDS ARE EXPECTED TO GENERATE EXTENSIVE AREAS OF BLOWING  
DUST ON THE DESERTS. VISIBILITIES HAVE THE POTENTIAL TO FALL TO  
UNDER A MILE AT TIMES...ESPECIALLY NEAR AGRICULTURAL AREAS.

A WIND ADVISORY MEANS THAT SUSTAINED WIND SPEEDS OF BETWEEN  
30 AND 40 MPH ARE EXPECTED...OR WIND GUSTS TO 45 MPH. WINDS THIS  
STRONG CAN PRODUCE HAZARDOUS CROSS-WINDS AND MAKE DRIVING  
DIFFICULT...ESPECIALLY FOR HIGH PROFILE VEHICLES. USE EXTRA  
CAUTION.



# History

- Dust storm warnings issued by National Weather Service since 2006
  - Areal extent based on public zones



**Common  
dust corridor  
represented  
by only one  
or two zones**

**NWS Phoenix  
Public Zones  
before April 2017**

# Pre-2011 Dust Storm Warnings

- Combined with other unrelated warnings such as Wind Advisory and Excessive Heat Warnings
  - Resulted in long, confusing products, often with nonsensical statements (e.g., “Drink water” for a Dust Storm Warning)
  - Were time-consuming for forecasters to issue due to many steps to produce
  - Inability to define precise start and stop times

WWUS75 KPSR 142142

NPWPSR

URGENT - WEATHER MESSAGE

NATIONAL WEATHER SERVICE PHOENIX AZ

242 PM MST FRI APR 14 2006

AZZ020-025-026-142300-

/O.NEW.KPSR.DS.W.0001.060414T2142Z-060414T2300Z/

/O.CON.KPSR.WI.Y.0010.000000T0000Z-060415T0400Z/

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# History

## “Local Dust Storm Warnings”

- In 2011 NWS Phoenix experimented with issuing polygon dust storm warnings using Special Weather Statements which allowed us to create a polygon, called “Local Dust Storm Warning”
- This included the biggest dust storm seen in Arizona for at least the past 12 years: July 5<sup>th</sup>, 2011

# “Local Dust Storm Warning”

WMUS85 KPSR 050143  
SPSPSR  
SPECIAL WEATHER STATEMENT  
NATIONAL WEATHER SERVICE PHOENIX AZ  
643 PM MST MON JUL 4 2011

AZZ028-050245-  
PINAL AZ-  
643 PM MST MON JUL 4 2011

THE NATIONAL WEATHER SERVICE IN PHOENIX HAS ISSUED A  
LOCAL DUST STORM WARNING FOR...  
WEST CENTRAL PINAL COUNTY IN SOUTH CENTRAL ARIZONA

\* COMMUNITIES IMPACTED: CASA GRANDE AND ARIZOLA  
\* UNTIL 745 PM MST  
\* MAJOR HIGHWAYS IMPACTED INCLUDE:

I-10...  
I-8...  
STATE HIGHWAY 87 AND 84

IF THIS STORM INTENSIFIES...A WARNING MAY BE NEEDED. STAY TUNED TO  
NOAA WEATHER RADIO...LOCAL RADIO OR TV FOR THE LATEST UPDATES.

LOCALLY DENSE BLOWING DUST IS POSSIBLE. IF YOU ENCOUNTER BLOWING DUST  
WHILE DRIVING...PULL OVER AS FAR OFF THE ROADWAY AS POSSIBLE AND  
PARK. TURN OFF YOUR HEADLIGHTS AND KEEP YOUR FOOT OFF THE BRAKE.

\* A LOCAL DUST STORM WARNING IS ISSUED WHEN WINDS HAVE GENERATED  
LARGE AREAS OF BLOWING DUST OR BLOWING SAND THAT HAVE SUBSTANTIALLY  
REDUCED VISIBILITIES...TO 1/4 MILE OR LESS...RESULTING IN VERY  
HAZARDOUS DRIVING CONDITIONS IN SOME AREAS. BE READY FOR A SUDDEN  
DROP IN VISIBILITY TO NEAR ZERO. IF YOU ENCOUNTER BLOWING DUST OR  
BLOWING SAND ON THE ROADWAY OR SEE IT APPROACHING...PULL OFF THE ROAD  
AS FAR AS POSSIBLE AND PUT YOUR VEHICLE IN PARK. TURN THE LIGHTS ALL  
THE WAY OFF AND KEEP YOUR FOOT OFF THE BRAKE PEDAL.

&&

LAT...LON 3275 11175 3276 11178 3279 11179 3279 11186  
3276 11189 3276 11196 3294 11213 3304 11157  
3276 11159 3272 11170 3272 11173

