

Arizona Prescribed Fire Plan, Agency Coordination & Smoke Management

October 2, 2024

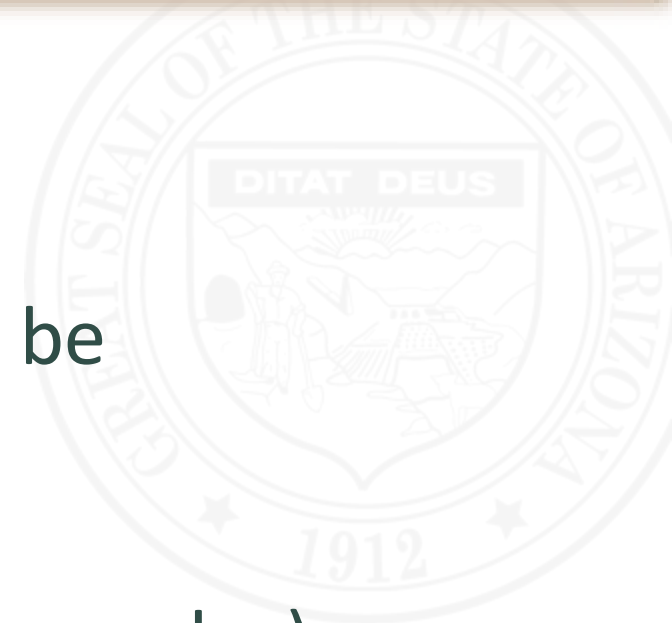
Camp Verde Community Library & Virtual



Engage with the community to provide information regarding smoke management in Arizona. This will include information from the Arizona Department of Forestry and Fire Management (DFFM), United States Forest Service (USFS) and the Arizona Department of Environmental Quality (ADEQ), which is responsible for approving, disapproving, or conditionally approving prescribed fire across Arizona.

Tips for a good meeting

- **Share from your experience and perspective**
- **Please listen when others are speaking**
- **Allow space for all to participate** (speak briefly, be focused and on topic)
- **Be generous** (we at ADEQ want to be open to
 - community input and we ask that you remain open also))
- **We ask that all present try to be respectful**
 - and kind and we believe that this will lead to good outcomes



Sign In



bit.ly/oct2_sign_in

Agenda



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Online Tools

Use the Question Tool



The screenshot displays the GoToWebinar control panel. At the top, there is a menu with 'File', 'View', and 'Help'. Below this, the 'Audio' section is expanded, showing 'Sound Check' with a signal strength indicator. Under 'Audio', 'Computer audio' is selected with a radio button, and 'Phone call' is unselected. A red 'MUTED' indicator is present next to a microphone icon. Below this, a dropdown menu shows 'Microphone (HD Webcam C510)'. A volume slider is visible, followed by another dropdown menu showing 'Speakers (High Definition Aud...'. Below the 'Audio' section, the 'Questions' section is expanded, featuring a text input field with the placeholder '[Enter a question for staff]' and a 'Send' button. At the bottom of the interface, it displays 'Multi sessions different registrants', 'Webinar ID: 980-960-603', and the GoToWebinar logo.



WELCOME!

- **Daniel Czecholinski** (ADEQ) Director of Air Quality
- **Brody Droppleman** (ADEQ) Smoke Management Meteorologist
- **Dr. Matt Pace** (ADEQ) Smoke Management Meteorologist
- **Roy Hall** (DFFM) State Prescribed Fire Officer
- **Ron Sherron** (USFS) Southwest Regional Smoke Coordinator



6 PM - 8 PM

1. Welcome, Housekeeping & Introductions

Justin Harris
ADEQ Manager of Community and Intergovernmental Engagement

2. DFFM Roles and Responsibilities

Roy Hall
DFFM State Prescribed Fire Officer

3. USFS National Priority Landscapes

Ron Sherron
USFS Southwest Regional Smoke Coordinator

4. ADEQ Smoke Management Program

Brody Droppleman
ADEQ Smoke Management Meteorologist

5. Understanding Air Quality Monitors vs.
Sensors

Matt Pace
ADEQ Smoke Management Meteorologist

6. Prescribed Fire Outlook

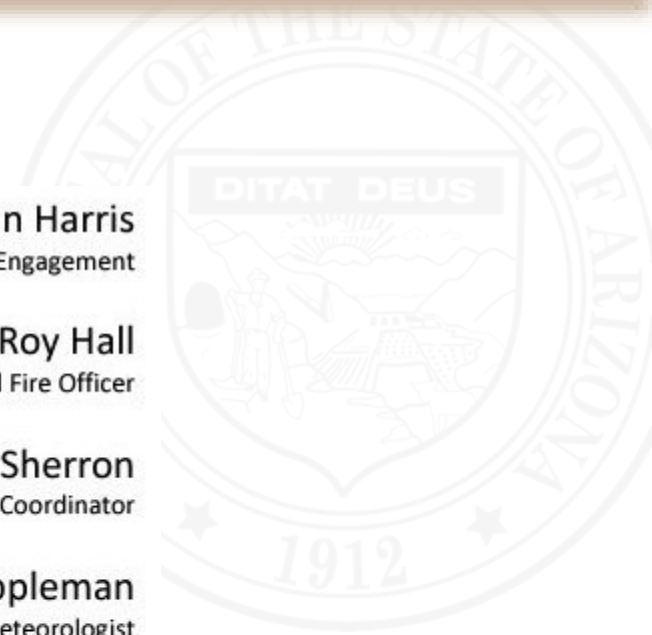
ADEQ/USFS/DFFM

7. Facilitated Question and Answer Session

Justin Harris
ADEQ Manager of Community and Intergovernmental Engagement

8. Closing Remarks

Daniel Czecholinski
ADEQ Director of Air Quality



Department of Forestry and Fire Management

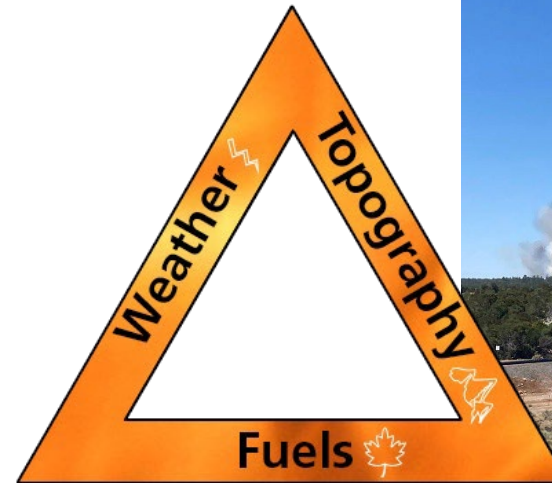


Prescribed Fire and its Benefits



What We Do

- The Arizona Department of Forestry and Fire Management (DFFM) provides fire protection to 22-million acres of state and private lands
- Per Arizona State Statute, DFFM is responsible for fire prevention, suppression, and fuels mitigation – which includes **prescribed fire** on state and private lands
- Divisions include: Fire, Forestry, and Office of the State Fire Marshal



Healthier Forests/Safer Communities



- DFFM tasked with fuels mitigation to protect communities and improve forest health on private, state, and federal lands
- Fuels mitigation conducted through hand thinning, equipment work (mastication) and prescribed fire
- Prescribed fire: pile burning and broadcast burning



Prescribed Fire & its Benefits

- Pile Burning vs Broadcast Burning
- Partner w/ other state agencies, federal and tribal land management agencies to conduct work across different jurisdictions to increase efficiency and effectiveness of acres treated
- Benefits:
 - Helps reduce the risk of wildfires to communities
 - Protects infrastructure like high power utility lines and watersheds
 - Improves the health of Arizona's forests by reducing dead/dying vegetation and diseased trees
 - Enriches soil nutrients



Smoke Management



- Weather plays critical role in project implementation; moisture, humidity, temperatures, wind direction, wind speed, etc.
- State works with ADEQ to ensure limited smoke impacts
- ADEQ approves all burn plans prior to ignitions to minimize smoke impacts to nearby communities



Thank You

Roy Hall
State Prescribed Fire Officer
rhall@dffm.az.gov

Arizona Department of Forestry and Fire
Management





Priority Landscapes

Ron Sherron, Smoke Coordinator
USDA Forest Service Southwest Region



Wildfire Crisis Strategy (WCS)

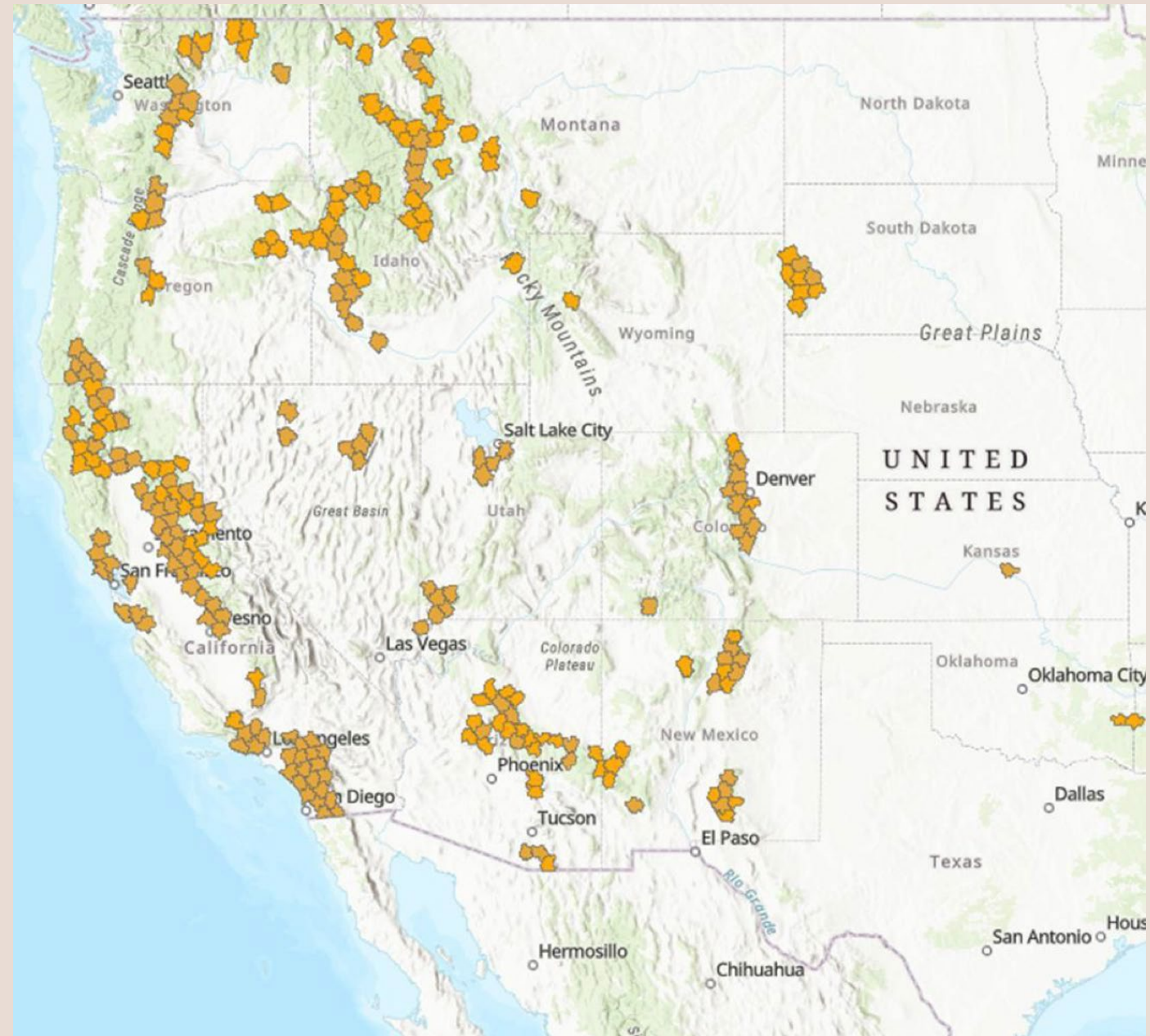
- In January 2022, the Forest Service launched 10 year strategy [“Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America’s Forests,”](#)
- addresses the wildfire crisis in the places where it poses the most immediate threats to communities, critical infrastructure (water, power, national security, etc.) and natural resources.
- combines a years of scientific research and planning with a historic downpayment of congressional funding with into a national effort that will:

WCS

- Goal is to increase the scale and pace of forest health treatments 4 times in the west
 - treat 20 million acres on USFS lands
 - treat 30 million acres on no FS lands in the next 10 years
- agency will work with states, Tribes and other partners to address wildfire risks to critical infrastructure, protect communities, and make forests more resilient.
- **Change in the paradigm**

