

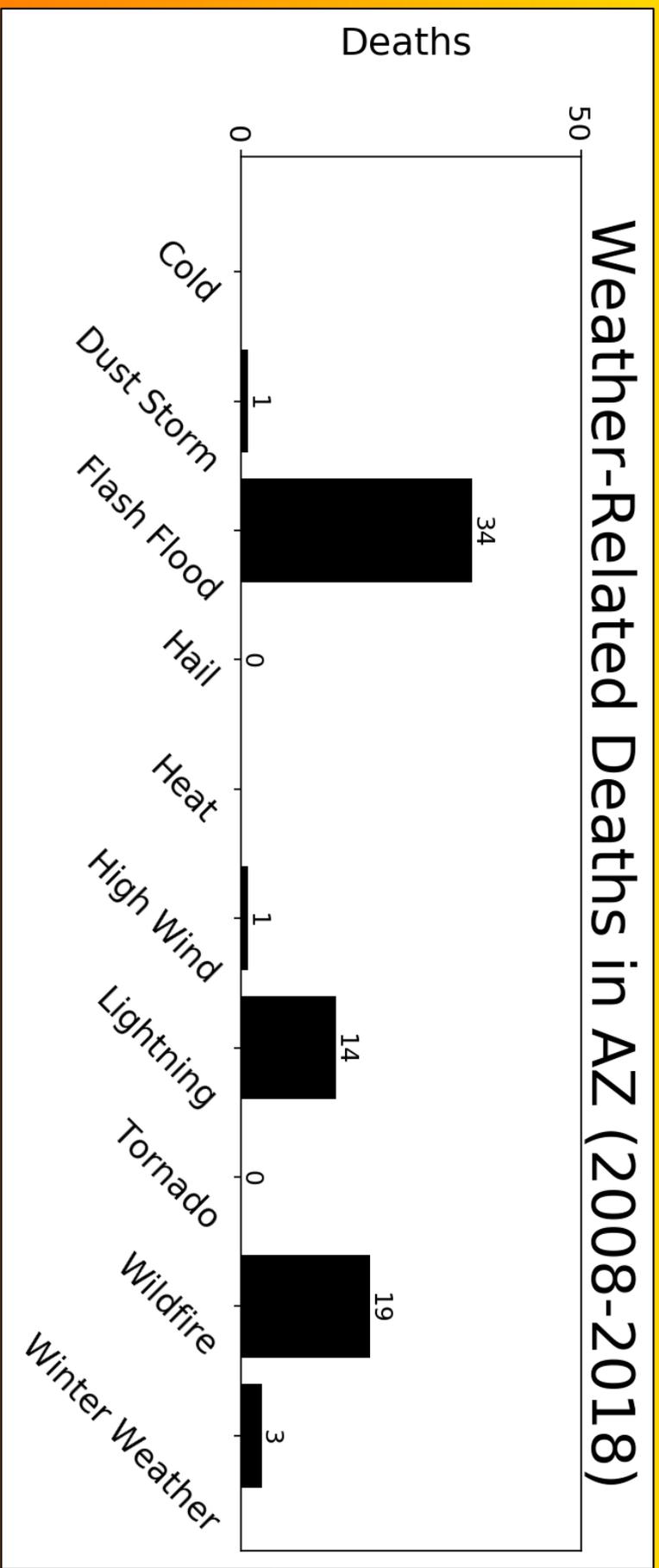
NOAA/National Weather Service Heat Program



Paul Iniguez
Science & Operations Officer
NOAA/NWS/WFO Phoenix
Paul.Iniguez@noaa.gov
30 January 2020