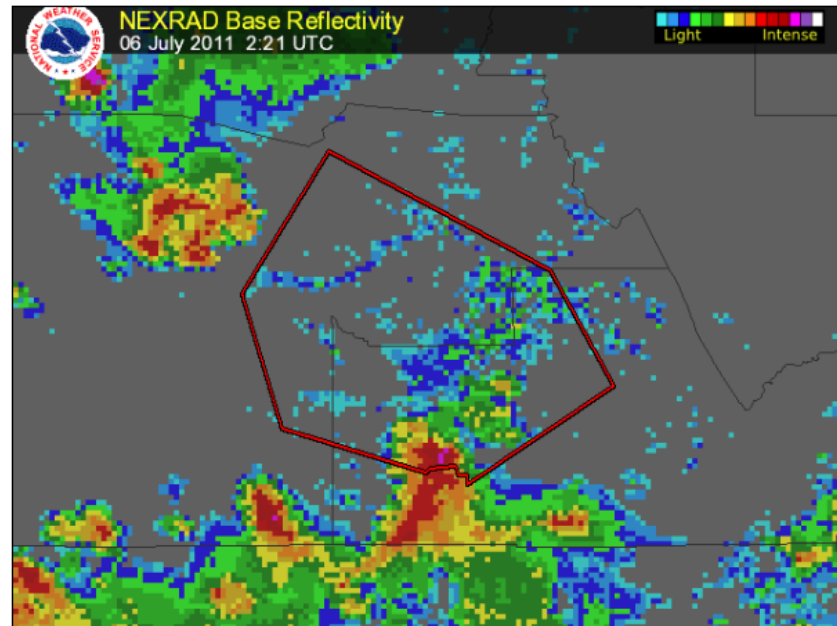
!\$

WANEK

## The Delivery

At 7 PM MST (02 UTC) the leading edge of the massive dust storm hit the far southeast portions of the Phoenix area. The dust continued to push further and eventually through the entire metropolitan area during the next two hours. Trained spotters inundated NWS Phoenix with reports of literally zero visibility and winds gusting 30 to 50 MPH (50 to 80 KPH). A few measured wind gusts even approached 70 MPH (110 KPH).

At 626 PM MST (0126 UTC) the NOAA/Storm Prediction Center issued a [Severe Thunderstorm Watch](#) for Maricopa and Pinal Counties, including the Phoenix Metropolitan Area, until 11 PM MST (06 UTC). NWS Phoenix issued the Local Dust Storm Warning 632 PM MST (0132 UTC) for the areas southeast of Phoenix, expanding the warning for the East Valley of Phoenix at 655 PM MST (0155 UTC) and nearly all of the Phoenix area at 721 PM MST (0221 UTC). Additional Local Dust Storm Warnings were issued as the dust cloud rolled west of the Phoenix area.



Dust Storm Warning #1 | Dust Storm Warning #2 | [Dust Storm Warning #3](#)

# “Massive” Dust Storm—July 5, 2011

- Height: est. 8,000-10,000 feet  
Widest: est. 250 miles
- Longest Fetch: 300 miles (into CA and NV)
- Duration: > 4 hours

EarthSky Updates on your cosmos and world

TONIGHT | SPACE | **EARTH** | HUMAN WORLD | STARGAZE | COMMUNITY PHOTOS |

## Ken Waters: Why the July 5 Arizona dust storm was so huge

By Beth Lebwahl in EARTH | July 6, 2011

The huge dust storm in Phoenix on July 5, 2011 started with rapidly descending air moving outward from area thunderstorms – combined with a lot of available dust.

Sharing is caring!

90 SEC PODCAST 0:00 / 1:30 DOWNLOAD 90 SEC PODCAST

On July 5th, 2011, a powerful dust storm swept through Phoenix, Arizona. Many residents said it was the largest they'd seen in decades – if ever. EarthSky spoke with Ken Waters, the warning coordination meteorologist for the National Weather Service in Phoenix. He explained that the July 5 Arizona dust storm started with rapidly descending air moving outward from area thunderstorms – combined with a lot of available dust.

These dust storms are common in Arizona. They're known as haboobs (derived from Arabic word for “strong wind”). But not a storm of this size. He said:

[The storm] lasted for a good two hours, and covered at least 100 miles in horizontal distance, maybe more. It was truly massive. It's kind of like a once-in-a-lifetime event, like when you see a tsunami or tornado. We were just in awe. The video is just amazing, to watch it.