FireSheds

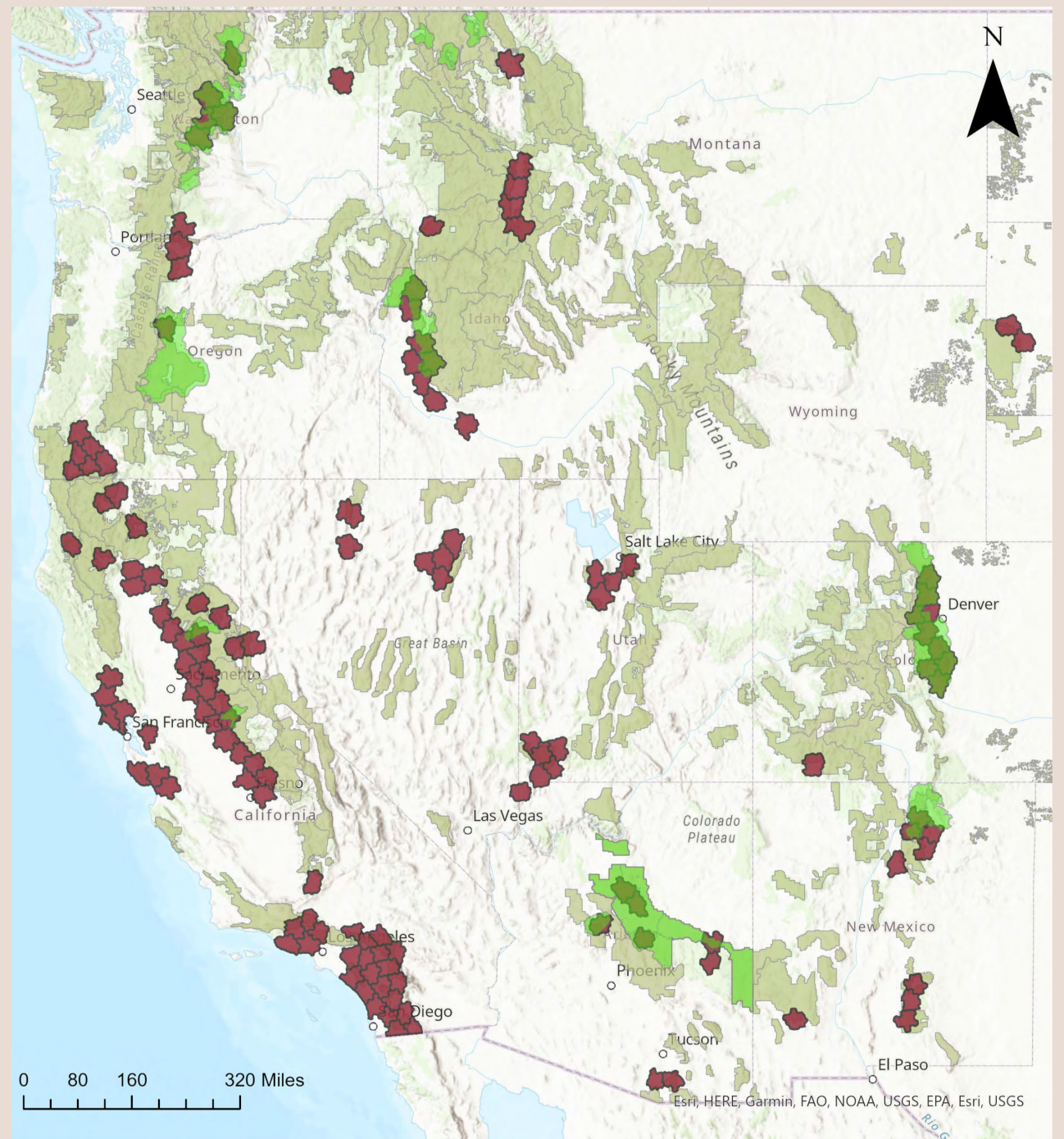
- Used best available science and resources to simulate 79 million wildfires
- help decision makers identify where treatments should take place
- Mapped the top 250 FireSheds



Implementing the Plan

identify the Priority Landscapes based of the top 250 FireSheds:

- that are at scale or can be built out to scale
- are outcome driven
- are developed with communities and ready for implementation,
- allow for investment in underserved communities
- could leverage current partner investments
- maximize use of existing authorities, including: Collaborative Forest Landscape Restoration Program, Tribal Forest Protection Act, Good Neighbor Authority, Joint Chiefs' Landscape Restoration Partnership Program, and Shared Stewardship agreements



10 Initial Landscapes

Landscape Name	State	Size of Landscape [Acres]	FY 2022 Funding [Millions]	FY 2022 Accomplishment [Acres]	Total FY 2022-2024 Funding [Millions]	Total FY 2022-2024 Accomplishment [Acres]
4FRI	Arizona	2,400,000	\$12.0	100,000	\$160.0	300,000
Prescott	Arizona	401,000	\$11.1	28,000	\$28.7	87,700
North Yuba	California	313,000	\$6.8	4,500	\$25.5	16,900
Stanislaus	California	245,000	\$21.8	8,500	\$55.2	32,500
Colorado Front Range	Colorado	3,500,000	\$18.1	10,000	\$170.4	36,100
Southwest Idaho	Idaho	1,720,000	\$17.4	18,000	\$59.5	55,000
Kootenai Complex	Montana	800,000	\$3.6	900	\$19.3	7,200
Enchanted Circle	New Mexico	1,500,000	\$6.6	9,000	\$11.3	32,500
Central Oregon	Oregon	2,600,000	\$4.5	5,000	\$41.3	50,000
Central Washington Initiative	Washington	2,450,000	\$24.6	24,000	\$102.6	124,000
Total			\$131.3	208,000	\$673.8	742,000

* In total 29 candidates for in initial investments were proposed

Four Forest Restoration Initiative (4FRI)

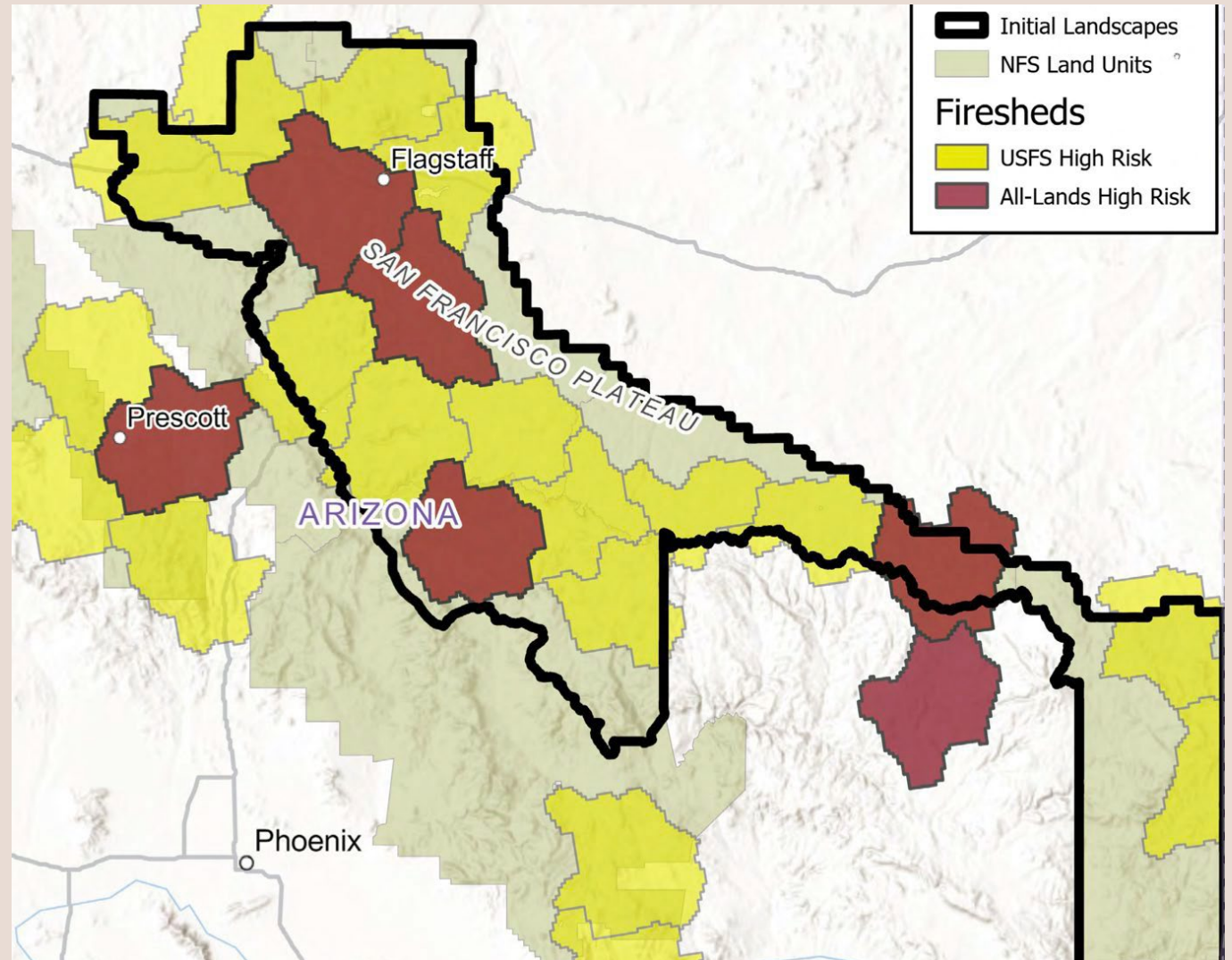
Kaibab, Coconino, Apache-Sitgreaves and Tonto
National Forest

2,400,000 acres

Initial treatments expected to be finished 2042

Partners:

The Nature Conservancy, The Center for Biological Diversity, Trout Unlimited, Great Old Broads of Wilderness, The Grand Canyon Trust, county representatives from all 4FRI counties, National Forest Foundation, Ecological Restoration Institute, National Wild Turkey Federation, Northern Arizona Loggers Association, NewLife Forest Products LLC, Novo BioPower, Campbell Global, Salt River Project, AZ Department of Forestry and Fire, AZ Game and Fish Dept, Bureau of Reclamation, and AZ Commerce Authority



Greater Prescott Area Wildfire Protection and Restoration

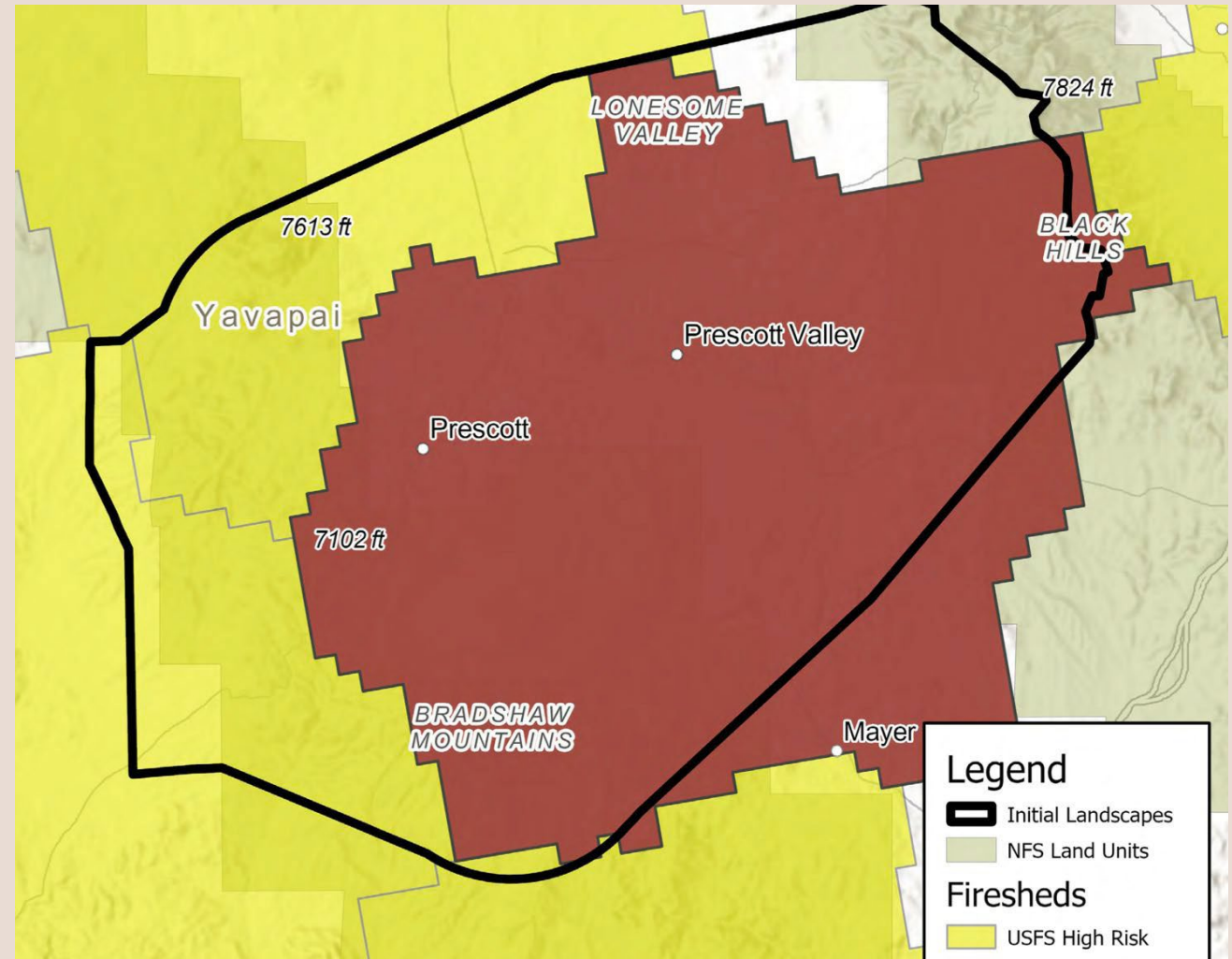
Prescott National Forest

401,000 acres

Initial treatments expected to be finished 2032

Partners:

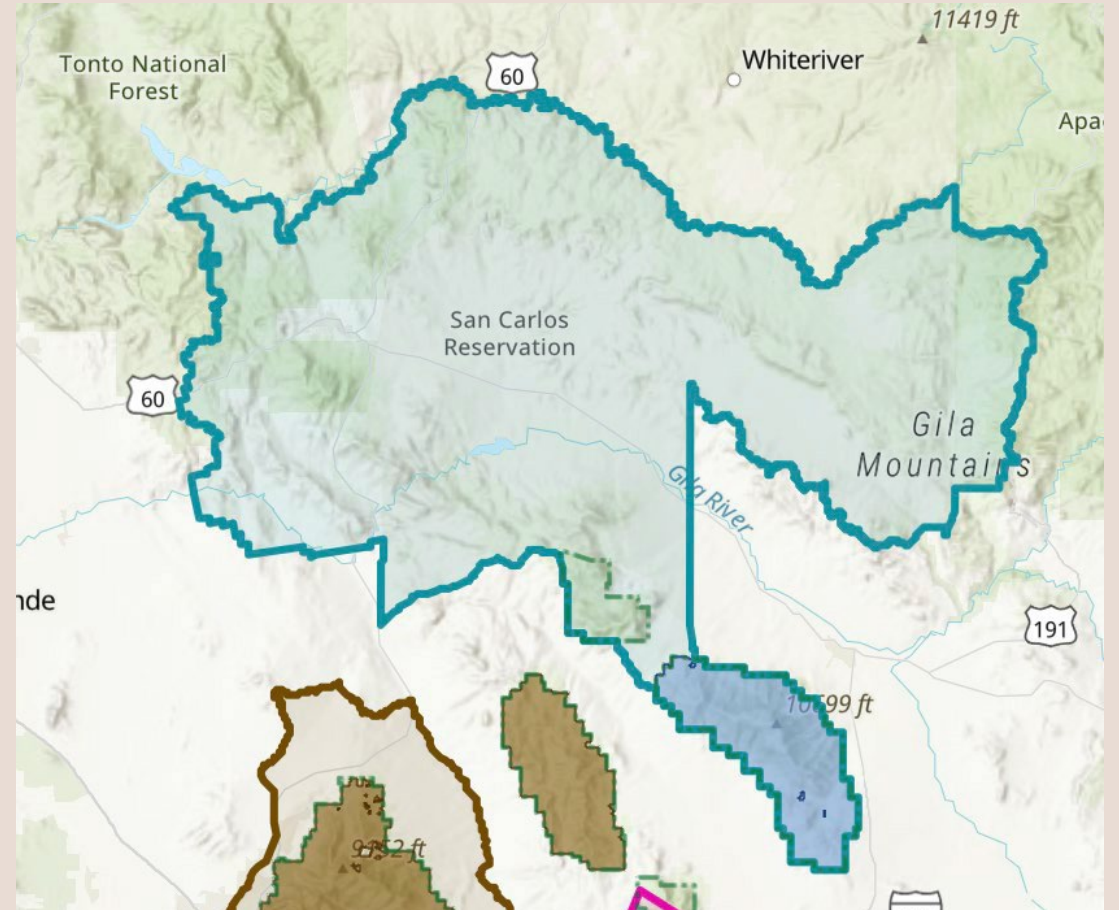
Bureau of Land Management, AZ Division of Forestry & Fire Management, Prescott Area Wildland Urban Interface Commission, Yavapai County Emergency Management, Yavapai County Public Works, Yavapai County Sheriff's Office, Local Fire Departments, above listed Tribes, National Forest Foundation, Arizona Game & Fish, Natural Resource Conservation Service, Natural Resource Conservation District, Arizona Public Service, Salt River Project



Tribal Forest Protection Act

San Carlos Apache Tribal Forest Protection Project of 2023

- San Carlos Apache Tribe, Tonto, Apache-Sitgreaves and Coronado National Forests
- 3,000,000 acres
- 87,000 acres expected by 2027
- Partners:
 - National Forest Foundation, the Arizona Game and Fish Department, the Mule Deer Foundation, and the Salt River Project



What is a Priority Landscape

- Its part of the 10 year strategy
- Use best available science and resources to prioritize fire risks
- Invest where we could best reduce the risk of catastrophic wildfire change the paradigm
- continue to work with ALL partners to support implementation, and identify additional investments needed

Smoke Management in Arizona

Brody Droppleman

Air Quality Meteorologist



Clean Air, Safe Water,
Healthy Land for Everyone



ADEQ Smoke Management Program

- Article 15: Forest and Range Management Burns
 - Coordination, coordination, coordination
 - Review burn plans and examine daily burn requests (smoke forecast)
 - Approve/disapprove or conditionally approve burn requests
 - Collect accomplishment data and tracking emissions & Emissions Reduction Techniques



Smoke Dispersion Evaluation Summary:

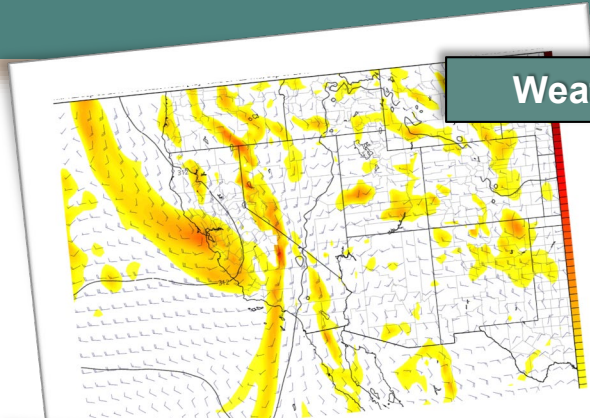
- Analysis of emissions from ongoing prescribed/wildfire
- Analysis of local burn conditions (smoke forecast)
- Assessment of duration and intensity of smoke emissions
- Protection of Class I Areas & National AQ Standards

R18-2-1506. Smoke Dispersion Evaluation [Effective August 7, 2023]

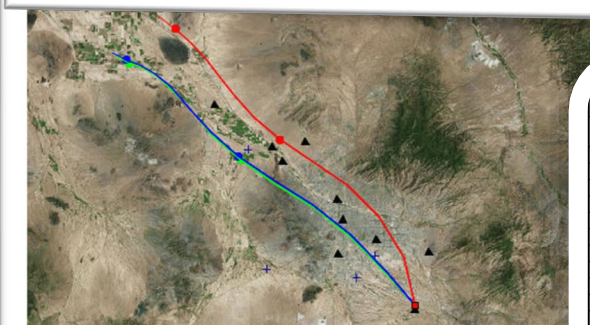
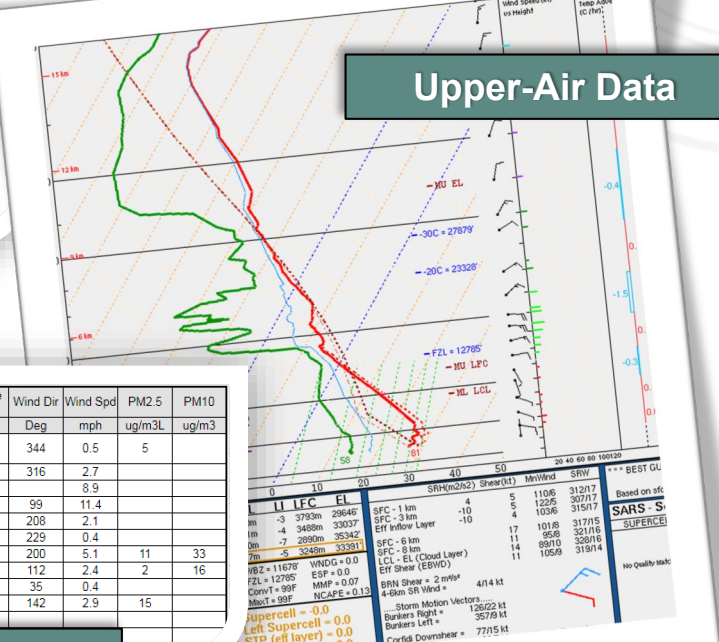
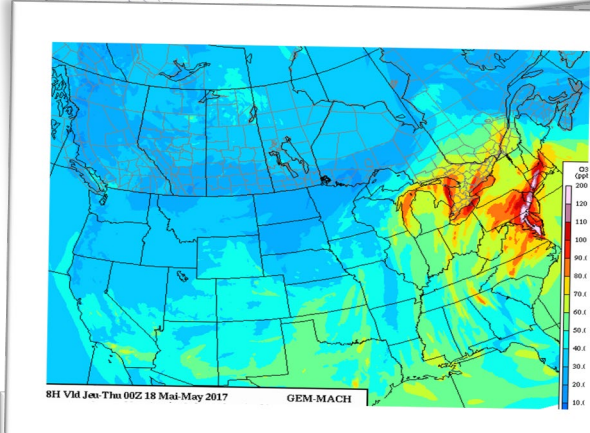
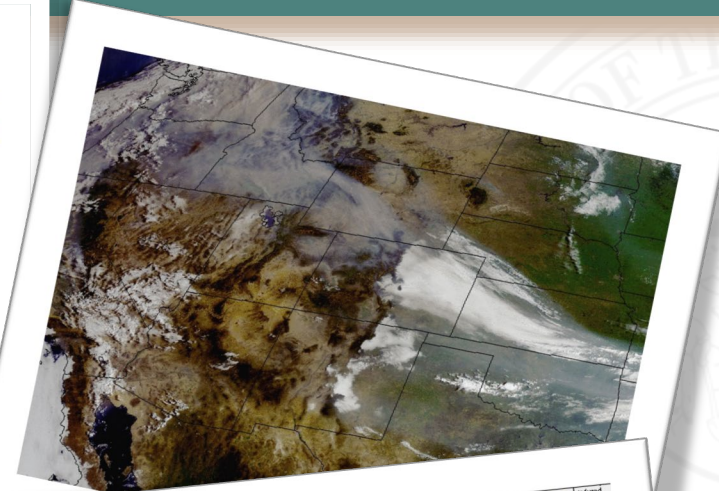
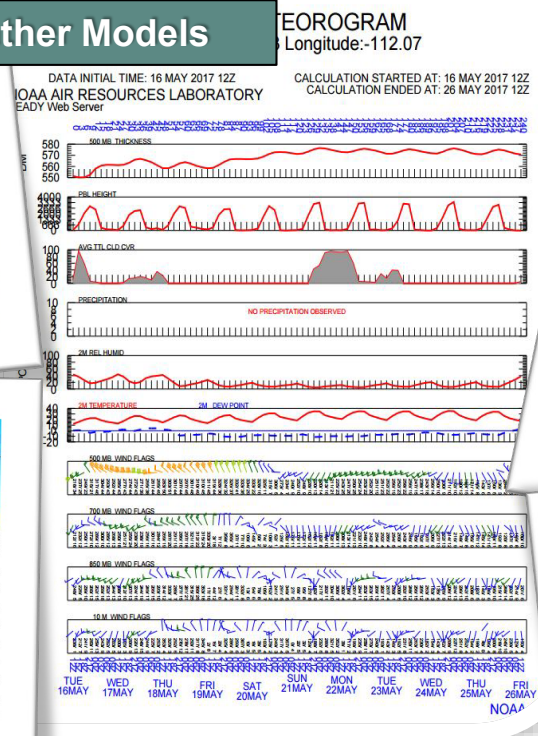
ADEQ shall approve, approve with conditions, or disapprove a Daily Burn Request submitted under R18-2-1505, by using the following factors for each smoke management unit:

1. Analysis of the emissions from burns in progress and residual emissions from previous burns on a day-to-day basis;
2. Analysis of the emissions from wildfires greater than 100 acres and consideration of their potential long-term growth;
3. Local burn conditions;
4. Burn prescription and smoke management prescription from the applicable Burn Plan, i.e. meteorological or smoke modeling;
5. Existing and predicted local air quality;
6. Local and synoptic meteorological conditions;
7. Type and location of areas to be burned;
8. Protection of the national visibility goal for Class I Areas under § 169A(a)(1) of the Clean Air Act and 40 CFR 51.309;
9. Assessment of duration and intensity of smoke emissions to minimize cumulative impacts;
10. Minimization of smoke impacts in Class I Areas, areas that are non-attainment for particulate matter, carbon monoxide, and ozone non-attainment areas, or other smoke sensitive areas including transportation corridors;
11. Protection of the National Ambient Air Quality Standards.

ADEQ Smoke Management Program: Tools



Weather Models

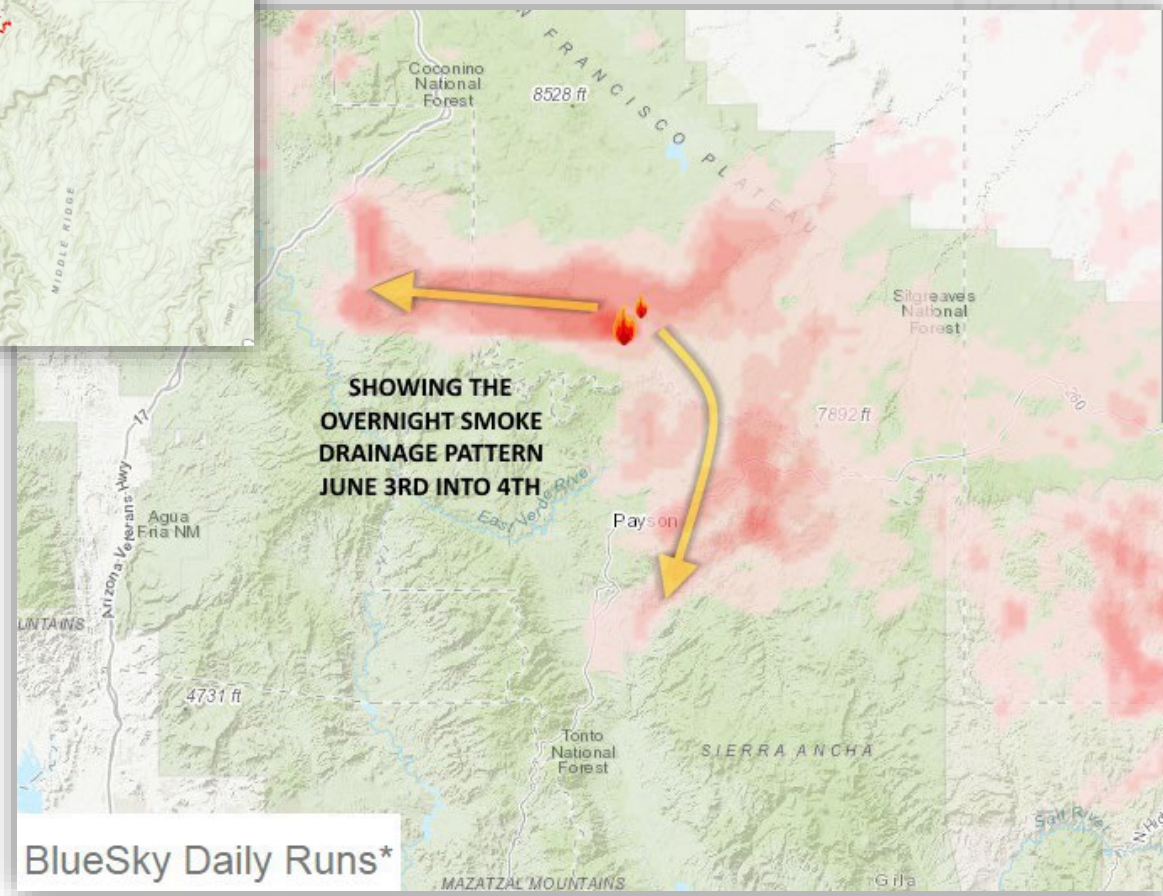
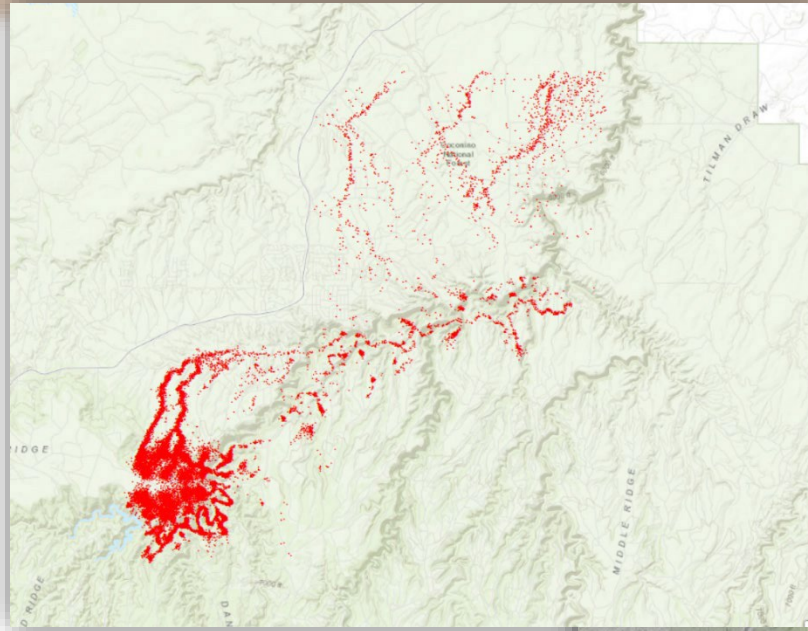