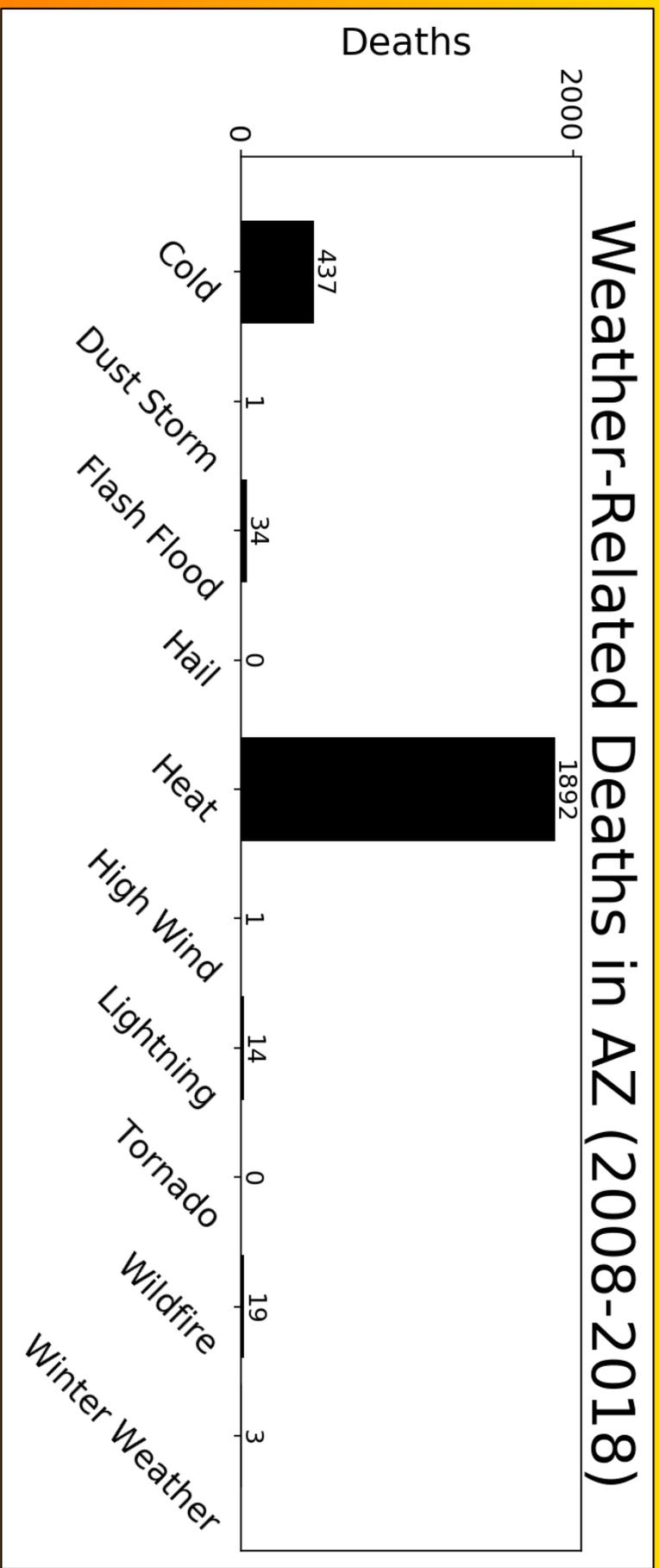
Challenge: Risk Perception



Source: NOAA, ADHS



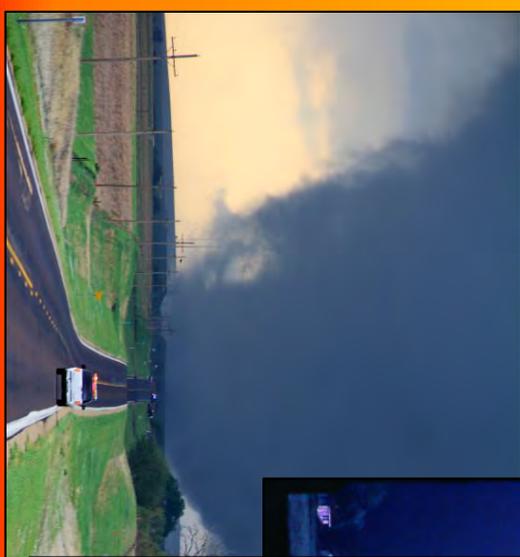
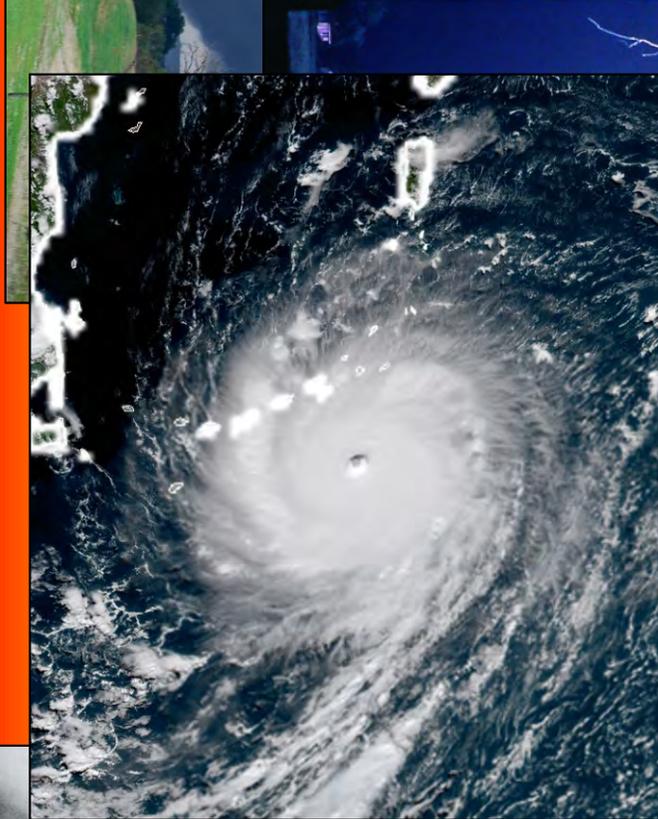
Challenge: Risk Perception



Source: NOAA, ADHS



Challenge: Visual Threat





Challenge: Visual Threat



75 °F



115 °F



Challenge: Arizona is Hot!

FINAL EDITION

THE ARIZONA REPUBLIC

35¢

Phoenix, Arizona

1036 year, No. 40

Wednesday, June 27, 1990 *****

Copyright 1990, The Arizona Republic

1:00 p.m.	1:05 p.m.	1:08 p.m.	1:27 p.m.	2:47 p.m.
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3 die in Valley — Today: Only 120°

By Mike Saenger
The weather reports:

Lethal record heat gripped the Valley for the second day in a row Tuesday. The 120-degree weather was reported in three deaths and dozens of hospitalizations, caused record power usage, and even provoked suicides.

And today is expected to be just as hot. The high temperature is expected to hit at least 120, with a low of 86, according to ACCU-Weather Inc., a private weather-forecasting company.

"It's dangerously hot," said Steve

horne, a Phoenix Fire Department spokesman. "It's time to take a serious look at people eager to go outside at night. The Phoenix's official high — Monday's 126 degrees — was broken Tuesday at 127 degrees. When the mercury reached 121, it then peaked 123 at 4:47 p.m.

Before that week, Phoenix's all-time high had been 116, set in 1925. That had been matched three times, then recently 2007 events.

Monday's record was matched about a year later Tuesday at 91 degrees at 6:45 p.m. The low Tuesday of 91 degrees is a record for a mid-June day.

— See METEOR, page A-4

— See METEOR, page A-4

Forget snow: Jetliners in Phoenix 'heatbound'

By Guy Weastor
The Arizona message:

The Phoenix version of snowbird (snowy) climate Tuesday. Hundreds of passengers at Sky Harbor International Airport found their flight grounded or schedules changed when the temperature dipped 121 degrees while on its way to a record 122.

At least 25 flights on the airline were canceled, or delayed or diverted for about 40 minutes while temperatures exceeded 122.

— See PHOENIX, page A-2

Regulator of body on overtime

By Peter Ashburn
The Arizona message:

Maybe you're a smoker. Maybe you're a mother. Maybe you're just a fool. In any case, as you stride on into the 110-degree, your body starts a vigorous internal dialogue on which your life depends.

To be precise, your hypothalamus, concealed in its bunker at the base of your brain, sets to work desperately trying to turn a body designed for a biological summer into an air conditioner.

This is no small task. Ordinarily, the body turns food into heat to keep the body temperature at 98.6 degrees. Good thing — a few degrees off either way, and you're in big trouble.

"Your body is designed to produce heat," said Dr. Murray

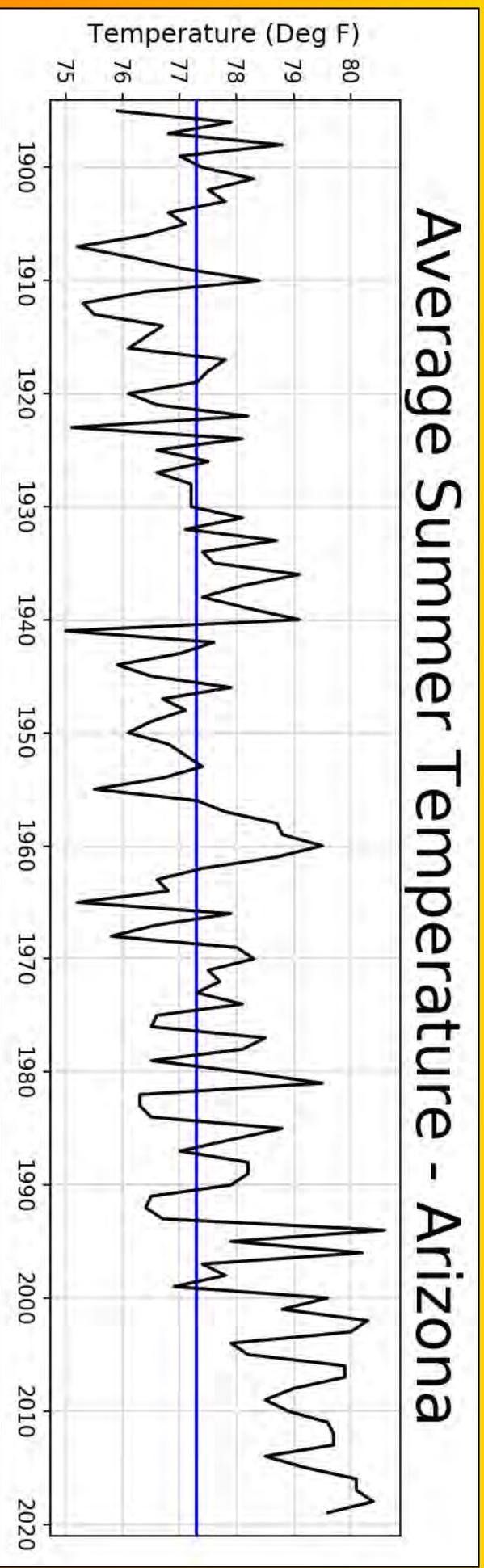
— See MET, page A-2

PHX averages ~110 days of Normal high temperature for July is 106 °F. Average 8 days with a low temperature of 90+ °F.

100+ °F each year.

