CITY COUNCIL STUDY SESSION MEETING

STUDY SESSION AGENDA

TUESDAY, FEBRUARY 14, 2023, 1:00 PM

201 S. Cortez Street
Prescott, AZ 86303
Council Chambers

Phil Goode, Mayor

Brandon Montoya, Mayor Pro Tem	Cathey Rusing, Councilwoman
Connie Cantelme, Councilwoman	Steve Sischka, Councilman
Eric Moore, Councilman	Clark Tenney, Councilman

The following Agenda will be considered by the Prescott **City Council Study Session** at its **Study Session** pursuant to the Prescott City Charter, Article II, Section 13. Notice of the meeting is given pursuant to Arizona Revised Statutes, Section 38-431.02. One or more members of the Council may be attending the meeting through the use of a technological device.

Viewing & Participation
This meeting may be viewed on Channel 64, Facebook Live or on the City Website: **Live City Council Meeting Videos**
Comments for Council may be submitted through the City website: **Public Comment Form**

1. CALL TO ORDER

2. ROLL CALL

3. DISCUSSION

A. Presentation from PROTECT, Planning for Resilience of Our Towns, Environment, Climate and Tourism Releasing the Climate Risk Assessment for Prescott.

Recommended Action: This item is for discussion only. No formal action will be taken.

B. Initial Presentation and Discussion Regarding the 2023-2028 City of Prescott Fire Department Fire Strategic Plan.

Recommended Action: This item is for discussion only. No formal action will be taken.

4. ADJOURNMENT

EXECUTIVE SESSION

Upon a public majority vote of a quorum of the City Council, the Council may hold an executive session, which will not be open to the public, regarding any item listed on the agenda but only for the following purposes:

(1) Discussion or consideration of personnel matters (A.R.S. §38-431.03(A)(1));
(2) Discussion or consideration of records exempt by law (A.R.S. §38-431.03(A)(2));
(3) Discussion or consultation for legal advice with the city's attorneys (A.R.S. §38-431.03(A)(3));
(4) Discussion or consultation with the city's attorneys regarding the city's position regarding contracts that are the subject of negotiations, in pending or contemplated litigation, or in settlement discussions conducted in order to avoid litigation (A.R.S. § 38-431.03(A)(4));
(5) Discussion or consultation with designated representatives of the city to consider its position and instruct its representatives regarding negotiations with employee organizations (A.R.S. §38-431.03(A)(5));
(6) Discussion, consultation or consideration for negotiations by the city or its designated representatives with members of a tribal council, or its designated representatives, of an Indian reservation located within or adjacent to the city (A.R.S. §38-431.03(A)(6);
(7) Discussion or consultation with designated representatives of the city to consider its position and instruct its representatives regarding negotiations for the purchase, sale or lease of real property (A.R.S. §38-431.03(A)(7)).

THE CITY OF PRESCOTT ENDEAVORS TO MAKE ALL PUBLIC MEETINGS ACCESSIBLE TO PERSONS WITH DISABILITIES. With 72 hours advanced notice, special assistance can be provided for sight and/or hearing-impaired persons at this meeting. Reasonable accommodations will be made upon request for persons with disabilities or non-English speaking residents. Please call the City Clerk (928) 777-1272 to request an accommodation to participate in this public meeting. Prescott TDD number is (928) 445-6811. Additionally, free public relay service is available from Arizona Relay Service at 1-800-367-8939 and more information at www.azrelay.org

Confidentiality

Arizona statute precludes any person receiving executive session information from disclosing that information except as allowed by law. A.R.S. §38-431.03(F). Each violation of this statute is subject to a civil penalty not to exceed $500, plus court costs and attorneys' fees. This penalty is assessed against the person who violates this statute or who knowingly aids, agrees to aid or attempts to aid another person in violating this article. The city is precluded from expending any public monies to employ or retain legal counsel to provide legal services or representation to the public body or any of its officers in any legal action commenced for violation of the statute unless City Council takes a legal action at a properly noticed open meeting to approve of such expenditures prior to incurring any such obligation or indebtedness. A.R.S. §38-431.07(A)(B).

CERTIFICATION OF POSTING OF NOTICE

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Prescott City Hall on _____ at _____m. in accordance with the statement filed by the Prescott City Council with the City Clerk

Sarah M. Siep

Sarah M. Siep, City Clerk

CITY OF PRESCOTT

COUNCIL AGENDA MEMO

MEETING TYPE/DATE: **STUDY SESSION** **02-14-23**

DEPARTMENT: **City Clerk**

AGENDA ITEM: **Presentation from PROTECT, Planning for Resilience of Our Towns, Environment, Climate and Tourism Releasing the Climate Risk Assessment for Prescott.**

ITEM SUMMARY

Council will receive a presentation from PROTECT, Planning for Resilience of Our Towns, Environment, Climate and Tourism Releasing the Climate Risk Assessment for Prescott conducted with the Climate Assessment for the Southwest (CLIMAS) and Dr. Alison Meadow with the University of Arizona.

The group has provided the following statement:
"We are pleased to submit the following two documents to Prescott City Council for review and discussion at the February 14, 2023 Study Session: 1) Quad Cities Climate Profile and; 2) Local Climate Action Options. Without your unanimous support on May 24 of last year, the Profile, prepared by CLIMAS at no cost to the City or region, would not have been possible! We hope the Quad Cities Climate Profile and the companion document, Local Climate Action Options, will serve as a springboard for future action on climate resiliency and sustainability in our region."
- The PROTECT Campaign Steering Committee

BACKGROUND

At the May 24, 2022 Voting Meeting, City Council approved the processing of a Climate Risk Assessment for Prescott to be conducted by CLIMAS. Since that time PROTECT has been working with CLIMAS to accomplish the assessment. Mayor Pro Tem Montoya and Councilmember Rusing were contacted by the group regarding completion of the study and have requested a presentation at this Study Session.

FINANCIAL IMPACT

None.

Recommended Action: **This item is for discussion only. No formal action will be taken.**

ATTACHMENTS

1. CLIMAS Report.pdf

PROTECT

Planning for the Resilience of Our Towns, Environment, Climate and Tourism

WE ARE ALL IN THIS TOGETHER.

We are pleased to submit the following two documents to Prescott City Council for review and discussion at the February 14, 2023 Study Session: (1) Quad Cities Climate Profile and (2) Local Climate Action Options. Without your unanimous support on May 24 of last year, the Profile, prepared by CLIMAS at no cost to the City or region, would not have been possible!

We hope the Quad Cities Climate Profile and the companion document, Local Climate Action Options, will serve as a springboard for future action on climate resiliency and sustainability in our region.

The PROTECT Campaign Steering Committee

Note: The digital format of both documents are now available at: https://yavapaiclimatecoalition.org/climate-action-hub

Local Climate Action Options
February 1, 2023

The climate adaptation/mitigation options below were compiled from suggestions made by stakeholders throughout the Quad Cities region during public outreach events and meetings between July 2021 and December 2022. The adaptation/mitigation options accompany the Quad Cities Climate Profile to help members of the community to translate the CLIMAS report's findings and suggestions into action at the local level. It is intended to be a living document, in the sense that it can change over time as some solutions are implemented and new information becomes available. A broad-based Working Group of local stakeholders, representing community organizations and local governmental agencies, contributed to the compilation as well as the final production of this document. It is hoped that an even wider segment of the local citizenry will become involved in the future.

As the CLIMAS report makes clear, climate change is already upon us, and it presents our region with important challenges. Our economy, public health, and infrastructure are interdependent with one another and with the natural systems in which our communities are embedded, and sustaining any of these critical elements depends upon sustaining the others. The suggestions below are therefore offered from a framework of sustainability – i.e., solutions that *simultaneously* maintain environmental integrity and economic vitality.

The greatest impacts of climate change in the arid southwest are often presented as increasing wildfire intensity and frequency, reduced water availability, and threats to wildlife. These are indeed critical and happening already, and they figure prominently in the document below. At first glance, our additional focus on economic vitality, agriculture, and organizational capacity-building might seem out of place, but these areas arose in stakeholder meetings out of the recognition of how interdependent our people, our economy, and the natural environment are. Without a vibrant local economy, the Quad Cities region cannot hope to be resilient to the challenges of a changing climate. Without adequate human capital, infrastructure, and tax base, our region cannot hope to prepare for increased wildfires or to rebuild following them, nor manage development in a way that provides for adequate water supplies into the future. And without healthy forests, grasslands, and other natural systems that provide our water, support much of our economy, and provide the very quality of life that makes us want to live here, our communities themselves cannot be sustained.

We recognize that environment, economy, and human health and well-being are interdependent, and our greatest desire is keeping the Quad Cities area the best place to live, work, and play, both for ourselves and for those who come after us.

1. **WATER RESOURCES:** All aspects of life depend upon water, and in our region water is an increasingly limited resource. Without Improved management, our water supply, our local economy, our quality of life, our citizenry and natural ecosystems are at great risk. Water use by our current population is four times larger than natural recharge, so our aquifers are declining. Rapid development in the Quad Cities region increases demand, while climate change reduces aquifer recharge. Our water supply is squeezed between growth and drought.

   a. Promote "green infrastructure" for individual residences, developments and municipalities. Green infrastructure refers to natural and engineered ecological systems for managing stormwater and harvesting rainwater, but such systems provide aesthetic, recreational, and wildlife habitat benefits as well. Some examples from other communities can be seen here.
   b. Encourage the use of water-efficient appliances, fixtures, landscaping, rainwater harvesting, and watering systems in new residential and commercial developments, and consider offering incentives for water-efficiency retrofits in existing construction.
   c. Require all new development to follow the principles of "Water Neutral Development": minimize groundwater use on landscaping, recover wastewater for recharge; no septic tanks permitted; collect stormwater for recharge. See Alliance for Water Efficiency website for more information.
   d. Integrate consideration of ecosystem services into water management policies. Ecosystem services are the benefits to humans provided by intact, healthy ecosystems. In the context of water resources, these include water provisioning, water purification, flooding mitigation, erosion prevention, support of wildlife, and recreation. For a useful resource, see https://link.springer.com/collections/ebifejeafg.
   e. Enhance protection of the Upper Verde River watershed, by reducing threats of increased groundwater pumping.
   f. Develop a regional water conservation plan. Many regions of the country have developed comprehensive water conservation plans to serve areas larger than individual municipalities. Examples include Washington County, Utah, the Northern California Water Association, the Albuquerque / Bernalillo County Water Utility Authority's Water Resources Management Strategy, and many others.
   g. Increase natural recharge through watershed restoration and stormwater management.

2. **WILDFIRE PROTECTION, HEALTHY FORESTS AND GRASSLANDS:** Our region is already prone to wildfires, and the frequency and intensity of wildfire is projected to increase in the future as a result of climate change under even the most encouraging emission-reduction scenarios. With increasing development, wildfire threatens public safety, the regional economy, and property values in communities across the Quad Cities region. Reducing the economic and human impact of fire is a critical part of adapting to climate change.

    a. Continue to increase capacity of current Yavapai Firewise programs.
    b. Integrate wildfire planning into land use regulations and long-range plans, including for example, the 2023 Multi-Jurisdictional Hazard Mitigation Plan; the 2023 Yavapai Communities Wildfire Protection Plan; and the City of Prescott 2025 General Plan.
    c. Proactively manage for expected ecosystem transitions, including the potential threat to regional juniper forests.
    d. Incorporate wildfire evacuation routes into regional transportation planning and education.
    e. Focus attention on vulnerable populations (including livestock and pets, when evacuation is necessary) to be impacted by increased wildfire risks (as well as higher temperature impacts).
    f. Integration into the USFS Fireshed management system to qualify for federal mitigation funding; also see FEMA.
    g. Utilize *Fire Adapted Communities* framework to incorporate a community-wide approach to wildfire resilience.
    h. Explore the impacts of projected higher wind impacts, with respect to power outages, wildfires and preventive measures.

3. **Flooding:** As described in the Quad Cities Climate Profile, climate change impacts the propensity for more extreme flooding events, including post-fire floods. These impacts not only create hazardous conditions for homes, roads and other infrastructure, but also result in damaged ecosystems. The resulting devastation was clearly seen in 2017 with flooding within the Grapevine Canyon watershed, impacting Big Bug Creek and the town of Mayer. More recently, severe flooding events have taken place on and downstream from recent burn scars (e.g., from the 2019 Museum Fire and the Pipeline Fire in the Flagstaff area).

    a. Green infrastructure options should be assessed in each of our local communities and across the County.
    b. Updates to the Yavapai County Multi-Jurisdictional Hazard Mitigation Plan should include this QC Climate Profile as a reference guide to risk, adaptation and mitigation.
    c. The use of native plants is encouraged throughout the region, for individual properties as well as subdivision development.
    d. Identify high-traffic, flood prone areas to explore the potential for curb cuts to passively water roadside vegetation.

e. Work in flood-prone areas to provide for groundwater infiltration, to reduce evaporation and accelerate recharge of the aquifer (connect to YC Flood Control District to learn more about their project activity)

4. **ENERGY USE:** Increasing the use of renewable energy will reduce our contribution to climate change while providing resiliency and cost savings, and contributing to a more vibrant local economy. Transportation and building energy consumption both account for significant proportions of greenhouse gas emissions. Therefore, our communities need to focus on the built environment (man-made structures and the roads and other infrastructure that supports them) and transportation systems to leverage the renewable energy that we can obtain from nature via wind, solar, and passive geothermal.

   a. Implement energy-efficiency design features in new residential and commercial developments, e.g., rooftop solar, wiring for EV charging, ground-source heat pumps for HVAC, passive lighting through building codes and potential local, state and federal incentives. Examples range from whole-building design (e.g. recommendations from the Sustainable Buildings Industry Council or the American Society of Landscape Architects) to guidelines for energy-efficient appliances.
   b. Promote installation of similar design features on existing residential and commercial properties; for example, using a solar co-op model, like Solar United Neighbors, to work with Quad Cities homeowners
   c. Encourage new and existing projects to meet holistic sustainability standards such as LEED certification
   d. Consider strategic tree planting to reduce HVAC needs in residential and commercial settings - carefully positioned trees can reduce a home's energy use by up to 25%. Useful introductions can be found at the Department of Energy's website and at Utah State University's Forestry Extension site.
   e. Facilitate the transition to electric vehicle use through installation of charging stations through development of a regional EV infrastructure plan
   f. Examine the potential of electrifying municipal and school district fleets (see Quad Cities Electric Vehicle Campaign)
   g. Undertake municipal energy audits (resource directory) (See recent Prescott Valley presentation on THEIR energy audit)
   h. Implement solar energy at water production and wastewater treatment facilities. Water treatment is estimated to consume 3-4% of energy production in the U.S., much of which can be offset using available renewable sources at the facilities themselves. In addition, promising new treatment technologies can also make use of solar energy. See this article about an installation in Bisbee, AZ and this one about a recent installation in Gilbert, AZ.
   i. Increase development of community gardens, school gardens and composting programs.

j. Explore methane capture at landfill sites.
k. Expand public transportation options, particularly in heavily traveled commercial corridors such as highway 69 between Prescott and Prescott Valley.
l. Encourage the integration of local best practices of renewable energy resources into City building codes and long-range plans, including, for example, the City of Prescott 2025 General Plan, the Prescott Valley General Plan 2035 and the Chino Valley 2040 General Plan.

5. AGRICULTURE & LAND USE:

Farming and ranching are important to the character, heritage and livelihoods in several of our region's communities. Moreover, small acreage food production and local food gardening is clearly increasing. Conversion of rangelands to residential and commercial developments will exacerbate the region's water shortage. Climate change will adversely impact growing seasons and rangeland foraging conditions. All of these trends must be integrated into the region's land use planning.

a. Preserve ranch lands, which use less water and require less infrastructure than residential developments; leverage federal, state and local programs and incentives to keep ranching viable. USDA's Agricultural Conservation Easement Program is a good example. The Natural Resources Conservation Service has several other programs that provide support for rangeland management and conservation as well.
b. Enhance access to tools that enable ranchers and farmers to reduce wildfire and flooding risks (See, for example, programs at USDA's NCRS and Farmers.Gov websites).
c. Explore livestock management practices designed for arid lands (see, for example, USDA's Sustainable Agriculture Research and Education program).
d. Invest in conservation of high quality natural open space to preserve ecosystem health and resilience, as well as protect the integrity and quality of water, wildlife, and recreational resources. Several Quad Cities, county, and state governmental units are already pursuing ambitious projects (e.g., Glassford Hill open space) as are regional NGO's (e.g., Citizens Water Advocacy Group, Friends of the Verde River, Save the Dells), and others. Our region provides great opportunities for collaboration among government and non-government organizations.
e. Include ranchers and farmers in creating "climate-smart food pathways" (See, for example - AZ Food System Networks' Statewide Action Plan.
f. Collaborate with Cooperative Extension and others to increase our local food supply.

g. Encourage integration of solar energy installations into agricultural operations. Solar installations, either with or without utility-scale battery storage, can make individual ranches or farms energy-independent. More importantly, "solar farms" can provide a second, independent revenue stream that can insulate ranches and farms from market uncertainties and thereby make agricultural operations more profitable. Solar installations can be made to be compatible with livestock grazing and even many crops. Information specific to ranching is available here. The potential for agricultural lands to generate solar energy is being promoted more by government agencies that provide expertise and even funding, e.g. these recent Department of Energy projects. See this trailer for the film, "Other Side of the Hill" that highlights solar farms in rural eastern Oregon.

6. **COMMUNITY & ORGANIZATIONAL CAPACITY BUILDING:**
As the Quad Cities Climate Profile indicates, successful climate adaptation requires attention to resource management and a focus on collaborative implementation strategies and actions. It's about our mutual desire to achieve a sustainable future for our region, based perhaps on the 3 Ps - People, Planet and Prosperity. For a fuller discussion of these concepts and principles and how they intersect with one another, see the thoughtful description provided by the Sustainability Alliance.

a. Assess how the Working Group (the broad-based advisory group of local stakeholders convened to ensure a Quad Cities perspective and local input were considered in the Climate Profile) can be leveraged as a sustained resource for evaluating and implementing proposed climate adaptation strategies within the Quad Cities region.
b. Establish local or regional bodies (such as a commission, advisory council, or multi-stakeholder group) to develop strategies for increasing climate resiliency, as well as to focus on community-wide sustainability. Such a citizen-based body could include existing municipal or county staff as well as local experts on water, energy, wildfires and forest health, transportation, etc. This first step might establish a foundation for future sustainability staff positions within Prescott or Prescott Valley (or a joint position serving several communities). Cities across the country have created such commissions, or have appointed Sustainability Directors or Chief Resilience Officers (see, for example, the City of Flagstaff Sustainability Office , the City of Sedona.and the Grand Rapids, MI Office of Sustainability), to name but a few). Similar organizational models at the county and municipal level might help us move our own community-wide sustainability strategies forward.
c. Develop frameworks for implementation, specifically for and in collaboration with cities and towns in the Quad Cities region.

Climate Profile for
THE QUAD CITIES REGION OF ARIZONA

Climate Profile for the Quad Cities Region of Arizona

Climate Assessment for the Southwest (CLIMAS)

February 1, 2023

Alison M. Meadow
CLIMAS and University of Arizona Office of Societal Impacts

Jeremy Weiss
Arizona Cooperative Extension

Michael Crimmins
CLIMAS and Arizona Cooperative Extension

With contributions from:

Connie Woodhouse
CLIMAS and School of Geography and Development

Heidi Brown
CLIMAS and College of Public Health

Sarah LeRoy
Southwest Climate Adaptation Science Center (formerly of CLIMAS)

Ladd Keith
CLIMAS and College of Architecture, Planning, and Landscape Architecture

Photo Credits: top - *Beautiful Valley*; bottom left – *Glassford Hill*; bottom right – *Thumb Butte.*
All photos by Walt Anderson.

Suggested Citation: Alison M. Meadow, Jeremy Weiss, Michael Crimmins, and the Quad Cities Profile Working Group (2023) *Climate Profile for the Quad Cities Region of Arizona*. Climate Assessment for the Southwest – University of Arizona.

Table of Contents

Preface

In early 2021, a group of citizens of the Quad Cities region sought to commission a study that would help our communities to better understand and prepare for the challenges posed by climate change in our area. Led by the Yavapai Climate Change Coalition (YCCC), the PROTECT campaign coordinated with the Prescott City Council and approached CLIMAS (Climate Assessment for the Southwest; https://www.climas.arizona.edu/), a team of social, physical, and natural scientists at the University of Arizona and New Mexico State University that works with partners across the Southwest to increase resilience to regional climate change. On 24 May 2022, the Prescott City Council voted unanimously to commission the study, and in response to this local interest and support, CLIMAS offered to prepare the report. The report is funded, through CLIMAS, by the National Oceanic and Atmospheric Administration's Regional Integrated Sciences and Assessments (RISA) program through grant NA12OAR4310124.

Over the next several months, a broad-based working group of local stakeholders coordinated with CLIMAS to ensure that the Quad Cities' particular strengths and vulnerabilities to climate change were considered in the report, and this thoughtful input and review was vital to the report's final publication. The Working Group also contributed to the production of a companion document, Local Climate Action Options, hosted on the YCCC website, the Quad Cities Climate Action Hub (https://yavapaiclimatecoalition.org/climate-action-hub). This companion document is intended for use by Quad Cities communities, businesses, and individual citizens as a springboard to local climate actions across the region.

Our community is immensely grateful to CLIMAS for their expertise and generosity, to the Prescott City Council for their leadership and support, and to the organizations and individuals comprising the Working Group as listed below.

Dr. Alison Meadow	Climate Assessment for the Southwest (CLIMAS)
Patrick Grady	PROTECT Campaign
Kaia Hayes	PROTECT Campaign
Ashley Ahlquist	Yavapai County Office of Emergency Management
Lynn Whitman	Yavapai County Flood Control District
Cindy Blackmore	Town of Chino Valley
Tammy DeWitt	City of Prescott
George Worley	City of Prescott
Holger Durre	City of Prescott
Gilbert Davidson	Town of Prescott Valley
Ernest Rubi	Town of Prescott Valley
Kevin Hurrell	U.S. Forest Service
Gary Beverly	Citizen Water Advisory Group/Sierra Club
Zach Czuprynski	Prescott College
Darla Deville	Arizona Public Service
Rebecca Rudd	Arizona Public Service
Shirley Howell	Prescott Area Wildland Urban Interface Commission
K. Greg Murray	Yavapai Climate Change Coalition
Tom Rusing	Save the Dells

Climate Profile Summary

The earth's climate is changing. Global average temperatures have risen 1.8° F since 1901. Warming temperatures are driving other environmental changes such as melting glaciers, rising sea levels, changes in precipitation patterns, and increased drought and wildfires.

The magnitude of future changes will depend on the amount of greenhouse gases (GHGs) emitted into our atmosphere. Without significant reductions in GHGs, global average temperatures could rise as much as 9° F over pre-industrial temperatures by the end of this century.

This climate profile has been created for the Quad Cities region of Arizona (comprising Prescott, Prescott Valley, Chino Valley, and Dewey-Humboldt and the rural areas between them) using the boundaries of the Prescott Active Management Area. The Quad Cities region is also experiencing climatic changes that will impact temperatures, precipitation patterns, ecosystems, and human health and well-being. Changes for the region include:

Temperature

Average temperature

- The average temperature for the Quad Cities area for the reference period 1961 – 1990 was 53.9° F. However, almost every year since 1985 has had annual average temperatures over this long-term average.
- These trends are projected to continue into the future. Average annual temperatures could be 5° F warmer (about 59° F) by 2050 and more than 11° F warmer (65° F) if we follow the higher greenhouse gas emissions scenario.

Extreme temperatures

- Between 1961 and 1990, the Quad Cities area averaged 8 days per year where high temperatures reached above 95° F. Recently, the area has seen about 20 days per year over 95° F. The projected change in the number of days above 95° F by 2100 ranges from 35 to 40 days per year.
- Minimum temperatures are also expected to rise, which means fewer days when temperatures fall below freezing. By the end of the century, the Quad Cities area could experience as few as 55 days per year that reach freezing temperatures (compared to the 1961 – 1990 average of 133 days per year).

Precipitation

Average precipitation

- The average annual precipitation in the Quad Cities area for the 1961 – 1990 reference period was 18.2 inches.
- Precipitation in this region is naturally variable from year-to-year. There is no clear trend toward changes in *average* precipitation amounts in the Quad Cities region. We expect this natural year-to-year variability to continue in the future.

- However, even with no change in average precipitation, rising temperatures will increase evaporation and transpiration rates, which will lead to drier soils, less surface water, reduced aquifer recharge, and will contribute to more frequent and severe drought.

Extreme precipitation

- As the atmosphere warms, it will be able to hold more moisture, which will produce more extreme precipitation even if the average amount of precipitation does not change very much.
- Another change in the character of precipitation is the frequency at which it falls. By 2050, the Quad Cities area could have an additional 10 days without precipitation (both the lower and higher scenarios). By the end of the century, dry days are projected to be approximately 275/year (lower scenario) to 285/year (higher scenario).
- Therefore, while the overall average amount of precipitation may not change substantially, the Quad Cities area may receive that precipitation in fewer, but more extreme storms.

Impacts

Human Health

- Extreme heat can affect human health, especially in vulnerable populations such as older adults, children and those with chronic illnesses. Extreme heat can also strain energy grids as residents increase their use of air conditioning to stay cool.
- Higher temperatures, smoke from wildfires, and dust storms all contribute to poor air quality and can create serious health problems, especially in vulnerable populations.
- Climate change may affect certain vector-borne diseases including West Nile Virus because warmer temperatures will create a more welcoming environment for the mosquitoes that carry West Nile Virus.
- Many people exposed to climate-related disasters such as flooding, heat, and wildfire experience serious mental health consequences such as post-traumatic stress disorder.

Forest Health

- Heat stress, lack of moisture, and increased insect outbreaks are all climate-related threats to forest health.
- Trees under stress from heat and drought are less able to defend themselves from insect outbreaks.
- All three stressors are already contributing to tree mortality in Southwestern forests, including those in the Quad Cities region.

Wildfire Risk

- Warming is already driving an increase in the area burned by wildfire as well as an expansion of fire season; this trend is expected to continue as temperatures rise and drought conditions persist. Fire frequency could increase 25% in the Southwest and the frequency of very large fires (over 12,000 acres) could triple.

- Communities in the wildland-urban interface are at particular risk from increased fire frequency and size.
- According to FEMA, the highest natural hazard risk to residents in Yavapai County as a whole is from wildfire.

Flooding

- The risk of flooding increases along with the risk of more extreme precipitation events. Areas that are already flood-prone may experience larger and more frequent floods and areas that do not regularly flood now may begin to flood as flood plains change due to extreme precipitation.
- Yavapai County is at a relatively high risk for riverine flooding at present.
- Extreme precipitation after wildfire events (post-fire flooding) can cause debris flows, decrease water quality, and even change the geomorphology of a basin.

Water Resources

- As the character of precipitation changes in the Quad Cities area it may see lower rates of aquifer recharge (like other areas in the Southwest). The Quad Cities area relies on groundwater for municipal, residential, and agricultural needs but current groundwater pumping often exceeds recharge rates. A further reduction in aquifer recharge due to climate change poses a risk to water resources in the area.

Climate Change Adaptation

- Climate change adaptation planning is the process of planning to adjust to new or changing environments in ways that reduce negative effects and take advantage of beneficial opportunities.
- Climate change adaptation strategies can be integrated into existing community plans such as hazard mitigation plans, land use plans, or municipal strategic plans.
- Climate change adaptation plans can also be stand-alone plans – but communities should take care to ensure that adaptation plans and other community planning efforts are coordinated.
- Adaptation planning is a community-driven process in which community members and leaders should identify and discuss community values, goals, and capacities.

Introduction to the Climate Profile

Decisions about how to best manage natural resources or help your community adapt to a changing climate often require long-term records–or data–about both daily ***weather***[1] and the area's ***climate***. Weather data, in its most basic form, is made up of measurements of temperature and precipitation taken at least once a day. When collected at the same locations for a long time, weather data gives us information about the climate of a place. For example, by looking at many years of weather data we can see how prone a region is to droughts, floods, heat waves or cold spells. These historical weather records also reveal ***climate trends***, such as whether a place is getting wetter or drier or warmer or cooler over long periods of time.