Air Parcel Trajectories

Station	Date And Time	Ozone	CO	NO ₂	SO ₂	NO _y	Outside Temp	Wind Dir	Wind Spd	PM _{2.5}	PM ₁₀
		ppm	ppm	ppb	ppb	ppb	DegF	Deg	mph	ug/m3L	ug/m3
Childrens Park NCore	9/5/2017 11:00 AM	0.059		5.5		6.8	96.3	344	0.5	5	
Alvernon & 22nd	9/5/2017 11:00 AM		0.2				96.0	316	2.7		
Craycroft & 22nd	9/5/2017 11:00 AM	0.057	0.1	5.1			97.0		8.9		
Fairgrounds	9/5/2017 11:00 AM	0.055					98.1	99	11.4		
Tangerine	9/5/2017 11:00 AM	0.051					95.7	208	2.1		
Saguaro Park East	9/5/2017 11:00 AM	0.057						229	0.4		
Geronimo	9/5/2017 11:00 AM						96.1	200	5.1	11	33
Green Valley	9/5/2017 11:00 AM	0.054					97.3	112	2.4	2	16
Coachline	9/5/2017 11:00 AM	0.058					96.9	35	0.4		
Rose Elementary	9/5/2017 11:00 AM	0.055					97.2	142	2.9	15	
Cherry & Glenn	9/5/2017 11:00 AM										
Golf Links	9/5/2017 11:00 AM										

Current Air Quality Data

ADEQ Smoke Management Program: Tools



BlueSky Daily Runs*

Communicating Daily Burn Information

smoke.azdeq.gov

- Lists daily burn approvals, locations and restrictions
- Map showing approved burns for the day
- Accomplished burns are added by federal and state land managers following burns

Messages from ADEQ

Please use Chrome or Edge to submit burn requests. You may experience issues using Internet Explorer.

REMINDER: All burn requests are due by 2 pm the business day BEFORE your planned ignition day. Burn requests for Saturday, Sunday, and Monday are due by 2 pm Friday.

To see current particulate levels, visit ADEQ's Portable Particulate Monitors page

To file an official smoke complaint, you can access the complaint forms here

Notes for burns approved on Tuesday, 11/7/2023:

Black Hills (PNF2001B) - 100 acres

- Ignitions only approved to protect values at risk and strengthen existing control lines.
- Ignition cannot occur if the Cottonwood2 Portable Particulate Monitor 24-Hour Running Average is at/or above 35.5ug/m³. You can view the monitor readings at: <https://www.phoenixvis.net/PPMdata.aspx>

Pole Knoll (ASF631B) - 2020 acres

- Watch impacts to SR-280

Info: There are no daily messages from ADEQ for 2023-11-07.

Approved Daily Burns Today is 2023-11-07

Burn Number	Burn Name	Ignition Date	Approved Acres	Location	Notes
ASF631B	Pole Knoll	2023-11-07	2020	Location (34.0, -109.5)	
PNF2001B	Black Hills	2023-11-07	100	Location (34.6, -112.1)	
TNF0409B	Rim Country	2023-11-07	2449	Location (34.3, -111.6)	

Accomplished Daily Burns Today is 2023-11-07

Info: No accomplishments have been submitted for 2023-11-07.

Prescribed Fires on Tribal Land Today is 2023-11-07

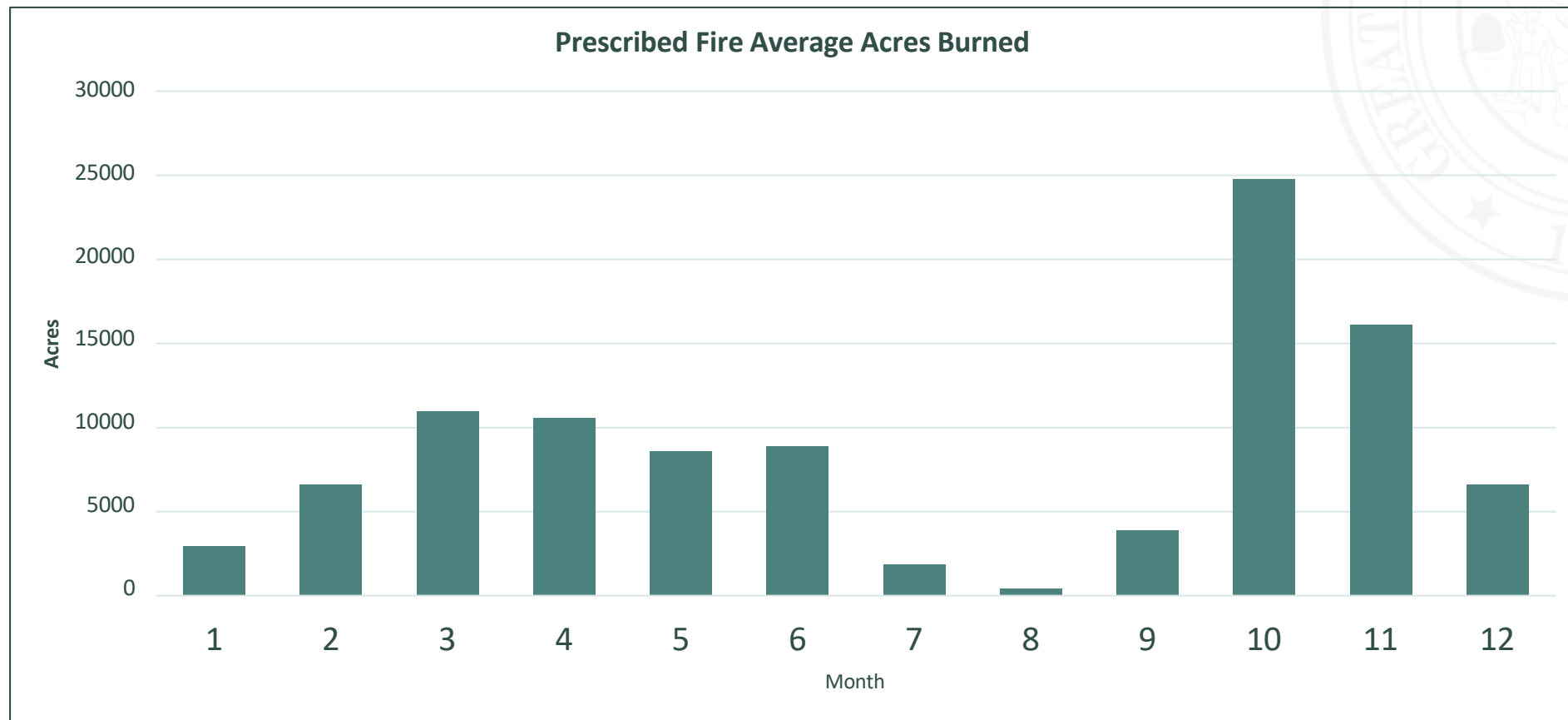
(ADEQ does not have jurisdiction over prescribed fires on tribal land. The information below is for informational purposes only and may not represent every prescribed fire on tribal land.)

Approved Burns for Today, 2023-11-07



Prescribed Fire Acres

Average: ~95,000 acres per year
Average: ~450 request per year



Air Quality Sensors and Monitors

Oct. 2, 2024: Smoke Management Community Meeting

Matthew Pace, PhD

Air Quality Meteorologist (Principal Scientist)



Clean Air, Safe Water,
Healthy Land for Everyone



Monitor vs Sensor

	Reference Monitors	Low-Cost Sensors
Typical Purchase Cost Range	\$15,000 to \$50,000	\$100 to \$2500
Operating Expense	Expensive	Inexpensive
Siting Location	Fixed Location (building/trailer needed)	Portable (basic weather shielding)
Staff Training	Highly trained technical staff	Little or No Training
Data Quality	Known and consistent quality in a variety of conditions	Unknown and may vary from sensor to sensor and in different weather conditions
Operating Lifetime	10+ Years (calibrated and operated to maintain accuracy)	Short (1 year) or Unknown (may become less sensitive over time)

Source: https://www.epa.gov/sites/default/files/2018-01/documents/collocation_instruction_guide.pdf

Portable Smoke Monitors

www.phoenixvis.net

Portable Particulate Monitors

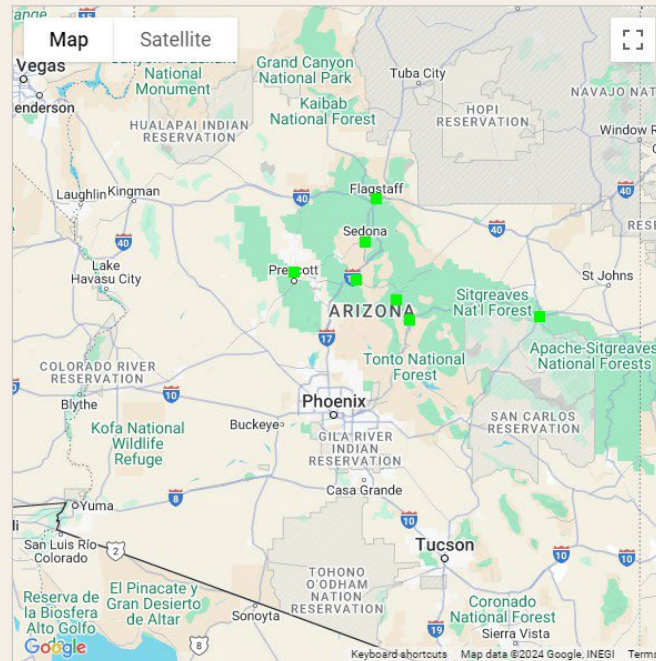
The Arizona Department of Environmental Quality (ADEQ) operates a network of Portable Particulate Monitors across Arizona. These monitors record hourly average concentrations of particulates which have been linked to health and visibility concerns.

The purpose of this web page is to provide to the public in near real time, data recorded by the Portable Particulate Monitor Network. The 24-Hour averages are provided color-coded based on the official EPA 24-Hour Air Quality Index (AQI). 1-Hour averages are also provided for assessing short term particulate exposure for people in sensitive groups.

Click on a location name below or a colored square on the map to the right to access data for that monitoring station in a new window. The default data graph will present the current and previous day's data, and all historical data can be accessed through the selection tools below the graph.