Link: <https://player.vimeo.com/video/26045314>



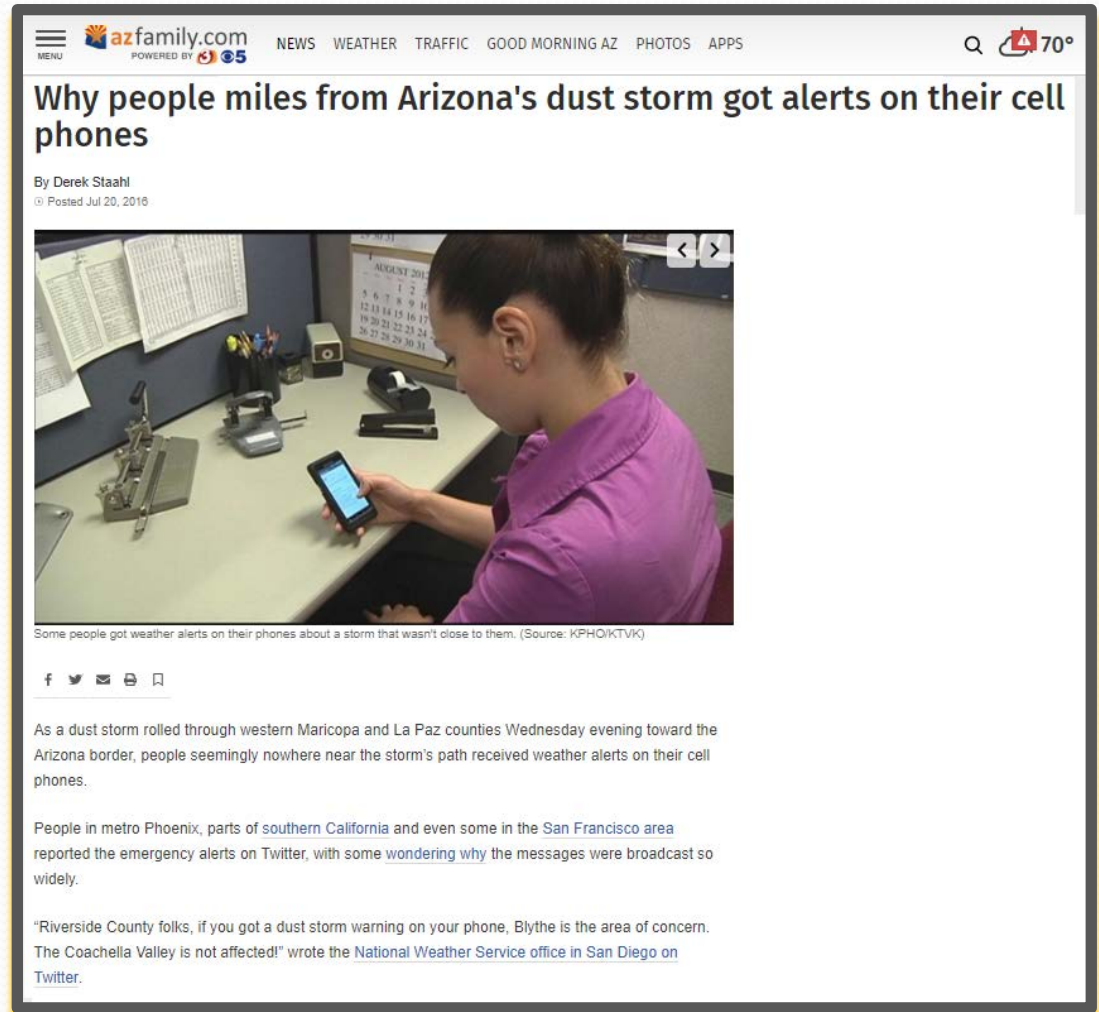
# History

## “Local Dust Storm Warnings”

- Short-lived as some private weather providers had difficulty decoding these polygon warnings
- Some TV stations unable to display the polygon areal extent
- Stopped in August 2012

# History

- April 2012: New Wireless Emergency Alert capability released
  - First time cell phones can be alerted for dust storms
  - Quickly became problematic because dust storm warnings used zones and cell phone companies “extrapolated” out to entire counties intersected
  - Resulted in huge amount of over-warning
  - Many reports of far flung locations getting the warnings, sometimes up to 400 miles away
  - Huge county sizes complicated the situation

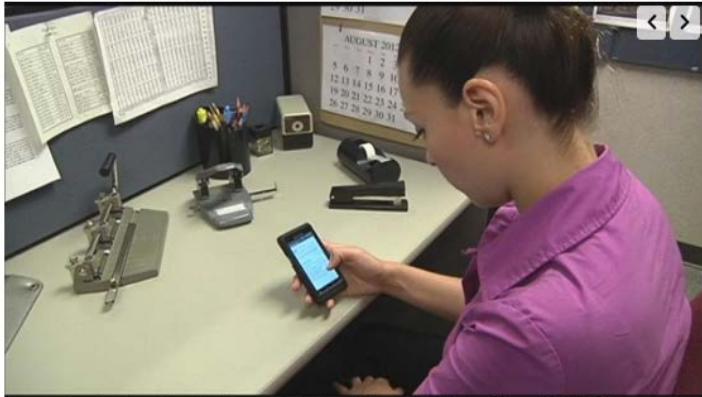


The screenshot shows a news article from azfamily.com, powered by CBS 5. The article is titled "Why people miles from Arizona's dust storm got alerts on their cell phones" and is written by Derek Staahl, posted on July 20, 2016. The article includes a photo of a woman in a purple shirt sitting at a desk, looking at her smartphone. Below the photo is a caption: "Some people got weather alerts on their phones about a storm that wasn't close to them. (Source: KPHO/KTVK)". The article text discusses a dust storm that rolled through western Maricopa and La Paz counties on Wednesday evening, causing people far from the storm's path to receive weather alerts. It mentions that people in metro Phoenix, parts of southern California, and even some in the San Francisco area reported the emergency alerts on Twitter, with some wondering why the messages were broadcast so widely. A quote from the National Weather Service office in San Diego is also included: "Riverside County folks, if you got a dust storm warning on your phone, Blythe is the area of concern. The Coachella Valley is not affected!"

azfamily.com  
POWERED BY CBS 5  
NEWS WEATHER TRAFFIC GOOD MORNING AZ PHOTOS APPS  
70°

## Why people miles from Arizona's dust storm got alerts on their cell phones

By Derek Staahl  
Posted Jul 20, 2016



Some people got weather alerts on their phones about a storm that wasn't close to them. (Source: KPHO/KTVK)