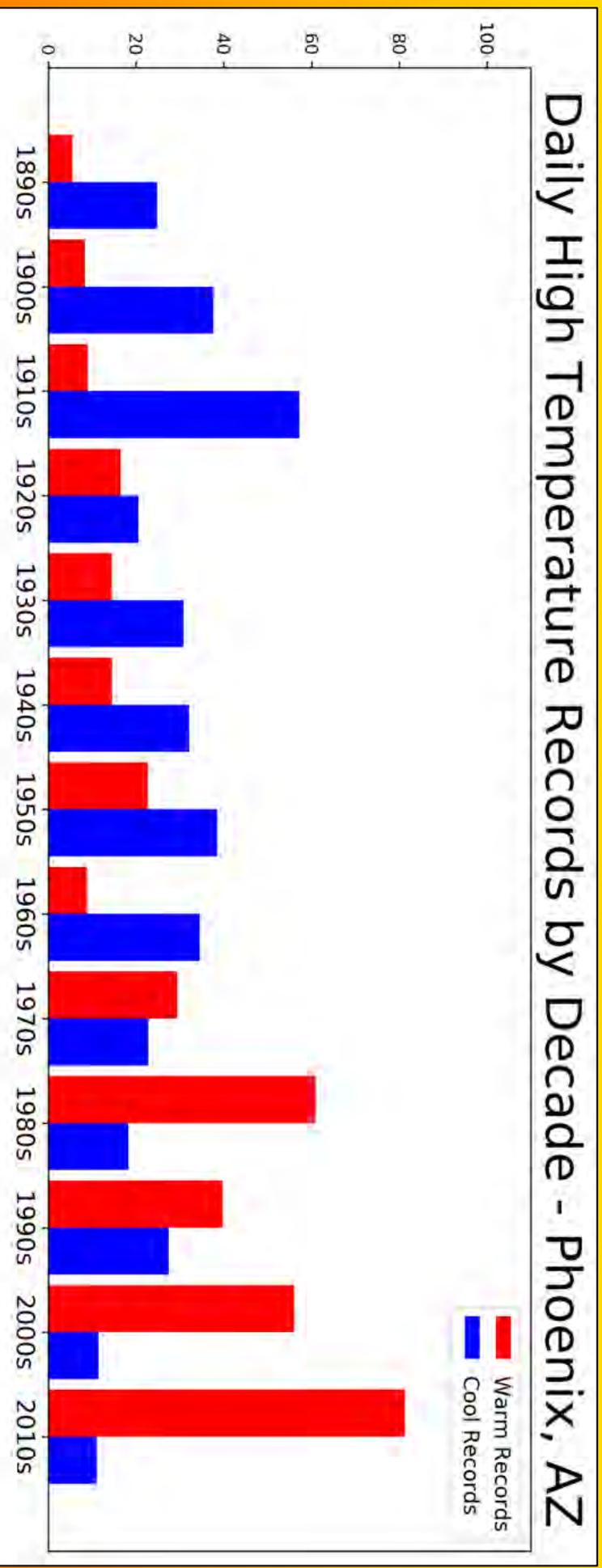


Challenge: Getting Hotter



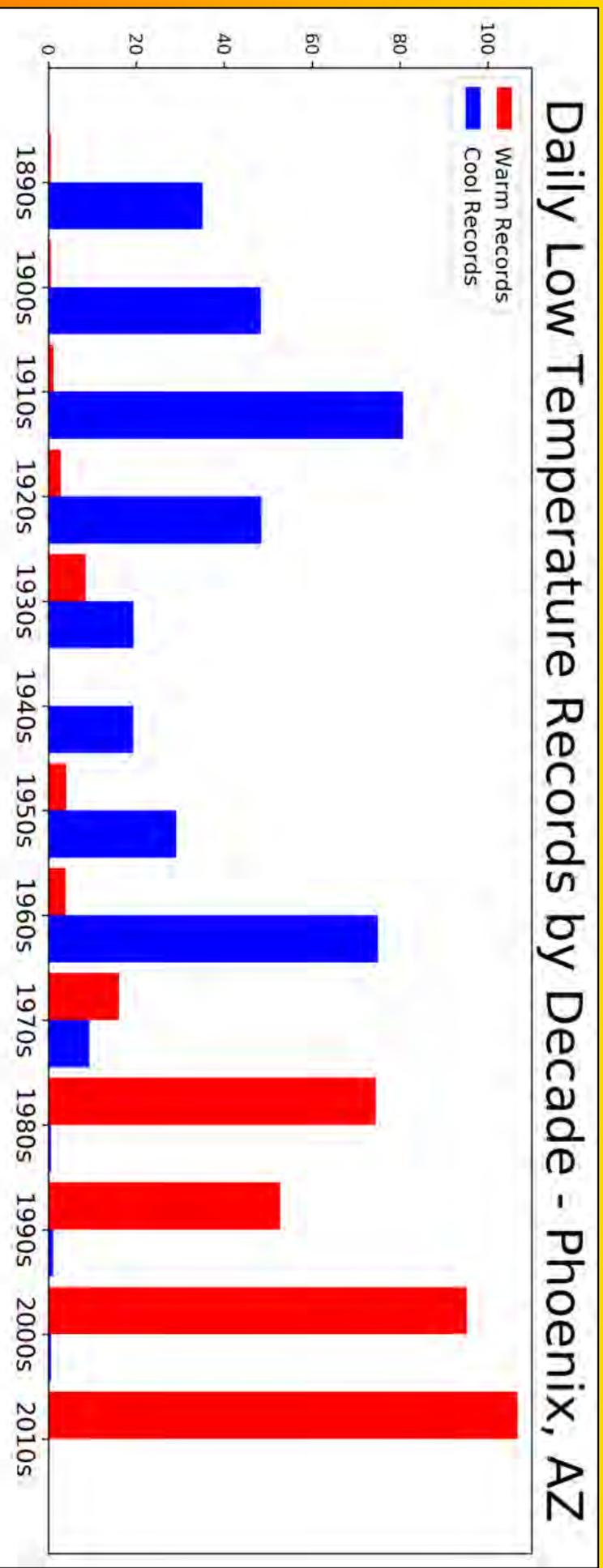


Challenge: Getting Hotter





Challenge: Getting Hotter



Last Record Low: Aug. 28, 2008



NOAA/NWS Heat Services

To address these challenges, NOAA/NWS conducts a number of activities and offers a number of services.

- Temperature Forecast
 - Includes HeatRisk product
- Social Media
- Partner (Email) Briefings
- Official Alerts -- “Biggest Bells” to Ring
- Extensive Partner Interaction



Weather.Gov/Phoenix

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Local forecast by City, Str or ZIP code
 Enter location: Go
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NEWS HEADLINES
 • Skywarn Storm Spotter class schedule - Updated
 • This Day in Weather History

MY FORECAST
 3 Miles N Tempe AZ
[Weather.gov > NWS Phoenix](#)

84°F 29°C
 Get Detailed Info

Current Hazards Current Conditions Radar Forecast

Click a location below for detailed forecast.

Last Map Update: Mon, Mar. 23 2019 at 4:57:25 PM MST

Temperature Forecasts

Extended Forecast for 3 Miles N Tempe AZ

Day	Forecast	Low	High
Tonight	Increasing Clouds	58°F	60°F
Tuesday	Mostly Sunny	59°F	83°F
Tuesday Night	Mostly Cloudy	55°F	83°F
Wednesday	Cloudy	55°F	83°F
Wednesday Night	Partly Cloudy	55°F	83°F
Thursday	Sunny	55°F	83°F
Thursday Night	Clear	55°F	83°F
Friday	Sunny	55°F	83°F
Friday Night	Mostly Clear	55°F	83°F

Detailed Forecast

Tonight Increasing clouds, with a low around 58. Calm wind becoming west northwest around 5 mph.
Tuesday Mostly sunny, with a high near 89. East wind around 5 mph becoming calm.
Tuesday Night Mostly cloudy, with a low around 60. West wind around 5 mph becoming calm.
Wednesday Cloudy, with a high near 87. Calm wind becoming west southwest around 5 mph in the afternoon.
Wednesday Night Partly cloudy, with a low around 59. West wind around 5 mph becoming calm.
Thursday Sunny, with a high near 85. Light southwest wind becoming west 5 to 10 mph in the afternoon.
Thursday Night Clear, with a low around 55. West wind 5 to 10 mph.
Friday Sunny, with a high near 83. Calm wind becoming west around 5 mph in the afternoon.
Friday Night Mostly clear, with a low around 55. West wind around 5 mph becoming north northeast after midnight.
Saturday Sunny, with a high near 84. Northeast wind around 5 mph becoming west in the afternoon.
Saturday Night Mostly clear, with a low around 57. West wind around 5 mph becoming north northeast after midnight.
Sunday Sunny, with a high near 84. Northeast wind around 5 mph becoming west northwest in the afternoon.
Sunday Night Clear, with a low around 57. Calm wind becoming east northeast around 5 mph.
Monday Sunny, with a high near 85. East northeast wind around 5 mph becoming calm.