For more information about this network contact:

Air Quality Division
(602) 771-4834 or (602) 771-0004

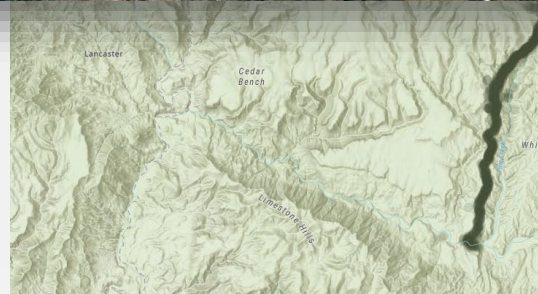
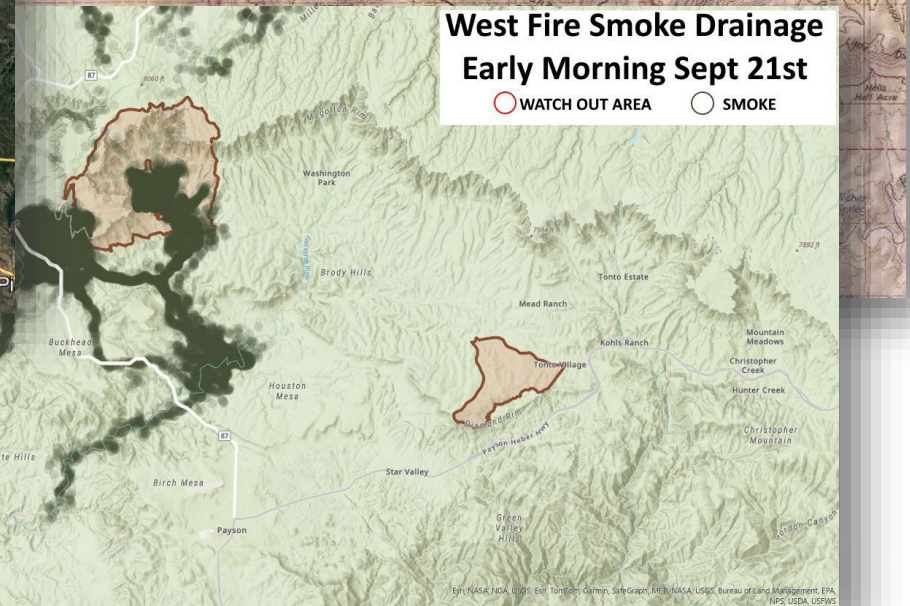


Location	Pollutant	*1-Hour Average (µg/m ³)	**24-Hour Average (µg/m ³)
Camp Verde	PM _{2.5}	11	4
Flagstaff	PM _{2.5}	0	5
Payson	PM _{2.5}	0	3
PineFD2024	PM _{2.5}	12	46
Prescott	PM _{2.5}	4	3
Sedona	PM _{2.5}	20	4
Show Low	PM _{2.5}	12	5
ADOT	PM _{2.5}		

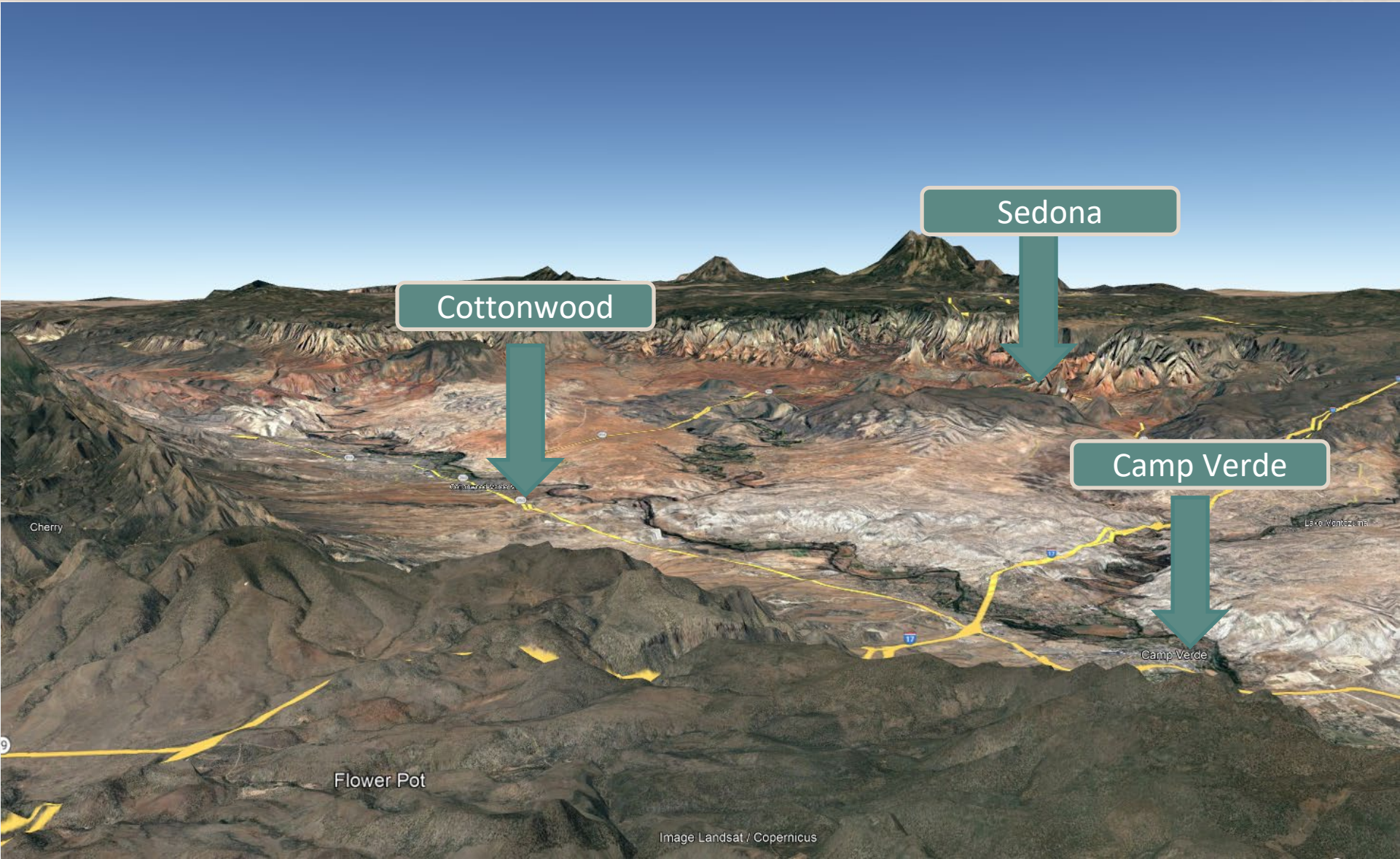


- Semi-permanent and temporary air monitoring locations
- Provides an idea of air quality impacts from prescribed burns and wildfires
- Monitors are placed, moved, or removed as needed

Topography: Monitor Location

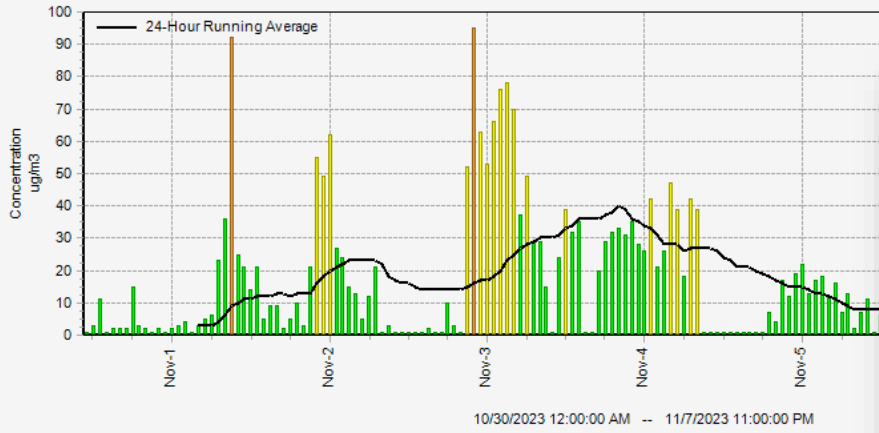


Topography: Monitor Location

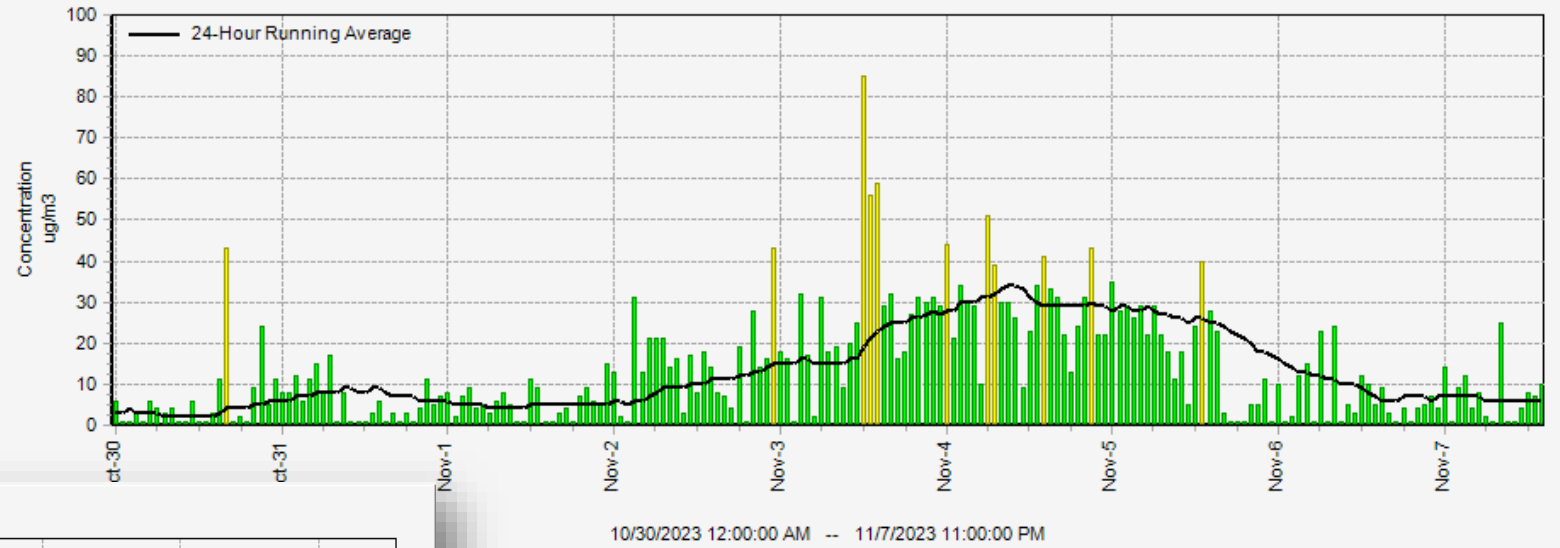


Monitor Data

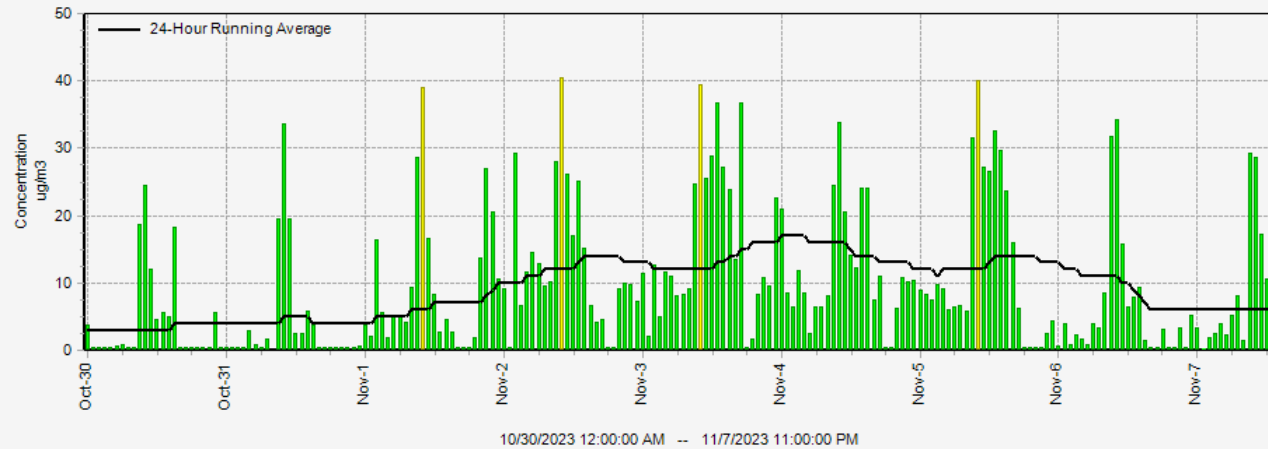
PM2.5 Concentration for Vernon 2023



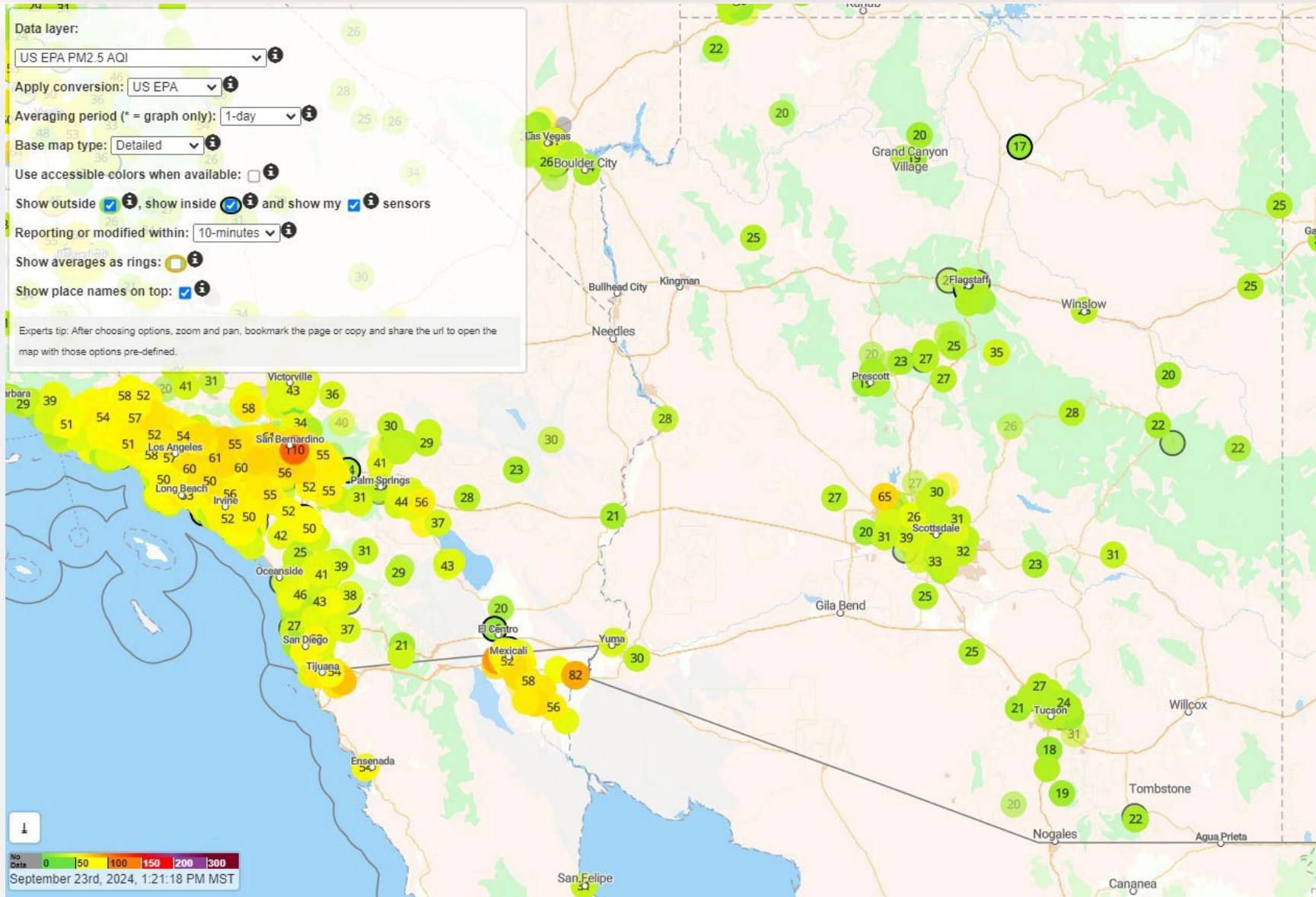
PM2.5 Concentration for Camp Verde



PM2.5 Concentration for Cottonwood2



Sensors: Air Map



Example Map Settings

Data layer:
US EPA PM2.5 AQI

Apply conversion: US EPA

Averaging period (* = graph only): Real-time

Base map type: Detailed

Use accessible colors when available:

Show outside , **show inside** and **show my** sensors

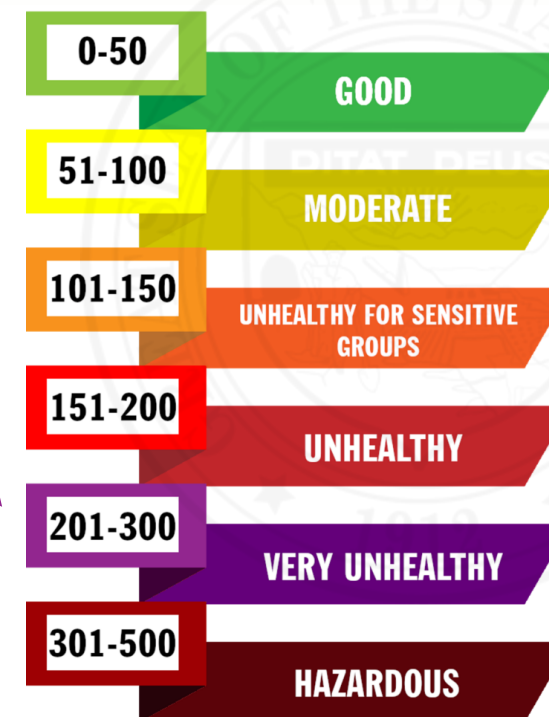
Reporting or modified within: 10-minutes

Show averages as rings:

Show place names on top:

Experts tip: After choosing options, zoom and pan, bookmark the page or copy and share the url to open the map with those options pre-defined.

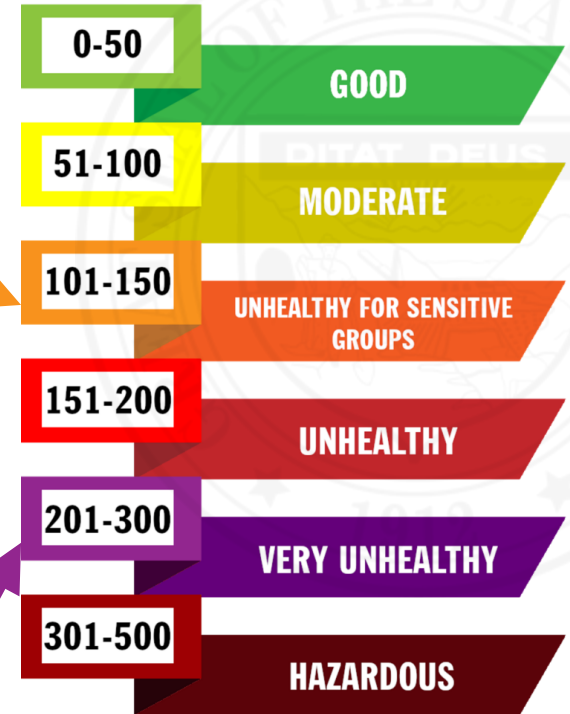
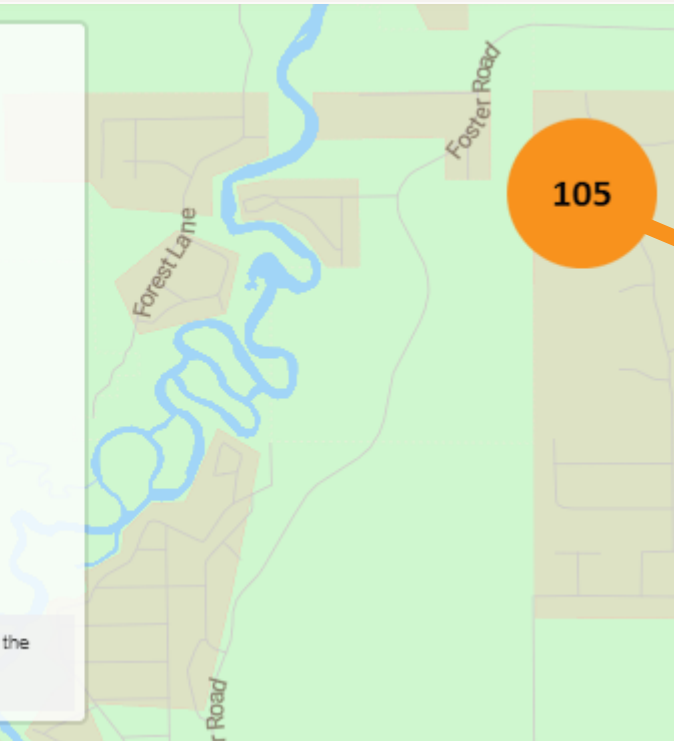
The map shows a purple circle with the number 212, indicating the current AQI value.



Example Map Settings

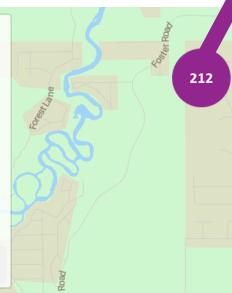
Data layer:
US EPA PM2.5 AQI **i**
Apply conversion: US EPA **i**
Averaging period (* = graph only): 1-hour **i**
Base map type: Detailed **i**
Use accessible colors when available: **i**
Show outside **i**, show inside **i** and show my **i** sensors
Reporting or modified within: 10-minutes **i**
Show averages as rings: **i**
Show place names on top: **i**

Experts tip: After choosing options, zoom and pan, bookmark the page or copy and share the url to open the map with those options pre-defined.



Data layer:
US EPA PM2.5 AQI **i**
Apply conversion: US EPA **i**
Averaging period (* = graph only): Real-time **i**
Base map type: Detailed **i**
Use accessible colors when available: **i**
Show outside **i**, show inside **i** and show my **i** sensors
Reporting or modified within: 10-minutes **i**
Show averages as rings: **i**
Show place names on top: **i**

Experts tip: After choosing options, zoom and pan, bookmark the page or copy and share the url to open the map with those options pre-defined.



Example Map Settings

Data layer:

US EPA PM2.5 AQI

Apply conversion: US EPA

Averaging period (* = graph only): 1-day

Base map type: Detailed

Use accessible colors when available:

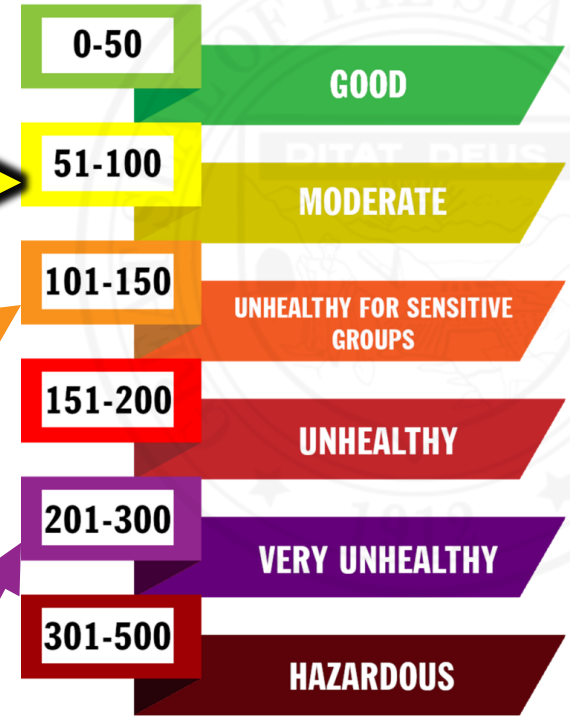
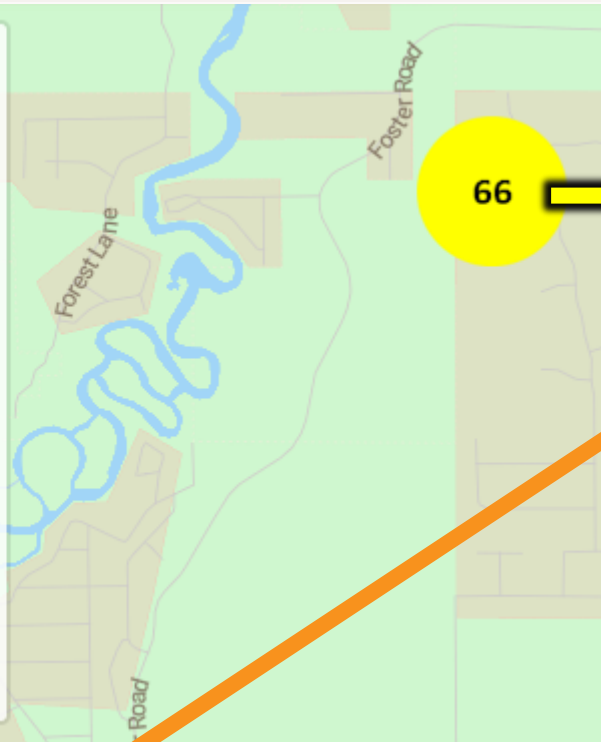
Show outside , show inside and show my sensors

Reporting or modified within: 10-minutes

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Data layer:

US EPA PM2.5 AQI

Apply conversion: US EPA

Averaging period (* = graph only): 1-hour

Base map type: Detailed

Use accessible colors when available:

Show outside , show inside and show my sensors

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Show averages as rings:

Show place names on top:

Experts tip: After choosing options, zoom and pan, bookmark the page or copy and share the url to open the map with those options pre-defined.

Data layer:

US EPA PM2.5 AQI

Apply conversion: US EPA

Averaging period (* = graph only): Real-time

Base map type: Detailed

Use accessible colors when available:

Show outside , show inside and show my sensors

Reporting or modified within: 10-minutes

Show averages as rings:

Show place names on top:

Experts tip: After choosing options, zoom and pan, bookmark the page or copy and share the url to open the map with those options pre-defined.

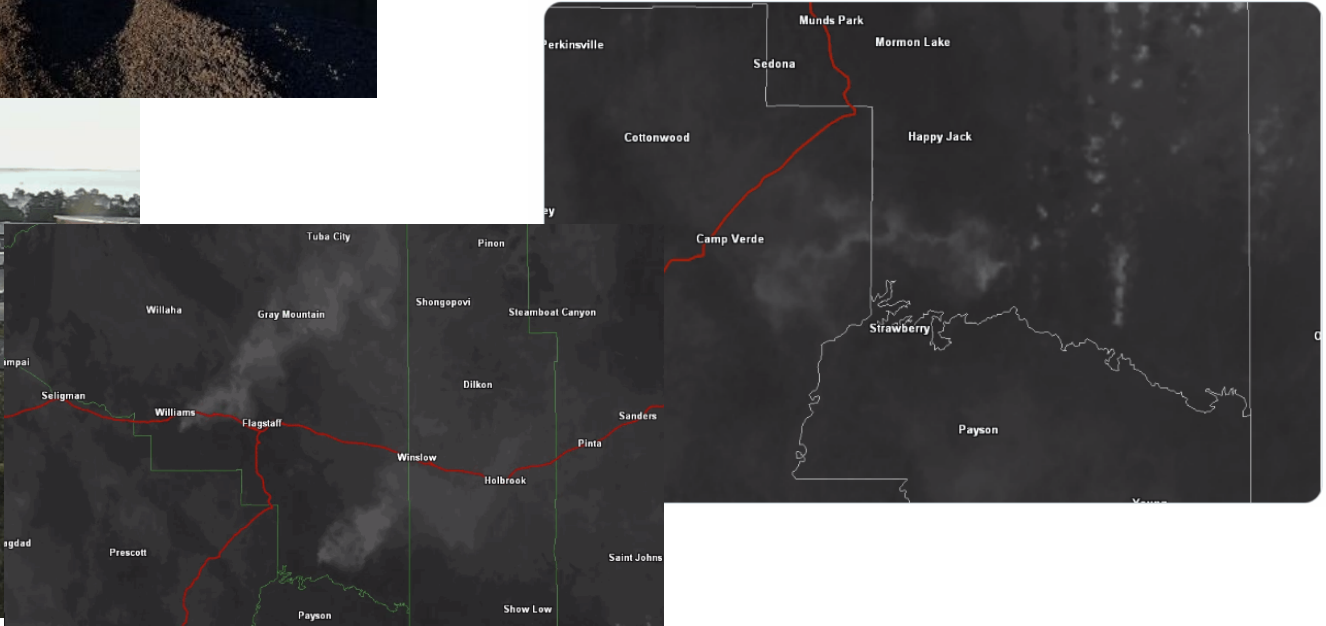
105

212

Alternatives to monitors and/or sensors



SR260



5-3-1 Rule

5

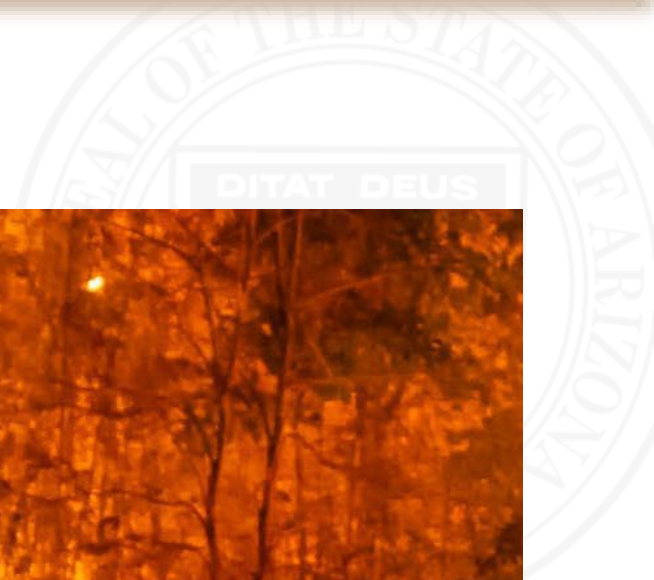
5 MILES AWAY:
AIR QUALITY IS UNHEALTHY FOR VULNERABLE
GROUPS. MINIMIZE OUTDOOR ACTIVITIES.