Projections of future climate conditions, commonly referred to as ***climate projections,*** are developed using computer-based climate models. These models provide us with estimates or ***scenarios*** of possible future climate conditions.

Both observed (historical) data and projected data can be useful in helping a community make decisions about how to adapt to climate ***variability*** and change in the best interests of community members and the surrounding environment.

This climate profile has been created for the Quad Cities region of Arizona (comprising Prescott, Prescott Valley, Chino Valley, and Dewey-Humboldt and the rural areas between them) using the boundaries of the Prescott Active Management Area (see Figure 1). We used both observed climate and weather data as well as computer model projections of future climate for this analysis.

[1] ***Bold/italizized*** terms are defined in the Glossary at the end of the report.

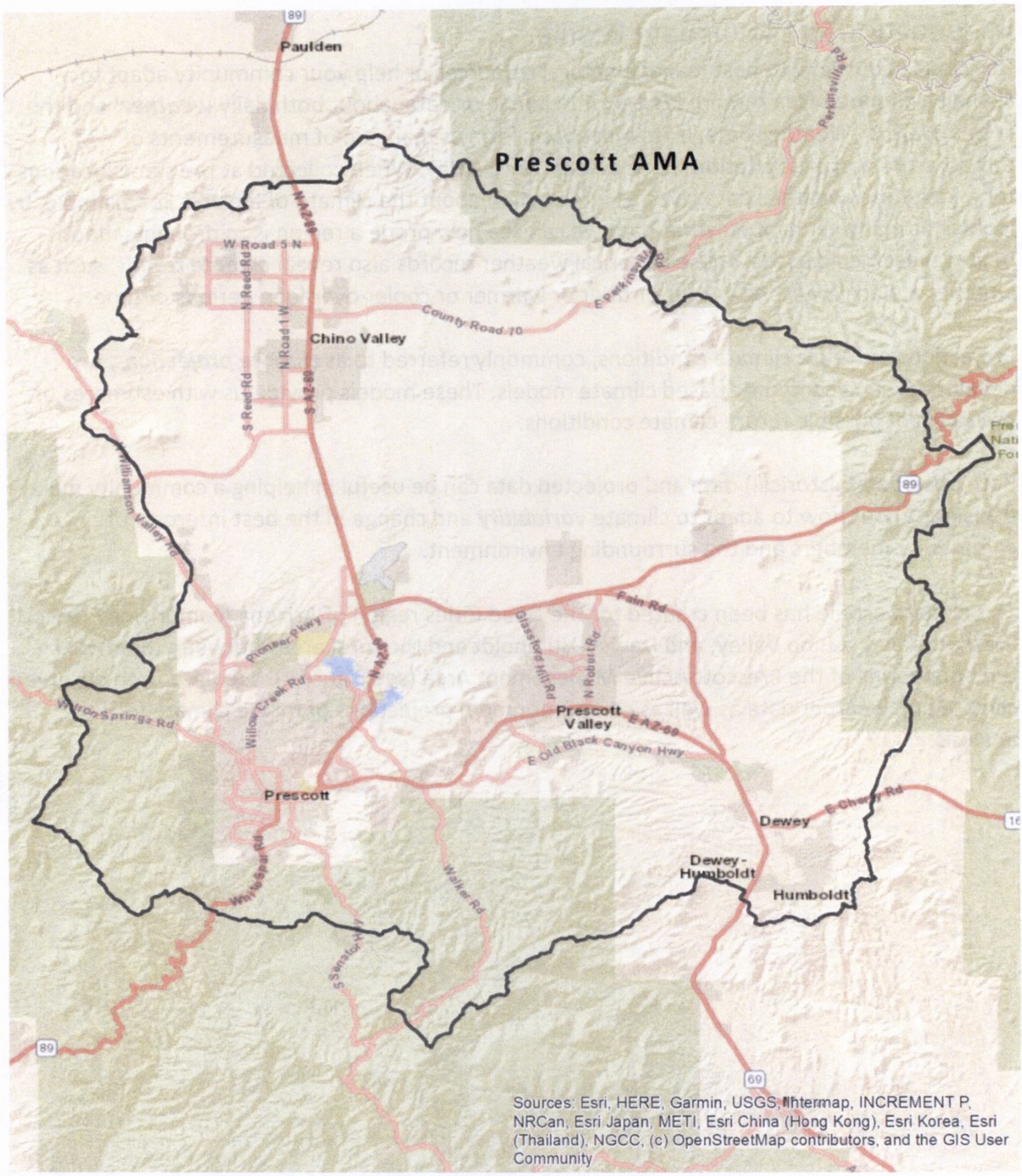


Figure 1: Prescott Active Management Area as defined by Arizona Department of Water Resources. This is the region selected for the climate analysis presented in this report.

Climate Trends and Climate Change

Global average temperatures are rising. They do not rise everywhere or every year in exactly the same amount. Natural climate variability means that some years are still cold or colder than average. Nevertheless, the world is warming up. Figure 2 shows some of the changes scientists and others have observed about how the Earth is changing. The white arrows indicate upward trends, like rising temperatures and sea levels. The black arrows indicate downward trends, such as the amount of snow in northern and mountain regions.

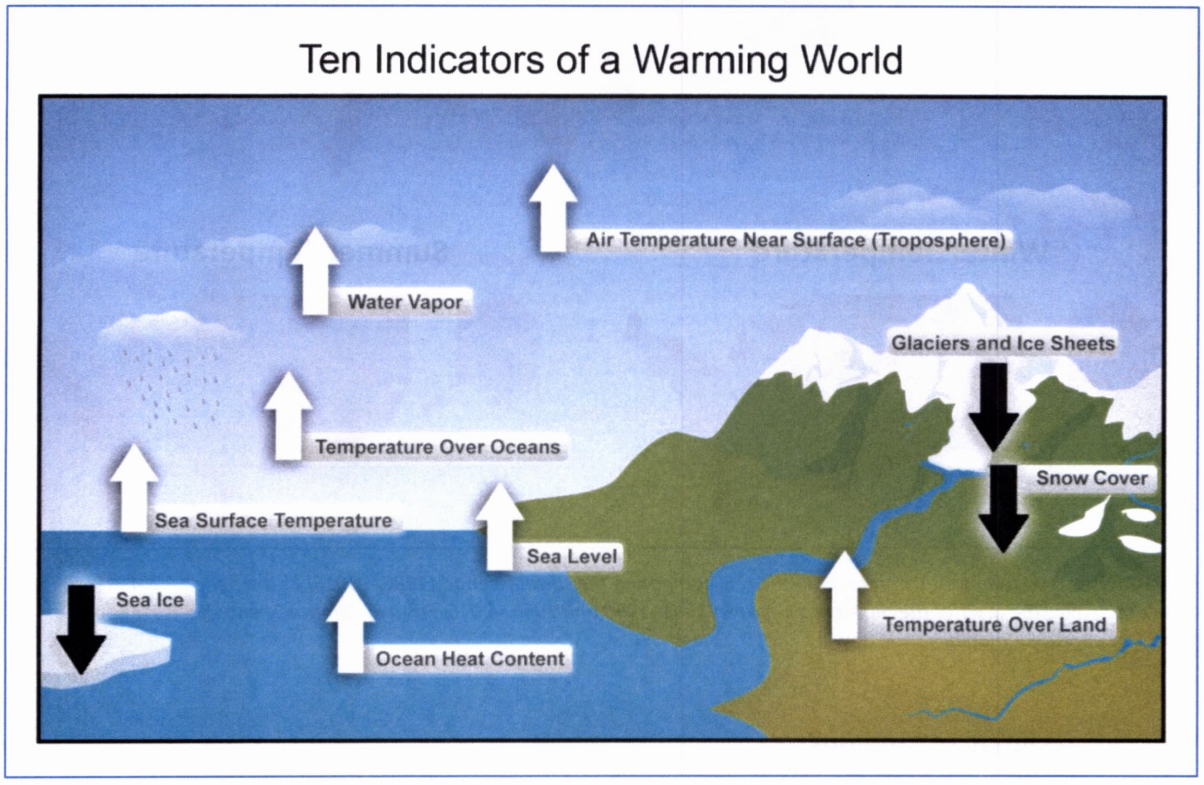


Figure 2: Observed indicators of a warming world. White arrows indicate increasing trends. Black arrows indicate decreasing trends. Source: http://nca2014.globalchange.gov/report/our-changing-climate/observed-change#tab2-images.

While most areas of the United States have warmed in recent decades, not every area has experienced (or will experience) a constant rate of warming (Figure 3). **The Southwest is one of the regions that has experienced the fastest rate of warming – more than 1.5° F in recent decades**. The warming is particularly evident during the winter season.

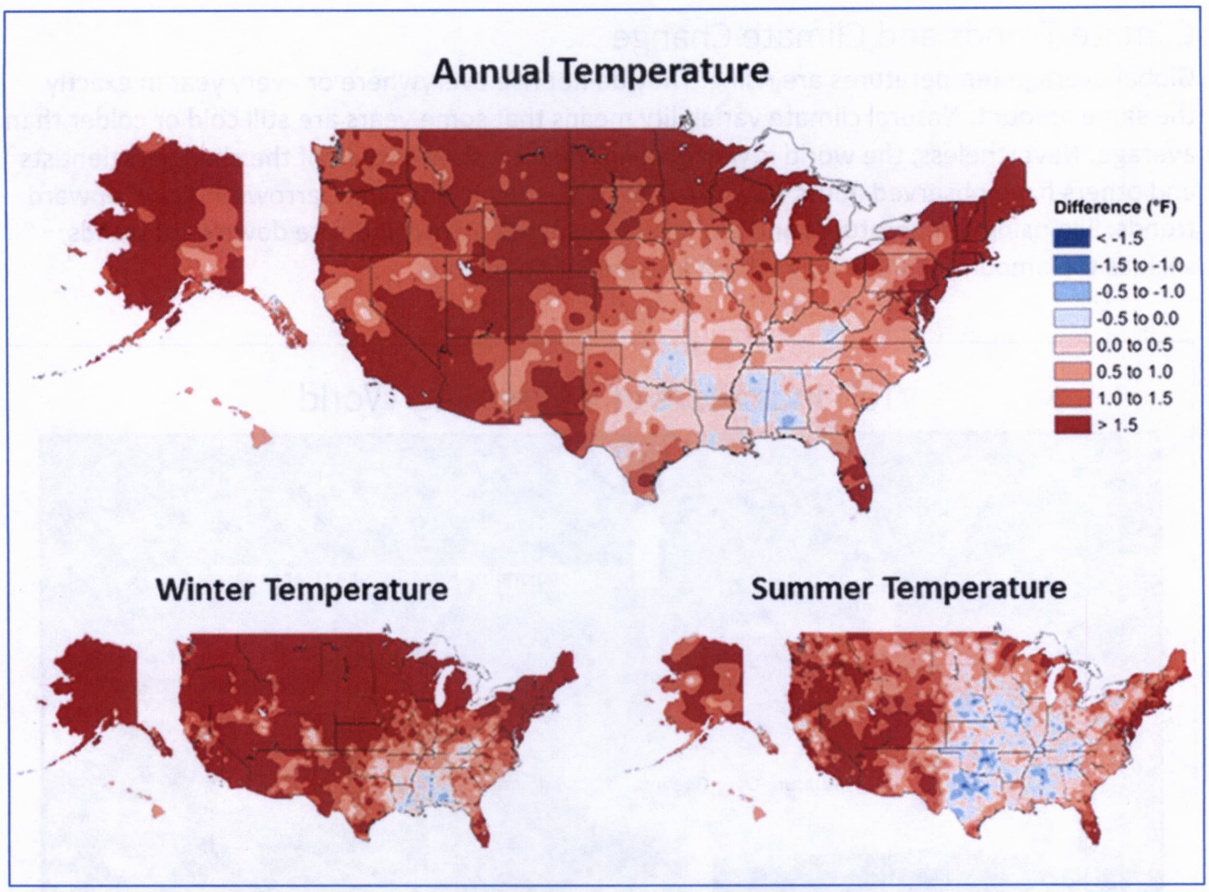


Figure 3: Observed temperature changes in the U.S. comparing the current period (1986 – 2016) to the period 1901–1960. The darker the color, the greater the difference between 1901–1960 and 1986 - 2016. Source: Climate Science Special Report: https://science2017.globalchange.gov/.

Why is the climate changing?

The sun's energy comes to the Earth as short-wave radiation. The Earth and its atmosphere reflect some of this energy back to space, while some of it naturally passes through the atmosphere and is absorbed by the Earth's surface (Figure 4). This absorbed energy warms the Earth's surface, and is then re-radiated back out to space as long wave radiation. However, some of the long wave radiation does not make it to space, and is absorbed in the atmosphere by ***greenhouse gases (GHGs)***, warming the surface and keeping the planet warmer than it would be without an atmosphere. This natural process is what makes the earth habitable. However, while GHGs are naturally occurring in the atmosphere, human activity is increasing the amounts of GHGs emitted directly to the atmosphere. Carbon dioxide, methane, and nitrous oxide are major GHGs. Carbon dioxide (CO_2) is primarily released through the burning of fossil fuels such as coal, natural gas, and gasoline, and accounts for about 75% of the warming impact of these emissions. Methane (from such sources as livestock, fossil fuel extraction, and landfills) accounts for about 14% of the warming impact from GHG emissions and has a much more potent effect on global warming per unit of gas released. Agriculture contributes nitrous

oxide to the atmosphere from fertilizers and livestock waste; it is the most potent GHG and accounts for about 8% of the warming.

By increasing levels of GHGs, humans are intensifying the natural effect of warming the planet. Heat from the sun can still get in, but more and more of it cannot get back out again.

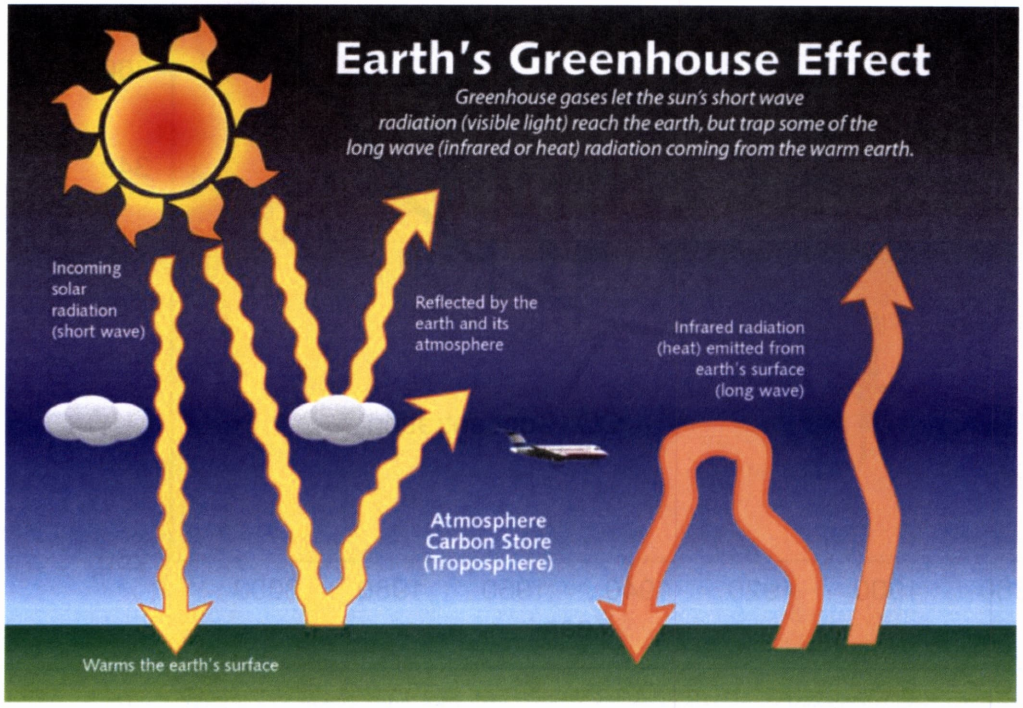


Figure 4: The Greenhouse Effect. Source: New York State Department of Environmental Conservation.

By comparing the amount of CO_2 in the atmosphere to changes in temperatures, we can see that the rising global temperatures are correlated to rising CO_2 concentrations in the atmosphere (Figure 5). In Figure 5, the blue bars represent years with an average temperature lower than the long-term (instrumental record since 1880) global average of 57° F and the red bars are years in which the temperature was warmer than average. The black line traces the amount of carbon dioxide in the atmosphere (in parts per million, or ppm).

Although we see a long-term trend toward higher temperatures, there are still year-to-year variations in temperature that are due to natural processes such as the effects of the ***El Niño Southern Oscillation (ENSO)***. These variations can cause global temperatures to rise quickly during El Niño years and cool during La Niña years.

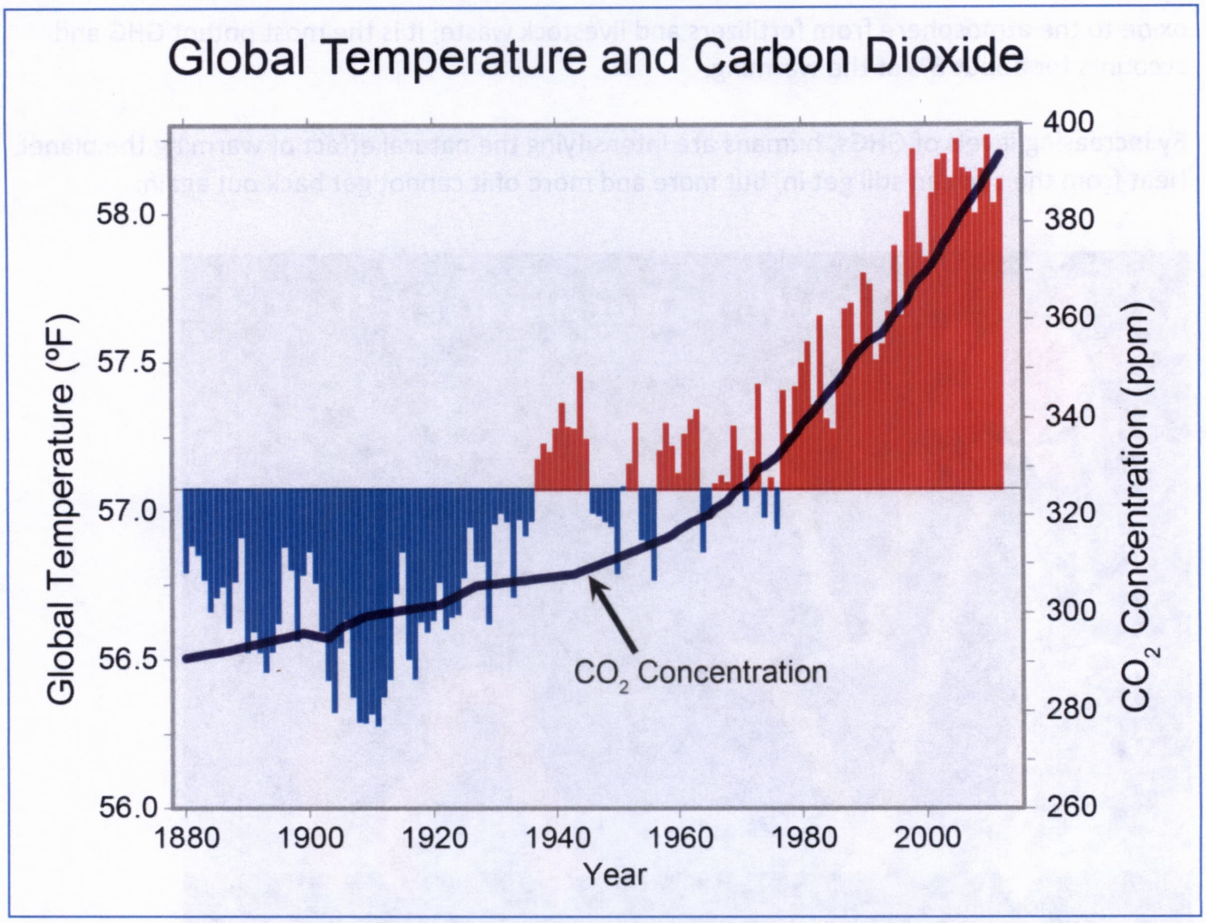


Figure 5: The corresponding rise in CO2 and global temperatures. Source: http://nca2014.globalchange.gov/report/our-changing-climate/observed-change#tab2-images

The strong relationship between temperature and amount of CO_2 is apparent, and scientists have been able to perform more detailed experiments to confirm that the increasing amounts of GHGs are the cause of warming. Since a controlled experiment cannot be conducted in the real world by raising and lowering overall GHGs, scientists build mathematical models of the Earth's systems using computers. The graph in Figure 6 shows results of an experiment with climate models in which scientists compared natural warming factors, such as periodic changes in how much energy the Earth receives from the sun or the effects of volcanic eruptions, with the temperatures that had been observed since 1895. They found that the natural warming factors (the green shaded area) do not match the observed temperatures. But when they added in human causes – GHG emissions – along with natural processes (the blue shaded area), they found that their results matched very well with the observed temperatures.

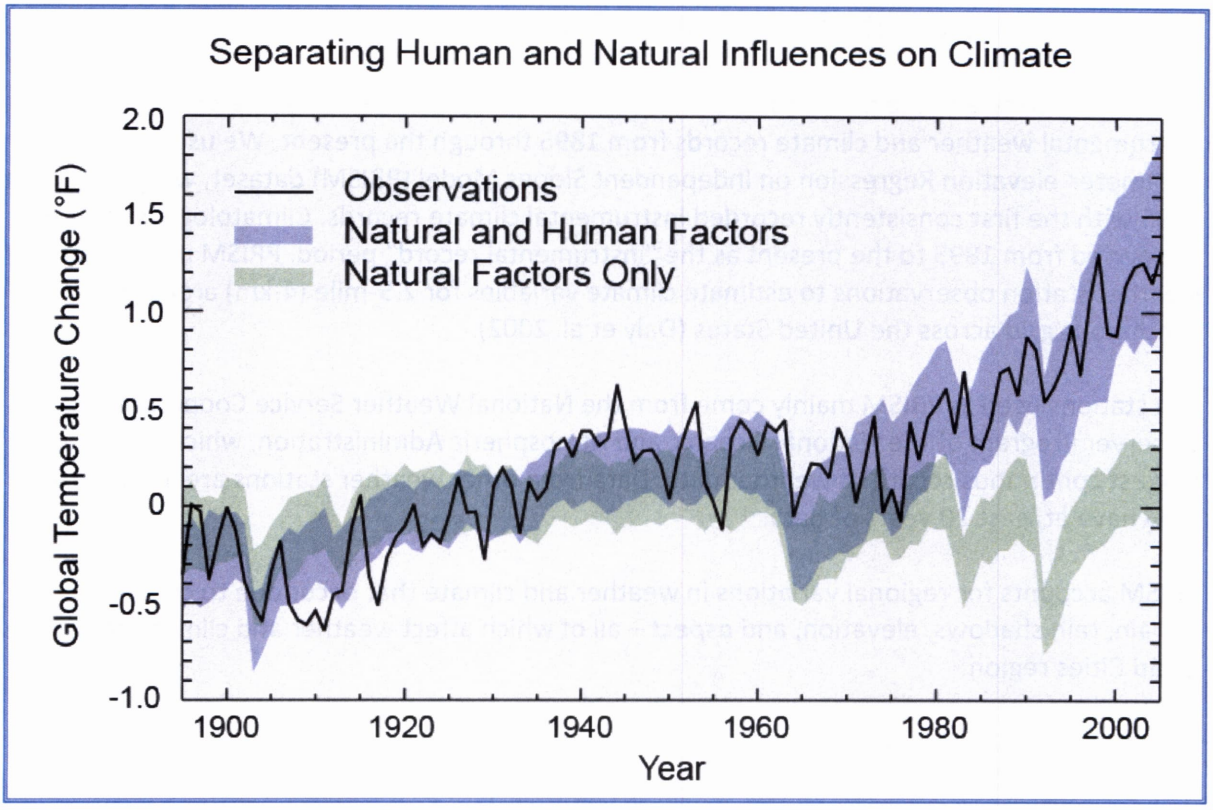


Figure 6: Results from a model experiment to compare natural warming factors with observed temperature changes since 1895. Source: Third National Climate Assessment, http://nca2014.globalchange.gov/report/our-changing-climate/observed-change#tab2-images

Scientific Consensus

The scientific understanding of the drivers of climate change is settled. The vast majority of climate scientists (between 90% and 100% of scientists) agree that climate change is being driven primarily by human activities (Myers et al. 2021). The scientific literature also demonstrates the validity of this conclusion – since 2012 over 99% of climate-related peer-reviewed publications (the standard for scientific research) have concluded that contemporary climate change is being driven by human activities (Lynas, Houlton, and Perry 2021).

Nearly all major U.S. scientific societies, including those representing physicists, astronomers, chemists, biologists, geologists, and meteorologists (https://climate.nasa.gov/scientific-consensus/); international scientific societies; and national academies of science also agree on the role of human activities as a primary driver of climate change (https://www.opr.ca.gov/facts/list-of-scientific-organizations.html).

Baseline Climate Data for the Quad Cities Region

To better understand the past and current climate of the Quad Cities area, we examined the instrumental weather and climate records from 1895 through the present. We used the Parameter-elevation Regression on Independent Slopes Model (PRISM) dataset, which begins in 1895 with the first consistently recorded instrumental climate records. Climatologists refer to the period from 1895 to the present as the "instrumental record" period. PRISM uses regional weather station observations to estimate climate variables for 2.5-mile (4-km) areas in a continuous grid across the United States (Daly et al. 2002).

The stations used in PRISM mainly come from the National Weather Service Cooperative Observer Program of the National Oceanic and Atmospheric Administration, which have the longest continuous record of weather data. Data from other weather stations are included if they have at least 20 years of data.

PRISM accounts for regional variations in weather and climate that occur due to complex terrain, rain shadows, elevation, and ***aspect*** – all of which affect weather and climate across the Quad Cities region.

Temperature in Historical Perspective

Annual average temperature refers to the average of the highest and lowest temperatures each day averaged over a whole year. The lowest annual average temperature in the Quad Cities area was in 1913 at 51.4° F degrees. The highest annual average temperature was in 2017 at 57.4° F. Throughout this report, we will use the period 1961 – 1990 as a reference period, in alignment with the National Climate Assessment. For that period, the annual average temperature for the Quad Cities area was 53.9°F. Although year-to-year variability in temperature are natural and expected in this region (illustrated in Figure 7 by the many points above and below the long-term average orange line), we see a fairly consistent upward trend in annual average temperatures since the mid-1980s. In Figure 7, the straight horizontal line represents the reference period average (53.9° F), and the orange line shows year-to-year average temperatures. **Almost every year since 1985 has seen average annual temperatures above the long-term average**.