Topographic Click Map For Forecast

Disclaimer Forecast Area
 Point Forecast: 3 Miles N Tempe AZ



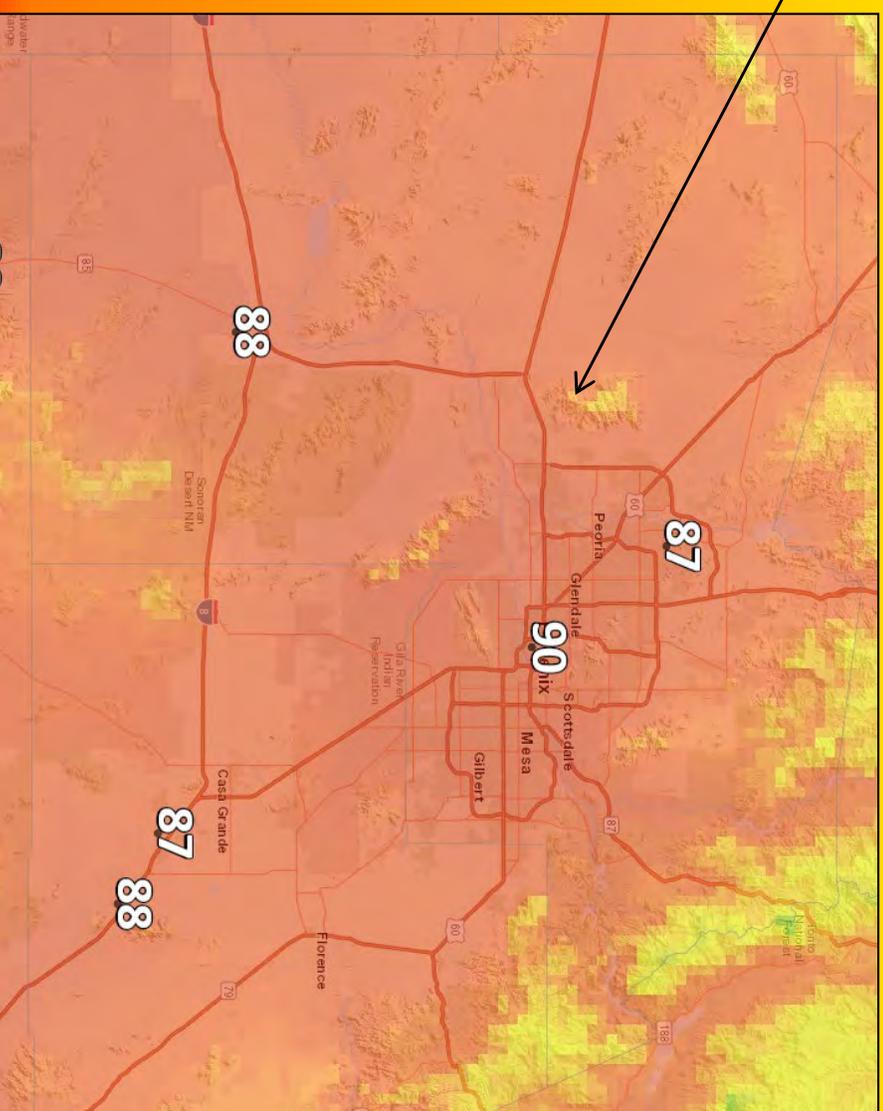
Temperature Forecasts

1-mile by
1-mile Grid

~800 in
Phoenix
Area

3,783 in
Maricopa
County

47,083 in
Arizona





National Weather Service
National Oceanic and Atmospheric Administration

EXPERIMENTAL NWS POTENTIAL HEAT RISKS

Heat affects everyone differently. In order to better address heat risk and allow you to prepare for upcoming heat events, the NWS has created a new tool for you to explore potential heat risks and WWS forecast for a location.

Click map for potential heat risks and official NWS forecast for a location.

Bookmark Download **KML** Graphics Cards Survey

Wed	Thu	Fri	Sat	Sun	Mon	Tue
9/6	9/7	9/8	9/9	9/10	9/11	9/12

Click map for **Max** heat risks and WWS forecast for a location.

HeatRisk [More Information](#)

Category	Meaning
Green	No Elevated Risk
Yellow	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	Very High Risk for entire population due to long duration heat, with little to no relief overnight

HeatRisk

- A flexible Framework
- Puts NWS forecast high & low temperatures into a climatological context based on location & time of year.
- Considers duration of expected heat.
- Humidity is indirectly accounted for in elevated low temperatures.
- Official method for determining when & where to issue official heat alerts across the Western U.S.

<https://www.wrh.noaa.gov/wrh/heatrisk/>



NATIONAL WEATHER SERVICE



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Local forecast by "City, St" or ZIP code

Enter location:

Go

Location Help

News Headlines

- NWS Phoenix Active News Headlines -- RSS feed

NWS Forecast Office Phoenix, AZ

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NWS Phoenix
Weather Forecast Office

- Current Hazards
- Current Conditions
- Radar
- Forecasts
- Rivers and Lakes
- Climate and Past Weather
- Local Programs

Click a location below for detailed forecast

Last Map Update: Wed, Apr. 19, 2017 at 1:24:21 pm MDT

Customize Your Weather.gov

City, ST

Enter Your City, ST or ZIP Code

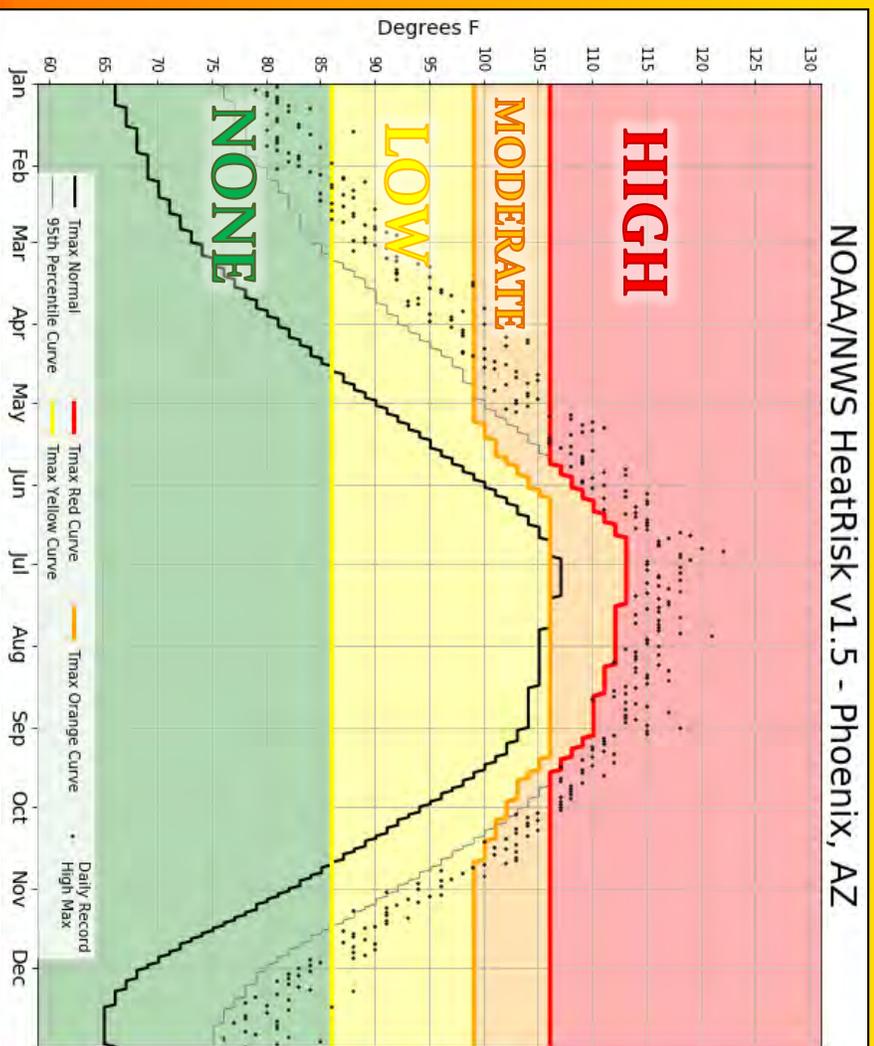
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How Does HeatRisk Work?