f t e b

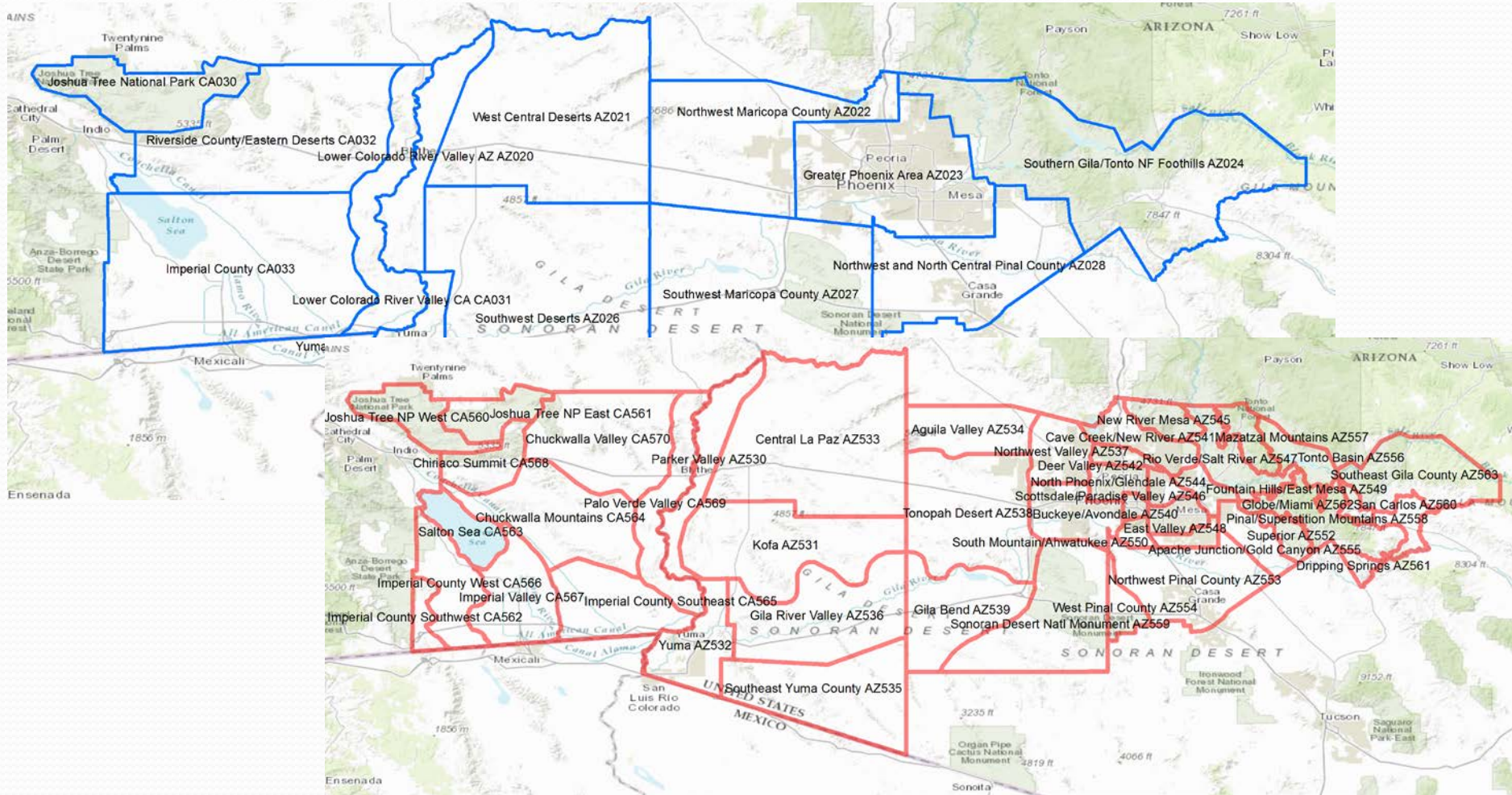
As a dust storm rolled through western Maricopa and La Paz counties Wednesday evening toward the Arizona border, people seemingly nowhere near the storm's path received weather alerts on their cell phones.

People in metro Phoenix, parts of southern California and even some in the San Francisco area reported the emergency alerts on Twitter, with some wondering why the messages were broadcast so widely.

"Riverside County folks, if you got a dust storm warning on your phone, Blythe is the area of concern. The Coachella Valley is not affected!" wrote the National Weather Service office in San Diego on Twitter.