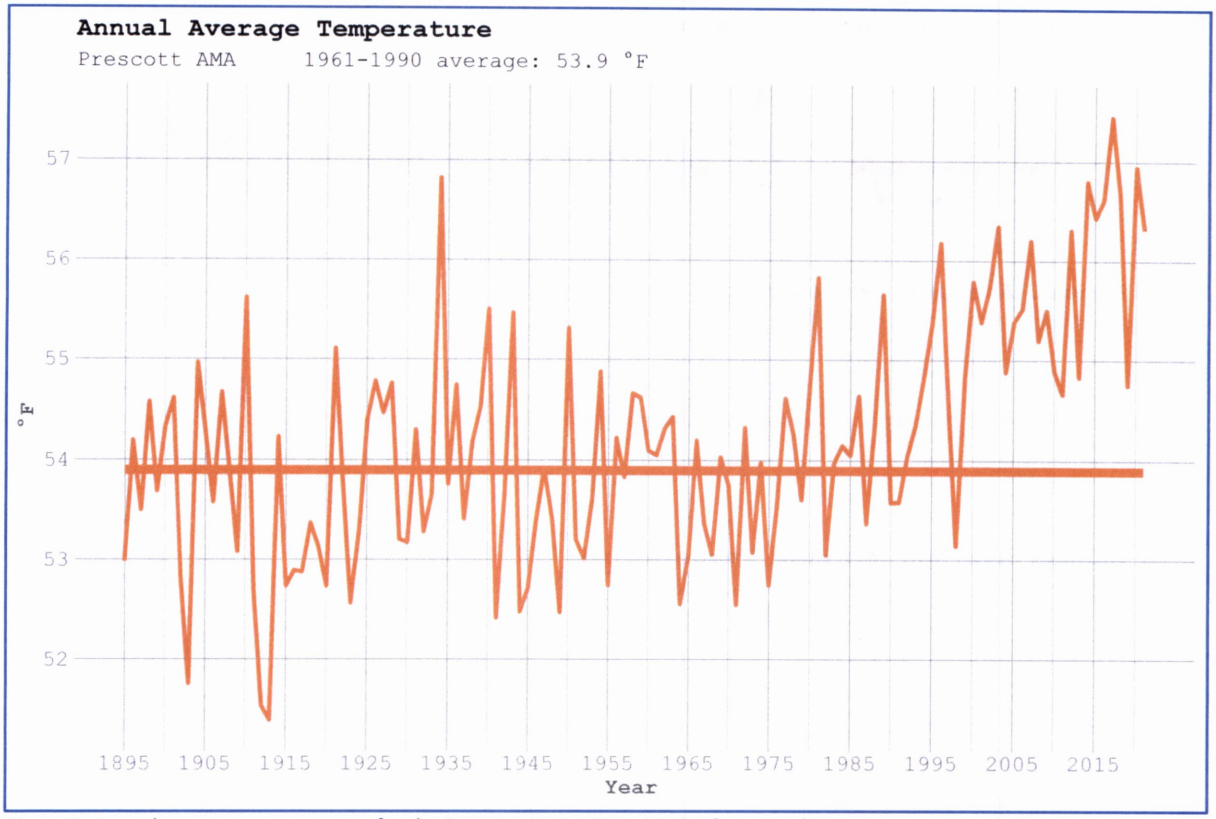


Figure 7: Annual average temperatures for the Prescott AMA 1895 – 2021. The annual average temperature for the 1961 – 1990 reference period was 53.9 °F. Almost every year since 1985 has seen average annual temperatures above this long-term average.

Disaggregating temperatures as average daily maximum, average daily minimum, as well as overall average allows us to identify patterns in how warming is impacting the region. *Maximum* annual average temperature tells us the average of all the warmest, typically afternoon, daily temperature readings in an area. *Minimum* annual average temperature tells us the average of the lowest temperature readings, which typically occur in the early morning. The overall average is the average of both maximum and minimum temperatures for an area over a given time.

In Figure 8, we see that *minimum* annual average temperatures (shown in yellow) for the Quad Cities area have been rising faster than *maximums* (shown in red) – although both are rising. Minimum temperatures have been consistently above average and rising since the year 2000. This pattern indicates that **the warming trend is mostly being driven by rising low temperatures**, such as days not being as cold and fewer cold days each year (see Temperature Extremes section below on page 23).

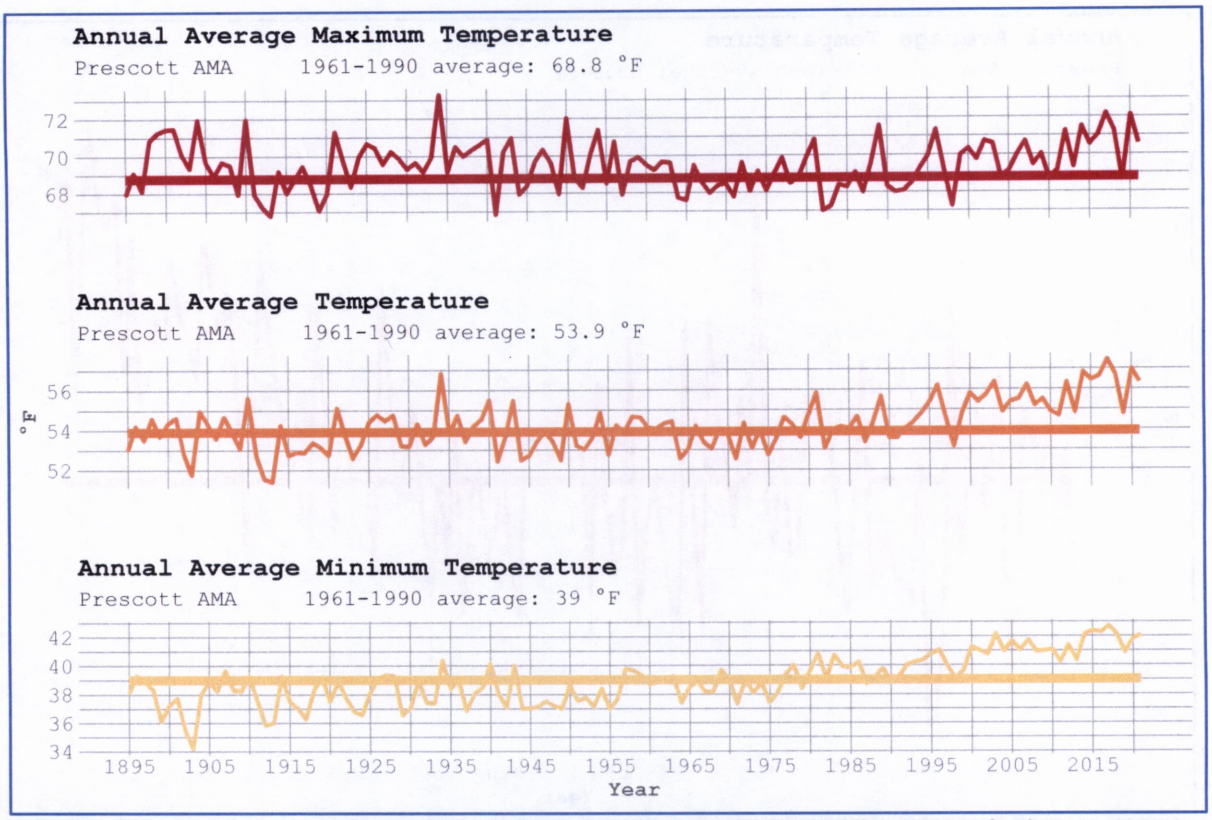


Figure 8: Annual average maximum (red), minimum (yellow), and overall average (orange) temperatures for the Prescott AMA from 1895 – 2021. Minimum temperatures are rising even faster than maximum temperatures; both are pushing the overall average temperatures higher.

Precipitation in Historical Perspective

As is normal in the southwestern U.S., precipitation across the Quad Cities area is highly variable and has ranged from a high of 39.3 inches in 1905 (1905 was a record precipitation year across the region) to a low of 7.3 inches in 1956. The average annual precipitation across the Quad Cities area between for the reference period 1961 – 1990 was 18.2 inches (Figure 9). In Figure 9, green bars represent years with above-average precipitation and brown bars represent years with below-average precipitation.

The Quad Cities area has experienced two periods of generally above-average precipitation (***pluvials***), which are noted with light green shading. The most distinct pluvials occurred from 1905 through the mid-1920s, and again in the late 1970s through the mid-1990s. Multi-year drought periods (multiple years with below-average precipitation), noted with light brown shading, occurred in the late 1800s to early 1900s, 1940s to early 1960s, and throughout the 2000s so far. These drought periods were felt across a broad swath of the Southwest.

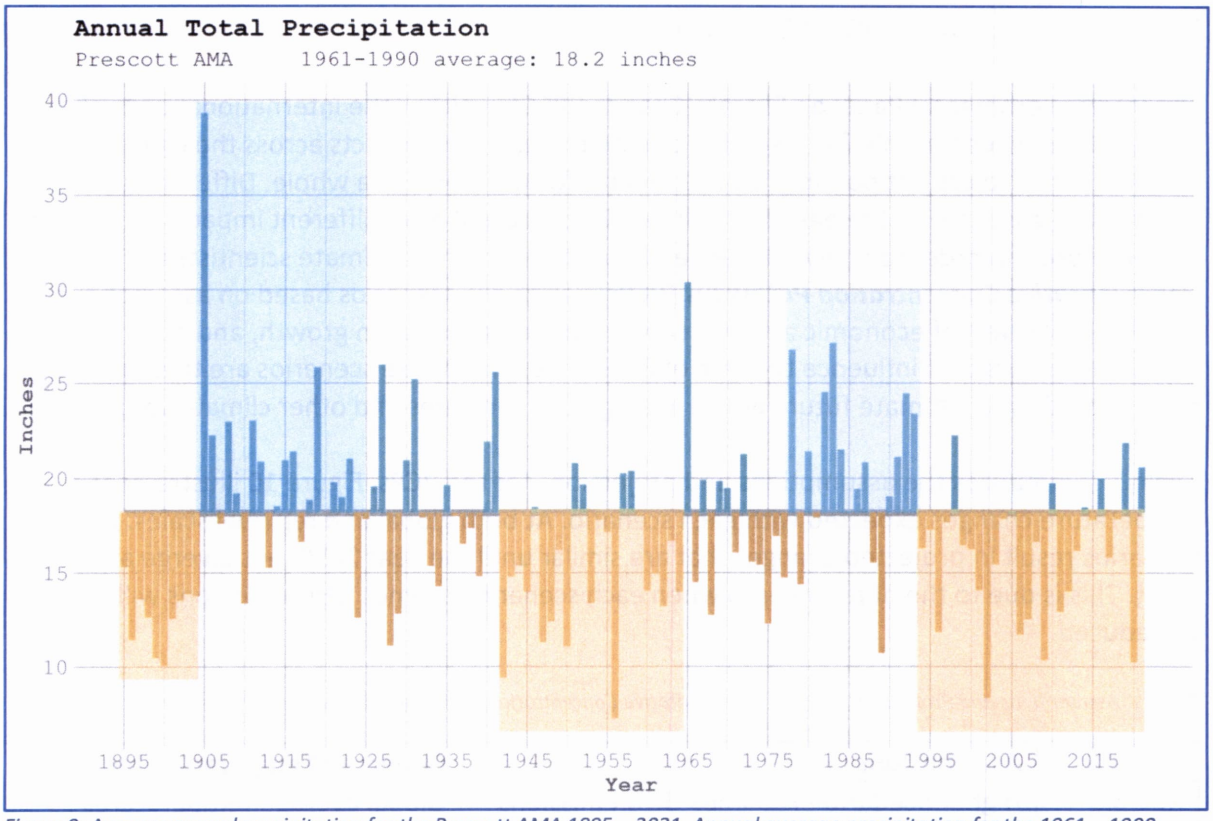


Figure 9: Average annual precipitation for the Prescott AMA 1895 – 2021. Annual average precipitation for the 1961 – 1990 reference period was 18.2 inches, but the region experiences naturally highly variable precipitation year-to-year.

Projecting Future Climate Conditions

The Intergovernmental Panel on Climate Change (IPCC), which is the international body of the United Nations responsible for assessing climate changes and impacts across the globe, has used scenarios to project possible future climates for the world as a whole. Different levels of greenhouse gases (GHGs) released into the atmosphere will have different impacts on warming temperatures. In order to show this range of possible outcomes, climate scientists use ***Representative Concentration Pathways (RCPs)***, which are scenarios based on assumptions about global levels of economic activity, energy sources, population growth, and other socio-economic factors that influence the rate of GHG emissions. These scenarios are then used in climate models to estimate future global average temperatures and other climate variables.

Table 1 summarizes the assumptions and projections for the RCPs. Figure 10 illustrates the temperature changes expected with each scenario. At both global and regional scales, the scenarios result in projected changes that are similar until the year 2050, but diverge at that point. This is due to the differences in when each scenario assumes GHG emissions will begin to be reduced.

Table 1. Assumptions and Projections for each Representative Concentration Pathway, represented in Figure 10.

Scenario	Assumptions	Projected Temperature Increase
RCP 8.5 *red line and shading*	Higher Scenario - Assumes GHG emissions continue to grow at current rate through 2100.	Global average temperatures increase more than 8° F (3.7° C) by 2100 (relative to the 1986 – 2015 average).
RCP 4.5 *aqua line*	Lower Scenario - Assumes that GHG emissions will peak at around 50% higher than year 2000 levels in about 2040 and then fall.	Global average temperatures increase 4° F (1.8° C) by 2100 (relative to the 1986 – 2015 average).
RCP 2.6 *green line and shading*	Even Lower Scenario - Assumes that GHG emissions begin decreasing by 2020 and decline to around zero by 2080, leading to a slight reduction in today's GHG levels by 2100.	Global average temperatures increase 2.5° F (1° C) by 2100 (relative to the 1986 – 2015 average).

Figure 10 shows the projected global temperature increases under the emissions scenarios described in Table 1. The black line in the left panel represents the observed change in GHG emissions since 1900. The red line in the left panel represents the higher emissions scenario for GHGs as described in Table 1. The aqua line in the left panel represents the lower emissions scenario and the green line represents the even lower emissions scenario. In the panel to the right, the black line represents the observed global average temperature since 1900. The colored lines (red, aqua, and green) represent the projected temperature increases associated with each of the emissions scenarios. The shading around each of the lines represents the spread of the projections from each of the individual 32 models; the solid lines are the averages

of the outputs of all 32 models. Although there is a range of possible temperatures for each scenario (shaded areas), they all project rising temperatures. In this report, we use only the lower scenario (RCP 4.5) and higher scenario (RCP 8.5) because the even lower scenario is no longer attainable.

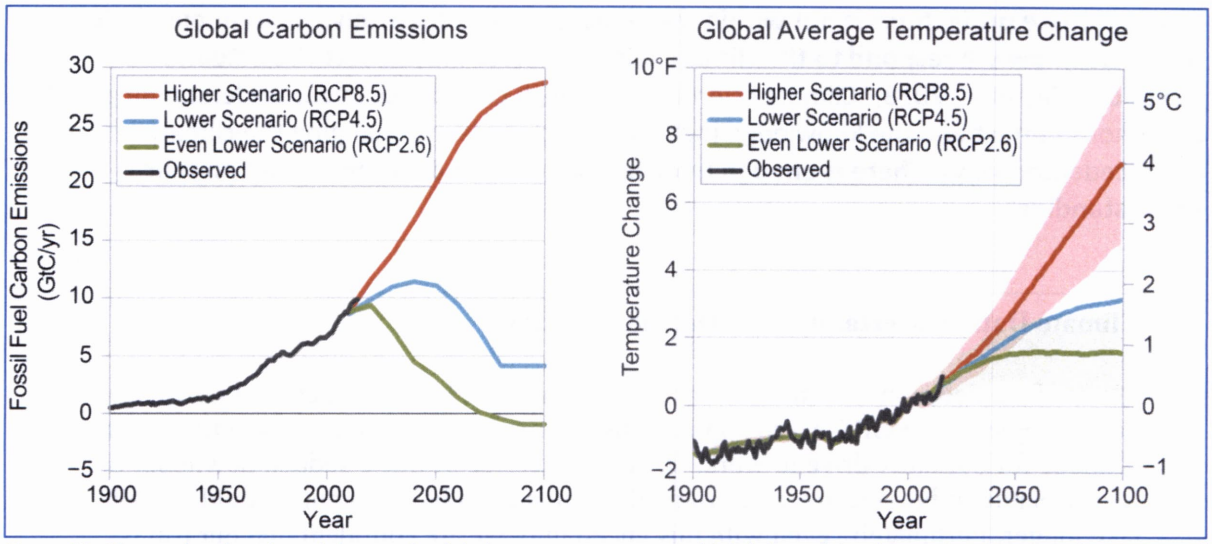


Figure 10: Observed and projected changes in global average temperature (right) depend on observed and projected emissions of carbon dioxide from fossil fuel combustion (left) and emissions of carbon dioxide and other heat-trapping gases from other human activities, including land use and land-use change. Source: Fourth National Climate Assessment; https://nca2018.globalchange.gov/chapter/2#fig-2-2Strengths and Limitations of Climate Models

Using Scenarios in Decision Making

Global and regional climate models represent, as accurately as possible, the complex atmospheric, oceanic, and other processes that affect the climate. Although they are not perfect representations of the Earth's systems, they have proven remarkably accurate in simulating the climate change we have experienced to date, particularly in the past 60 years. The observed signals of a changing climate continue to become stronger and clearer over time, giving climate scientists increased confidence in their findings (Jay et al. 2018).

Despite their increasing accuracy, climate models still have some limitations that should be kept in mind when seeking to understand projections for the globe or any given region.

- Climate model projections are not designed to predict year-to-year variations in climate conditions; they capture long-term changes, such as changes over decades.
- Projections are based on a set of scenarios of possible GHG emissions and how those are likely to affect the climate system. These are possible future conditions – *not predictions* of future conditions.
- Climate scientists are confident in the direction of change the models show – things are getting warmer under all scenarios and in the observed record. However, there is less certainty about the ***magnitude of change***, or exactly how much warming will occur.

Climate scientists increase their level of confidence by using multiple models in their analyses (not relying on just one source of data). The projection data presented in this report come from a combination of 32 climate models.

As the 2018 Fourth National Climate Assessment notes, **the biggest source of uncertainty in future climate projections is not within the climate models themselves, but in our choices as humans in how we respond to the climate crisis and how that affects the actual GHG emissions** (Jay et al. 2018). Climate scientists have high confidence in our understanding of the greenhouse effect and the knowledge that human activities are changing the climate in unprecedented ways. **There is enough information to make decisions based on that understanding**.

Climate Data, Uncertainty, and Decision Making

Many of the decisions we make every day are based on less-than-perfect knowledge. For example, while GPS-based applications on smartphones can provide a travel-time estimate for our daily drive to work, an unexpected factor like a sudden downpour or fender bender might mean a ride originally estimated to be 20 minutes could actually take longer. Fortunately, even with this uncertainty we are confident that our trip is unlikely to take less than 20 minutes or more than half an hour—and we know where we are headed. We have enough information to plan our commute.

– Guidance from the Fourth National Climate Assessment (Jay et al. 2018)

Regional Climate Models

We used the Localized Constructed Analogs (LOCA) dataset for the projections of future climatic conditions presented in this report. LOCA is a technique for ***statistically downscaling*** global and spatially coarser model projections of future climate. The LOCA downscaled climate projections provide temperature and precipitation at grid cells that are 6 kilometers (3.7 miles) across. We included all LOCA cells that intersect with the Prescott AMA portrayed in Figure 1. LOCA preserves extreme hot days and heavy rain events better than the previous generation of ***downscaling*** approaches and is used in the U.S. Fourth National Climate Assessment (Jay et al. 2018). The data cover the period 1950-2100, use 32 global climate models, and provide analyses based on the RCP 4.5 and 8.5 scenarios discussed above.

In the following discussion, we use the time period 1961 – 1990 as a reference period by which to compare projected changes to current conditions. This reference period aligns with one used for the most recent National Climate Assessment, so changes in the Quad Cities area can more easily be compared and contrasted with those occurring in other communities and other regions around the country. The Climate Explorer (https://crt-climate-explorer.nemac.org/) is a tool that allows for easy comparison of county-scale data.

Climate Projections for the Quad Cities Area

Annual Average Temperature

Model projections for the Quad Cities region show a range of possible future temperature increases, depending on the climate scenario. The average annual temperature for the reference period 1961 – 1990 was 54° F[2] (Figure 11). As described earlier, the solid lines in Figure 11 (and subsequent figures) represent the average of all the 32 model projections for each scenario while the shaded areas present the range of projections from all the models.

The annual average temperature is projected to climb 4 – 5 degrees F by 2050 for RCP 4.5 and 8.5, respectively, to approximately 58 - 59° F, which is the current average temperature of Albuquerque, NM. By the end of the century, annual average temperatures could be between 6° F higher than the 1961-1990 average for RCP 4.5 (orange line and shading) to over 11° F higher for RCP 8.5 (red line and shading) by the year 2100. End of century annual average temperatures could be 65° F. For comparison, the annual average temperature in Tucson, AZ now is approximately 68° F.

[2] There is a slight difference between the modeled historical temperature data and the observed record data. Figure 11 contains a modeled historical average of 54° F, while the observed record is 53.9° F. Slight differences in the modeled historical data do not affect the clear data about direction of change – temperatures are rising, despite small uncertainties about specific magnitudes.

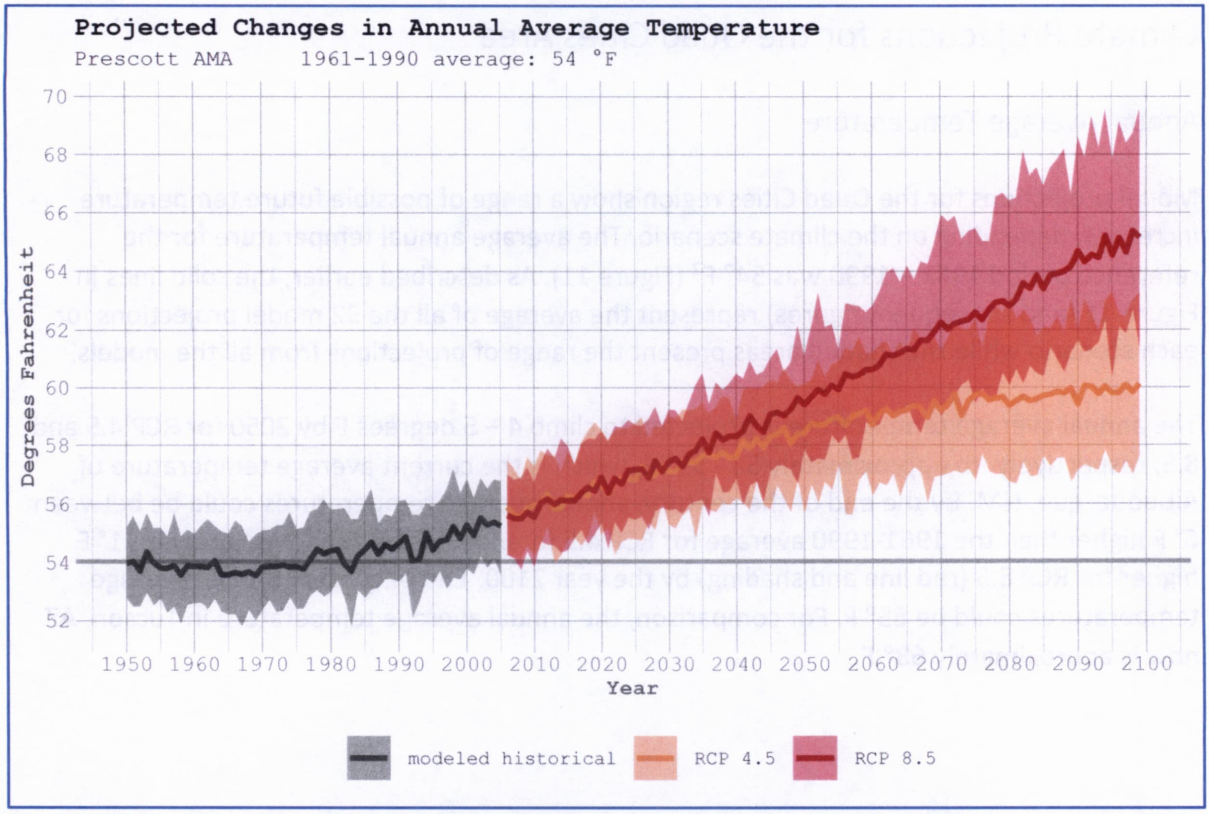


Figure 11: Downscaled model projections for the Quad Cities area show a range of possible future temperature increases, from 6° F higher than the 1961–1990 average for RCP 4.5 (orange line) to 11° F higher for RCP 8.5 (red line) at the end of this century.

Temperature Extremes

The average number of days above 95° F in the Quad Cities area has been 8 days per year (between 1961 and 1990) (Figure 12). **Recently, the area has seen about 20 days per year over 95. The projected change in the number of days above 95° F by 2100 ranges from 35 – 40 days by 2050 and 50 days per year (lower scenario) to as many as 95 days per year (higher scenario) by the end of the century.**

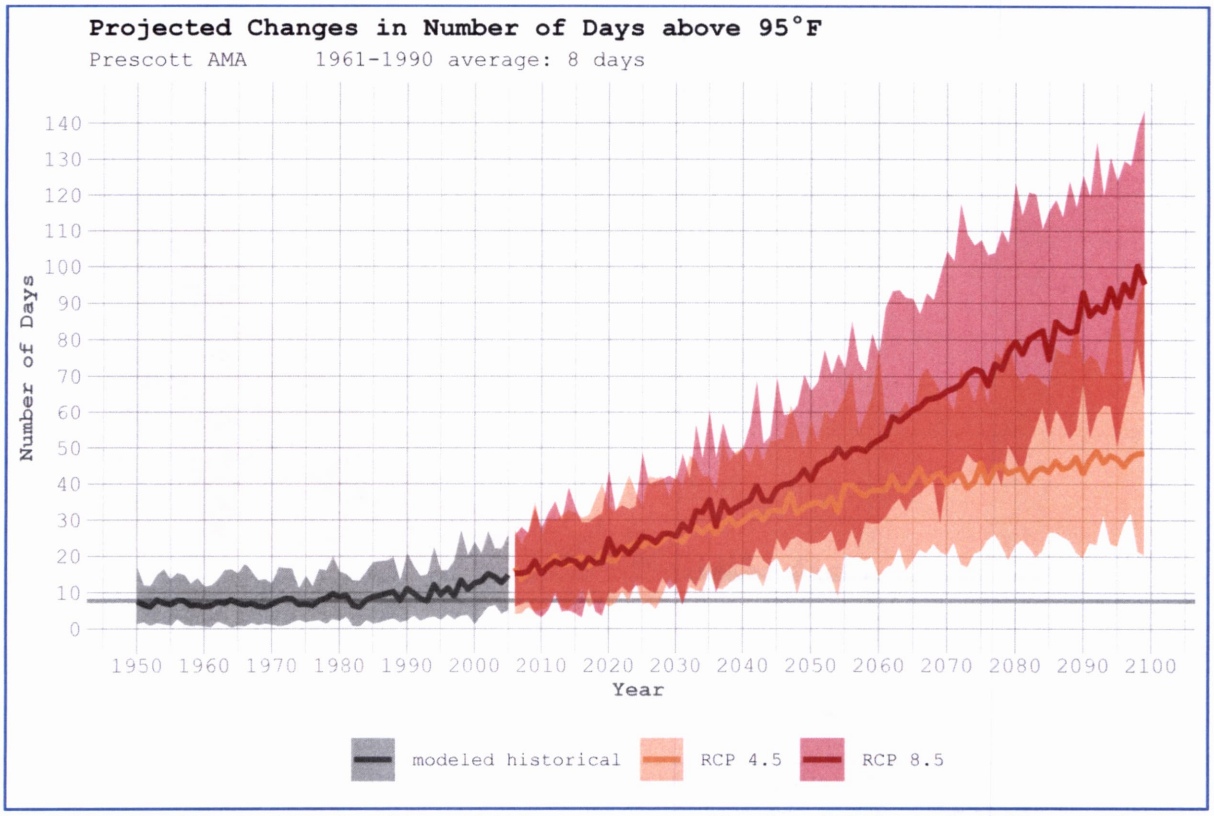


Figure 12:Projected changes in number of days with high temperatures reaching above 95 °F for the Quad Cities area. The area could experience between 50 and 95 days with maximum temperatures over 95 °F by the end of the century.