Red (High)
~95th Percentile

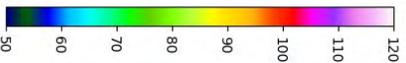
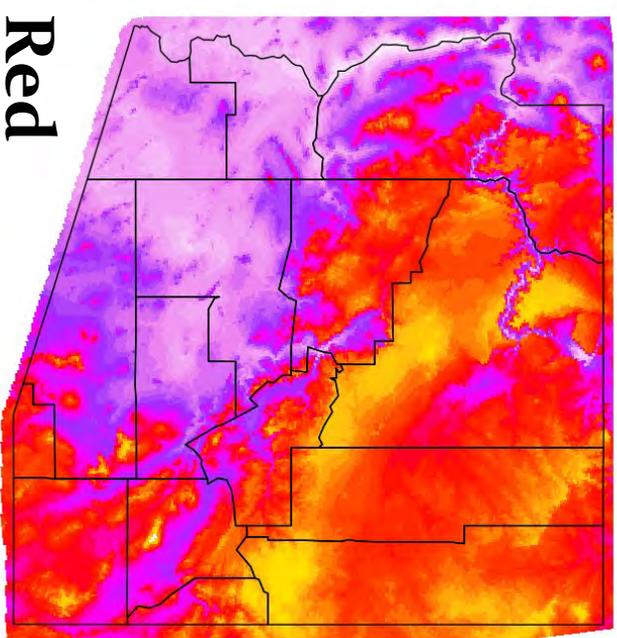
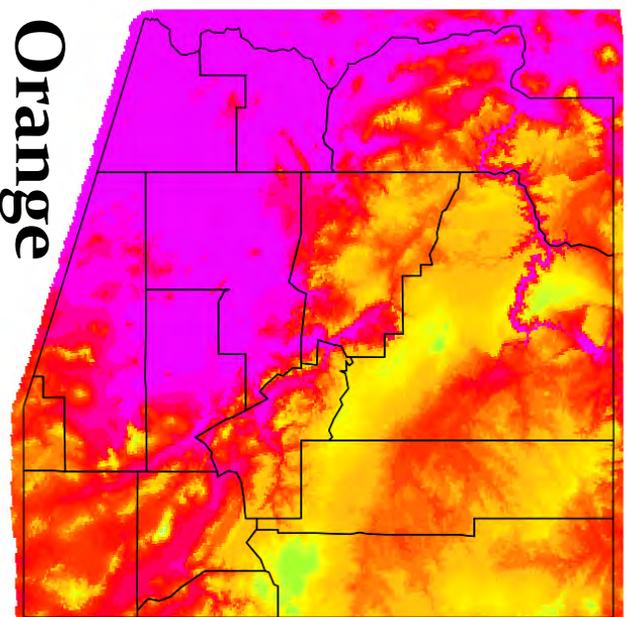
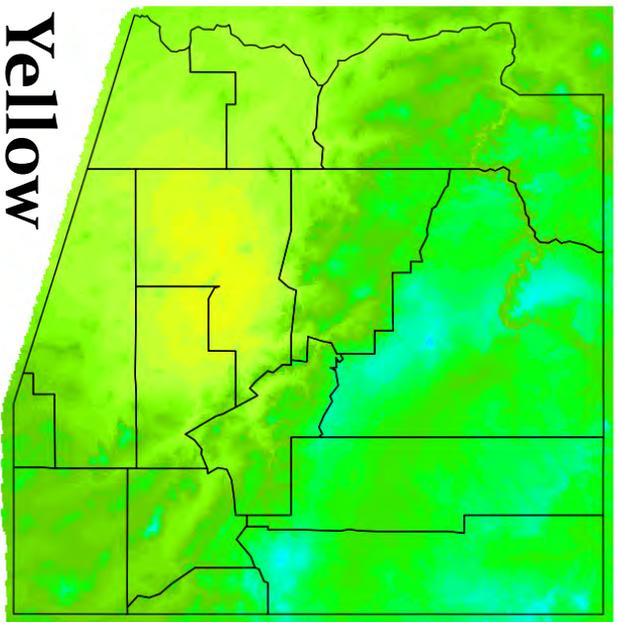
Orange (Mod)
Seasonal Split

Yellow (Low)
CDC Collaboration

Similar Process for Low Temperatures



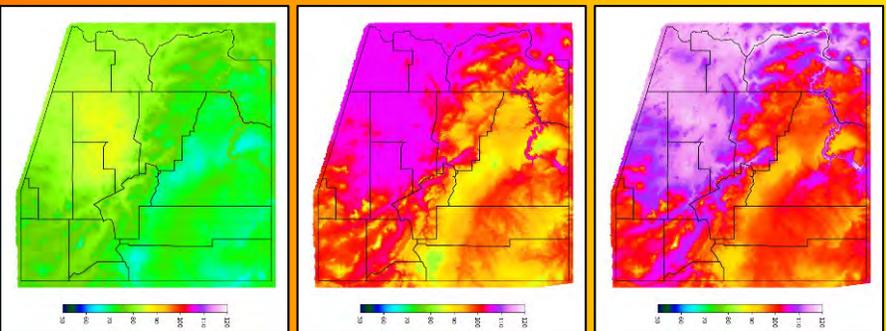
How Does HeatRisk Work?



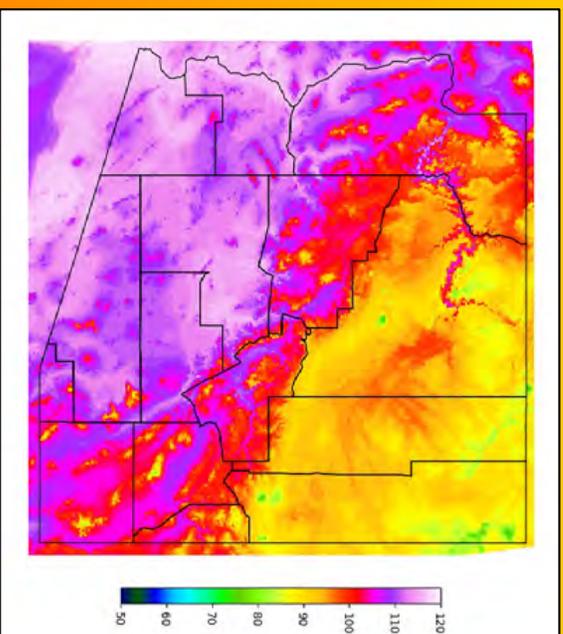
HeatRisk High Temperature Thresholds – July 4