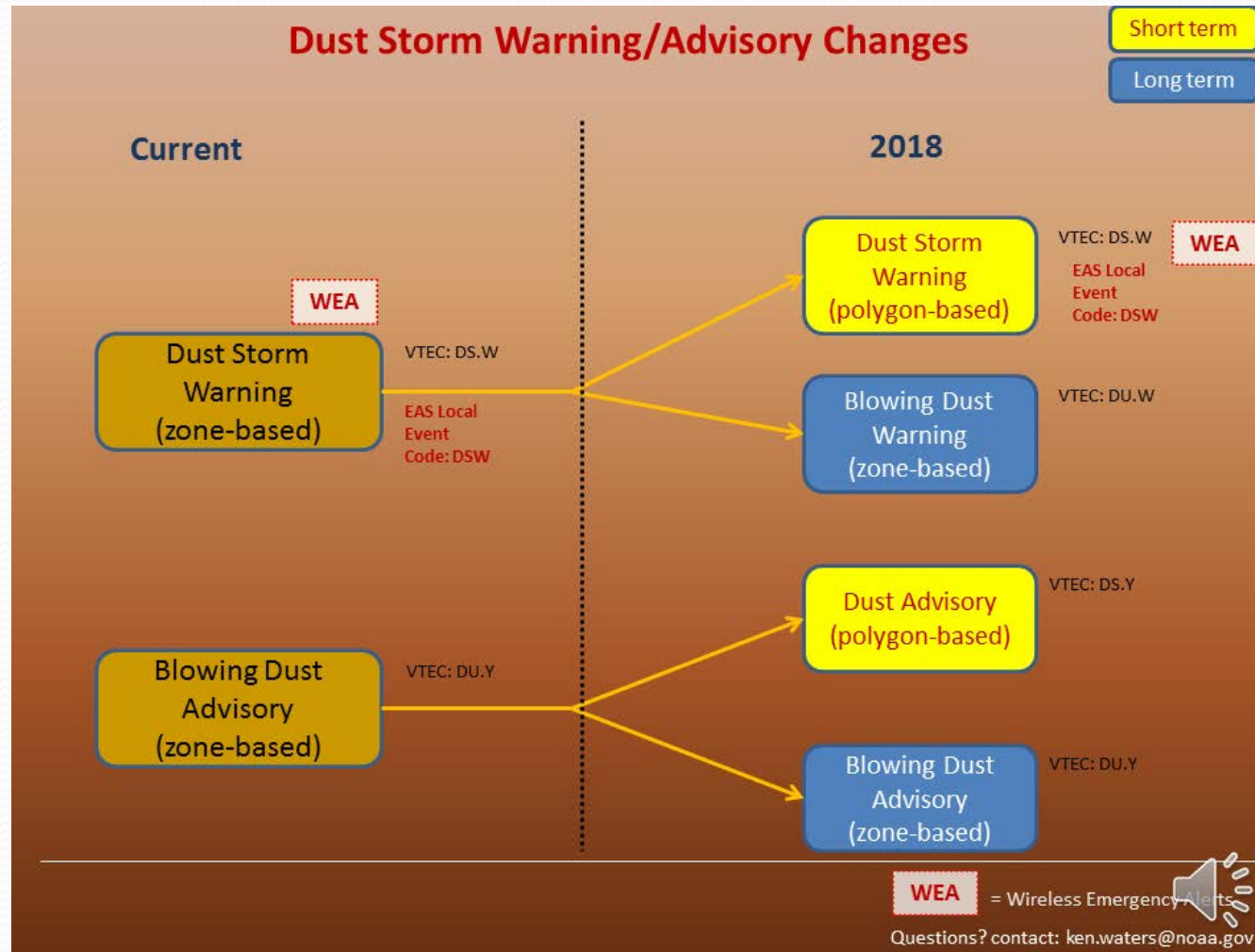
# History

- New public zones issued by NWS Phoenix, April 4, 2017

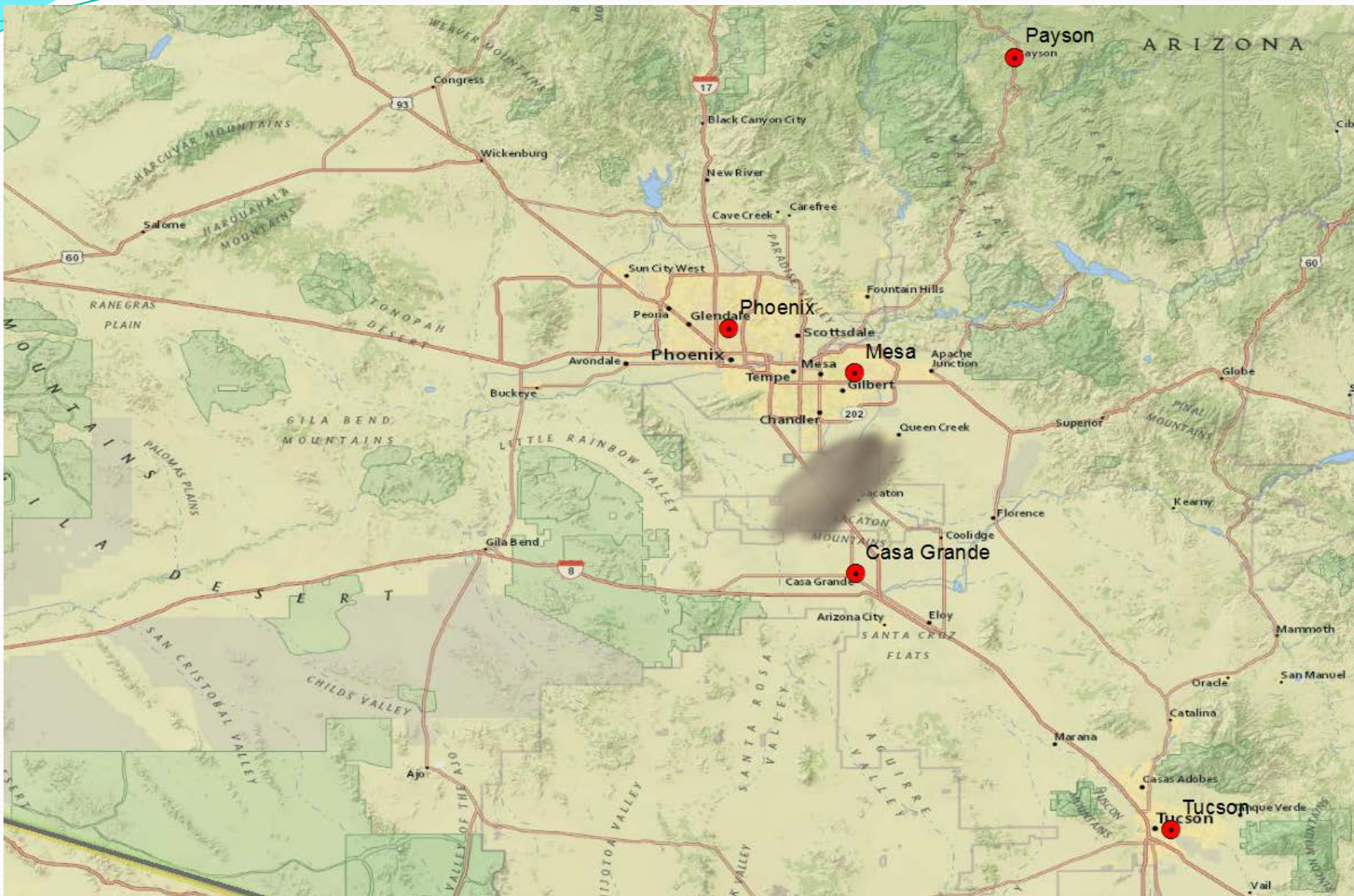


# Moving Forward

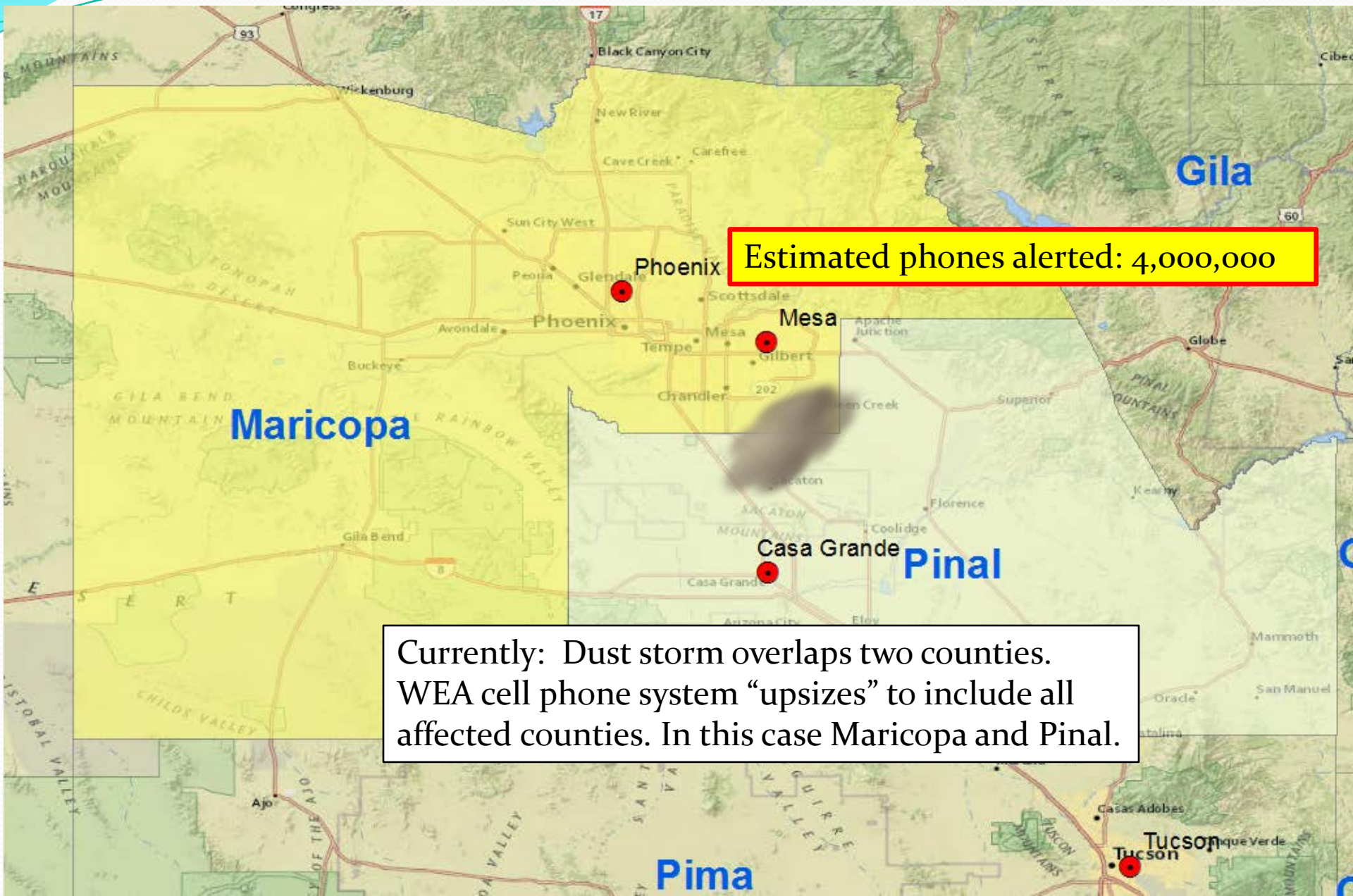
- Multi-year effort (2014 – 2017) to finally create a completely separate Dust Storm Warning product
  - First new warning product authorized by the National Weather Service in more than 10 years
  - Also, added a polygon Blowing Dust Advisory