3

3 MILES AWAY:
VULNERABLE GROUPS SHOULD STAY INDOORS. OTHERS
SHOULD LIMIT OUTDOOR ACTIVITIES.

1

1 MILE AWAY:
EVERYONE SHOULD REMAIN INDOORS
AND AVOID ANY OUTDOOR ACTIVITIES.



Burn Windows

Oct. 2, 2024: Smoke Management Community Meeting

Matthew Pace (ADEQ)

Brody Droppleman (ADEQ)

Roy Hall (DFFM)

Ron Sherron (USFS)

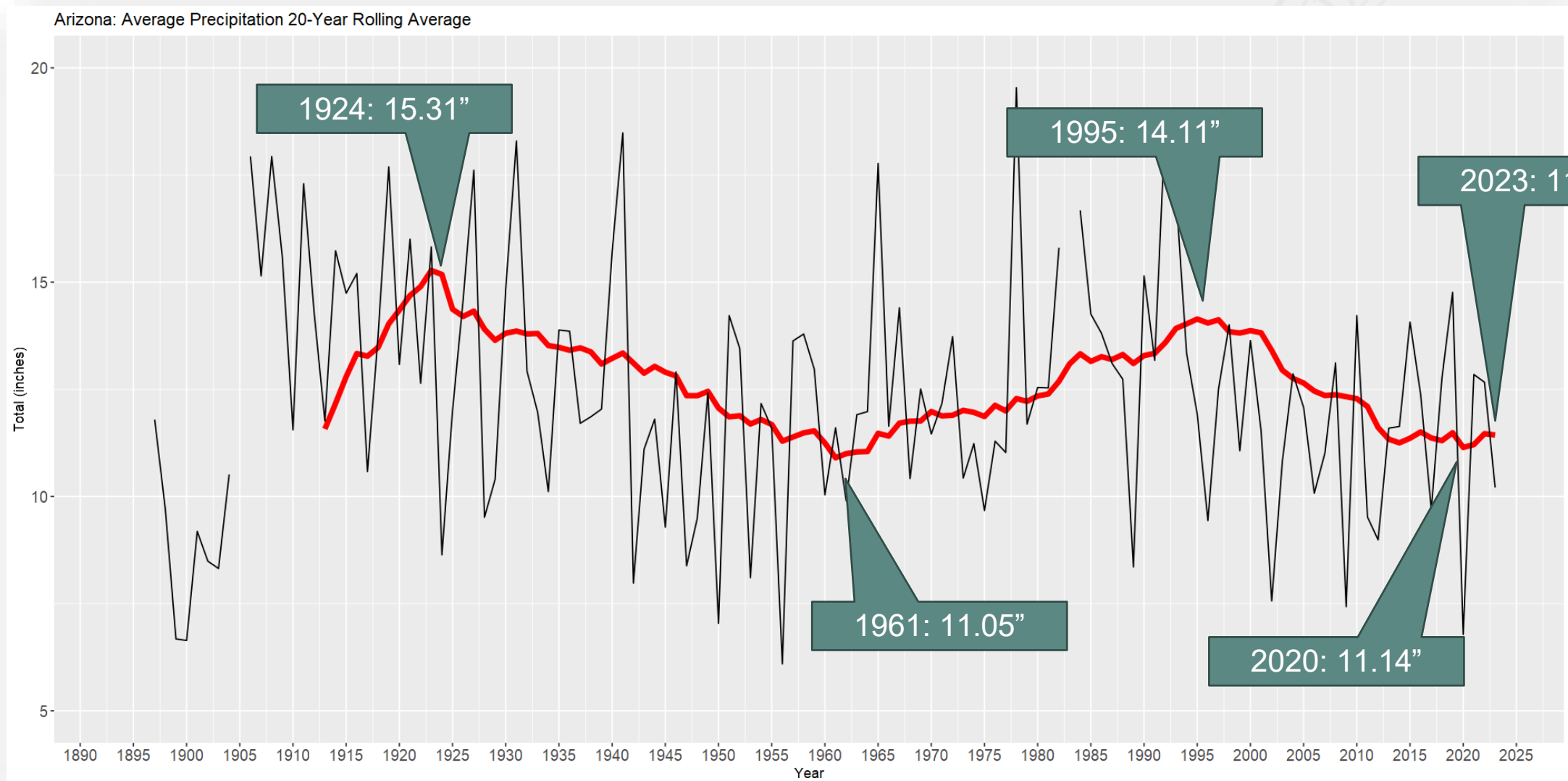


Clean Air, Safe Water,
Healthy Land for Everyone



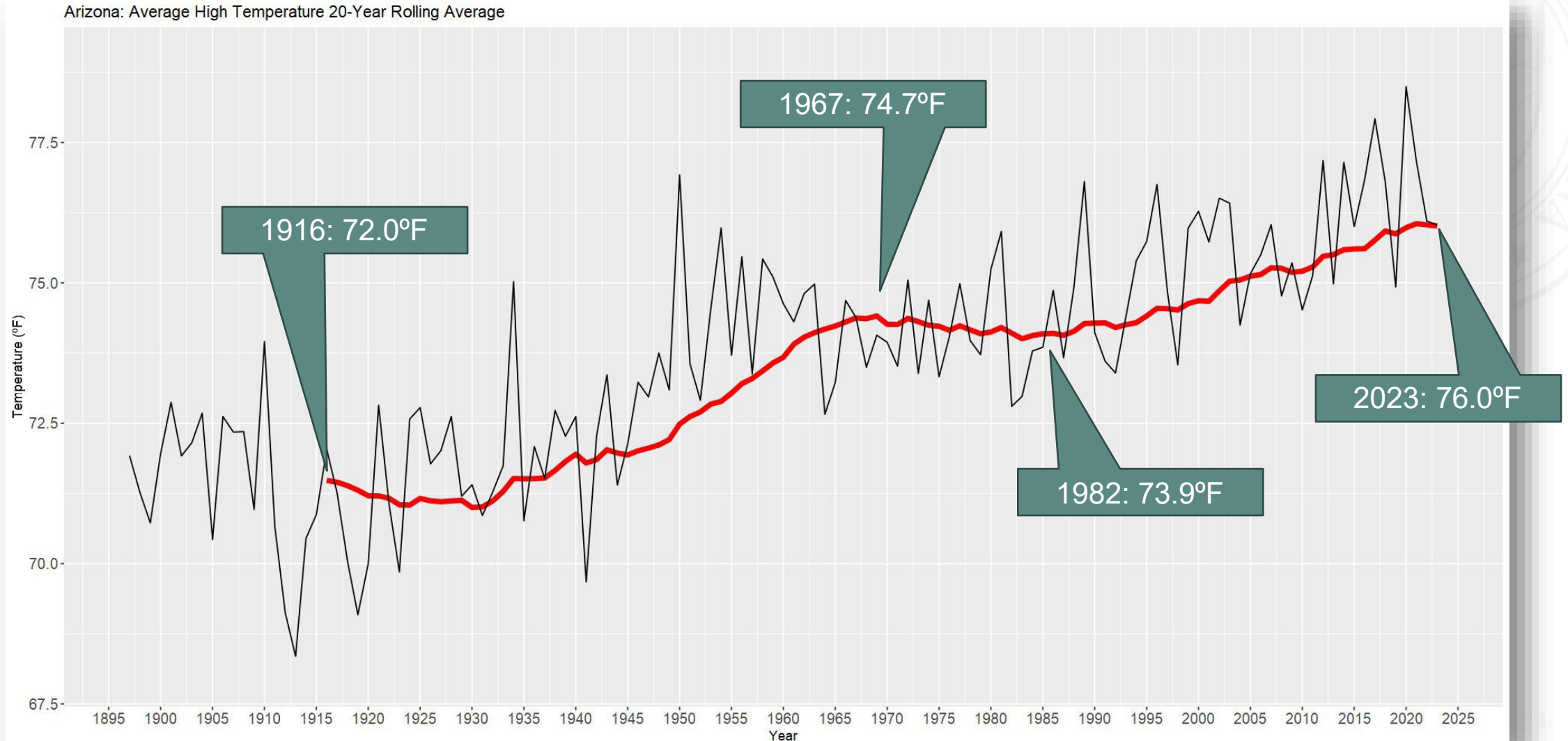
Changing Weather Windows: Precipitation

Since the mid-90s to 2023 precipitation has dropped 2.68"