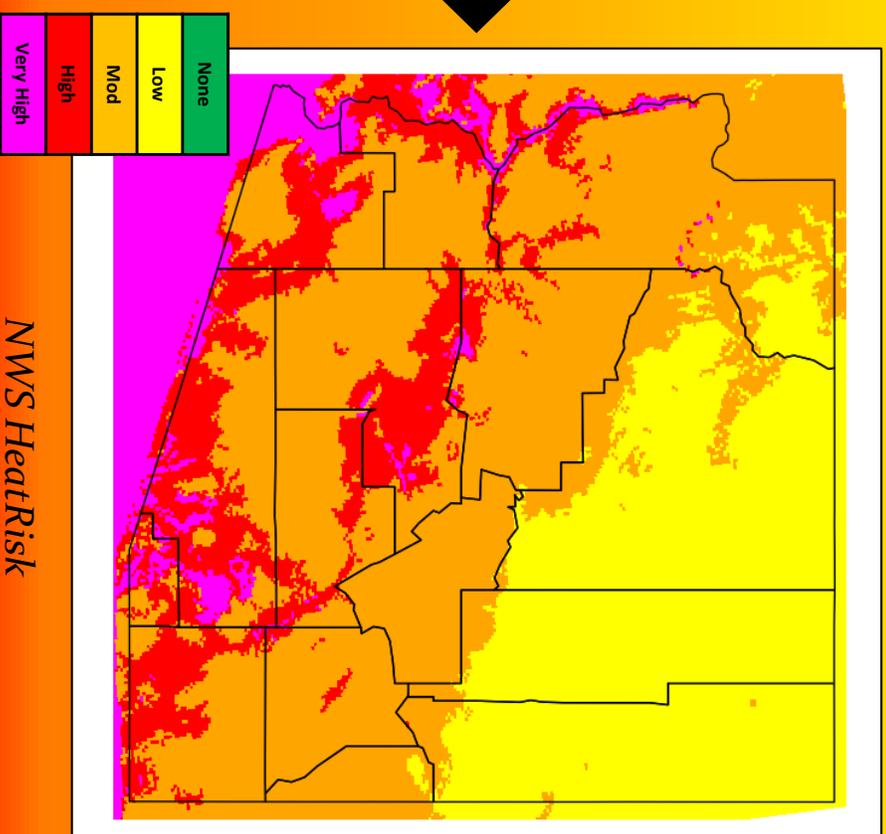
How Does HeatRisk Work?



Thresholds



*Official NWS Forecast
(High & Low Temperature)*

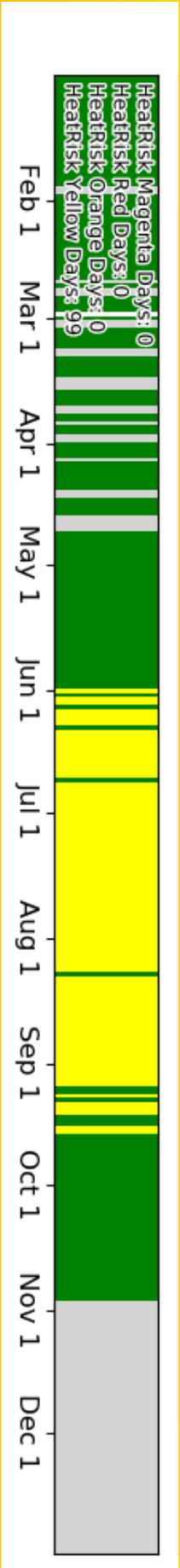


NWS HeatRisk

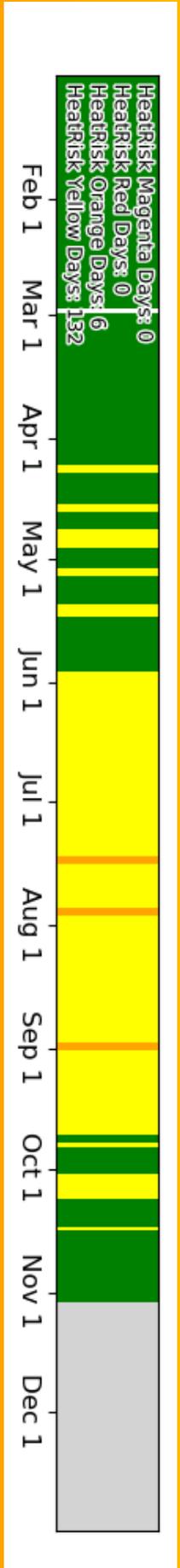


HeatRisk - 2019

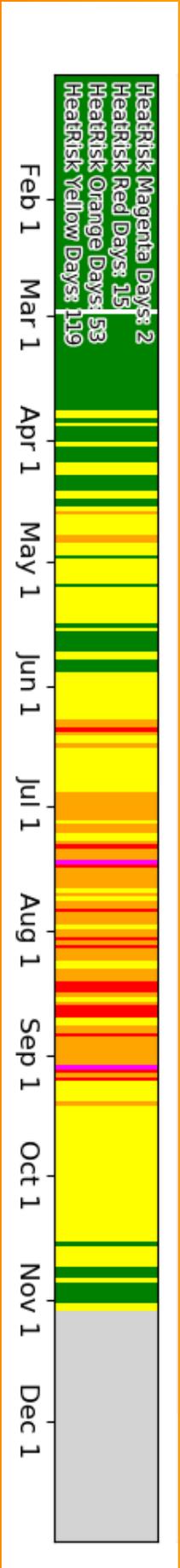
Alpine



Flagstaff



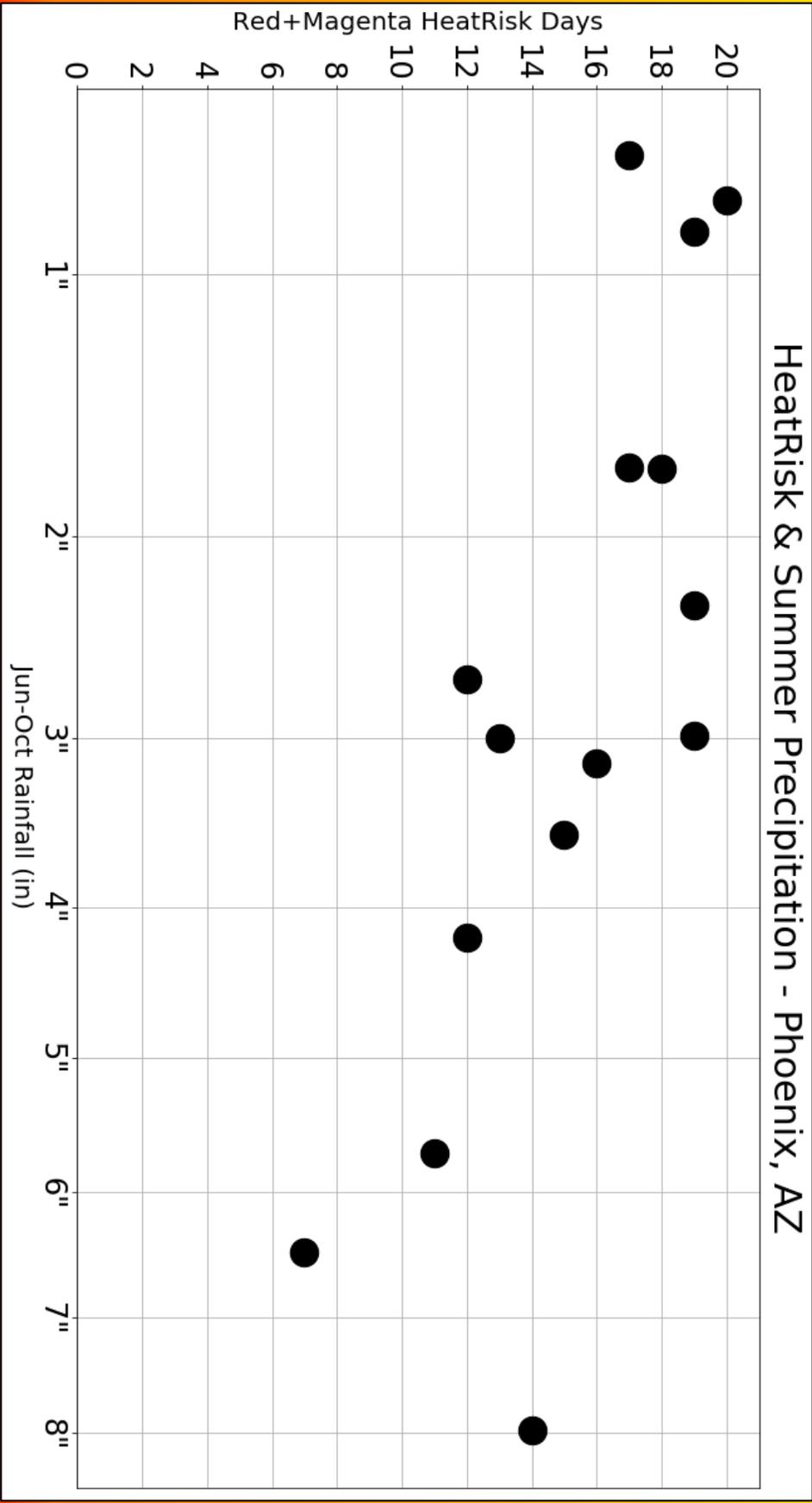
Phoenix





Heat & Drought

HeatRisk & Summer Precipitation - Phoenix, AZ





NOAA/NWS Heat Policy

The NOAA/NWS HeatRisk product is used to determine our messaging tone and actions across Arizona.