# New Polygon Dust Storm Warnings



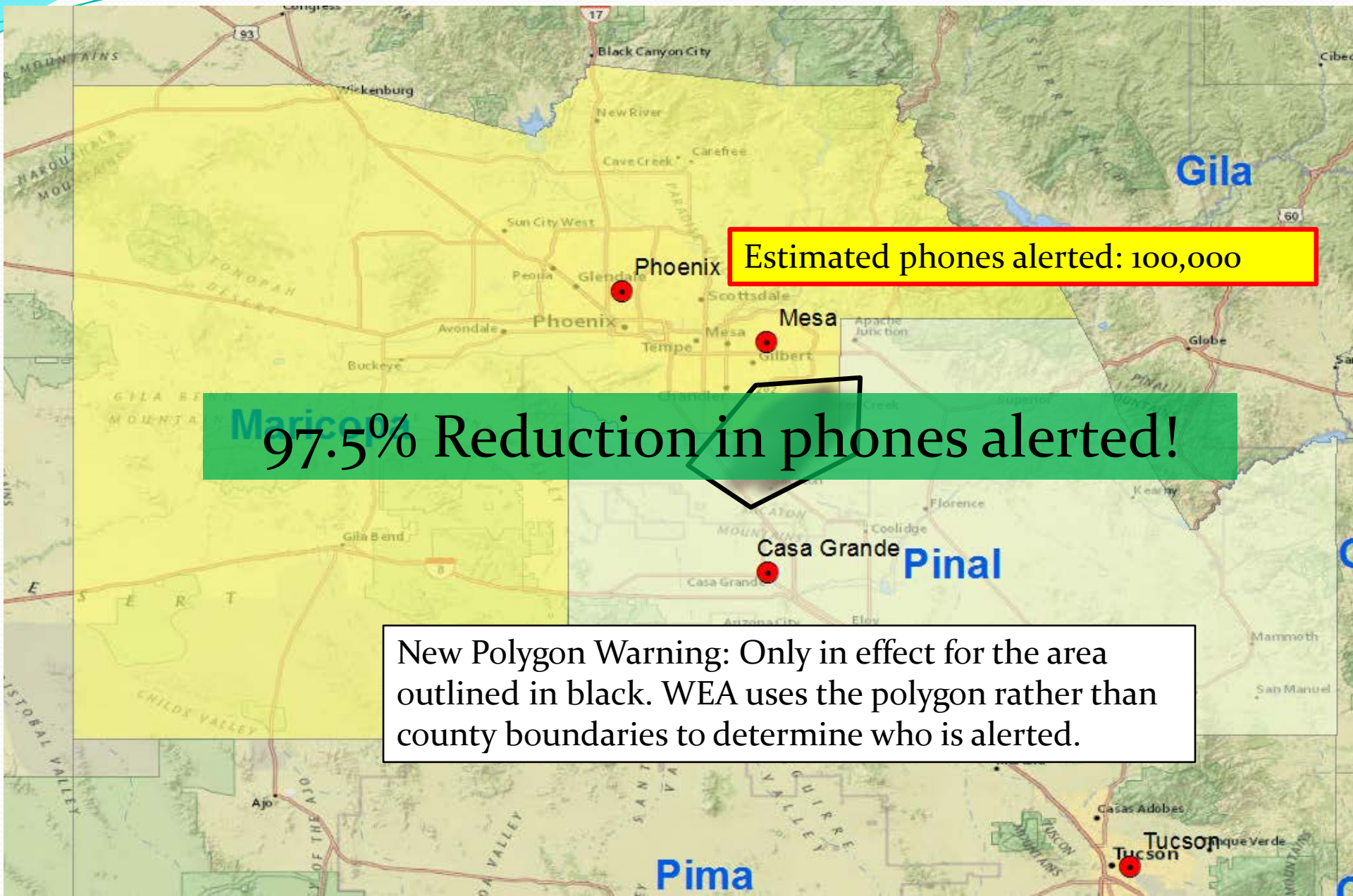
# New Polygon Dust Storm Warnings



Estimated phones alerted: 4,000,000

Currently: Dust storm overlaps two counties. WEA cell phone system “upsizes” to include all affected counties. In this case Maricopa and Pinal.

# New Polygon Dust Storm Warnings



Estimated phones alerted: 100,000

97.5% Reduction in phones alerted!

New Polygon Warning: Only in effect for the area outlined in black. WEA uses the polygon rather than county boundaries to determine who is alerted.

# 1<sup>st</sup> Polygon Dust Storm Warning!

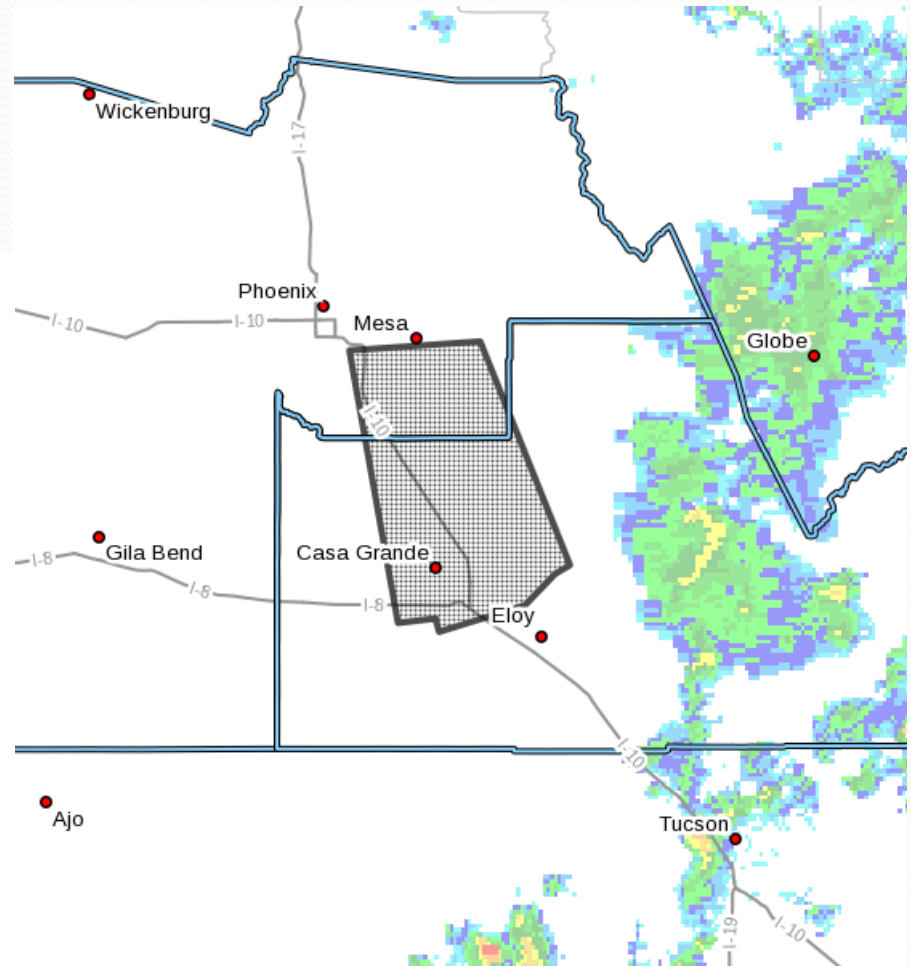
AZC013-021-060000-  
/O.NEW.KPSR.DS.W.0002.180705T2314Z-180706T0000Z/  
Maricopa AZ-Pinal AZ-  
414 PM MST Thu Jul 5 2018

The National Weather Service in Phoenix has issued a

\* Dust Storm Warning for...  
Maricopa County in south central Arizona...  
Pinal County in southeastern Arizona...