The Quad Cities area averaged about 1 day per year above 100° F between 1961 and 1990 (Figure 13). **More recently, the area has seen about 5 days per year over 100. The projected change in the number of days above 100° F range from: 10 – 12 days by 2050 and 15 days per year (lower scenario) to as many as 55 days per year (higher scenario) by the end of the century.**

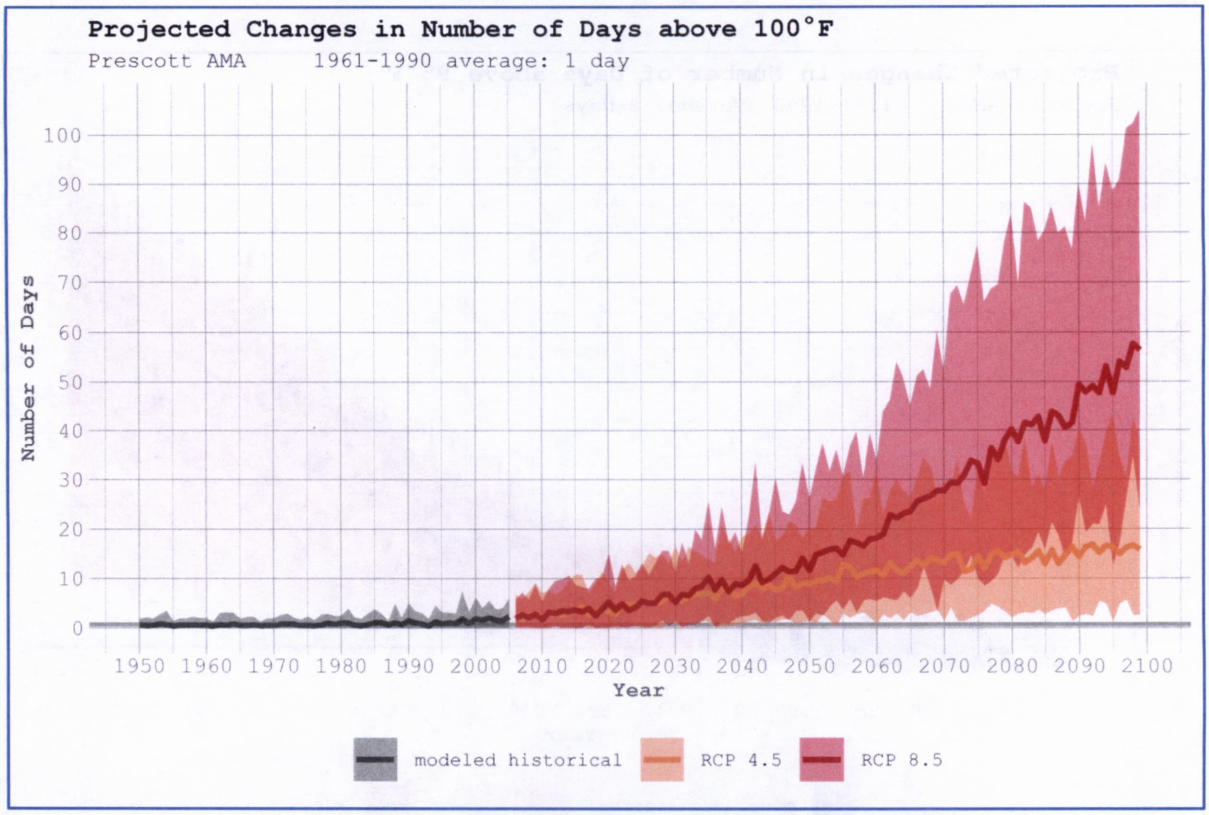


Figure 13: Projected changes in number of days with high temperatures reaching above 100 °F for the Quad Cities area. The area could experience between 15 and 55 days with high temperatures over 100 °F by the end of the century.

On average, the Quad Cities area has experienced 133 days per year in which the minimum temperature is 32° F or colder (1961 – 1990) (Figure 14). **Projections for the region indicate that the number of days with temperatures that fall below the freezing point could decrease to between 95 and 100 days by 2050 and to 90 days per year (lower scenario) and as few as 55 days (higher scenario) by the end of the century.**

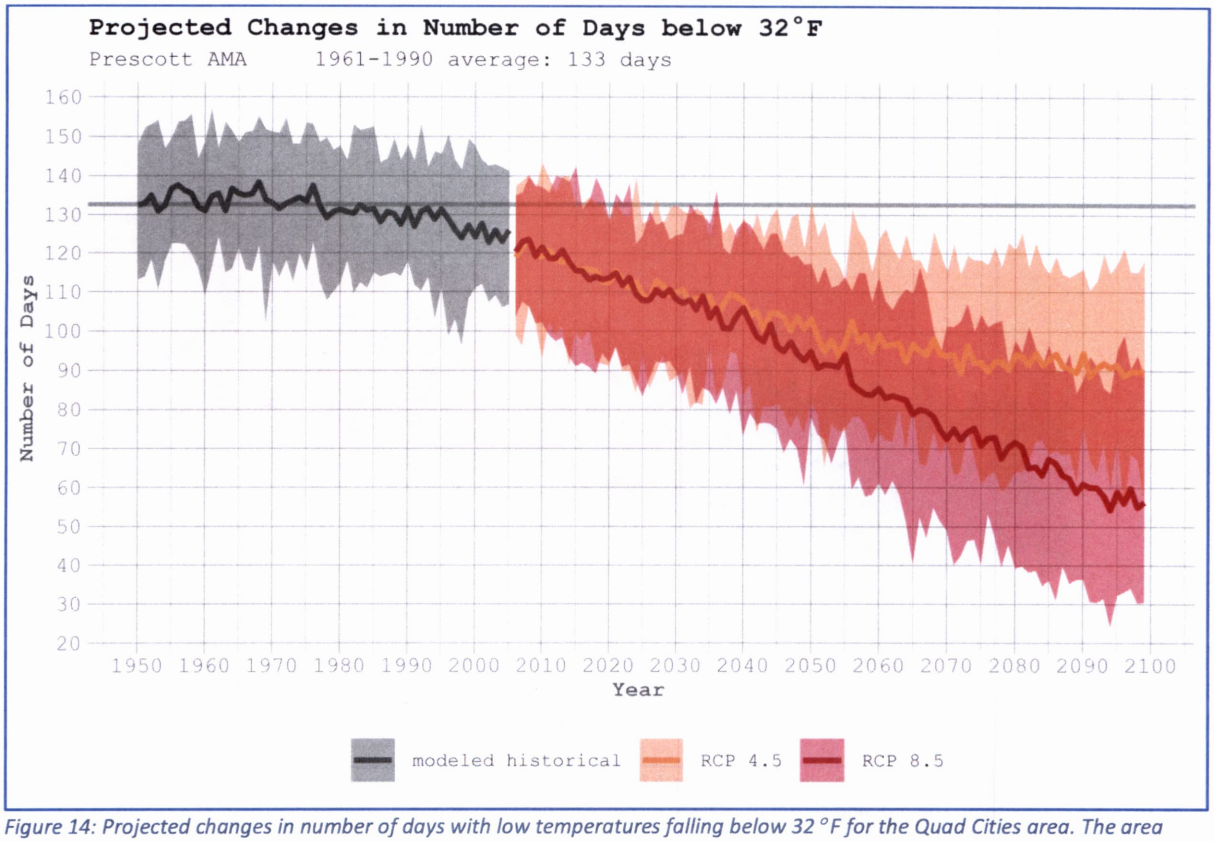


Figure 14: Projected changes in number of days with low temperatures falling below 32 °F for the Quad Cities area. The area could experience as few as 55 days with low temperatures below 32 °F by the end of the century.

Growing Season

The growing season is generally considered to be the time between the last freeze (<32° F) in the spring and the first freeze (<32° F) in the fall. The growing season in the Quad Cities region was about 167 days per year between 1961 and 1990. Based on the projected temperature changes for the Quad Cities, **the growing season is likely to increase by between about 30 days (lower scenario) and 60 days (higher scenario) by the end of the century** (Figure 15).

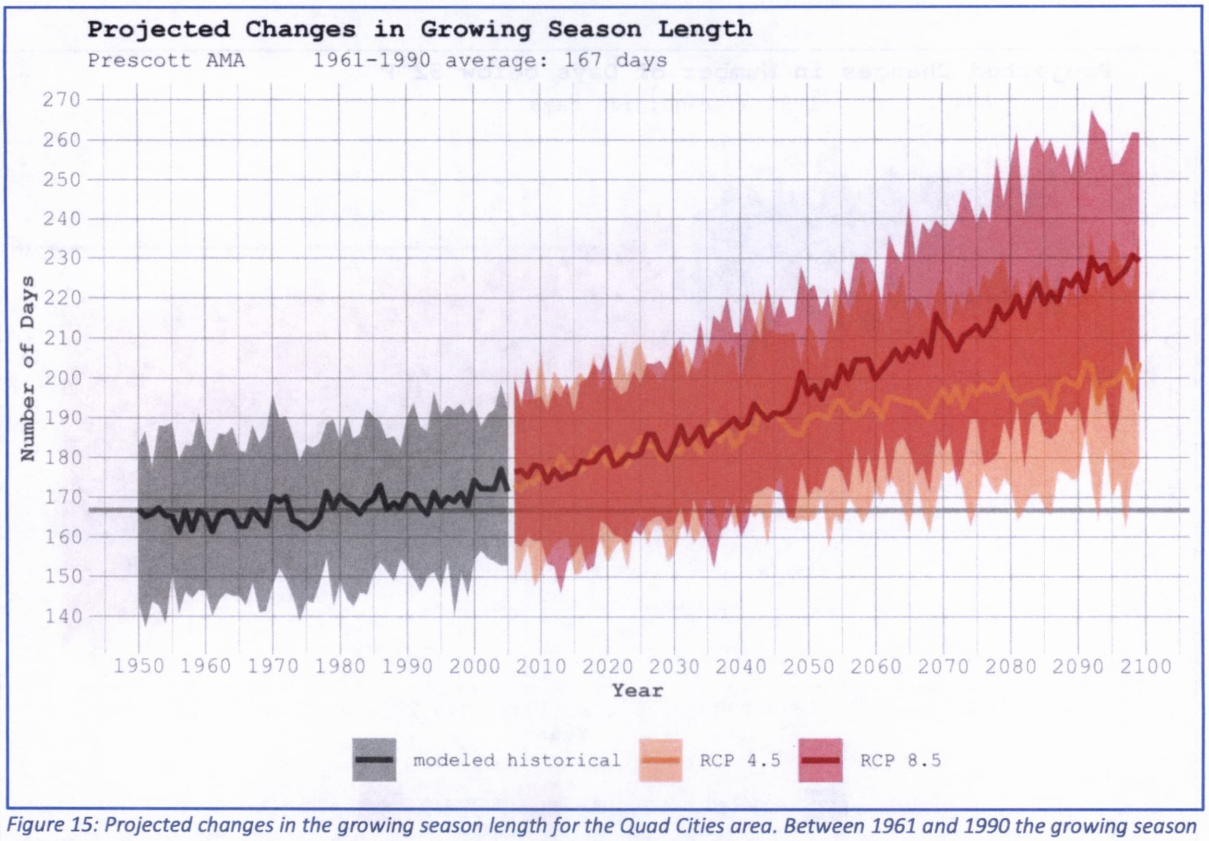


Figure 15: Projected changes in the growing season length for the Quad Cities area. Between 1961 and 1990 the growing season was 167 days on average. The growing season is likely to increase by between about 30 days and 60 days by the end of the century.

Annual Average Precipitation

While the projections for *temperature* show possible increases in both scenarios, **the projections of annual total precipitation show little-to-no change for the Quad Cities area** (Figure 16). The light blue line, representing the lower scenario, shows no change in the amount of annual precipitation by the end of the century. The dark blue line, representing the higher scenario, shows the potential for a slight decrease (1-3 inches) in annual total precipitation by the end of the century. However, given the uncertainty of these projections (discussed in the paragraph below), many climate scientists recommend assuming that annual total precipitation in the region will remain relatively consistent, with year-to-year variation as we see now.

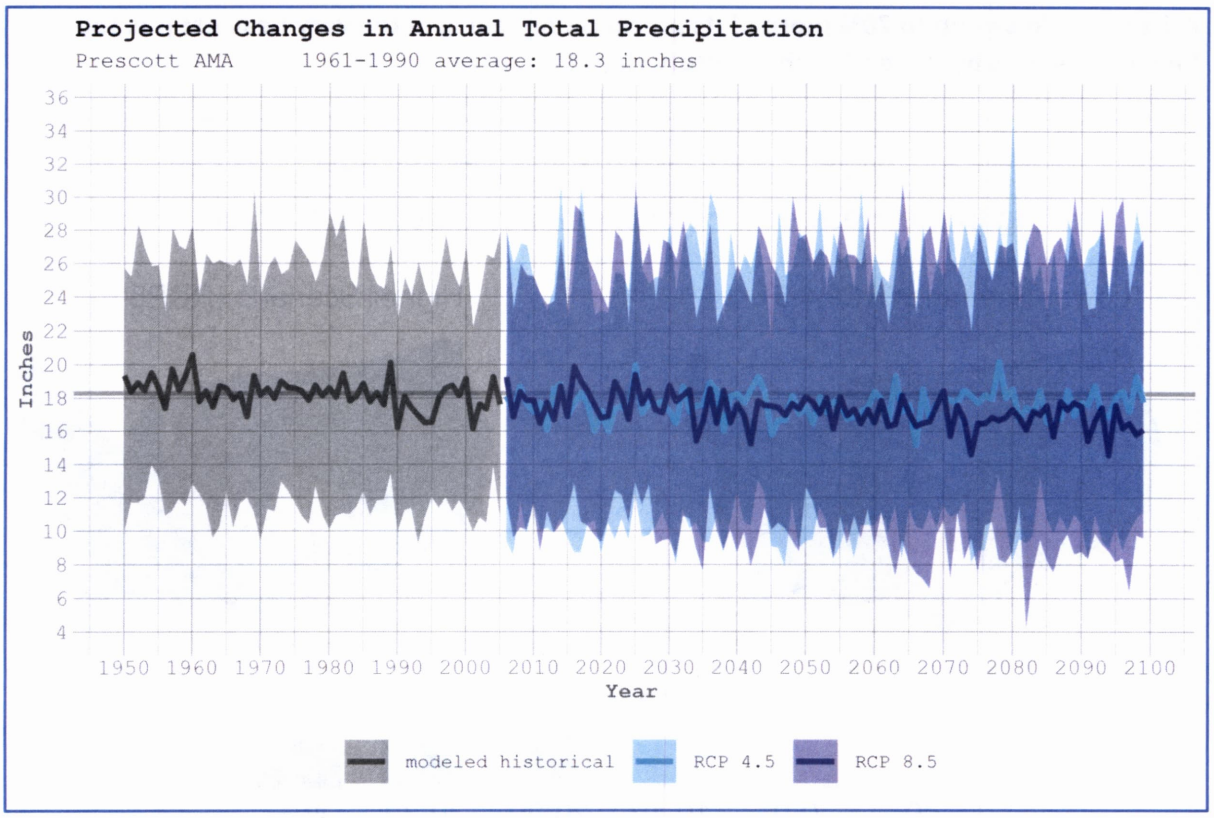


Figure 16: Between 1961 and 1990 the annual average precipitation for the Quad Cities area was 18.3 inches. Projections of future precipitation show little change and are more uncertain than projections of temperature changes,

Precipitation Extremes

While scientists are very certain about the projections of future temperature change (i.e. warming), creating high-confidence projections of precipitation for this region has proven very difficult. Multiple phenomena influence this region's precipitation, including the ***El Niño Southern Oscillation (ENSO)***, the ***Pacific Decadal Oscillation (PDO)***, the ***North American Monsoon (NAM)***, and ***atmospheric rivers*** (Sheppard et al. 2002; Crimmins et al. 2017). Each of these phenomena play out on the landscape in different ways that contribute to precipitation

(or lack thereof); the diversity of phenomena is difficult to capture in a climate model. Therefore, projections of annual average precipitation in the Southwest region are less certain than projections of future precipitation in other parts of the country (Gershunov et al. 2013)[3].

Changes in Character of Precipitation

Although projections of changes in precipitation amounts are uncertain, based on our understanding of the physical effects of climate change, we can describe likely changes to the *character* of precipitation in this region. As the atmosphere warms, it will be able to hold more moisture, which will produce more extreme precipitation when that precipitation falls. According to analyses included in the Fourth National Climate Assessment (Figure 17), **northern Arizona could see up to 20% more of its precipitation falling in the very heaviest (i.e. top 1% heaviest) events by the end of this century** (Jay et al. 2018).

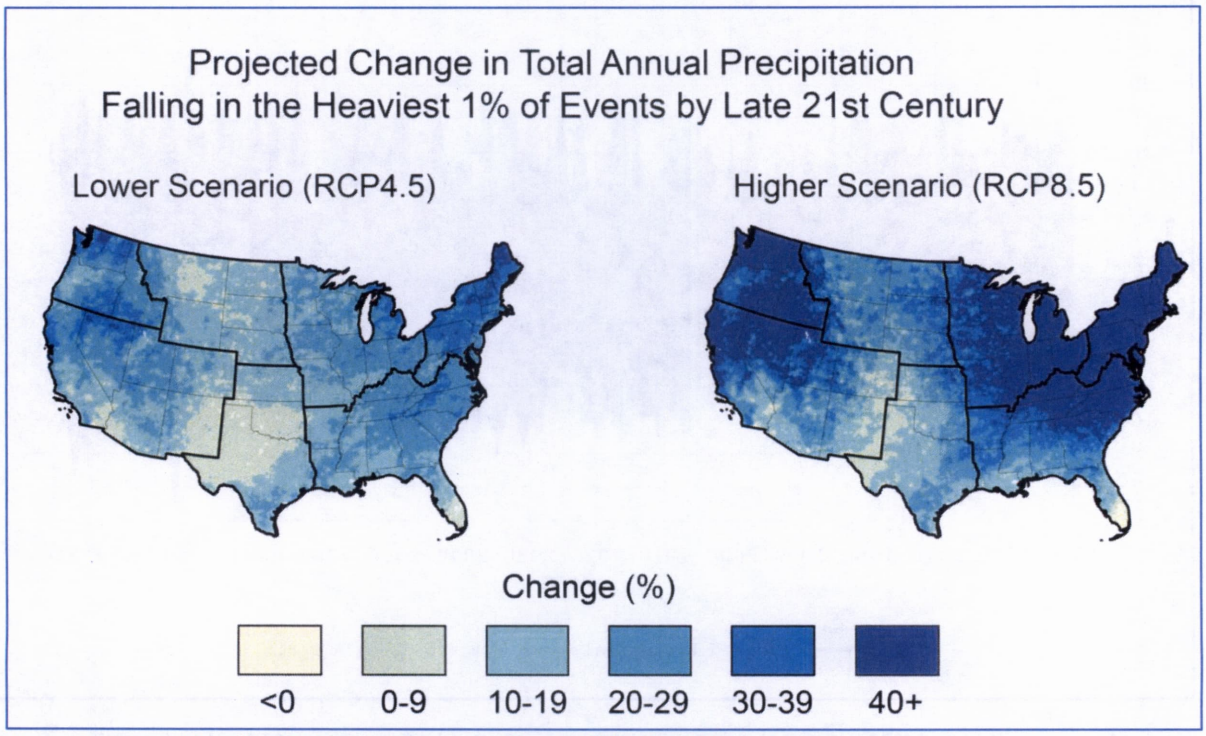


Figure 17: Source: https://nca2018.globalchange.gov/chapter/2#section-kf-key-message-6.

We can see how the warming atmosphere is likely to change storm events in the future by looking at the projected changes in daily maximum precipitation. Annual daily maximum precipitation is a measure of the largest, single day precipitation event that falls each year. Between 1961 and 1990, the average of daily maximum precipitation (average of all the daily

[3] The authors of the 2013 Assessment of Climate Change in the Southwest United States expressed only medium-low confidence in projections related to precipitation changes in the region (Overpeck et al. 2013).

maximums) was 2.7 inches. In Figure 18 we do not see much projected change according to the model average lines – they both show the possibility of the average daily maximum precipitation reaching about 3 inches. However, when we look at the shaded area, which reflects the range of the data from each of the 32 models used in this analysis, we see that the shaded area is larger above the average line. This indicates that there is a **greater likelihood of larger storms with higher daily maximum precipitation in the future**.

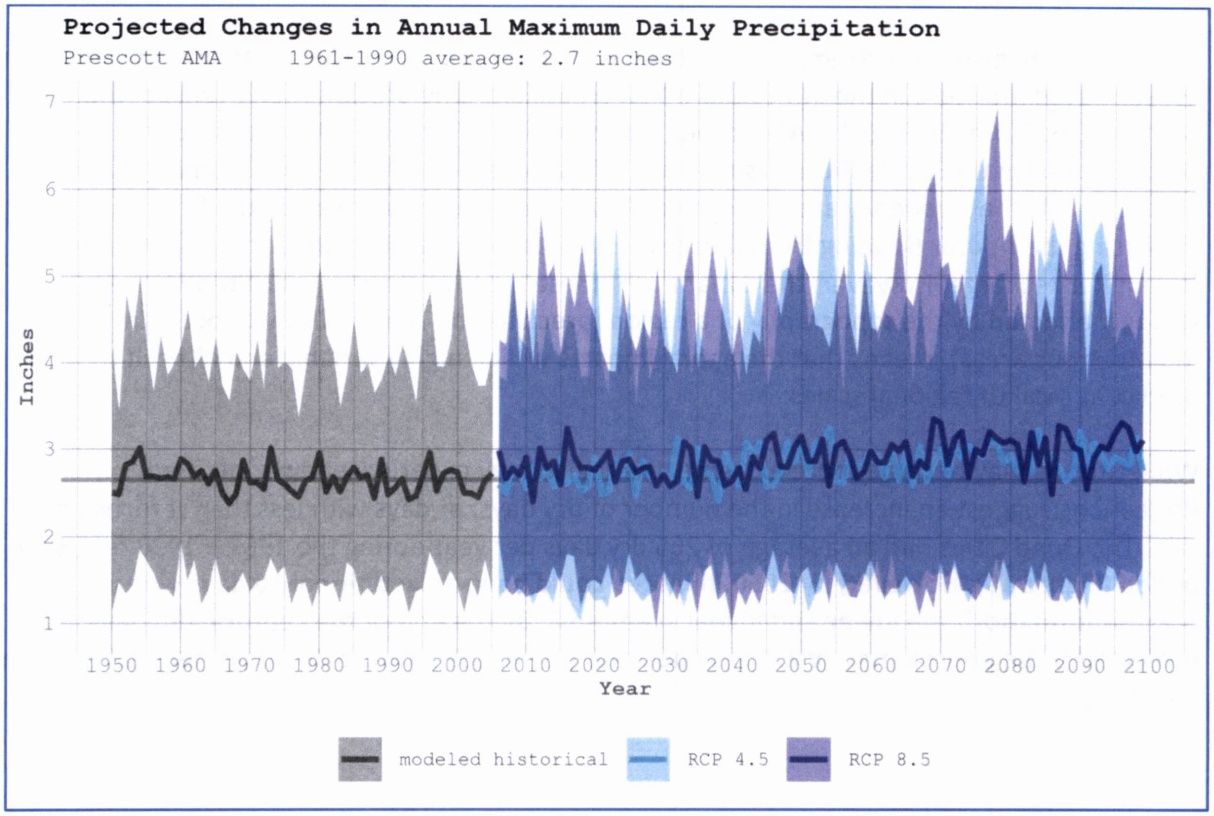


Figure 18: Between 1961 and 1990, the average of daily maximum precipitation in the Quad Cities area was 2.7 inches. There is little projected change according to the model average lines. However, the shaded area is larger above the average lines, which indicates that there is a greater likelihood of larger storms with higher daily maximum precipitation in the future.

Recent research on the ***North American Monsoon*** (NAM) and ***atmospheric rivers*** (ARs) points to changes that may affect the Quad Cities. In addition to allowing the atmosphere to hold more moisture, warmer temperatures are related to expansion and intensification of the monsoon ridge. The monsoon ridge, which is a ridge of high pressure that acts to block moisture flow toward the north, determines where storms develop and move. These changes in the monsoon ridge result in fewer storms across Arizona during the peak of the monsoon season (late-July to mid-August) (Lahmers et al. 2016). **Even though there have been fewer storms, the heaviest rain events have become more extreme (as measured by the amount of precipitation and wind gusts).** Between 1980 and 2010, during the latter part of the monsoon (mid-August to September), some higher elevation areas have experienced increases in total

precipitation amounts as thunderstorms that develop over this terrain (such as parts of northern Arizona) have moved less frequently into the lower deserts. These storms have stayed in more mountainous areas, which also increases the flood potential in those areas (Lahmers et al. 2016). As storms, like those associated with the NAM, have become more extreme in terms of precipitation, maximum wind gusts also have become higher. Higher winds during severe storms are also projected to continue in the future (Luong et al. 2017; Castro 2017). **While the overall average amount of precipitation may not change substantially, the Quad Cities may receive that precipitation in fewer, but more intense storms** (Castro 2017).

Another mechanism for extreme precipitation is atmospheric rivers (ARs), narrow corridors of concentrated moisture in the atmosphere that create extreme precipitation events in the western U.S. From 1979–2011, ARs accounted for about 25% of the total cool season precipitation for the Verde River Basin, in just a few extreme events (Rivera, Dominguez, and Castro 2014). The frequency and intensity of ARs is projected to increase in the future, increasing the risk for flooding from these storms but also providing additional opportunities for aquifer recharge. However, the dynamics of these types of storms, which tend to be strongly affected by the topography of a region (precipitation is more likely to occur in mountainous areas), means that the actual impacts will be highly variable and difficult to predict at local to regional scales.

While storms may become more extreme, the region may experience fewer of them. Projections suggest an increase in the number of dry days, or days with less than .1 inches of rain. The Quad Cities had an average of 265 dry days per year during the 1961 – 1990 reference period (Figure 19). However, **by 2050, the area could have an additional 10 days without precipitation (both the lower and higher scenarios). By the end of the century, dry days are projected to be approximately 275days per year (lower scenario) to 285 days per year (higher scenario)**.

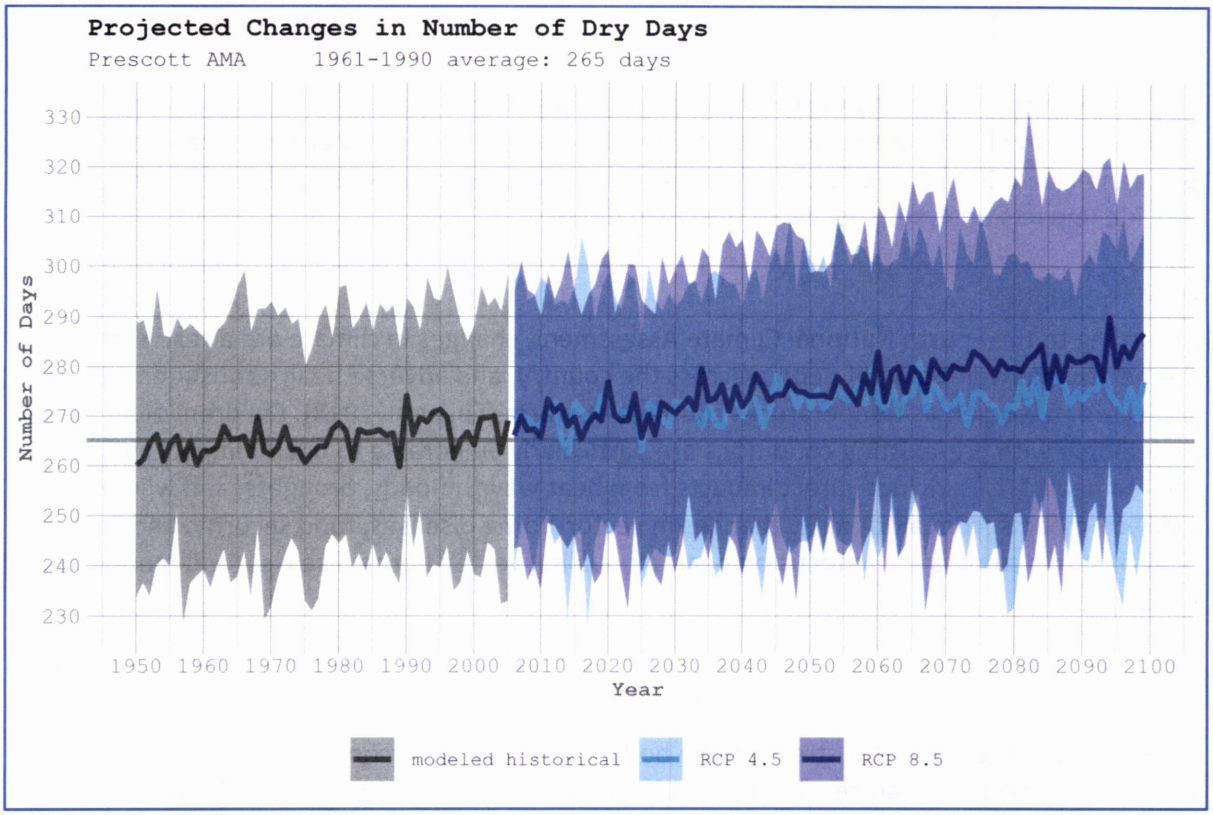


Figure 19: The Quad Cities averaged 265 dry days (less than .1 inches of precipitation) between 1961 and 1990. Projections for the area indicate a rise in dry days to between 275 and 285 days per year by the end of the century.