- Verbiage in social media/briefing material
- When & where to issue official heat alerts



NWS Heat Alerts

- **Excessive Heat Warning**
 - High Confidence (80%+)
 - HeatRisk of High (red) or Very High (magenta)
 - High/Very High Impact Level (e.g, increased morbidity) Expected
 - May be preceded by “Excessive Heat Watch” (confidence 50%)
- **Heat Advisory**
 - High Confidence (80%+)
 - For AZ, High Elevation Areas Only (~5,000'+)
 - HeatRisk of Moderate (orange)
 - Moderate/High Impact Level Expected



Historical SW June 2017

- Nearly 350 (250) daily MaxT (MinT) temperature records were tied and almost 800 (800) were broken across the West.
- Impacts: power disruptions, flight cancelations, and an increase in heat morbidity/mortality.
- In Maricopa County, AZ alone (location of Phoenix), roughly 50 heat-related deaths occurred.



ARIZONA + JUNE = HEAT

Arizona's high of 119 was 4th-warmest ever

Arizona's warmest

Phoenix, Thursday, June 15, 2017, hit 119 degrees Fahrenheit, the fourth-highest temperature ever recorded in the city's history. The previous record was 117 degrees, set in 1990. Phoenix is the only city in the United States to have recorded a temperature of 119 degrees.

Arizona's warmest

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No in-state tuition for 'dreamers,' court rules

State appeals court says DACA students can qualify for in-state tuition

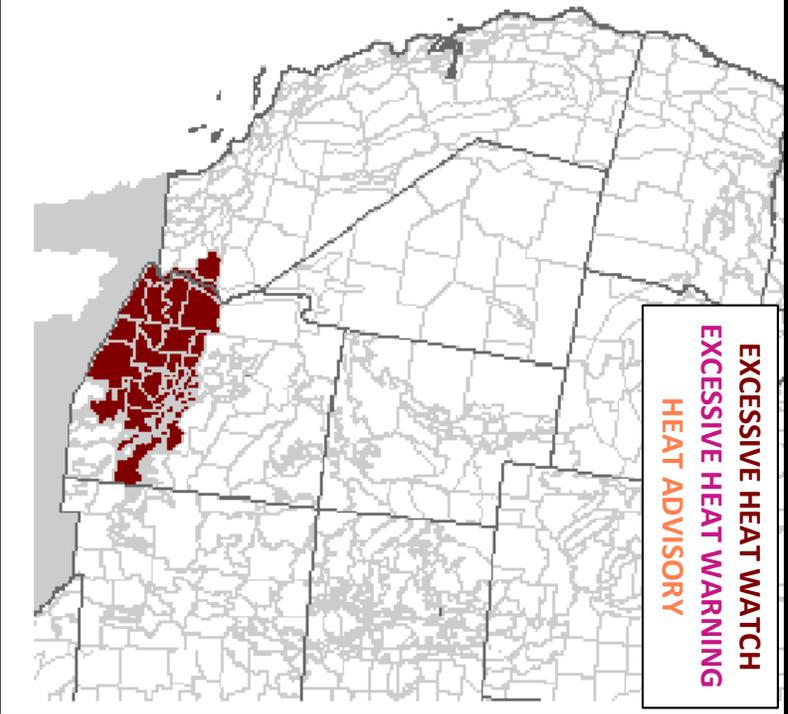
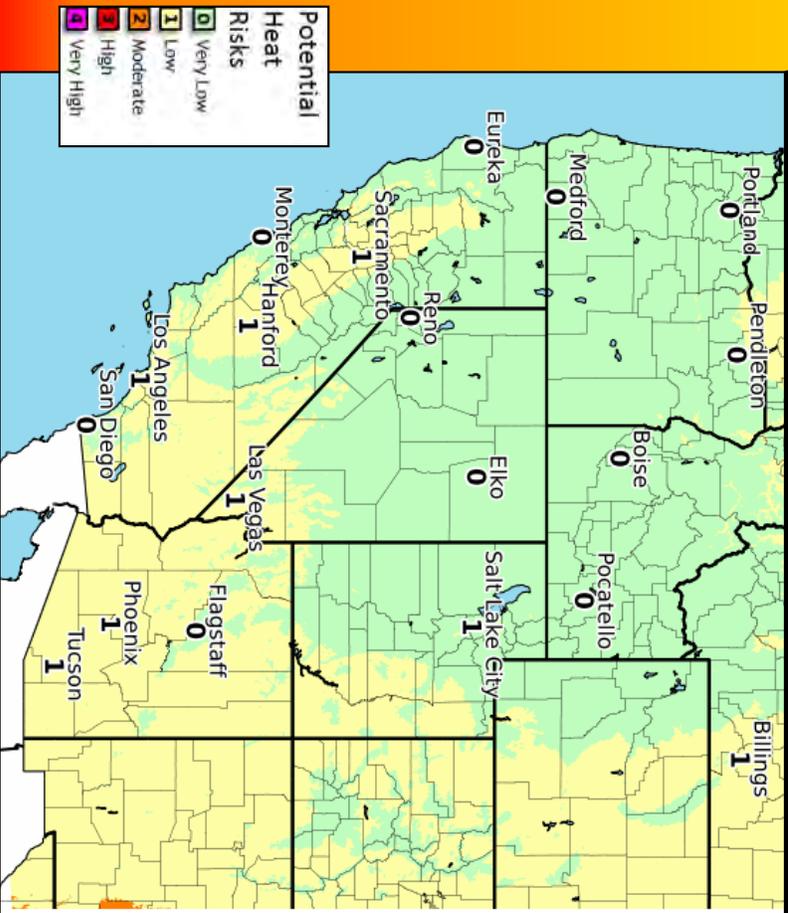
Exotic beetle may doom bird to save rare Arizona bird

Arizona bird



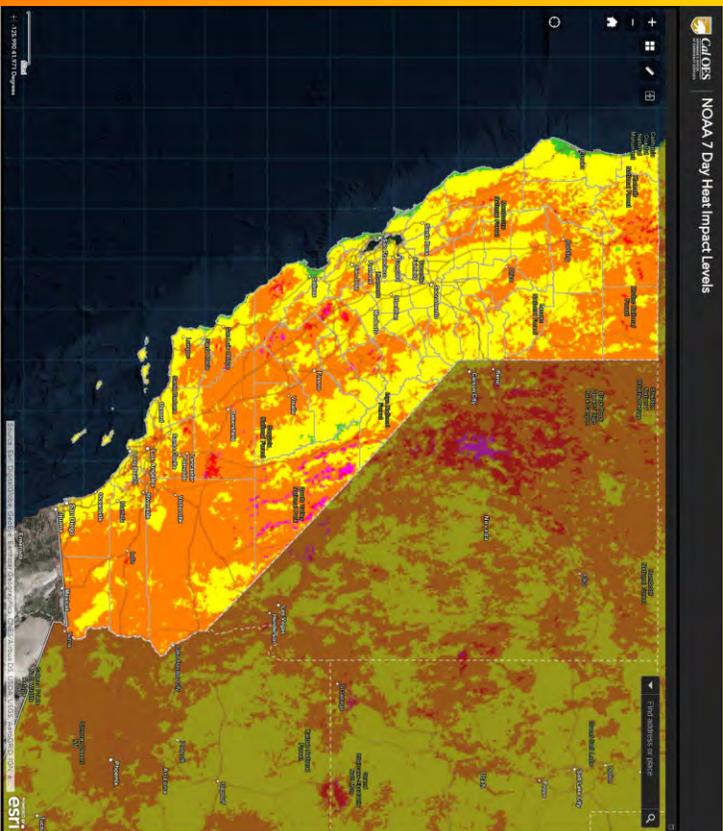
Historical SW June 2017

HeatRisk & NWS Alerts
 Note Excellent Coordination/Consistency Across the Southwest!