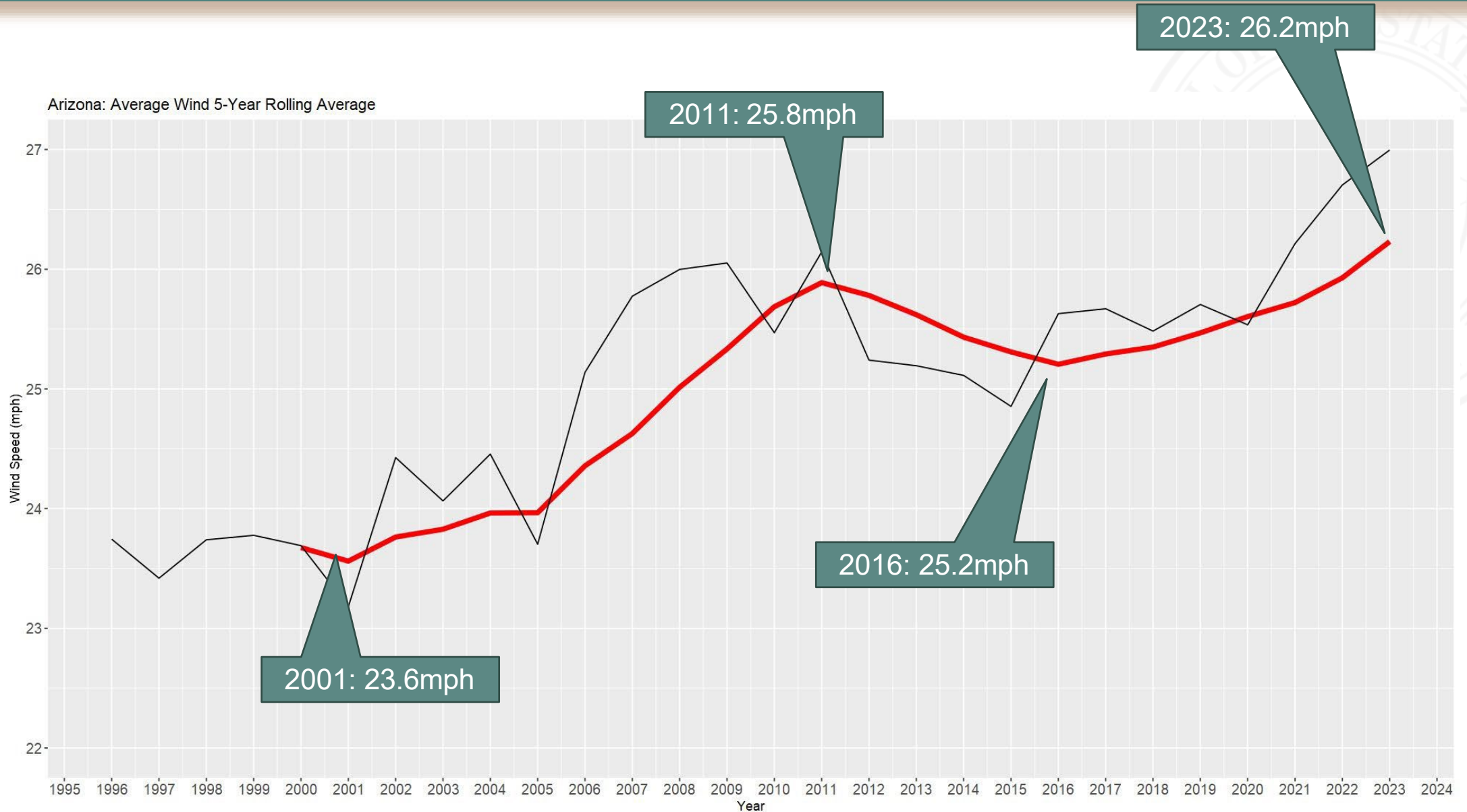


Changing Weather Windows: Temperature

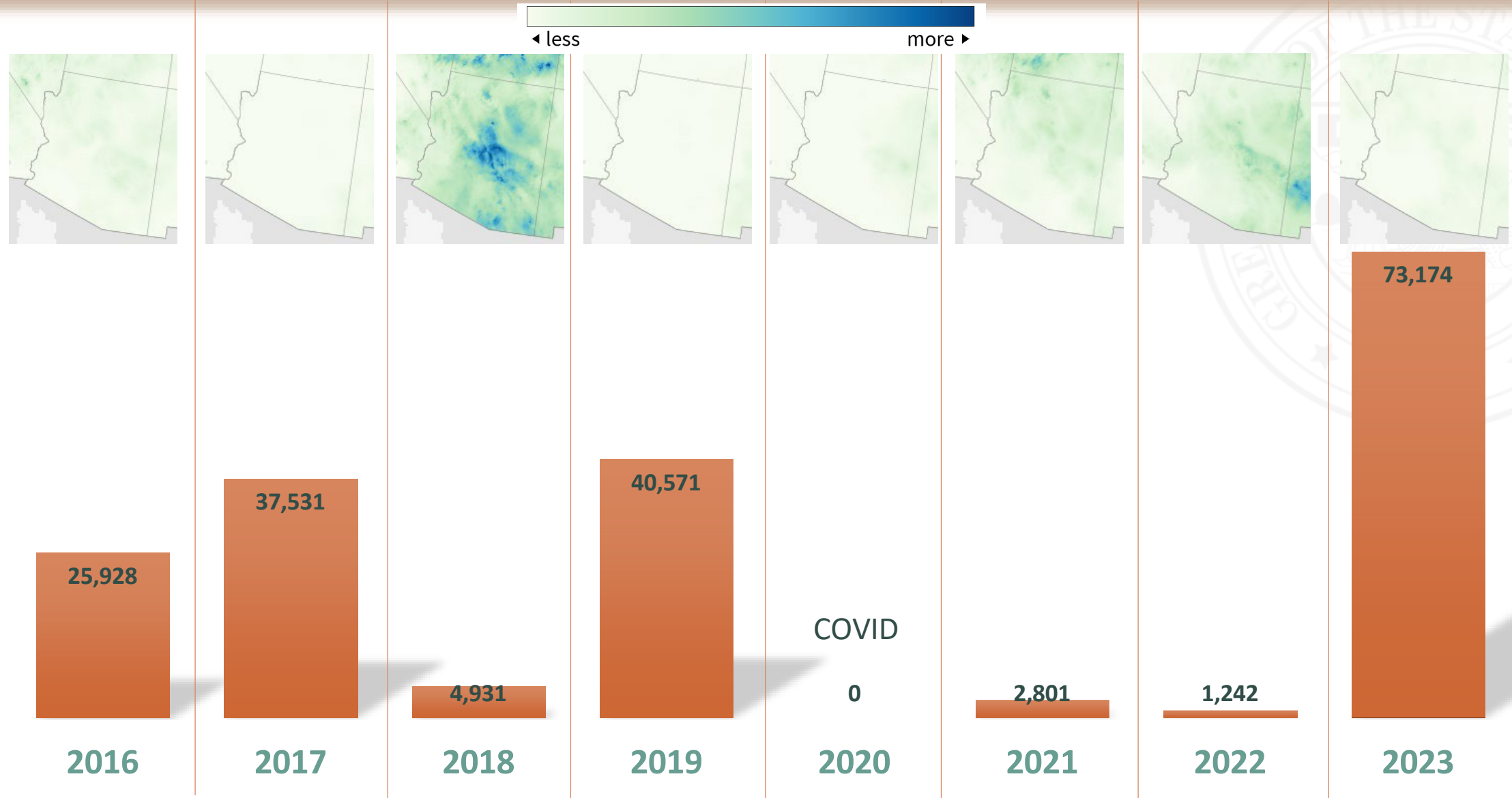
Since 1982 high temperatures have increased by 2.1°F



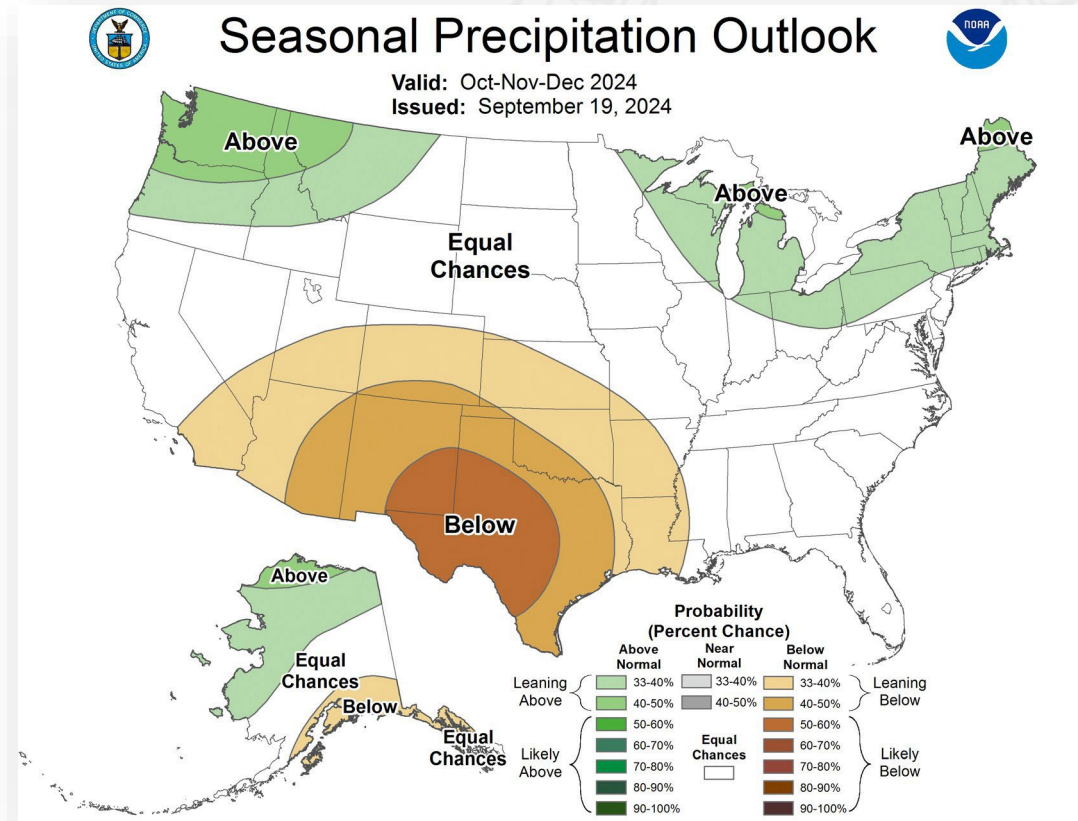
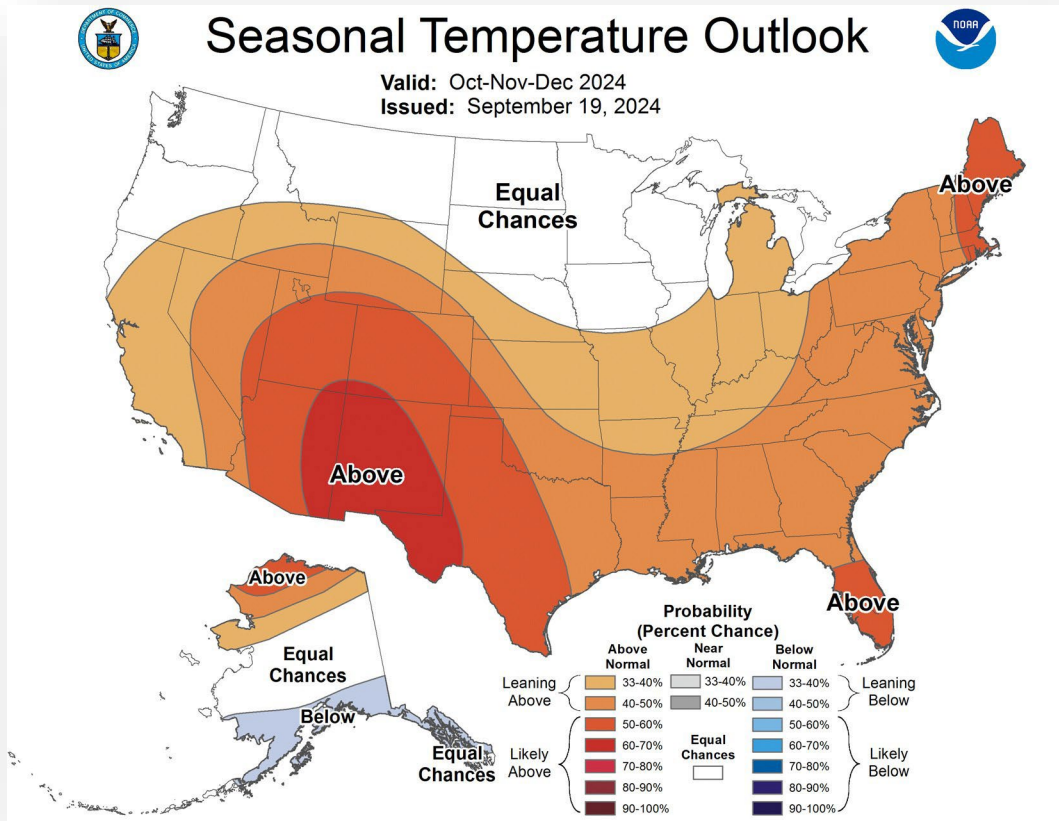
Changing Weather Windows: Wind Speed



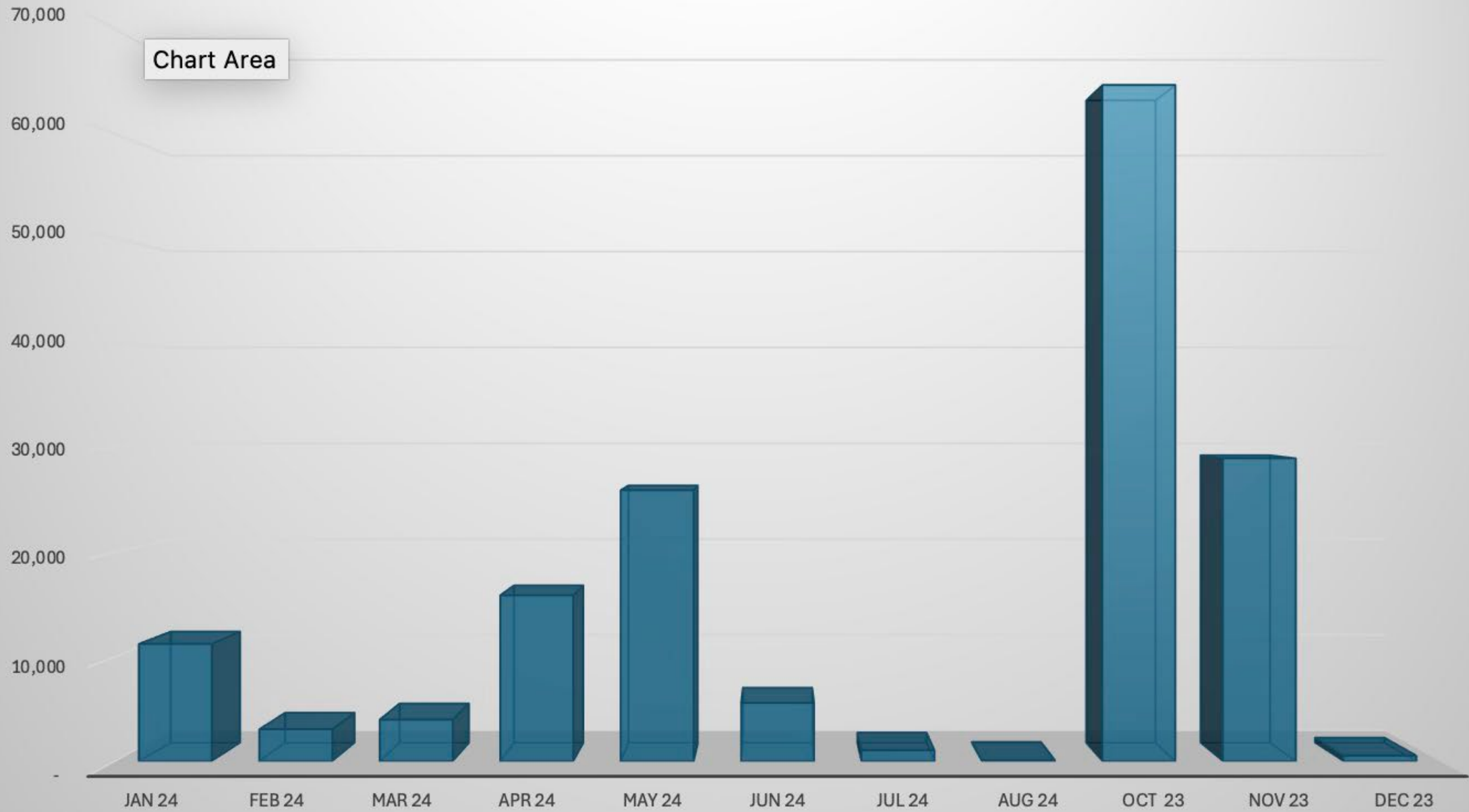
Acres Burned vs Precip In October: 2016-2023



The Outlook



USFS SW Region FY 2024 Arizona NF Prescribed Fire Accomplishments



Projected activity

- Fire Needs Assessment (377,444 mean acres)
- In AZ all activity for FY24 we did 320,737 acres including: prescribed fire, wildfire, mechanical treatments
- Mechanical would be the most effective at 1st entry level, but we don't have the funding or industry available currently.
- We do prescribed fire because we can treat at a landscape scale with the funding we receive.
- If we can stay close to 150k-160k we are close to where we need to be.



Contact Information

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