Even if with no change in total precipitation, the Quad Cities could become much drier as projected warmer temperatures will mean more evaporation of surface water and more transpiration (use of water by plants), which will further dry the soil (See Drought on page 41).

Impacts of Climate Change

This overview of impacts from climatic changes is based on a literature review of impacts to the general region of central and northern Arizona. The information provided here can help to place the Quad Cities' specific climate projections into a regional context. This section does not provide impacts analyses specific to the Quad Cities.

Human Health

According to the Fourth National Climate Assessment, changes in climate are already affecting the health and well-being of people across the country, and adverse health consequences are projected to worsen as temperatures continue to warm (Ebi et al. 2018). Children, older adults, and people with pre-existing conditions are particularly vulnerable to health impacts. Climate-related health risks include direct impacts from heat waves, floods, droughts, and wildfire, and indirect impacts from air quality, changes in vector-borne diseases, food security, and mental health. In this summary, we focus on heat, air quality, vector-borne diseases, and mental health.

Extreme Heat and Energy Use

Extreme heat places greater stress on the body, especially when combined with humidity and when nighttime temperatures don't cool off enough to allow the body relief (Brown, Comrie, and Drechsler 2013). Older adults, children, those who work outside, those with chronic illnesses, and those who are socially isolated tend to be at greater risk. Between 2003 and 2013, 1574 people in Arizona died due to exposure to excessive natural heat (Arizona Department of Health Services 2015). As temperatures rise, heat waves in the Southwest U.S. are predicted to become longer, more frequent, and more intense, which will increase the risk of heat-associated deaths (Gershunov et al. 2013). By 2050, based on the higher emissions scenario (RCP 8.5), the Southwest is projected to experience an estimated 850 additional deaths per year with an associated economic loss of $11 billion (in 2015 dollars) from the loss of labor and productivity associated with loss of life (Gonzalez et al. 2018). By 2090, deaths and associated economic losses are projected to double from those projected for 2050.

Humans have been adapting to higher overall temperatures through a combination of improved social responses, physiological acclimatization, and technology (i.e., air conditioning) (Crimmins et al. 2016). Increased use of air conditioning (AC), because of higher daytime and nighttime temperatures and improved access to technology, will increase energy consumption. Due to the need for additional cooling, by 2080–2099, electric consumer energy will cost an estimated $164 million more per year in the state of Arizona, compared to 2008–2012; on a household basis, this equates to about $100 per household per year (Huang and Gurney 2017). Additionally, increased energy use can stress the electrical grid, increasing the risk for brownouts—a partial, temporary reduction in system voltage (Tidwell et al. 2013). Furthermore, if the energy comes from the burning of fossil fuels, then it will release more

greenhouse gases, increasing temperatures further, which will in turn increase demand for AC, and so on.

Air Quality

Climatic changes are also affecting air quality, with implications for human health such as rising rates of asthma and other allergic diseases as well as respiratory diseases (Crimmins et al. 2016). Ground-level ozone pollution, fine particulate matter 2.5 (PM2.5; particulate matter smaller than 2.5 microns), and particulate matter 10 (PM10; particulate matter between 2.5 and 10 microns) are several of the air pollutants likely to be affected by climatic changes.

Increased temperatures will increase ground-level ozone pollution, which is produced when nitrogen oxides and hydrocarbons from automobile exhaust, power plant and industrial emissions, gasoline vapors, chemical solvents, and some natural sources react in heat and sunlight. Exposure to ground-level ozone is linked to reduced lung function and respiratory problems such as pain with deep breathing, coughing, and airway inflammation (Brown, Comrie, and Drechsler 2013), which can contribute to increased deaths (Crimmins et al. 2016).

Ozone exceedance days have fallen in Yavapai County (station located near Prescott) since the early 2000s (Figure 20). However, ozone in Yavapai County tends to peak in the hotter months preceding the monsoon season – April through June (Figure 21). As temperatures rise and heat waves become more common, ozone exceedance days may also rise.

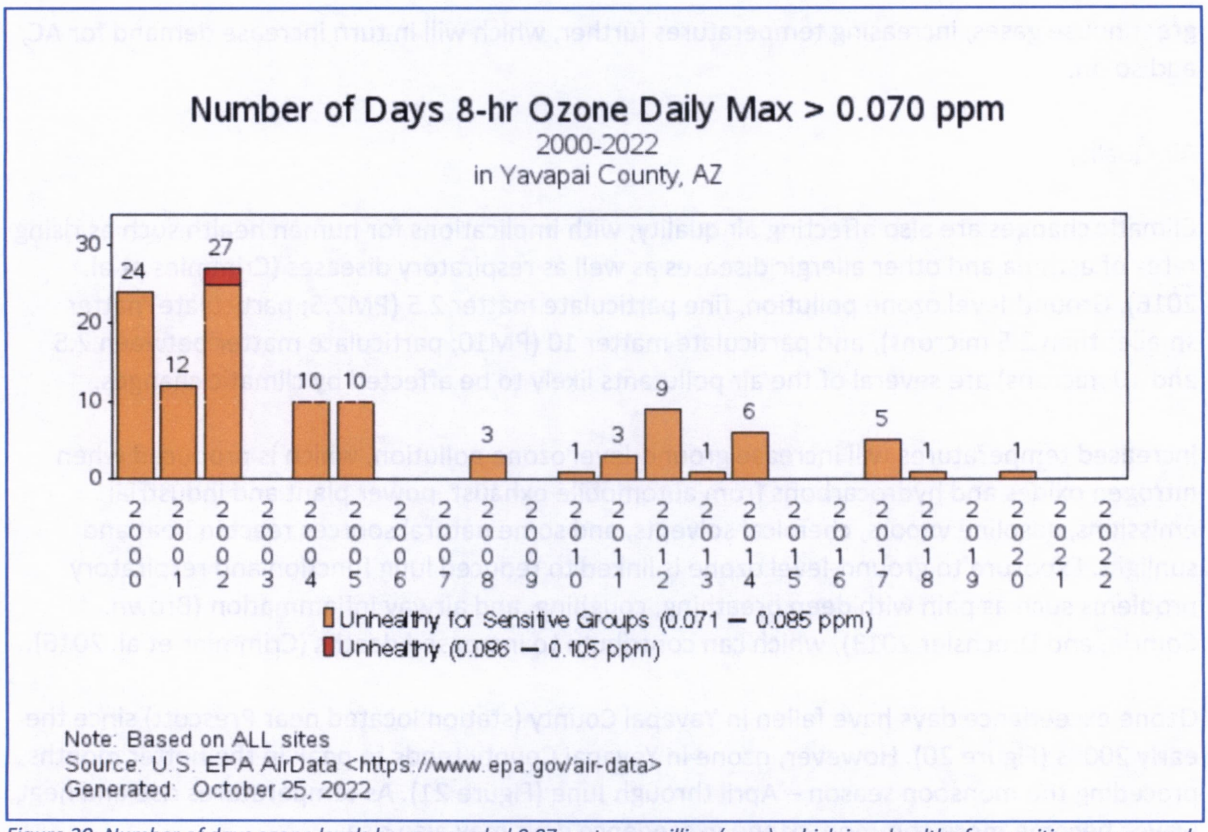


Figure 20: Number of days ozone levels have exceeded 0.07 parts per million (ppm), which is unhealthy for sensitive groups, and 0.086 ppm, which is unhealthy for all. Source: https://www.epa.gov/outdoor-air-quality-data/air-data-ozone-exceedances.

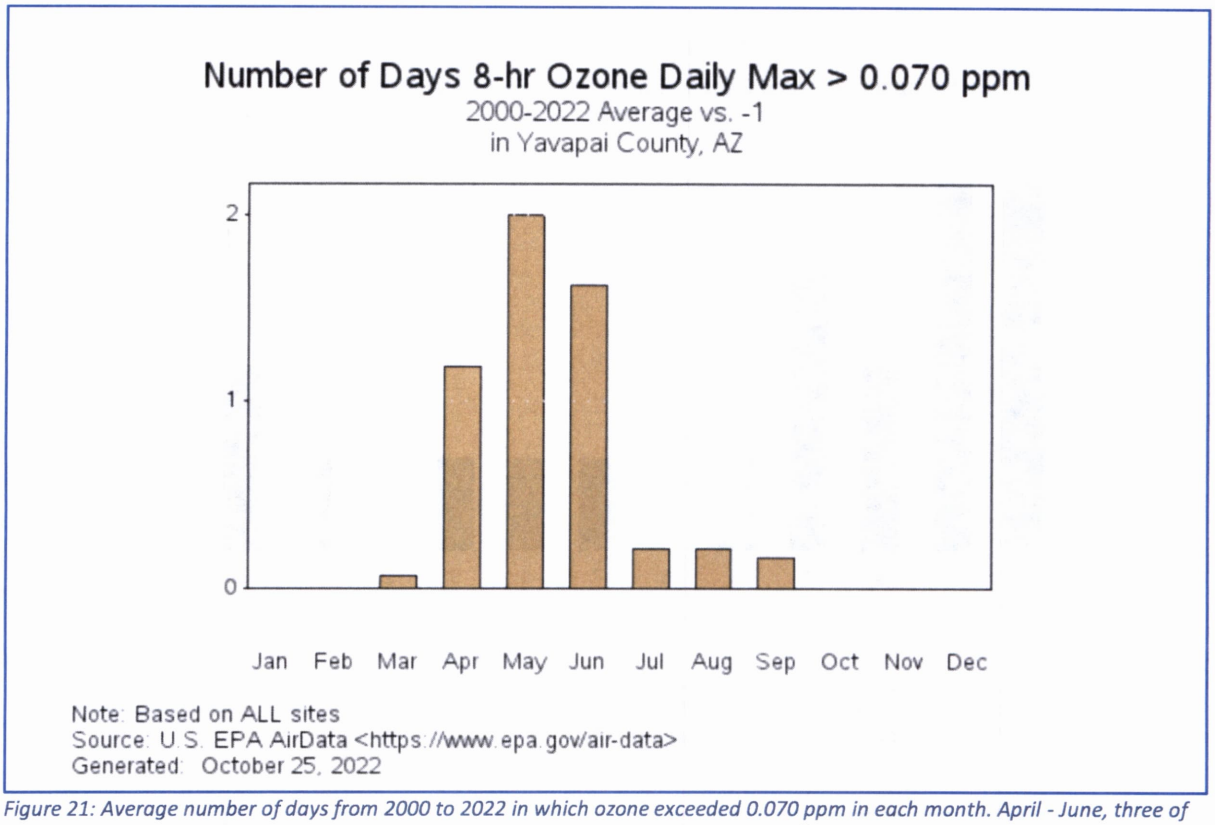


Figure 21: Average number of days from 2000 to 2022 in which ozone exceeded 0.070 ppm in each month. April - June, three of the warmest months, also had the highest number of high ozone days. Source: https://www.epa.gov/outdoor-air-quality-data/air-data-ozone-exceedances.

PM2.5 is often generated by vehicle exhaust and power plant emissions (Environmental Protection Agency 2013). Another source of PM2.5 is wildfires, which are expected to become larger and more frequent as climate conditions become hotter and drier (see the section on Wildfires on page 39). A recent nationwide analysis found that wildfires have accounted for up to 25% of PM2.5 in recent years and up to 50% in some Western regions (Burke et al. 2021). High levels of PM2.5 are associated with mortality related to cardiovascular problems, particularly among the elderly, and reduced lung function and growth, increased respiratory stress, and asthma in children (Brown, Comrie, and Drechsler 2013). The increase of days with smoke in the air, due to wildfires, threatens to undo the improvements the country has seen in air quality in recent decades (Burke et al. 2021).

In Yavapai County, PM10 pollution often comes in the form of dust. In Central Arizona, dust storms tend to peak during the winter months, as Pacific storms bring gusty winds causing localized blowing dust from single point sources such as degraded desert, abandoned farmland and dirt roads (Figure 22) (Lader et al. 2016). Dust storms have been occurring more frequently and over a longer season in recent years in Arizona due to drought conditions (Tong et al. 2017). The decade of the 2000s saw significantly more dust storms than the 1990s (Figure 23) (Tong et al. 2017). Dust can enter the nose and lungs and create serious health problems.

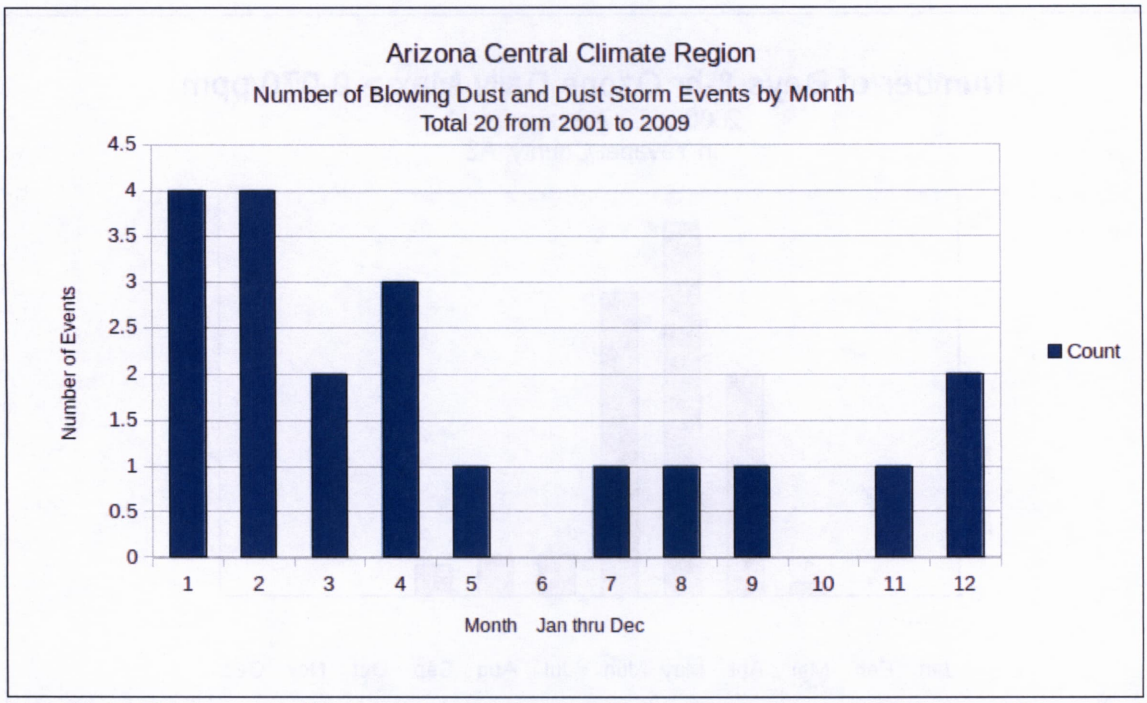


Figure 22: Monthly frequency of blowing dust and dust storms in the Central climate region, including most of Yavapai and Gila Counties, from 2001-2009. Most events occurred in December – April. Source: Lader et al. (2016).

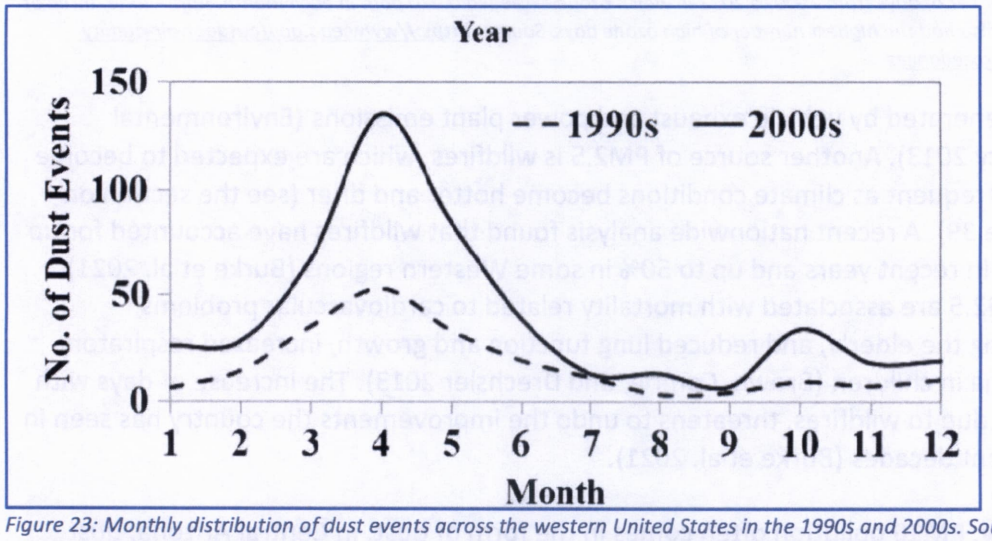


Figure 23: Monthly distribution of dust events across the western United States in the 1990s and 2000s. Source: Tong et al. (2017). The dashed line represents the total number of dust events in the decade of the 1990s; the solid line represents the total number of events in the decade of the 2000s. The 2000s had more dust events in almost every month than in the 1990s.

Vector-borne and Climate-related Diseases

Climate change seems likely to affect certain vector-borne diseases like West Nile Virus (WNV), because warmer temperatures will create a more welcoming environment for the mosquitos that carry WNV. The primary mosquitos that carry WNV in the region are *Culex tarsalis* and *Culex quinquefasciatus*.

Climate change is likely to lengthen the season during which mosquitos can survive and breed. However, in some areas, extreme temperatures in mid-summer (over 104° F) may be high enough to substantially reduce mosquito populations during the hottest months. In other words, the mosquito season may expand, but there may be a reduction in the number of mosquitos during the hottest months of the year in the future. However, mosquito populations may rebound once temperatures cool in the late summer and early fall – so the reduction may be temporary and only occur in areas with extreme summer temperatures (Roach et al. 2017).

Although not currently a common occurrence in the Quad Cities area, Valley fever may pose additional risks in the future due to climate-related changes. Valley fever (VF) is a fungal disease that is at least partially influenced by climate and weather conditions. Predicting changes in VF cases due to climate change is challenging because there are many factors involved. The highest incidence (cases/population) tend to occur in more populated counties. Age seems to be a risk factor, as is working outdoors. VF tends to occur when conditions are first moist, then hot, dry, and windy, which allows the fungus to grow and then become aerosolized. The timing of these weather events is critical as well as the direction of the wind: from places where the fungus grows to places where the population is at risk. However, because the ability to detect fungus in the soils remains limited, it is difficult to predict if and when VF might affect specific communities now or in the future (Roach et al. 2017).

Mental Health

Many people exposed to climate-related disasters, such as flooding, heat, and wildfire, experience serious mental health consequences, such as post-traumatic stress disorder, depression, and general anxiety, which often occur simultaneously. These consequences are especially true with events that involve "loss of life, resources, or social support and social networks or events that involve extensive relocation and life disruption" (Dodgen et al. 2016). Populations at particular risk of mental health consequences include children, the elderly, pregnant and post-partum women, people with preexisting mental illness, the economically disadvantaged, the homeless, and first responders.

Of particular interest in central and northern Arizona is the potential mental health consequences from relocation due to wildfire. Additionally, clinical depression has been

observed in patients infected with WNV (Dodgen et al. 2016). Some studies have shown a connection between higher temperatures and suicide rates (Gonzalez et al. 2018).

Ecosystem

Forest Health

Drought and rising temperatures affect forests in several ways. First, direct stress from heat and lack of moisture reduces tree growth and increases tree mortality (Williams et al. 2010). Second, insect outbreaks increase with warmer temperatures and drought-stressed forests are more vulnerable to those outbreaks. In mid-elevation conifer forests in the western U.S., the rate of tree death has doubled from 1955–2007 (Gonzalez et al. 2018). Bark beetle infestations killed 7% of western U.S. forest area between 1979 and 2012 (Gonzalez et al. 2018). Insect populations, such as mountain pine beetle and spruce beetle, are expected to increase as temperatures and the incidence of drought increase. However, there will be variability over time and geographic area (Bentz et al. 2010). While most research on temperature impacts and forest pests to date has focused on the mountain pine beetle and spruce beetle (Bentz et al. 2022), the *Ips* bark beetles are of greater concern in the forests surrounding the Prescott Basin (Negron et al. 2009); Arizona five-spined *Ips* and pine engraver beetles (also in the *Ips* genus) are the primary mortality agents of ponderosa pine and pinyon *ips* in piñon pine. Warmer and drier climate in combination with suitable forest conditions contribute to increased potential for current and future bark beetle outbreaks (Bentz and Logan 2009; Negron et al. 2009). Warming temperatures will likely lengthen the period of flight activity and increase the number of generations per year for *Ips* species (Williams et al. 2008).

Wildfires

Warming is already driving an increase in the area burned by wildfires as well as an expansion of the fire season (Westerling et al. 2006). These trends are expected to continue with increased warming in the future.

From 1984–2015, the area burned by wildfire was approximately 24 million acres, twice what would have burned without climate change (about 12 million acres) (Figure 24) (Gonzalez et al. 2018). The effects of warming are exacerbated by insect outbreaks, human settlements, and the 20th century policy of fire suppression, all of which contribute to increased fire risk in southwestern forests (Abatzoglou and Williams 2016).

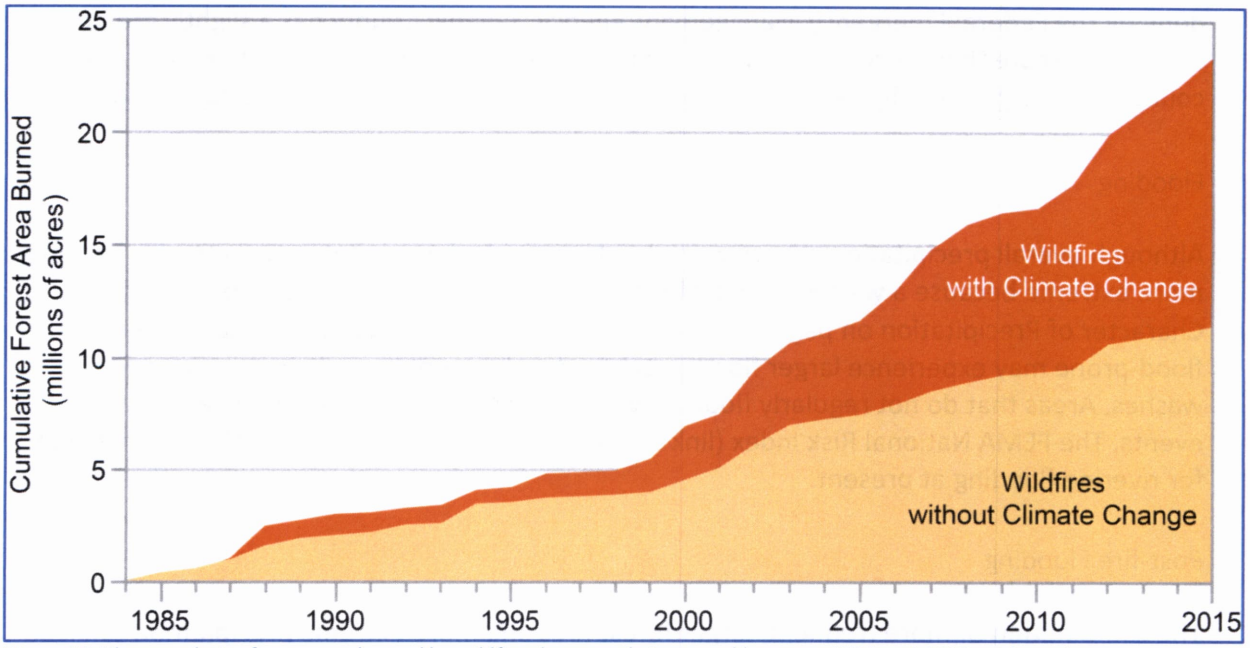


Figure 24: The cumulative forest area burned by wildfires has greatly increased between 1984 and 2015, with analyses estimating that the area burned by wildfire across the western United States over that period was twice what would have burned had climate change not occurred. Source: Figure 25.4 from Gonzalez et al. (2018); adapted from Abatzoglou and Williams (2016).

Given climate change projections, substantial increases in the area burned by wildfires are projected in the future as well (Hurteau et al. 2014). Under the higher emissions scenario, fire frequency could increase 25% and the frequency of very large fires (greater than 12,000 acres) could triple (Gonzalez et al. 2018). In addition to the effect of the warming trend, human-caused fires are also increasing. The majority of contemporary fires in the United States are human-started; for the period of 1992–2013, 84% of ignitions were human-caused (Balch et al. 2017), and that rate is increasing (Cattau et al. 2020). However, lightning-caused fires are still more common in the Southwest (Balch et al. 2017).

In specific areas, the occurrence of larger, more frequent fires may be tempered if fuels are less available or flammable in any given year (due to drought or past fires, for example) (Littell et al. 2018). Despite the overall trend in larger, more frequent fires, there will still be year-to-year variability in fire events.

Communities in the wildland-urban interface (WUI) are at particular risk from increased fire frequency and size. Both people and infrastructure will be increasingly vulnerable without appropriate adaptation strategies (USDA Forest Service 2022; U. S. Department of Agriculture 2021). The number of homes in the WUI is also contributing to the cost of fighting wildfires because firefighting effort focuses heavily on protection of private homes. Nationwide, there are approximately 49 million residential homes in the WUI and that number grows by about 1 million every three years (Burke et al. 2021). The anticipated increase in the number of fires and acres burned means rising costs. Cumulative firefighting costs in the Southwest could total $13 billion from 2006 to 2099 (in 2015 dollars) (Gonzalez et al. 2018). According to analysis

done by the Federal Emergency Management Agency, Yavapai County has a slightly greater overall risk score than Arizona as a whole – with wildfire posing the greatest risk within the county (https://hazards.fema.gov/nri/report/viewer?dataLOD=Counties&dataIDs=C04025)

Flooding

Although overall precipitation may remain steady, individual precipitation events may become more extreme because a warmer atmosphere holds more water (see section on Changes in Character of Precipitation on page 29). Areas in and around the Quad Cities that are already flood-prone may experience larger floods, such as development near rivers, creeks, and washes. Areas that do not regularly flood now could become flood-prone with larger storm events. The FEMA National Risk Index (link above) places Yavapai County at relatively high risk for riverine flooding at present.

Post-fire Flooding

The combination of more frequent, larger forest fires and more extreme precipitation can lead to more post-fire flood events (Garfin et al. 2016). However, post-fire debris flows can occur even with relatively "normal" storms (Garfin et al. 2016). Post-fire floods can be dangerous and hard to predict. The effects of wildfires within fire footprints can linger for up to a decade. There are increased risks of debris flows for up to 3 to 5 years following fire as the ground cover and fine roots recover, and the risk of flash floods lingers for up to 5 to 8 years following fire as the soil returns to normal absorbance and vegetation regrows (Touma et al. 2022).

Post-fire floods can pose a direct risk to buildings, infrastructure, or people in their path. Post-fire floods can also decrease water quality by pushing sediment into water sources. Neighborhoods and community water systems in the wildland-urban interface (WUI) may be at greater risk from wildfire and post-fire floods/debris flows (Garfin et al. 2016).

Post-fire floods can also impact streamflow by changing the geomorphology of a basin; create hazards because of debris flows onto roads, houses, and other infrastructure; and damage ecosystems by eroding and denuding landscapes.

Drought

Even without changes to annual average precipitation, rising temperatures are likely to make drought conditions worse because of increased evaporation of water from surface sources and transpiration of water by plants. Both streamflow levels and soil moisture levels (both of which can be used as drought indicators) are likely to be impacted.

According to analyses done as part of the Fourth National Climate Assessment (Figure 25), the Southwest will experience reductions in soil moisture of between 1 and 3mm by the end of the century (using the higher scenario). The loss of soil moisture will be particularly noticeable in

the winter and spring, because of the reduction of snowpack – the region will lose the process of slow seeping of moisture into soil as snow melts.