\* Until 500 PM MST.

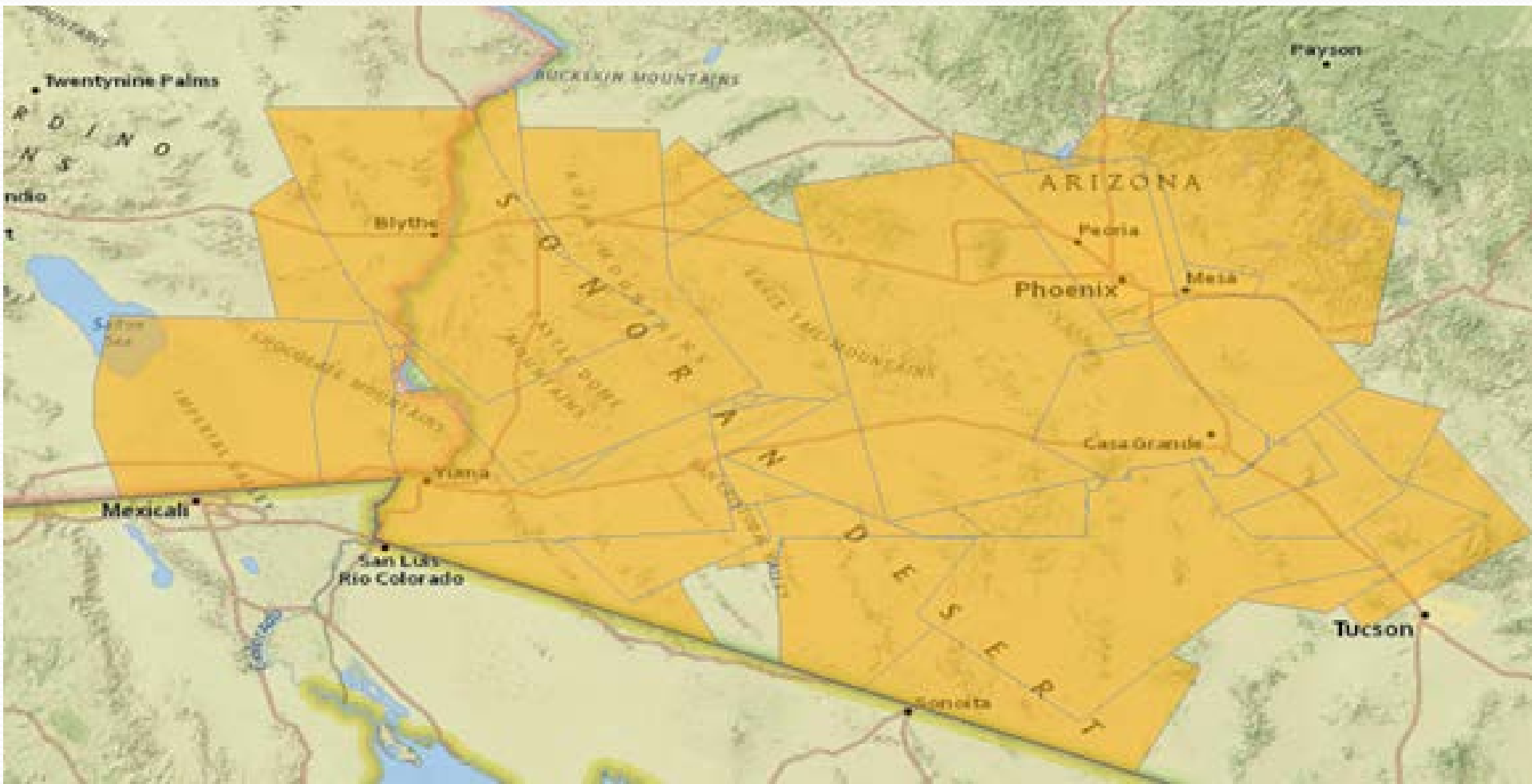
\* At 414 PM MST, a wall of dust was along a line extending from near Gilbert to Randolph, moving west at 20 mph.





# Dust Storm Warnings -- 2018

- Issued by NWS Phoenix and Tucson, initially
- These warnings are now operational across the entire country



# All Comments Received Were Positive

- Maricopa County EM: “done a great job in reducing the number of irrelevant WEA messages the general public receives”



Full evolution of MEGA HABOOB in southern Arizona on July 10, 2018!

126,931 views

838 29 SHARE



Reed Timmer

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# The Real Purpose --- Saving Lives

- <https://www.abc15.com/news/region-southeast-valley/mesa/father-contracts-valley-fever-dies-weeks-after-moving-to-arizona>

## Father contracts Valley Fever, dies weeks after moving to Arizona

BY: Zach Crenshaw

POSTED: 9:48 PM, Sep 18, 2018

UPDATED: 6:30 AM, Sep 19, 2018

TAG: mesa | southeast valley



# Working Together to Protect Lives and Property

*Contact Us - Come and Visit*

[weather.gov/phoenix](https://weather.gov/phoenix)

602-275-7418

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**Warning Coordination Meteorologist**

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