Partner Usage of HeatRisk



Heat Alert

Excessive Heat Warning Issued for 13 Counties

National Weather Service has issued an Excessive Heat Warning for:

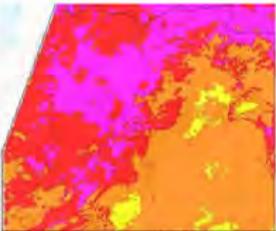
- Gila, La Paz, Maricopa, Pinal, Yuma Counties from 10 a.m. on June 17 to 6 p.m. on June 22.
- Graham, Greenlee, Pima Counties from 11 a.m. on June 17 to 7 p.m. on June 22.
- Cocoonino and Yavapai Counties from 10 a.m. on June 17 to 8 p.m. on June 21.
- Mohave County from 11 a.m. on June 17 to 11 p.m. on June 22.
- Santa Cruz County from 11 a.m. on June 18 to 7 p.m. on June 22.
- Cochise County from 11 a.m. on June 19 to 7 p.m. on June 22.

Daytime highs are expected to be in the **110 to 120 degrees Fahrenheit range**. Residents are advised to stay cool, stay hydrated, and stay informed.

Precautions to prevent heat exhaustion or heat stroke:

- Stay in air-conditioned buildings.
- Limit outdoor activity during the hottest part of the day (mid-day).
- Check on at-risk friends, family, and neighbors at least twice a day.
- Drink water before, during, and after working or exercising outside.

[Click here to learn more about today's heat risk map.](#)






Messaging Heat

Significant End of Week Heat Friday, July 15

What To Do

- Drink before you're thirsty
- Dress for heat
- Reduce time in the sun; avoid strenuous activity during the afternoon
- Help elderly, kids, & pets stay cool
- Close blinds during day – open windows at night

Orange Means...

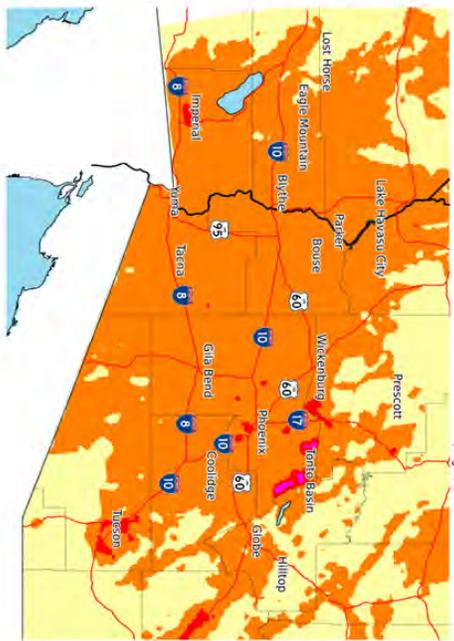
Heat like this happens many times a year. It will be relatively easy to take simple precautions to keep safe.

Red Means...

Heat of this magnitude happens a few times each year. Impacts are likely, even for the general population, if precautions are not taken.

Magenta Means...

Heat of this magnitude is rare, dangerous, and deadly.



Potential Heat Risks
Valid: Friday, July 15, 2018

NATIONAL WEATHER SERVICE
PHOENIX, AZ FORECAST OFFICE
WEATHER BRIEFING



Issued: Thu, September 13, 2018 @ 800 pm MST
Valid For: Friday-Saturday September 14-15, 2018

What: Excessive Heat Warning with highs between 106-112 degrees.

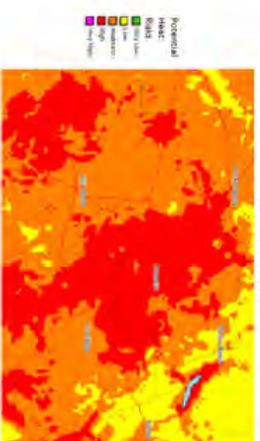
Where: Lower deserts of south central Arizona including the greater Phoenix area and portions of northwest Pinal County.

When: 10 am Friday through 8 pm Saturday.

Weather impacts: Increase in heat related illness for people exercising or working outdoors as well as vulnerable populations without access to air conditioning.

Confidence: High

Experimental NWS Potential Heat Risks
Valid: September 14, 2018



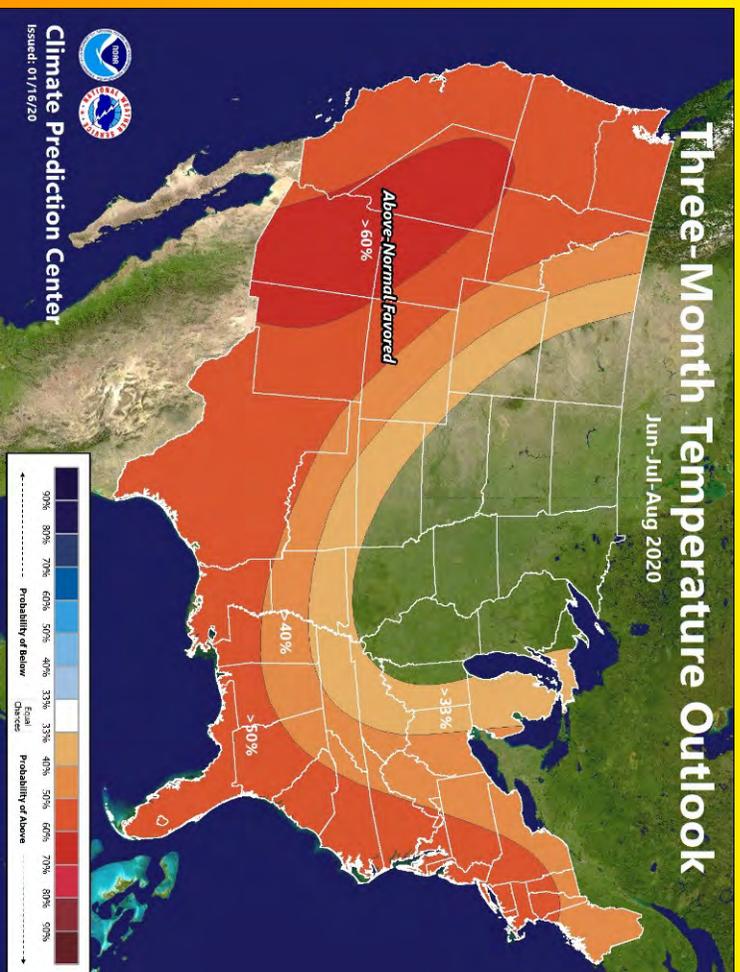
24/7 Decision Support Hotline

Chat

Follow Us: Facebook, Twitter, YouTube

Click here for Graphical Hazards Viewer

National Weather Service
PHOENIX, AZ
602.233.6133



This summer will be hot!
There will be extreme heat! Be prepared!

Paul.Iniguez@noaa.gov | Weather.Gov