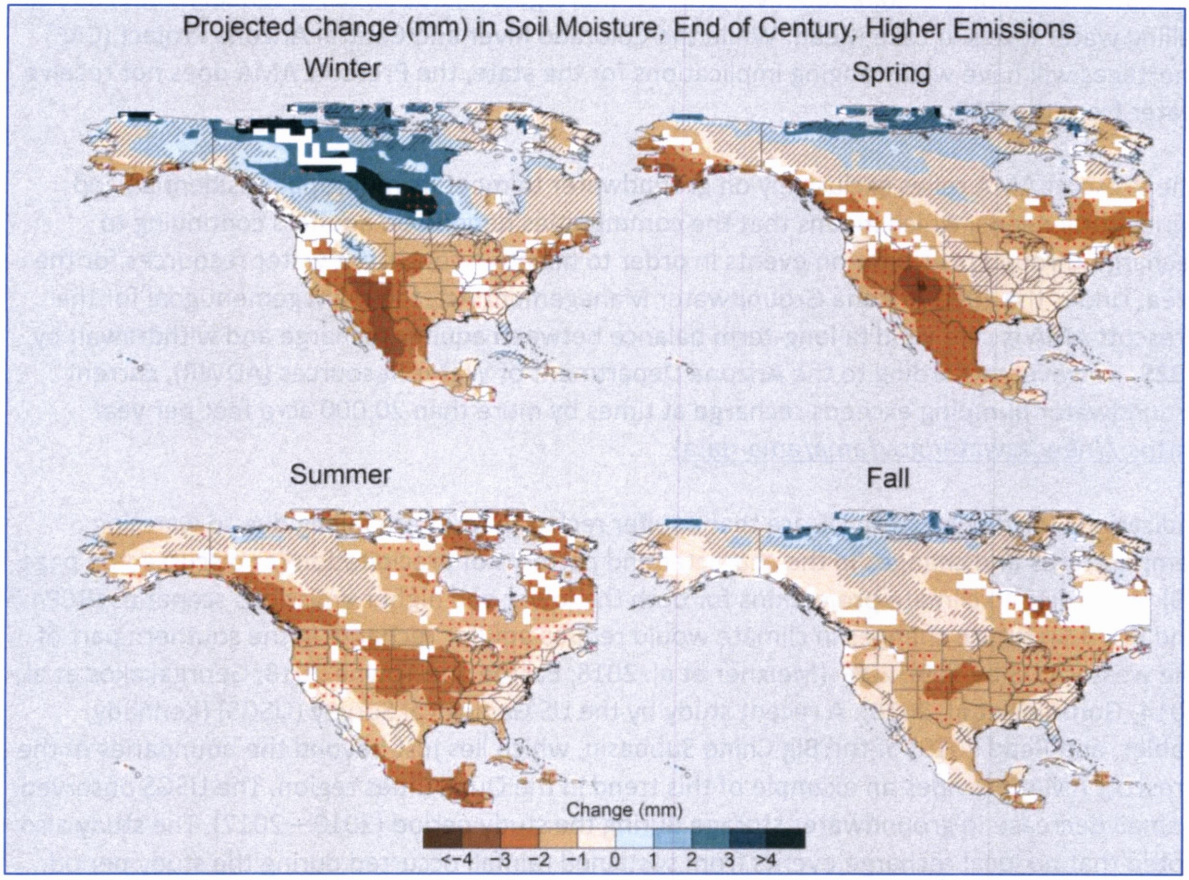


Figure 25: Projected changes in soil moisture by 2100 using the high emissions scenario. Source: https://science2017.globalchange.gov/chapter/8/

Another way to assess potential future drought impacts is to look to paleoclimate records to understand past conditions. Tree ring records can be used to track past climate variability by examining the size and timing of growth rings. In the Southwest, these tree ring records indicate that in the past, droughts lasting multiple decades (termed "megadroughts") have occurred in this region, with aridity as bad or worse than the worst droughts of the 20th century.

Historically, these megadroughts, lasting at least 35 years, occurred about once or twice per thousand years. If temperatures rise by more than 9° F, the risk of megadrought in the Southwest will be almost 100% by 2100 (Ault et al. 2016). Megadroughts could occur an average of once every 200 years, based on both the lower and higher emissions scenarios (RCPs 4.5 and 8.5) (Ault et al. 2014).

Water Resources

The Colorado River is the primary source of water for much of Arizona. Arizona and the states in the Lower Basin of the Colorado River are in a shortage declaration[4] as of January 2022, due to falling water levels in Lake Mead. While the Colorado River and Central Arizona Project (CAP) shortages will have wide-ranging implications for the state, the Prescott AMA does not receive water from the CAP.

The Prescott AMA relies exclusively on groundwater to meet its municipal, residential, and agricultural needs, which means that the communities depend on aquifers continuing to recharge through precipitation events in order to maintain consistent water resources for the area. Under the 1980 Arizona Groundwater Management Act, the management goal for the Prescott AMA is safe yield (a long-term balance between aquifer recharge and withdrawal) by 2025. However, according to the Arizona Department of Water Resources (ADWR), current groundwater pumping exceeds recharge at times by more than 20,000 acre feet per year (https://new.azwater.gov/ama/ama-data).

Indications for the Western US are that aquifer recharge rates are falling due to warming temperatures and changes in the character and patterns of precipitation (as discussed on page 29). According to climate projections for both the lower and higher emissions scenarios (RCP4.5 and RCP8.5), future changes in climate would reduce aquifer recharge in the southern part of the western US by 10%–20% (Meixner et al. 2016; Eastoe and Towne 2018; Georgakakos et al. 2014; Gonzalez et al. 2018). A recent study by the US Geological Survey (USGS) (Kennedy, Kahler, and Read 2019) of the Big Chino Subbasin, which lies just beyond the boundaries of the Prescott AMA, provides an example of this trend in the Quad Cities region. The USGS observed a small decrease in groundwater storage during the study period (2010 – 2017). The study also noted that no local recharge events from sustained rainfall occurred during the study period. Finally, the study found that baseflow discharge at the Verde River (which is fed by the subbasin) was consistently below the long-term average during the study period.

Verde River

Another way to understand the potential climate change impacts in the general region of the Quad Cities is to examine streamflow in the Verde River basin. Over the last 70 years, the Verde River basin has experienced significant increases in temperature, which are particularly evident in annual temperatures, and in early spring and summer (Woodhouse and Udall 2022). While few trends in annual or monthly precipitation are evident, trends in annual and monthly streamflow indicate decreasing flow over most months, and most strongly in April, May, and June.

[4] For more information about the shortage declaration and the Central Arizona Project, please see: https://www.cap-az.com/water/water-supply/adapting-to-shortage/colorado-river-shortage/

By 2050, projections indicate a potential 23% reduction in runoff from the Salt/Verde river system with a worst-case reduction of up to 50% (Bolin, Seetharam, and Pompeii 2010; Gober et al. 2010). A study simulating streamflow responses to projected climate change scenarios in the Verde River Basin found that stream drying events are projected to be longer and more frequent across the entire basin (Jaeger, Olden, and Pelland 2014). In spring and early summer, flowing portions of the Verde watershed could decrease by 8-20%, with longer stretches of dry channel fragments. These changes have large implications for native fish and other plant and animal species, as available seasonal habitat disappears (Jaeger, Olden, and Pelland 2014).

Water Quality

There are three main impacts to water quality from the rising temperatures and changes in precipitation patterns that are projected for the Quad Cities region: the effects of wildfires on surface water, the effects of drought, and the interaction between extreme precipitation and non-point source pollution. Wildfires, especially very large fires, can significantly alter landscapes and watersheds and increase the risk of runoff from flooding (USDA Forest Service 2022). When rainfall occurs up to a few years after a fire, erosion increases and changes in runoff greatly increase the amount of sediment that is transported downstream, in some cases increasing it up to 20 times normal levels (Garfin et al. 2016). Stormwater runoff from a burned area can also include higher concentrations of trace elements, organic carbon, pH and nitrates and sulfates (Smith et al. 2011).

More frequent and longer droughts, and associated low stream and other surface water levels, can increase the concentrations of nutrients in surface water, such as ammonia and nitrate, potentially raising the likelihood of harmful algal blooms and low oxygen conditions (Georgakakos et al. 2014).

With higher temperatures and changes in the character of precipitation including more extreme storms and more precipitation falling as rain instead of snow, the amounts of pollutants that wash from the ground and paved surfaces into streams and reservoirs increases (Georgakakos et al. 2014; USDA Forest Service 2022). Flooding and increased runoff from urban areas can carry pollutants such as oil, grease, and other automotive chemicals; pesticides and nutrients from lawns; bacteria from pet waste and septic systems (US Environmental Protection Agency 2021).

There is no one single factor affecting water availability and quality in the Quad Cities region. Population growth, water demand and use, changing climate, and water rights will all need to be considered by regional decision makers.

Agriculture

While farming and ranching are important to the character and heritage of several Quad City communities - particularly Chino Valley - most of the agricultural activity in the area consists of

cattle ranching. In Yavapai County about 1% of land use is classified as agricultural[5]; of that, almost all (96%) is pastureland (U.S. Department of Agriculture 2017).

As is true in other agricultural ecosystems, rangelands are vulnerable to a number of climate impacts. The USDA notes that reduction in agricultural productivity is an overall risk to the sector (U. S. Department of Agriculture 2021), and both forage and livestock productivity are at risk due to reduced water availability, animal heat stress, and the increased spread of pathogens and parasites.

Rising temperatures are likely to result in a longer growing season (Figure 15), but with no increase in precipitation forage quantity and quality is likely to suffer. In turn, declining rangeland conditions may lead to pressures to buy additional feed, reduce herd size, lease additional grazing land, or overgraze rangeland (Frisvold et al. 2013). In addition, hotter temperatures can increase the heat stress on livestock and contribute to disease proliferation (Hatfield et al. 2014; Gaughan et al. 2009). Climate-driven changes in species composition (e.g. invasive species) and increasing wildfire frequency also pose a threat to rangelands in Arizona (Holechek et al. 2020).

For those agricultural producers growing crops and vegetables, The USDA notes that reduction in agricultural productivity is an overall risk to the sector (U. S. Department of Agriculture 2021). Crop yields are at risk of declining due to rising temperatures, reduced water availability, and increases in pests and disease persistence. Extreme high temperatures can cause heat stress to plants. They also can alter plant phenology by slowing or even stopping photosynthesis (Morales-Castilla et al. 2020). The generally rising temperatures are already contributing to changes in growing seasons, which can affect planting and harvest timing (U. S. Department of Agriculture 2021).

The increased warmth may increase pest persistence and allow new pests to become established in the region (Frisvold et al. 2013). While some agricultural pests are increasing, rising temperatures are impacting beneficial insects like pollinators, with implications particularly for specialty crops (U. S. Department of Agriculture 2021).

In addition to climate stressors on agriculture, communities in the Quad Cities may also face development pressures. As lands currently used for agriculture are converted to commercial and residential development, there may be greater stress on water resources and less land available for agriculture.

[5] The USDA does not report agricultural statistics for areas smaller than county scale.

Climate Change Adaptation Planning

Climate change adaptation planning is the process of planning to adjust to new or changing environments in ways that take advantage of beneficial opportunities and reduce negative effects (Melillo, Richmond, and Yohe 2014).

The process of climate change adaptation planning can be similar to other resource management planning processes and generally includes the following steps:

- Identifying risks and vulnerabilities
- Assessing and selecting options
- Implementing strategies
- Monitoring and evaluating the outcomes of each strategy
- Revising strategies and the plan as a whole in response to evaluation outcomes

Figure 26: The Adaptation Process. Source http://nca2014.globalchange.gov/report/response-strategies/adaptation

Adaptation strategies can range from short-term coping actions to longer-term, deeper transformations. They can meet more than just climate change goals alone and should be sensitive to the community or region; there are no one-size-fits-all answers (Moser and Eckstrom 2010).

Key questions to ask community members, resource managers, decision makers, and elected officials when considering climate adaptation are:

- What are the community's goals and objectives in the future?
- What resources or assets need to be protected from climate change impacts?
- How will the resources be protected?
- What actions are necessary to achieve the community's goals?

The process of planning for climate change adaptation has already begun in many places. Seventeen states and approximately 200 cities have climate change adaptation plans (https://www.georgetownclimate.org/adaptation/plans.html).

Climate Adaptation Strategies

In this section, we present suggestions for possible climate adaptation strategies for the Quad Cities region. We present these strategies as options that can be considered as part of the planning process. We focus here on Wildfire, Flooding, Water Resources, and Agricultural strategies.

The communities in the Quad Cities area should make their own decisions about which strategies will be most beneficial and effective. To help in that process, a community-driven website, the Quad Cities Climate Action Hub (https://yavapaiclimatecoalition.org/climate-action-hub), has been created to provide a forum for sharing new projects and initiatives undertaken within the Quad Cities region by partnering organizations that will positively impact the issues raised in this Quad Cities Climate Profile.

Wildfire

Wildfire adaptation strategies include those related to emergency preparedness and individual risk reduction at the property level, as well as those related to long-range land-use decisions that can increase or decrease a community's overall fire risk at the wildland-urban interface (WUI).

- To improve community emergency preparedness, communities in the Quad Cities region can participate in the Yavapai Firewise program (https://yavapaifirewise.org/), which teaches residents how to adapt to living with wildfire and encourages community members to take action to prevent future losses. Currently, 44 neighborhood organizations in Yavapai County are certified as Firewise Communities by the National Fire Prevention Association (NFPA).

- The Prescott Area Wildland Urban Interface Commission (PAWUIC) (https://yavapaifirewise.org/) is an organization in the Quad Cities area that helps communities prepare for and reduce the risk of wildfire. Increasing community engagement with programs like PAWUIC can help make more homes and neighborhoods resilient in the face of increasing wildfire risk.

- Strengthening and adding more *Firewise* and *Fire Adapted* communities in the Quad Cities area can enhance public health and safety goals such as the need for evacuation routes, zoning and land use that considers fire risk, firewise landscape treatments, partnerships and community engagement, and wildfire response.

- Long-range land-use decisions also have an impact on wildfire risk, particularly as development encroaches upon previously forested and natural areas. Development pressures, as well as other community priorities such as increasing affordable housing, should be balanced carefully. Guidance on wildfire risk reduction can be found in the

American Planning Association's Planning the Wildland-Urban Interface report (https://www.planning.org/publications/report/9174069/), which discusses best practices for integrating wildfire protection into land-use regulations and long-range plans, including:

- Utilize existing planning processes, such as updates to existing community plans, hazard mitigation plans, and wildfire protection plans, as opportunities to engage the community on long-range land-use decisions that may place more development in WUI areas and increase exposure to wildfire risk.
- Balance affordable housing needs and wildfire risk if development is proposed in WUI areas and incentivize developments to occur in lower-risk areas, particularly within existing communities.
- Review transportation plans and the accessibility of existing neighborhoods and developments to allow for quick and efficient evacuation.
- Review and update subdivision regulations, zoning and land development codes, building codes, and applicable fire codes with increased risk of wildfire due to climate change in mind.
- Review and update emergency management plans with increased risk of wildfire due to climate change in mind.
- Ensure all stakeholders, such as the community, public health officials, land managers, utilities, and those currently working on wildfire risk reduction, are brought into future planning efforts to reduce wildfire risk.

- Encourage the use of firewise landscaping in and around the community, including in defensible space around homes and buildings. University of Arizona Cooperative Extension has compiled a list of plants that are suitable for use within defensible space, drought tolerant, and appropriate to areas above 3000 feet in elevation (https://cals.arizona.edu/extension/ornamentalhort/landscapemgmt/general/firewise.pdf). General guidance for plant selection includes:
  - Plants that shed their leaves or needles in extreme drought.
  - Drought-adapted plants that have smaller leaves or very succulent leaves that store water.
  - Salt tolerant plants that show natural fire resistance. A notable exception is salt cedar, which is highly salt tolerant but contains extremely volatile oils and burns very hot.

Flooding

Green infrastructure (GI) and low impact development (LID) (sometimes call *nature-based solutions*) are two well-established adaptation strategies to increase resilience to flood risk, and reduce reliance on scarce water resources for urban landscaping. Green infrastructure is an approach that uses plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters. Low

impact development refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat.

The goal of both GI and LID is to "slow it [water] down, spread it out, and soak it in." The cost-benefits of GI and LID installation and maintenance are important for communities to weigh as they consider implementation options and funding mechanisms. The American Rivers' The Value of Green Infrastructure report (https://www.americanrivers.org/conservation-resource/value-green-infrastructure/) and Urban Land Institute's Harvesting the Value of Water report (https://uli.org/wp-content/uploads/ULI-Documents/HarvestingtheValueofWater.pdf) both provide information on the economic, environmental, and social benefits and considerations. Values, such as gallons of water harvested in rainwater basins or reduced water treatment costs, can be quantified to show the impact of GI. Some other values, such as natural habitat increase or beautification of the landscaping, may be more difficult to quantify but should still be clearly articulated.

- Consider the use of common GI and LID design options such as bioswales, detention and retention ponds, porous pavements, and rainwater harvesting roadside curb cuts and gardens. When GI and LID are utilized in the Southwest, attention must be paid to our arid climate with high precipitation events, as well as the temperature differences between summer and winter.
    - Drought tolerant native plants that are low maintenance and can withstand normal temperature swings between hot and cold are the most ideal for GI and LID.
    - In areas with steeper slopes that may be more prone to erosion, GI should be designed differently than in flatter terrain.
    - Water harvesting basins in areas with steep slopes may not be feasible, but terraces, berms, and the use of porous materials can both slow and absorb water runoff.

- Urban forestry efforts to increase tree canopy can also have benefits of stabilizing soils, reducing flood severity, and providing shade, but should be considered strategically with water resources, maintenance costs, and wildfire risk in mind.

- Consult the American Planning Association Planning Advisory Services reports related to reducing flood risk through planning. The Planners and Water report (https://www.planning.org/publications/report/9131532/) uses the One Water approach to explore water supply, water quality, and stormwater holistically. The Subdivision Design and Flood Hazard Areas report (https://www.planning.org/publications/report/9112664/) offers practical local regulatory tools to review, inspect, and maintain flood risk across a variety of terrain and infrastructure needs, including:
    - Identify flood-prone areas to prioritize the installation of GI along the public right-of-way.

- Assess and update zoning regulations, engineering standards, and stormwater management programs as appropriate to allow for and incentivize GI and LID.
- Update required and recommended plant lists with climate projections so that landscaping planted today is appropriate for changing conditions in the future (see firewise plant list on page 49).
- Protect open space to minimize the increase of impervious surfaces and flood risk through the development of natural areas.
- Avoid new development in flood-prone areas and consider future conditions of the floodplain, including both development impacts and climate change.

- Other resources for GI and LID appropriate for the Quad Cities region include:
  - U.S. Environmental Protection Agency's Green Infrastructure: Low-Impact Development and Green Infrastructure in the Semi-Arid West (https://www.epa.gov/green-infrastructure/green-infrastructure-semi-arid-west)
  - U.S. EPA's Arid Green Infrastructure for Water Control and Conservation (https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=325750)
  - University of Arizona, Water Resource Research Center's Green Infrastructure for Southwestern Neighborhoods (https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/WMG_Green%20Infrastructure%20for%20Southwestern%20Neighborhoods.pdf)

- The National Flood Insurance Program (NFIP) (https://www.fema.gov/flood-insurance) allows property owners in participating communities to buy insurance to protect against flood losses. Participating communities are required to establish management regulations in order to reduce future flood damages. This insurance is intended to serve as an alternative to disaster assistance and reduces the rising costs of repairing damage to buildings and their contents caused by flood. Homeowners can determine whether their property lies in a flood-prone area by searching an online tool developed by the Federal Emergency Management Agency (FEMA) (https://msc.fema.gov/portal/home).
  - A challenge of the NFIP is that FEMA relies on historical flood data to determine 100-year flood plains. Although recommendations have been made to the agency to begin to incorporate climate change projections, they have not yet started the process. Therefore, some infrastructure that is newly at-risk due to more extreme precipitation might not be included in current FEMA flood plain maps
  - A new tool that incorporates climate projections into flood risk assessments, developed by First Street Foundation (a non-profit research foundation), is available for public use: https://riskfactor.com/
  - As storms are expected to become more intense, communities may consider reanalyzing existing drainage systems and washes to ensure that they can handle higher flood risk.

Water Resources

As climate change begins to affect both water availability and quality communities can implement a number of strategies to protect and conserve their water resources.

- A number of GI approaches can contribute to groundwater recharge, thus helping to alleviate water availability issues. American Rivers has identified: tree planting, bioretention and infiltration (i.e. rain gardens, bioswales and wetlands), permeable pavement, and water harvesting (capturing rainwater for use on-site) as strategies that can increase groundwater recharge. (https://www.americanrivers.org/conservation-resource/value-green-infrastructure/)
- On a region-wide scale, watershed restoration and ecosystem management, such as practices proposed by the USDA Forest Service, can help to reduce threats to water quality and increase groundwater recharge by slowing runoff (https://www.fs.usda.gov/managing-land/sc/adaptation):
    - Target watersheds vulnerable to climate change for watershed restoration projects that improve the natural storage of water for municipal and agricultural uses.
    - Implement projects that improve watershed function and prepare streams, rivers, and other water bodies for extreme events, flooding, and changes in hydrology.
    - Support climate-informed reforestation and restoration, using climate decision support tools to assist in native seed sourcing and planting climate-adapted nursery stock where appropriate.

- The Alliance for Water Efficiency (https://www.allianceforwaterefficiency.org/) suggests several policies that can be used to support water-neutral community growth, such as:
    - Require new development to off-set water use through water conservation retrofits, rainwater harvesting, and stormwater capture.
    - Replace inefficient fixtures in existing buildings.

- Examples of water adaptation techniques proposed or underway in the Southwest can be found using the USDA Southwest Climate Hub Water Adaptation Techniques Atlas (https://webapps.jornada.nmsu.edu/wata/). The atlas is still in a development phase, but many examples are already available for review. There are three projects included from the Quad Cities region:
    - An Arizona Department of Transportation plan to build two dry wells connected to existing stormwater retention basins that will allow stormwater to recharge into the aquifer more quickly and reduce evaporation.
    - A concept plan for "macro rain-water harvesting" that would install a pipeline underground to transport water from the Lonesome Valley to Granite Creek by gravity, to enhance recharge and reduce evaporation.
    - Watson Woods Riparian Reserve Restoration, which used a grant from the Arizona Water Protection Fund to restore 4,100 feet of stream channel, along with planting of native riparian vegetation and native grasses and construction of

ephemeral wetlands off the main stream channel in the 126-acre preserve.

- The American Planning Association's Policy Guide on Water (https://www.planning.org/policy/guides/adopted/water/) addresses the growing need for collaborative approaches to community water planning. They recommend that communities use:
    - A planning practice that employs an integrated, systems-oriented, comprehensive approach to water management.
    - Innovative land-use planning and urban designs to improve and protect water environments.
    - New and improved professional practices to manage water more sustainably and equitably.
    - Awareness of the potential for inequity in access to water supply, water pricing that is not sensitive to ability to pay (and yet does not fully account for the full cost of water), and environmental justice issues where discharge of pollution to waterways occurs and where there is insufficient attention to flood mitigation.

Agriculture

Adaptation options for agricultural producers include (adapted from Frisvold et al. 2013):

- Increasing crop diversity, such as by introducing or increasing crops better adapted to heat or with lower water requirements.
- Where irrigation is necessary, shifting to best practices for arid environments (e.g., drip rather than flood or spray irrigation).
- Participation in federal disaster relief programs when necessary.
    - USDA Farm Service Agency Disaster Assistance Program
    - Many ranchers work with the USDA Farm Service Agency (FSA) through the Disaster Assistance Program to help mitigate livestock losses during drought events.
- Participation in federal and state programs that support ranching or farming operations that combine agricultural productivity with natural resource conservation, such as the USDA's Natural Resources Conservation Service (https://www.nrcs.usda.gov/).
- Using livestock management strategies that can help to reduce vulnerability, such as:
    - Adjusting stocking rates
    - Implementing grazing management practices
    - Employing livestock bred for arid environments (such as Criollo cattle)
    - Erosion control along waterways
    - Use of alternate forage supplies

Plan Implementation

Climate adaptation planning can present opportunities for collaboration across traditional department silos as well as across various government agencies and community organizations.

While these efforts can require more time for coordination and resources, it can also create potential efficiencies and partnerships when areas of common interest are found. Consider potential partners interested in advancing climate adaptation strategies including natural resource managers, emergency managers and hazard mitigation planners, first responders, public health agencies, environmental organizations, faith-based organizations, school districts, and private sector partners such as the land development community, construction industry, and planning and design consultants.

Climate adaptation strategies can be integrated into existing community plans, such as FEMA hazard mitigation plans (updated every five years) or municipal or county general plans (usually updated every ten years). The process of integrating climate change adaptation into existing planning processes is generally referred to as "mainstreaming" climate adaptation. Alternatively, adaptation plans strategies can be written as stand-alone plans. Stand-alone plans should be revised regularly as mitigation strategies succeed or as new challenges are recognized.

Regardless of approach, integrating adaptation considerations across all plans helps to ensure the various plans that reduce risk and guide future land uses are not in conflict with each other, and instead work together to move a community forward on its vision for its future. For example, it is important to review the variety of plans that impact development holistically so that economic development goals in one plan do not encourage growth into areas identified as high risk in another plan.

Well-developed implementation sections in plans can also increase their effectiveness. To be effective, implementation sections in plans should specifically identify:

- Adaptation strategies and actions
- Assign who (which agency or group) will be responsible for moving the strategy or action forward
- Timeline for actions
- Secured or potential funding sources
- Clear evaluation criteria
- An assessment and update schedule for the plan

Revisiting the best-available data and evaluating the effectiveness of adaptation strategies regularly is necessary to ensure the overall effectiveness of plans and implementation efforts.

Additional Resources to Support Climate Change Adaptation Planning

The National Climate Assessment - Adaptation Chapter
https://nca2018.globalchange.gov/chapter/28/

National Oceanic and Atmospheric Administration's *Implementing the Steps to Resilience: A Practitioner's Guide*
The book, with accompanying online resources, is designed to help climate adaptation practitioners work with local governments and community organizations to incorporate climate risk into equitable, long-term decision-making.
https://library.oarcloud.noaa.gov/noaa_documents.lib/OAR/CPO/Climate_Smart_Communities/Vol_06_ImplementingStepsToResilience.pdf

Arizona Department of Health Services
2017 Arizona Climate Health Adaptation Plan 2017 and 2018 addendum
https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/pubs/arizona-climate-health-adaptation-plan.pdf
https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/extreme-weather/pubs/addendum-to-az-climate-health-adapt-plan.pdf

Climate Adaptation: The State of Practice in U.S. Communities
This report examines efforts to develop and implement climate-adaptation projects in 17 cities across the U.S. The study analyzed efforts underway, motivations for action and how communities went from planning to implementation.
https://kresge.org/resource/climate-adaptation-the-state-of-practice-in-u-s-communities/

Lincoln Land Institute of Land Policy's Planning for Climate Change in the West
This report highlights how local planners could implement land use–related practices and policies to take action against climate change impacts in their communities. The report offers tools and case studies, identifies barriers to local policy decisions, and provides recommendations for overcoming these obstacles to change.
https://resilientwest.org/2017/planning-for-climate-change-in-the-west/

First Street Foundation
Risk Factor tool maps fire, flooding, or extreme heat risk from climate change at a property level https://firststreet.org/risk-factor/

Quad Cities Climate Action Hub
A community-driven website created to provide a forum for sharing new projects and initiatives undertaken within the Quad Cities region by partnering organizations that will positively impact the issues raised in this Quad Cities Climate Profile.
https://yavapaiclimatecoalition.org/climate-action-hub

Glossary

Albedo: The proportion of solar radiation that is reflected by a surface, as opposed to being absorbed by that surface. Fresh snow has a relatively high albedo, because it is a light-colored surface and has high reflectivity.

Aspect: A surface feature of land: the direction a slope faces. A slope's aspect determines the amount of sun exposure it receives, so aspect affects temperature, humidity, and the type and amount of vegetation in a particular place.

Atmospheric rivers: narrow corridors of concentrated moisture in the atmosphere that lead to extreme precipitation events in the western U.S.

Climate: The averages and patterns of weather over time for a particular area, such as temperature, precipitation, humidity, and wind.

Climate projections: Estimates of future climatic conditions, usually made with mathematical models using different rates of greenhouse gas emissions to create different possible future scenarios.

Climate trends: Changes in climate in a particular area that have been observed over time, such as increases or decreases in average temperatures or the amount of annual precipitation.

Downscaling: Various methods that use data from global climate models to derive climate information for smaller areas of the world, such as specific regions (U.S. Southwest, for example).

El Niño Southern Oscillation (ENSO): El Niño and La Niña are the warm and cool phases of a recurring climate pattern across the tropical Pacific—the El Niño-Southern Oscillation, or "ENSO" for short. The pattern shifts back and forth irregularly every two to seven years, bringing predictable shifts in ocean surface temperature and disrupting the wind and rainfall patterns across the tropics.

Greenhouse gas (GHG): Any of the atmospheric gases that absorbs longwave, or infrared, radiation that otherwise would pass from the Earth's surface through the atmosphere and into outer space. They include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (NO_2), and water vapor.

Magnitude of change: In climate models, the magnitude of change is how much the climate is projected to change over a given period of time. Climate scientists generally have more confidence in models' ability to project the *direction* of change, such as whether it will be hotter in the future; but not exactly how much hotter it will be.

North American Monsoon (NAM): a seasonal change in the atmospheric circulation that occurs as the summer sun heats the continental land mass; as the summer heat builds over North America, a region of high pressure forms over the U.S. Southwest, and the wind becomes more southerly, bringing moisture from the Pacific Ocean and the Gulf of California. This circulation brings thunderstorms and rainfall to the monsoon region.

Pacific Decadal Oscillation (PDO): A sea surface temperature (SST) pattern in the North Pacific Ocean with warm and cold states, with longer cycles (decadal to multidecadal) than ENSO.

Pluvial: A period of time, often multiple years, in which a particular area experiences abundant or well-above average precipitation.

Representative Concentration Pathways (RCP): Scenarios of different levels of greenhouse gas emissions that are used to estimate future global temperatures. The four RCPs used by the Intergovernmental Panel on Climate Change are 2.6, 4.5, 6.0, and 8.5; the numbers represent changes in radiative forcing, or the amount of outgoing infrared radiation relative to incoming shortwave solar radiation, at the top of the atmosphere.

Scenario: A description of a possible future state of the world. Scenarios do not represent what will happen; they represent what could happen, given our activities and choices.

Statistical downscaling: Correlating historical local and regional observations with data from global climate models to derive climate projections at local and regional scales.

Variability: A term to describe year-to-year changes in climatic conditions such as annual temperature and precipitation.

Weather: The day-to-day conditions in a particular area, such as temperature, precipitation, humidity, and wind.

References Cited

Abatzoglou, John T., and A. Park Williams. 2016. Impact of anthropogenic climate change on wildfire across western US forests. *Proceedings of the National Academy of Sciences* 113 (42):11770-11775.

Arizona Department of Health Services. 2015. Deaths from Exposure to Excessive Natural Heat.

Ault, Toby R., Julia E. Cole, Jonathan T. Overpeck, Gregory T. Pederson, and David M. Meko. 2014. Assessing the Risk of Persistent Drought Using Climate Model Simulations and Paleoclimate Data. *Journal of Climate* 27 (20):7529-7549.

Ault, Toby R., Justin S. Mankin, Benjamin I. Cook, and Jason E. Smerdon. 2016. Relative impacts of mitigation, temperature, and precipitation on 21st-century megadrought risk in the American Southwest. *Science Advances* 2 (10).

Balch, Jennifer K., Bethany A. Bradley, John T. Abatzoglou, R. Chelsea Nagy, Emily J. Fusco, and Adam L. Mahood. 2017. Human-started wildfires expand the fire niche across the United States. *Proceedings of the National Academy of Sciences* 114 (11):2946-2951.

Bentz, Barbara J, E Matthew Hansen, Marianne Davenport, and David Soderberg. 2022. Complexities in predicting mountain pine beetle and spruce beetle response to climate change. In *Bark Beetle Management, Ecology, and Climate Change*: Elsevier.

Bentz, Barbara J., and Jesse A Logan. 2009. Bark Beetle Outbreaks in Western North America: Causes and Consequences. US Forest Service Rocky Mountain Station.

Bentz, Barbara J., Jacques Régnière, Christopher J. Fettig, E. Matthew Hansen, Jane L. Hayes, Jeffrey A. Hicke, Rick G. Kelsey, Jose F. Negrón, and Steven J. Seybold. 2010. Climate Change and Bark Beetles of the Western United States and Canada: Direct and Indirect Effects. *BioScience* 60 (8):602-613.

Bolin, Bob, Mohan Seetharam, and Brian Pompeii. 2010. Water resources, climate change, and urban vulnerability: a case study of Phoenix, Arizona. *Local Environment* 15 (3):261-279.

Brown, Heidi E., Andrew C. Comrie, and Deborah M. Drechsler. 2013. Human Health. In *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black and S. LeRoy. Washington D.C.: Island Press.

Burke, Marshall, Anne Driscoll, Sam Heft-Neal, Jiani Xue, Jennifer Burney, and Michael Wara. 2021. The changing risk and burden of wildfire in the United States. *Proceedings of the National Academy of Sciences* 118 (2):e2011048118.

Castro, Christopher L. 2017. Assessing Climate Change Impacts for Department of Defense Installations in the Southwest United States During the Warm Season.

Cattau, Megan E., Carol Wessman, Adam Mahood, and Jennifer K. Balch. 2020. Anthropogenic and lightning-started fires are becoming larger and more frequent over a longer season length in the U.S.A. *Global Ecology and Biogeography* 29 (4):668-681.

Crimmins, Allison, John Balbus, Janet L. Gamble, Charles B. Beard, Jesse E. Bell, Daniel Dodgen, Rebecca J. Eisen, Neal Fann, Michelle D. Hawkins, Stephanie C. Herring, Lesley Jantarasami, David M. Mills, Shubhayu Saha, Marcus C. Sarofim, Juli Trtanj, and Lewis Ziska. 2016. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Washington, DC: U.S. Global Change Research Program.

Crimmins, Michael A., Daniel B. Ferguson, Alison M. Meadow, and Jeremy L. Weiss. 2017. Discerning "Flavors" of Drought Using Climate Extremes Indices. *Journal of Applied Meteorology and Climatology* 56 (4):989-1001.

Daly, C., W.P. Gibson, G.H. Taylor, G.L. Johnson, and P. Pasteris. 2002. A knowledge-based approach to the statistical mapping of climate. *Climate Research* 22:99-113.

Dodgen, D., D. Donato, N. Kelly, A. La Greca, J. Morganstein, J. Reser, J. Ruzek, S. Schweitzer, M.M. Shimamoto, K. Thigpen Tart, and R. Ursano. 2016. Mental Health and Well-Being. In *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. Washington, DC: U.S. Global Change Research Program.

Eastoe, Christopher, and Douglas Towne. 2018. Regional zonation of groundwater recharge mechanisms in alluvial basins of Arizona: Interpretation of isotope mapping. *Journal of Geochemical Exploration* 194:134-145.

Ebi, K.L., J.M. Balbus, G. Luber, A. Bole, A. Crimmins, G. Glass, S. Saha, M.M. Shimamoto, J. Trtanj, and J.L. White-Newsome. 2018. Human Health. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* edited by D. R. Reidmiller, C. W. Avery, D. R. Easterling, **K. E.** Kunkel, K. L. M. Lewis, T. K. Maycock and B. C. Stewart. Washington, DC: U.S. Global Change Research Program.

Environmental Protection Agency. 2017. *Particulate Matter* 20132017]. Available from http://www.epa.gov/airquality/particlepollution/index.html.

Frisvold, George, J. Elizabeth Jackson, J.G. Pritchett, and J. P. Ritten. 2013. Agriculture and Ranching. In *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black and S. LeRoy. Washington D.C.: Island Press.

Garfin, Gregg, Sarah LeRoy, D. Martin, Mia Hammersley, Ann Youberg, and Ray Quay. 2016. Managing for Future Risks of Fire, Extreme Precipitation, and Post-fire Flooding. Report

to the U.S. Bureau of Reclamation, from the project Enhancing Water Supply Reliability. Tucson: Institute of the Environment.

Gaughan, J., N. Lacetera, S. Valtorta, J. Khalifa, L. Hahn, and T. Mader. 2009. Chapter 7: Response of domestic animals to climate challenges. In *Biometeorology for Adaptation to Climate Variability and Change*, edited by K. L. Ebi, I. Burton and G. McGregor. Netherlands: Springer.

Georgakakos, A., P. Fleming, M. Dettinger, C. Peters-Lidard, T.C. Richmond, K. Reckhow, K. White, and D. Yates. 2014. Ch. 3: Water Resources. . In *Climate Change Impacts in the United States: The Third National Climate Assessment*, edited by J. Melillo, T. C. Richmond and G. W. Yohe: U.S. Global Change Research Program.

Gershunov, Alexander, Balaji Rajagopalan, Jonathan Overpeck, Kristen Guirguis, D.R. Cayan, Mimi Hughes, Michael D. Dettinger, Chris Castro, Rachel E. Schwartz, Michael Anderson, Andrea J. Ray, Joe Barsugli, Tereza Cavazos, and Michael Alexander. 2013. Future Climate: Projected Extremes. In *Assessment of Climate Change in the Southwest United States: A Report Prepared for the National Climate Assessment*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black and S. LeRoy. Washington D.C.: Island Press.

Gober, Patricia, Craig W Kirkwood, Robert C Balling, Andrew W Ellis, and Stephanie Deitrick. 2010. Water planning under climatic uncertainty in Phoenix: Why we need a new paradigm. *Annals of the Association of American Geographers* 100 (2):356-372.

Gonzalez, Patrick, G.M. Garfin, D.D. Breshears, K.M. Brooks, H.E. Brown, E.H. Elias, A. Gunasekara, N. Huntly, J.K. Maldonado, N.J. Mantua, H.G. Margolis, S. McAfee, B.R. Middleton, and B.H. Udall. 2018. Southwest. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*, edited by D. R. Reidmiller, C. W. Avery, D. R. Easterling, K. E. Kunkel, K. L. M. Lewis, T. K. Maycock and B. C. Stewart. Washington D.C.: U.S. Global Change Research Program.

Hatfield, J., G. Takle, R. Grotjahn, P. Holden, R. Izaurralde, T. Mader, E. Marshall, and Diana Liverman. 2014. Ch. 6: Agriculture. In *Climate Change Impacts in the United States: The Third National Climate Assessment.*, edited by J. Melillo, T. C. Richmond and G. W. Yohe: U.S. Global Change Research Program.

Holechek, Jerry L, Hatim ME Geli, Andres F Cibils, and Mohammed N Sawalhah. 2020. Climate change, rangelands, and sustainability of ranching in the Western United States. *Sustainability* 12 (12):4942.

Huang, Jianhua, and Kevin Robert Gurney. 2017. Impact of climate change on U.S. building energy demand: Financial implications for consumers and energy suppliers. *Energy and Buildings* 139:747-754.

Hurteau, Matthew D, John B Bradford, Peter Z Fulé, Alan H Taylor, and Katherine L Martin. 2014. Climate change, fire management, and ecological services in the southwestern US. *Forest Ecology and Management* 327:280-289.

Jaeger, Kristin L., Julian D. Olden, and Noel A. Pelland. 2014. Climate change poised to threaten hydrologic connectivity and endemic fishes in dryland streams. *Proceedings of the National Academy of Sciences* 111 (38):13894-13899.

Jay, A. , D.R. Reidmiller, C.W. Avery, D. Barrie, B.J. DeAngelo, A. Dave, M. Dzaugis, M. Kolian, K.L.M. Lewis, K. Reeves, and D. Winner. 2018. Overview. In Impacts, Risks, and Adaptation in the United States. In *Fourth National Climate Assessment, Volume II* edited by D. R. Reidmiller, C.W. Avery, D.R. Easterling, K.E. Kunkel, and T. K. M. K.L.M. Lewis, and B.C. Stewart. Washington, DC, USA: U.S. Global Change Research Program.

Kennedy, Jeffrey R, Libby M Kahler, and Amy M Read. 2019. Aquifer storage change and storage properties, 2010-2017, in the Big Chino Subbasin, Yavapai County, Arizona. *Scientific Investigations Report-US Geological Survey* (2019-5060).

Lader, Glenn , Aishwarya Raman, Jeffrey T. Davis, and Ken Waters. 2016. Blowing Dust and Dust Storms: One of Arizona's Most Underrated Weather Hazards. In *NOAA Technical Memoranda*. Silver Spring.

Lahmers, T.M., C.L. Castro, D.K. Adams, Y.L. Serra, J.J. Brost, and T. Luong. 2016. Long-Term Changes in the Climatology of Transient Inverted Troughs over the North American Monsoon Region and Their Effects on Precipitation. *Journal of Climate* 29:6037-6064.

Littell, Jeremy S., Donald McKenzie, Ho Yi Wan, and Samuel A. Cushman. 2018. Climate Change and Future Wildfire in the Western United States: An Ecological Approach to Nonstationarity. *Earth's Future* 6 (8):1097-1111.

Luong, TM, CL Castro, HI Chang, T Lahmers , DK Adams, and CA Ochoa-Moya. 2017. The More Extreme Nature of North American Monsoon Precipitation in the Southwestern United States as Revealed by a Historical Climatology of Simulated Severe Weather Events. *Journal of Applied Meteorology and Climatology* 56:2509 - 2529.

Lynas, Mark, Benjamin Z Houlton, and Simon Perry. 2021. Greater than 99% consensus on human caused climate change in the peer-reviewed scientific literature. *Environmental Research Letters* 16 (11):114005.

Meixner, Thomas, Andrew H Manning, David A Stonestrom, Diana M Allen, Hoori Ajami, Kyle W Blasch, Andrea E Brookfield, Christopher L Castro, Jordan F Clark, and David J Gochis. 2016. Implications of projected climate change for groundwater recharge in the western United States. *Journal of Hydrology* 534:124-138.

Melillo, Jerry, Terese C. Richmond, and G.W. Yohe, eds. 2014. *Climate change consequences in the United States: The third national climate assessment.*: U.S. Global Change Research Program.

Morales-Castilla, Ignacio, Iñaki García de Cortázar-Atauri, Benjamin I Cook, Thierry Lacombe, Amber Parker, Cornelis van Leeuwen, Kimberly A Nicholas, and Elizabeth M Wolkovich. 2020. Diversity buffers winegrowing regions from climate change losses. *Proceedings of the National Academy of Sciences* 117 (6):2864-2869.

Moser, Susanne, and J.A. Eckstrom. 2010. A framework to diagnose barriers to climate change adaptation. *PNAS* 107 (51):22026-22031.

Myers, Krista F, Peter T Doran, John Cook, John E Kotcher, and Teresa A Myers. 2021. Consensus revisited: quantifying scientific agreement on climate change and climate expertise among Earth scientists 10 years later. *Environmental Research Letters* 16 (10):104030.

Negron, Jose F, Joel D McMillin, John A Anhold, and Dave Coulson. 2009. Bark beetle-caused mortality in a drought-affected ponderosa pine landscape in Arizona, USA. *Forest Ecology and Management* 257 (4):1353-1362.

Overpeck, Jonathan, Gregg Garfin, Angela Jardine, Dave Busch, Dan Cayan, Michael D. Dettinger, Erica Fleishman, Alexander Gershunov, Glen MacDonald, Kelly T. Redmond, William Travis, and Bradley Udall. 2013. Summary for Decision Makers. In *Assessment of Climate Change in the Southwest*, edited by G. Garfin, A. Jardine, R. Merideth, M. Black and J. Overpeck: Island Press.

Rivera, Erick R, Francina Dominguez, and Christopher L Castro. 2014. Atmospheric rivers and cool season extreme precipitation events in the Verde River basin of Arizona. *Journal of Hydrometeorology* 15 (2):813-829.

Roach, M., H.E. Brown, R. Clark, D. Hondula, J. Lega, Q. Rabby, N. Schweers, and J. Tabor. 2017. Projections of Climate Impacts on Vector-Borne Diseases and Valley Fever in Arizona. A report prepared for the Arizona Department of Health Services and the United States Centers for Disease Control and Prevention Climate-Ready States and Cities Initiative.

Sheppard, Paul R., Andrew C. Comrie, Gregory D. Packin, Krt Angersbach, and Malcolm K. Hughes. 2002. The climate of the US Southwest. *Climate Research* 21 (3):219-238.

Smith, Hugh G., Gary J. Sheridan, Patrick N. J. Lane, Petter Nyman, and Shane Haydon. 2011. Wildfire effects on water quality in forest catchments: A review with implications for water supply. *Journal of Hydrology* 396 (1–2):170-192.

Tidwell, Vincent C., Larry Dale, Kristen Averyt, Max Wei, Daniel M. Kammen, and James H. Nelson. 2013. Energy: Supply, Demand, and Impacts. In *Assessment of Climate Change in*

the Southwest: A Report Prepared for the National Climate Assessment, edited by G. Garfin, A. Jardine, R. Merideth, M. Black and S. LeRoy. Washington D.C.: Island Press.

Tong, Daniel Q., Julian X. L. Wang, Thomas E. Gill, Hang Lei, and Binyu Wang. 2017. Intensified dust storm activity and Valley fever infection in the southwestern United States. *Geophysical Research Letters*:n/a-n/a.

Touma, Danielle, Samantha Stevenson, Daniel L Swain, Deepti Singh, Dmitri A Kalashnikov, and Xingying Huang. 2022. Climate change increases risk of extreme rainfall following wildfire in the western United States. *Science advances* 8 (13):eabm0320.

U. S. Department of Agriculture. 2021. Action Plan for Climate Adaptation and Resilience. USDA.

U.S. Department of Agriculture. 2017. Census of Agriculture County Profile: Yavapai County Arizona. edited by USDA.

US Environmental Protection Agency. 2022. *Nonpoint Source: Urban Areas* 2021 [cited November 7 2022]. Available from https://www.epa.gov/nps/nonpoint-source-urban-areas.

USDA Forest Service. 2022. USDA Forest Service Climate Adaptation Plan. USDA Forest Service.

Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity. *Science* 313:940-943.

Williams, A. Park, Craig D. Allen, Constance I. Millar, Thomas W. Swetnam, Joel Michaelsen, Christopher J. Still, and Steven W. Leavitt. 2010. Forest responses to increasing aridity and warmth in the southwestern United States. *Proceedings of the National Academy of Sciences* 107 (50):21289-21294.

Williams, K, JD McMillin, TE DeGomez, KM Clancy, JA Anhold, and A Miller. 2008. Influence of elevation on bark beetle community structure in ponderosa pine stands of north-central Arizona. *Environmental Entomology* 37:94-109.

Woodhouse, Connie A, and Bradley Udall. 2022. Upper Gila, Salt, and Verde Rivers: Arid Land Rivers in a Changing Climate. *Earth Interactions* 26 (1):1-14.

CITY OF PRESCOTT

COUNCIL AGENDA MEMO

MEETING TYPE/DATE: **STUDY SESSION** **02-14-23**

DEPARTMENT: **Fire**

AGENDA ITEM: **Initial Presentation and Discussion Regarding the 2023-2028 City of Prescott Fire Department Fire Strategic Plan.**

ITEM SUMMARY

The purpose of the 2023-2028 Prescott Fire Department Strategic Plan is to serve as the primary guide for organizational prioritization, fiscal decision-making, and evaluation of the effectiveness of service delivery. These combine to help accomplish the daily mission and move towards achieving the long-term vision of the department. To accomplish those objectives, this strategic plan represents a significant departure from prior planning efforts in the fire department. While traditional features of a strategic plan continue to serve as the core of this document, this plan utilizes a results-oriented methodology that measures the impact on the customers we serve. This will help to objectively demonstrate how an improved resource allocation will directly benefit the community. The planning effort utilized relevant portions of the department's Community Risk Assessment and Standards of Cover and the Organizational Self-Assessment. In addition, a thorough stakeholder analysis was conducted that included department members, city leadership, elected officials, the business community, governmental partners, and our residents. The department is seeking feedback from Council for incorporation into the final document, which will be brought forward for adoption in March.

BACKGROUND

The Prescott Fire Department began the renewal of its strategic plan in Summer of 2022 with stakeholder sessions and a review of the other critical planning documents, including its risk assessment and standards of cover. This clearly identified that the department finds itself at a crossroads created by community growth, increased demand for services, and rising costs which are impacting the department's ability to meet the community's needs at the same level our stakeholders expect.

Due to these factors, the organization has become more reactive in responding to this operating environment. However, this is the opposite of what such a challenge demands. Public safety services are a primary function of local government, however these services require a significant allocation of public funds. This is further complicated by the fact that the city as an organization finds itself in a more complex policy environment than ever. Public safety services are a primary function of local government, but community issues extend far beyond public safety and solutions require collaboration and innovation.

To respond successfully to such challenges requires requires innovation and transitioning away from a one size fits all approach. The outcomes for citizens, rather than the solution itself, should drive decision making. This strategic plan is a significant departure from prior planning efforts by utilizing a results-oriented methodology that measures the impact on the customers we serve. It enables us to objectively demonstrate how an improved resource allocation will benefit the community instead. By linking resource allocation to performance, the department can partner with the rest of the city, the council, and the community to have an objective and consistent conversation to help discern the most appropriate solution to adaptive challenges.

The plan calls for a significant investment into public safety infrastructure. In the five-year planning range, two new fire stations, renovations to existing stations, and increased resources in emergency medical services are proposed. However, community growth has outpaced the ability of the city to respond to the demand for services by using capital and response resources alone. Therefore, several initiatives are aimed at community risk reduction, particular in the areas of wildfire impacts, emergency management, and reducing low-acuity call impacts. We also intend to leverage technology to increase efficiency of existing resources and to invest into our firefighters to ensure they safely return home at the end of their shifts and careers.

The issues that this plan identified are:

- **Staffing and Infrastructure** – There is a need for increased capital infrastructure and associated staffing to meet growth in the City of Prescott.
- **Occupational Safety** – Existing station infrastructure and policies need to incorporate current evidence-based research related to the fire service that influences the well-being of personnel.
- **Data Collection and Analysis** -The department must improve the utilization of data collection and analyze it in a manner that drives organizational performance management.
- **Community Growth** – Public safety resource allocation has not substantially increased while the community and its associated service demand has doubled.
- **Sustainable Funding** – The general fund for the City has experienced increased

demands creating the opportunity for solutions that more effectively align service demand with public safety resource allocation while accomplishing overall city priorities.
- **Resource Viability** – The current resources allocated to the department are not sufficient to effectively manage its current responsibility and must be addressed before meeting the demand for the expansion of capabilities.
- **Workforce Development** – Significant changes in the workforce and the community, coupled with an evolution of the profession's demands, require a dedicated focus on investing in the current workforce and being proactive about recruiting new public safety professionals.

To address these seven strategic issues and measure results focused on the customer, the department's budget and performance management structure has been reorganized into four primary executive-level sections that oversee 15 functional groups that to reduce the negative impact of these strategic issues. Progress will be measured and reported by evaluating the effectiveness of resource allocation using measures related to the demand for services, efficiencies, outputs, and performance-based outcomes that are meant to accomplish strategic results logically and predictably.

The strategic plan establishes five high-level strategic results to respond to the identified strategic issues in the community by 2028. These are:

- **Strategic Result 1: Responding to Risk - Achieving Effective Community Risk Reduction Solutions.**
- **Strategic Result 2: Infrastructure - Positioning Infrastructure to Deliver Strategic Results**
- **Strategic Result 3: Workforce – Supporting our People**
- **Strategic Result 4: Performance Measurement – Leveraging the Value of Data**
- **Strategic Result 5: Vision and Values - Forged by Values/Energized by Vision**

The new strategic plan directly links resource allocation to performance, the department leadership can partner with the rest of the city, the council, and the community to have an objective and consistent conversation to help discern the most appropriate solution to adaptive challenges.

FINANCIAL IMPACT

The strategic plan outlines a projection for the fiscal impact of both capital/one-time and ongoing expenses. Exact cost impacts are to be determined during the initial implementation based on the multi-

year nature of a strategic plan.

Recommended Action:	**This item is for discussion only. No formal action will be taken.**

ATTACHMENTS

1. Prescott Fire Department 2023-2028 Strategic Plan - Final Draft.pdf

Prescott Fire Department

2023 – 2028 Strategic Plan

Community First - Courage, Grit, and Duty - Driven by Excellence

Dedication

This document is dedicated to our community, whom we have a duty to protect, and the public safety professionals that came before us.

May we never forget their contribution and sacrifice to allow us the ability to stand on their shoulders so that we can envision a bold future.

Acknowledgments

The Prescott Fire Department wants to acknowledge the hard work of its stakeholders who created this plan. The residents, businesses, city leadership, and fire department membership genuinely engaged in this process to improve their fire department and their community.

The work on the 2023-2028 Strategic Plan began with an extensive assessment by internal and external stakeholders to establish a redefined organizational identity and an updated mission, vision, and values.

In addition, a comprehensive evaluation and utilization of currently relevant portions of the 2019 strategic plan prepared for the department's initial application as an accredited agency were conducted. Finally, the department assessed citizen, business, and departmental input in 2018 and 2022.

In 2022, the department also engaged the leadership of city departments as a distinct stakeholder group. With their feedback and dedication, this document was possible.

Finally, the department wishes to thank the professional expertise of several consulting partners used in this effort.

2019

Emergency Services International (ESCI)
Chantilly, VA
https://esci.us

2022

Advanced Strategy Center (ASC)
Scottsdale, AZ
https://www.advancedstrategycenter.com

Managing Results, LCC
Gunnison, CO
https://managingresults.com

Document Design

Prescott Fire Department

Prescott Fire Department is an Internationally Accredited Agency

2023 City and Department Leadership

Mayor & Council

Mayor Phil Goode

Mayor Pro Tem Brandon Montoya

Councilmember Eric Moore

Councilmember Clark Tenney

Councilmember Cathey Rusing

Councilmember Connie Cantelme

Councilmember Steve Sischka

City Management

Michael Lamar, City Manager

Tyler Goodman, Deputy City Manager

Joseph Young, City Attorney

Sarah Siep, City Clerk

Department Senior Leadership

Fire Chief Holger Durre

Deputy Fire Chief Thomas Knapp

Operations Chief Ralph Lucas

Professional Services Chief Scott Luedeman

Jaimie Sventek, Business Manager

Table of Contents

Letter from the Fire Chief

The Prescott Fire Department is at a crossroads as an organization. The pressures created by community growth, an increased demand for services, and rising costs are impacting the department's ability to meet the community's needs at the same level our stakeholders expect. Due to these factors, the organization has become more reactive in responding to this operating environment. However, this is the opposite of what such a challenge demands.

This is further complicated by the fact that the city as an organization finds itself in a more complex policy environment than ever. Public safety services are a primary function of local government, but community issues extend far beyond public safety and solutions require collaboration and innovation. To reduce the community's risk, this department intends to use this plan to allow city leaders to fulfill the duty of providing these services while also attending to a wide range of community issues.

To respond successfully to such challenges requires leveraging unique features of our operating environment, forecasting the factors that could influence future success, and developing an agile plan to prepare for the future. This requires innovation and transitioning away from a one size fits all approach. The outcomes for citizens, rather than the solution itself, should drive decision making.

This strategic plan calls for a significant investment into public safety infrastructure. In the five-year planning range, two new fire stations, renovations to existing stations, and increased resources in emergency medical services are proposed. However, community growth has outpaced the ability of the city to respond to the demand for services by using capital and response resources alone. Therefore, several initiatives are aimed at community risk reduction, particular in the areas of wildfire impacts, emergency management, and reducing low-acuity call impacts. We also intend to leverage technology to increase efficiency of existing resources and to invest into our firefighters to ensure they safely return home at the end of their shifts and careers.

This strategic plan is a significant departure from prior planning efforts by utilizing a results-oriented methodology that measures the impact on the customers we serve. It enables us to objectively demonstrate how an improved resource allocation will benefit the community instead. By linking resource allocation to performance, the department can partner with the rest of the city, the council, and the community to have an objective and consistent conversation to help discern the most appropriate solution to adaptive challenges.

Our volunteers, civilians, and public safety professionals share a common identity. It is a mindset that was affirmed as part of this strategic plan development, and you will see it reflected in all our interactions with our stakeholders. For the people of this organization, "Community First - Courage, Grit, and Duty - Driven by Excellence" is more than a slogan. It is the attitude and resolve that we face every challenge with. I am certain that this department, and the community, will look back at this being a time when the motivational energy created by adversity, coupled with a clear plan, became the roadmap that helped create truly impactful solutions that will endure. Thank you for joining us on the journey!

Holger Durre
Fire Chief

Community First - Courage, Grit, and Duty - Driven by Excellence

Executive Summary

The purpose of the 2023-2028 Prescott Fire Department Strategic Plan is to serve as the primary guide for organizational prioritization, fiscal decision-making, and evaluation of the effectiveness of service delivery. These combine to help accomplish the daily mission and move towards achieving the long-term vision of the department.

The planning effort utilized relevant portions of the department's Community Risk Assessment and Standards of Cover and the Organizational Self-Assessment. In addition, a thorough stakeholder analysis was conducted that included department members, city leadership, elected officials, the business community, governmental partners, and our residents.

Seven strategic issues were identified that the department must address to serve the community effectively. These challenges are all equally important and relate to the following:

- **Staffing and Infrastructure** – There is a need for increased capital infrastructure and associated staffing to meet growth in the City of Prescott.
- **Occupational Safety** – Existing station infrastructure and policies need to incorporate current evidence-based research related to the fire service that influences the well-being of personnel.
- **Data Collection and Analysis** -The department must improve the utilization of data collection and analyze it to drive organizational performance management.
- **Community Growth** – Public safety resource allocation has not substantially increased while the community and its associated service demand have doubled.
- **Sustainable Funding** – The general fund for the City has experienced increased demands creating the opportunity for solutions that more effectively align service demand with public safety resource allocation while accomplishing overall city priorities.
- **Resource Viability** – The current resources allocated to the department are not sufficient to effectively manage its current responsibility. Therefore, they must be addressed before meeting the demand for the expansion of capabilities.
- **Workforce Development** – Significant changes in the workforce and the community, coupled with an evolution of the profession's demands, require a dedicated focus on investing in the current workforce and being proactive about recruiting new public safety professionals.

To address these seven strategic issues and measure results focused on the customer, the department's budget and performance management structure has been reorganized into four primary executive-level sections that oversee 15 functional groups. 368 services. These groups are structured to direct resources in a targeted manner to reduce the strategic issues' negative impact. Progress will be measured and reported by evaluating the effectiveness of resource allocation using measures related to the demand for services, efficiencies, outputs, and performance-based outcomes that are meant to accomplish strategic results logically and predictably.

Five high-level strategic results guide the executive-level sections. These are the primary measurement areas the plan is designed to report progress towards. A measurable impact is expected to occur in the community by 2028. The five strategic results and associated measurable results are:

- **Strategic Result 1: Responding to Risk - Achieving Effective Community Risk Reduction Solutions.** The Prescott Fire Department (PFD) will reduce the negative consequences of life-threatening emergencies experienced by: Utilizing technology and performance management to affect a 3% annual reduction in response times, establishing a baseline measure for cardiac arrest patients that leave the hospital to live a normal life; and performing a comprehensive update of the Community Risk Assessment (CRA), with particular emphasis on wildland fire risk, followed by a mitigation plan to be approved by City Council.

Overall Cost Projection	
Capital/One-Time	Personnel/Ongoing
$2.17 million	$2.1 million

- **Strategic Result 2: Infrastructure - Positioning Infrastructure to Deliver Strategic Results.** The Prescott community will experience a customer-focused, responsive Fire Department capable of delivering services consistent with the City's adopted Standards of Cover by: Establishing a fire department survey to assess respondents' satisfaction with PFD services by geographic location in the city; and opening two new strategically located stations which will be staffed and operational.

Overall Cost Projection	
Capital/One-Time	Personnel/Ongoing
$19.2 million	$3.7 million

- **Strategic Result 3: Workforce – Supporting our People.** The Prescott Fire Department will focus on ensuring that firefighters have their health and safety needs met, experience personal and career development opportunities, and work in an inclusive organizational culture focused on achieving results for the community by: reducing the injury rate of personnel by 3% year-over-year; ensuring that 100% of eligible PFD members complete the annual department physical; establishing a career development plan for those interested; establishing an organizational succession plan for the roles of Engineer through Fire Chief; and, ensuring the needed number of qualified applicants are available for all recruitment and promotional opportunities.

Overall Cost Projection	
Capital/One-Time	Personnel/Ongoing
$2 million	$180,000

- **Strategic Result 4: Performance Measurement – Leveraging the Value of Data.** PFD will establish a performance management system to measure, report, and act based on data from cross-disciplinary databases by: developing data analysis resources that measure accurate and relevant information; ensuring that results-oriented performance measures will inform operational, policy, and budget decisions regarding the Fire Department; and, successfully

applying for progressively rigorous ICMA certificates in performance management to further guide the use of data within the organization.

Overall Cost Projection	
Capital/One-Time	Personnel/Ongoing
$120,000	$150,000

- **Strategic Result 5: Vision and Values - Forged by Values/Energized by Vision.** The firefighters and civilian staff of the Prescott Fire Department bring strong values and a forward-looking commitment to the work. Therefore, the department seeks and is committed to creating an organizational culture consistent and aligned with its members and values, by: ensuring that all messages, behaviors, and beliefs from department leadership are consistent with a customer-focused culture; establishing expectations and support systems for supervisors to reward, manage, and promote organizational values and expectations; evaluating organizational culture through an employee engagement survey that measures adherence to organizational values and expectations; and, ensuring each member and their supervisor have a conversation about the member's contribution to the organizational culture at regular performance evaluations.

Overall Cost Projection	
Capital/One-Time	Personnel/Ongoing
$5,000	$25,000

These results, if accomplished, will help place the community in a position to ensure that the public safety infrastructure, resources, and workforce are applied in a data-driven and values-based manner to maintain the high quality of life enjoyed by Prescott residents and visitors.

Planning Methodology

The department utilized a three-phase approach to develop the strategic plan. These consisted of a review of existing organizational planning documents, conducting a comprehensive organizational assessment using feedback from multiple stakeholder groups, and establishing a results-oriented business plan that consolidated all three phases. This comprehensive approach was chosen partly due to a change in leadership in the organization and a change in the political environment influencing the department.

The department relies on three key planning components in its environmental scan to identify the structural, cultural, and financial factors impacting its demand and ability to provide services. They are the Community Risk Assessment, External Stakeholder Input, and Internal Stakeholder Input. All three of these components rely heavily on

Review of Organizational Planning Documents

The work on the 2023-2028 Strategic Plan began with an extensive assessment of the department's existing strategic plan, the Community Risk Assessment/Standards of Cover, and the department's

accreditation report recommendations from its 2019 site visit. The goals and objectives of the previous strategic plan indicated that significant progress had been made but adjustments were needed to be contemporary to the current environment. These documents collectively formed a foundation to inform the strategy of the next two phases.

This strategy called for two distinct planning engagements. The most important of these was the establishment of a defined organizational identity that could be used as a foundation to establish a metrics driven business plan. Engaging in the latter could not occur until clarity was gained over the organization's identity.

Organizational Assessment and Identity

The Advanced Strategy Center (ASC) was selected for this work because of their experience with shift-based work common to fire departments, familiarity with issues unique to Arizona, and their ability to gather feedback from a much larger audience than found in other stakeholder engagements.

During June 2022, several stakeholder input sessions were held, including a fire department leadership workshop and a validation survey to the internal team members on the Mission, Vision, and Values work.

The sessions were well received and signaled that change is underway at the Prescott Fire Department. The work found that Prescott Fire Department is an organization that desires fundamental change, is ready for that change, and is ready to move forward.

The ASC conducted stakeholder sessions as follows:

- Internal stakeholder online sessions, June 7-9. 3 facilitated sessions were conducted with 58 participants; survey access was extended to anyone unable to join the live sessions, and two additional participants completed feedback for 60 total participants. This represented roughly 90% of firefighters assigned to operational roles.

- Community stakeholder session facilitated on June 20 at the Prescott Council Chambers in a public forum style capturing key themes and the fire chief adding context and handling additional open questions. About 15 members of the public attended, including the Mayor and an additional Council member. Cindy Barks from The Daily Courier also attended and conducted a follow-up interview with the Chief that led to a very positive front-page story published in the Courier on June 23 to explain the process to the public.

- An online community stakeholder session focused on business and agency organizations was conducted on June 21. 8 participants in the session, with an additional participant providing feedback on the survey access extended to 9 participants.

- A City department peer session was conducted on June 22 with 18 participants that provided perspective from the City of Prescott government.

This produced input documents that assessed the perspectives of just over 100 stakeholders that provided their input on the Prescott Fire Department today and how the organization could evolve in the future. Two additional activities were then conducted to review the input work as follows:

- The PFD Leadership Workshop was conducted on Monday, June 27, in person at the Prescott Centennial Center. 12 leadership team members provided their input via a blend of the Advanced Strategy Lab platform and open discussion to develop the recommendations on Mission, Vision, and Values and organizational identity.

- Based on the Workshop input, revised Mission, Values, and Values statements and organizational identity attributes were then made available to the PFD internal stakeholders for their review and comment as a 'validation survey.' 20 internal team members completed the 'validation survey'.

This resulted in the establishment of a fully updated Mission, Vision, and Values and organizational identity. This was established through two engagements of the PFD Senior Leadership Team analyzing the feedback of the stakeholders during this phase of the process.

Development of a Strategic Business Plan

Once this work was completed, the focus shifted to performing a performance-based assessment of the organization. Managing Results, LLC was used for three separate on-site engagements that did an in-depth environmental scan to assess strategic issues, identifying the services delivered by the department and organizing these into program areas, and finally develop strategic results that connected to the department's annual budget allocation.

During this phase of the process, the stakeholder model expanded by reaching further down the organizational structure of internal and external stakeholders to establish 15 distinct strategic programs with relevant measures established by subject matter experts in each area.

This work concluded in December of 2022 capping off a progressively detailed 6-month planning process. What follows is the culmination of these phases, which inform the organization's future direction. Prescott Fire Department members have committed time, effort, energy, and frank honesty to develop this plan. However, its success depends entirely on the follow-through by all organization members to achieve the stated outcomes listed herein and live up to the mission, vision, and values.

An organization that knows where it is going knows the environment in which it must operate and identifies how to get there has the best chance to meet the needs of its community and achieve its vision. In addition, this planning process has served to refresh the organization's continuing commitment to professionalism and set the path toward future success.

Section 1 - Mission, Vision, and Values

Prescott Fire Department
Core Identity and Mindset

Our Purpose - Mission

Mitigate the community's risk through service, excellence, and compassion

Our Core Identity and Attitude

Community First
Courage, Grit, and Duty
Driven by Excellence

Our Shared Values and Beliefs

Professionalism
Competence
Compassion
Trust
Collaboration
Integrity
Leadership
Innovation
Fun
Humility
Ownership

Our Aspiration - Vision

A community partner that instills pride, supports our people, leads the region, and proactively solves public safety challenges

Connection to the City Strategic Plan

The City of Prescott's 2023 strategic plan guides the city council in policy deliberations and decisions. The fire department receives a significant share of the general fund, and the department is very interested in leveraging the fire department plan in support of achieving overall city priorities. The following highlight the major elements of the City of Prescott's Strategic Plan that the fire department contributes to in connection with this plan to help the city meet overall goals and objectives.

Goal #1: Maintain a Stable General Fund.

Objectives:

2. Provide adequate and stable funding and flexibility to maintain a balanced budget as required by the City Charter.

Strategies:

Fire Contributes — Take a leadership role in forming local partnerships to seek infrastructure and other funding.

Fire Contributes — Explore the options of adding grant writing resources.

3. Monitor the City's PSPRS unfunded liability status to ensure that past issues don't occur.

Strategies:

Fire Contributes — Implement a policy and mechanism to quickly pay down any future unfunded liabilities as they accrue.

Fire Contributes — Follow PSPRS board actions and state initiatives to evaluate impact on the City's funded status.

4. Monitor Legislative, State Executive, and other Political Subdivision Actions.

Strategies:

Fire Contributes — Continue to establish multiple-jurisdictional partnerships to achieve legislative, executive, and political subdivision actions.

Goal #2: Economic Development – providing an environment to enable prosperity, job/career creation, and capital formation.

Objectives:

3. Continue to monitor a moderate, healthy, and sustainable rate of growth to promote and maintain the quality of life for the City and to support the local economy.

Strategies:

Fire Contributes — Establish and review quantitative data regarding growth at least annually utilizing federal, state, and local data to track the number of jobs, number of residences, and the population in Prescott to ensure the needs of the community are met.

Fire Contributes — Evaluate affordable housing through the City's Workforce Housing Committee and outside partnerships.

Goal #3: Airport - An airport which is preserved, dynamic, and has the capacity to accommodate current and future needs.

Objectives:

1. Enhance public safety by protecting the airport from encroachment by non-compatible development that would impede its airspace.

Strategies:

Fire Contributes — Update the Airport Area Specific Plan, Airport Master Plan, Airport Layout Plan, and Land Development Code to reduce the potential for incompatible residential encroachment and to support future airport evolution.

2. Seek federal, state, and regional financial support for current and future airport development and protection.

3. Support future commercial air service maintenance and growth.

4. Support airport safety and security.

Strategies:

Fire Contributes — Explore future locations for the Aircraft Rescue Firefighting Facility, Snow Removal Facility, and the Air Traffic Control Tower.

Fire Contributes — Collaborate with public safety to remain cognizant of response requirements for the airport.

Goal #4: Quality of Life – create a clean and safe city that provides superior essential services and enhances opportunities that allow for retention and attraction of people who want to live, learn, work, and play in Prescott.

Objectives:

6. Highly-Rated City Services – Perceived as and are (measurably) delivering efficient and effective services including transportation with improved flow, well-maintained streets, public safety, code compliance, water, and wastewater services.

Strategies:

Fire Contributes — Consider using a survey tool to measure citizen satisfaction and the efficiency and effectiveness of city services.

7. Plan and budget to improve response times and additional, necessary facilities for first responders.

Strategies:

Fire Contributes — Ensure effective recruitment and retention of first responders.

Fire Contributes — Evaluate, within the calendar year, the feasibility and establishment of an ongoing, dedicated funding mechanism for the funding of police and fire capital and operational needs.

Fire Contributes Evaluate alternative delivery mechanisms to provide optimal, effective public safety outcomes.

Goal #5: Service-Oriented Culture – Promote an accountable organizational culture of excellent/superior/solutions-driven service by the Mayor, Council, and City staff.

Objectives:

1. Measurably promote excellent service delivery based on trustworthy, timely, problem-solving, engaging, valuable, accessible, actionable, fair, consistent, and common-sense service as permitted by existing resources and by effective use of those resources.

Strategies:

Fire Contributes Continued customer service and other trainings.

Fire Contributes Customer experience feedback and survey.

Fire Contributes Performance measures from each department.

Fire Contributes Shared vision culture among employees at all levels of departments.

Other notes: culture of enforcement changed to culture of service and facilitation (attitude); seeking to have a Solution-Oriented culture.

2. Promote continuous process improvement which fosters better processes and procedures to improve customer service and provide quality services at the lowest possible cost to taxpayers.

Strategies:

Fire Contributes Foster a culture that enhances employee morale.

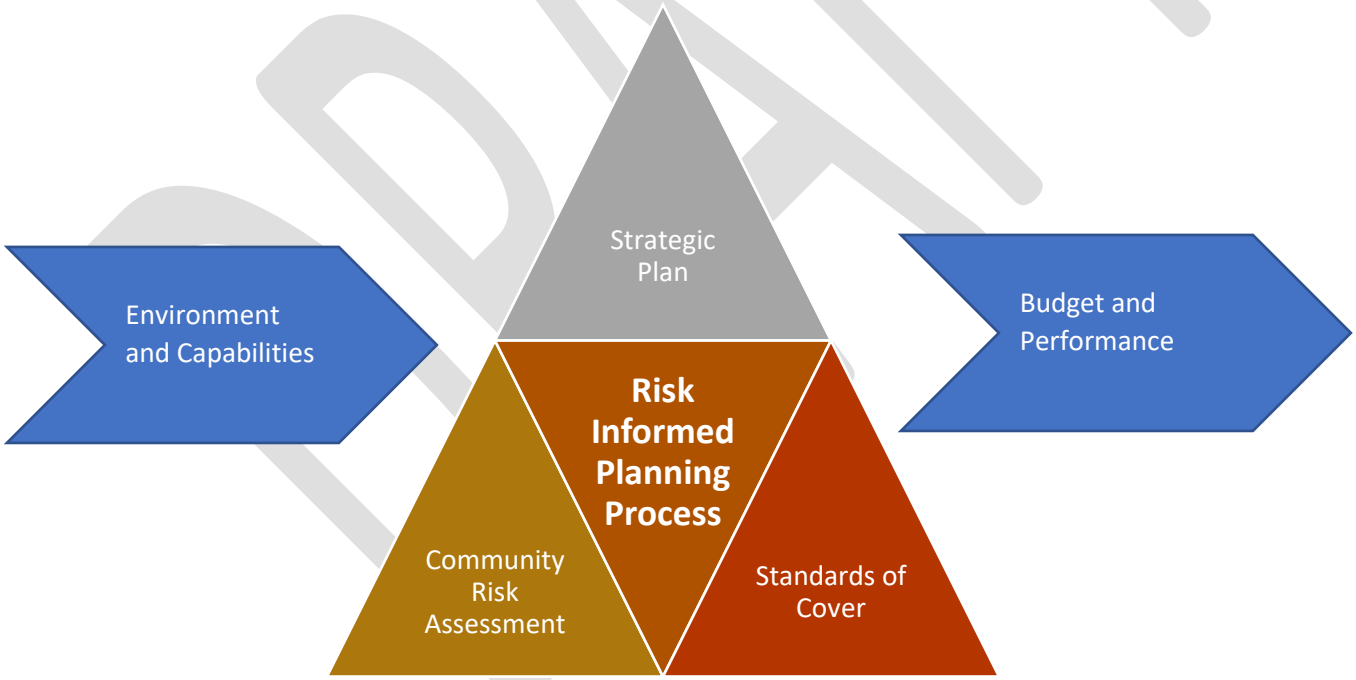
Fire Contributes Carry out the co-location of city facilities.

Courtesy: Prescott Chamber of Commerce

Section 2 - Organizational and Community Assessment

The need to perform rigorous risk assessments and community informed strategic planning is more essential than ever before. The number of services that fire departments provide have increased significantly due to a better assessment of true community risk and the application of more proactive solutions to those challenges. In addition, the emergencies today's firefighters are asked to address has become more complex, and in some cases more dangerous.

The Prescott Fire Department is truly an all-hazards emergency response organization. The only major area the department does not formally offer is response to shipboard fires and emergencies. Considering the relatively small size of the department, this fact is remarkable. To respond to this environment, the department uses three key elements in its planning process. They are the strategic plan, the community risk assessment, and the standards of Cover. In combination they inform budget requests and establish the foundation for the department's performance management approaches.



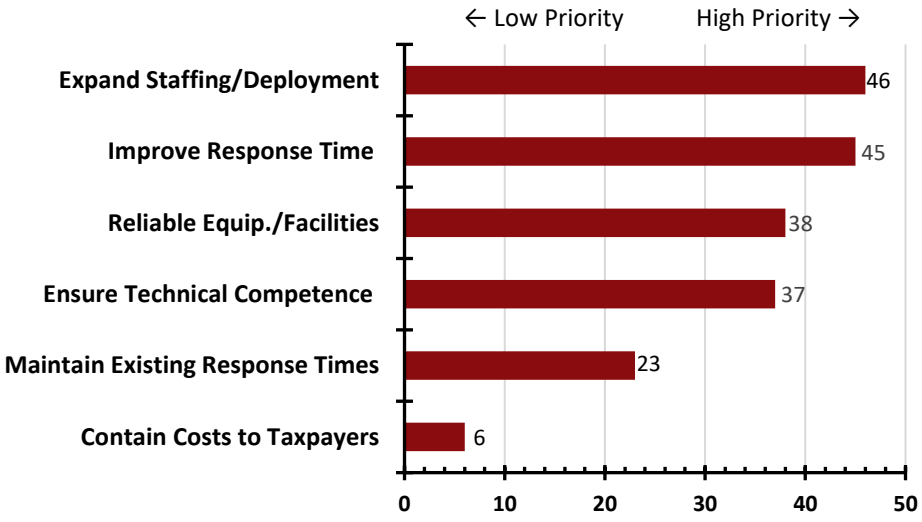
In 2019, the department completed a comprehensive community risk assessment that is the foundation for assessing the risks faced by the community. This is an integrated "living "document that will be updated along with the Standards of Cover on an annual basis. A major update is expected in 2024 as the department's initial five-year accreditation cycle is nearing an end and the assumptions utilized in this document need updating to prepare for re-accreditation.

Stakeholder Input and Engagement

2019 Strategic Plan Stakeholder Outreach

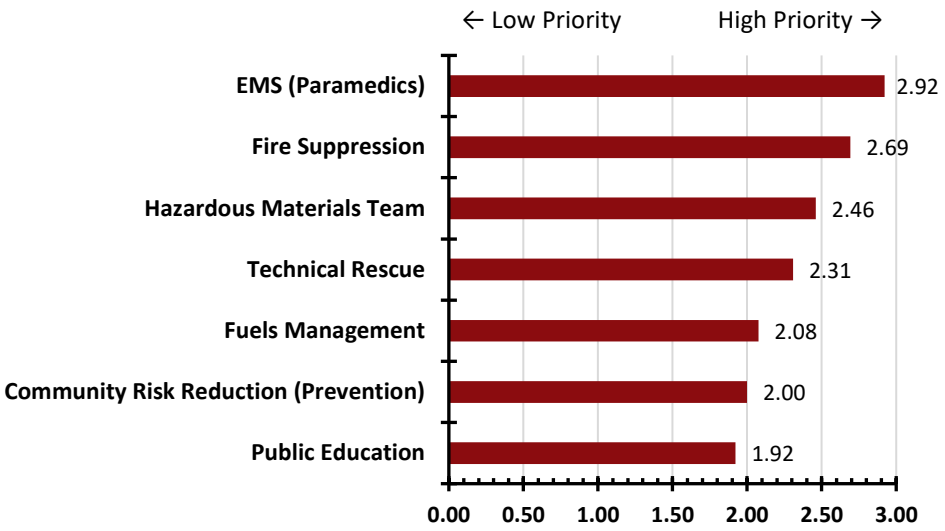
The 2019 process engaged stakeholders in a traditional in-person format and is represented here to show alignment with the findings of the 2022 process. While it was not formally a part of this update, it is relevant and shows the key assumptions remain unchanged. Both the business community, and citizen stakeholders were invited to participate. Below is a high-level summary of the findings of that engagement. Each group was asked report their planning priorities for the department, which services they felt were the most important, and their general opinions of the overall state of the department. Those in attendance (13) did not constitute statistical validation but should be viewed as a potential indicator of the business community's general leanings.

Figure 1. Business Community Planning Priorities



The attendees were given the preceding list of values or planning elements and given a forced choice: comparing each element to all of the others to decide which was the most important (e.g., technical competence versus contain costs, technical competence versus maintain response times, etc.). The total value possible cumulatively is 65 per planning element. The results are illustrated in Figure 1, reflecting that the group prioritized expanding staffing and deployment over every other planning element, followed closely by improving response times and then reliable equipment and facilities, ensuring the technical competence of PFD personnel, maintaining response times, and finally containing costs.

Figure 2. Business Community Service Priorities



In the same session as just discussed, the attendees were given a list of current services provided by the fire department, which were described. The choices were to assign a 3 (critical priority), a 2 (important priority), or a 1 (low priority) to the list of services. The respondents were allowed to assign as many 3s, 2s, or 1s as they wished and were also allowed to strike through any service, they felt the fire department should not be providing or add a service the individual respondents believed was missing from what should be provided. No attendees struck through any services, but two attendees separately added "EMTs well-checking frequent system users or post discharge patients."

The group prioritized advanced life support (paramedic) services as the most critical service offered by PFD, followed by fire suppression, hazardous materials, and technical rescue response. Fuels management, community risk reduction (prevention), and public education were scored lowest, but still at or above an important priority.

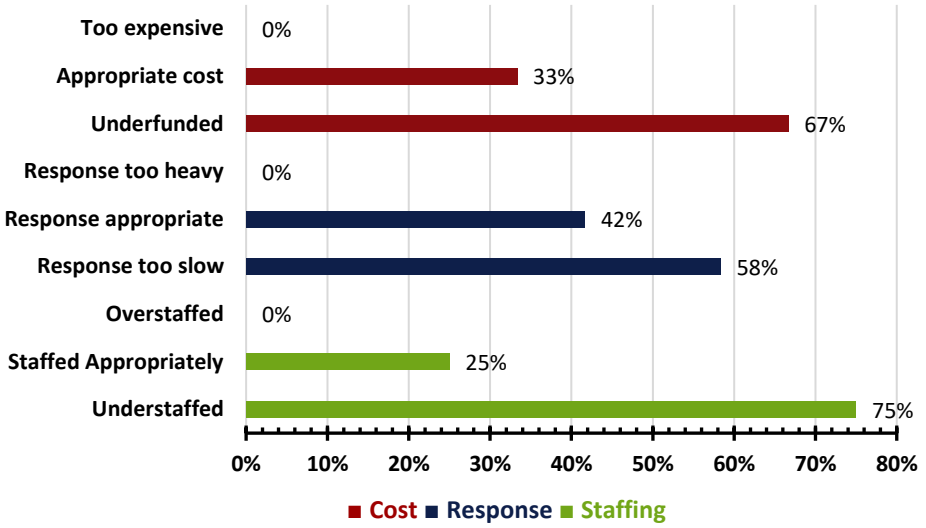
Finally, the attendees were given an opinion poll, where they were asked to check the one box under each of the headings in Figure 3 that most described their perspective.

Figure 3. Staff/Response/Cost Opinion Options

Staffing	Response Performance	Cost of Service
ϒ Overstaffed	ϒ Response too heavy	ϒ Too expensive
ϒ Staffed appropriately	ϒ Response appropriate	ϒ Appropriate
ϒ Understaffed	ϒ Response too slow/light	ϒ Underfunded

The results of the opinion poll are reflected in Figure 4.

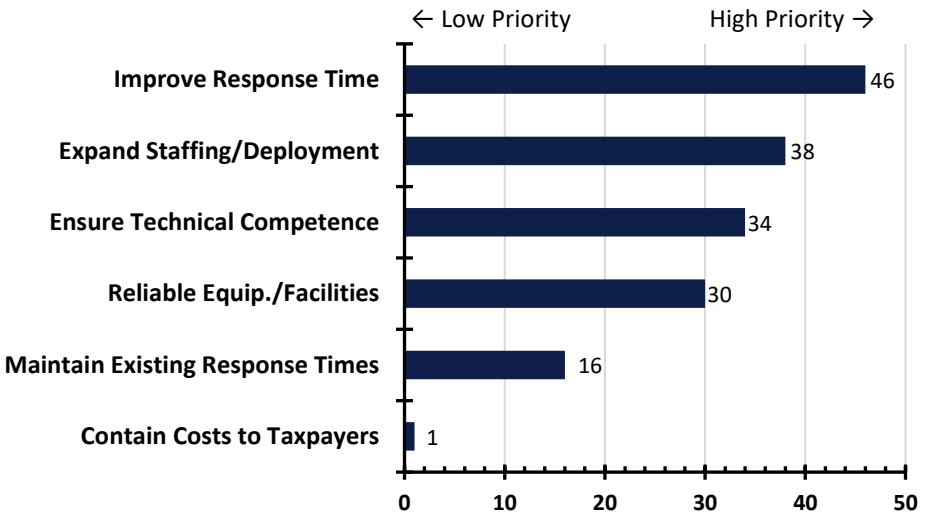
Figure 4. Business Community Staff/Response/Cost Opinion Poll Results



Interestingly, the business respondents agreed most that PFD was underfunded, that response was too slow, and that PFD was understaffed.

These same tools were administered in the same way with identical instructions on the same day to citizens of the community in a separate forum. Those in attendance (10) did not constitute statistical validation but should be viewed as a potential indicator of the community's general leanings.

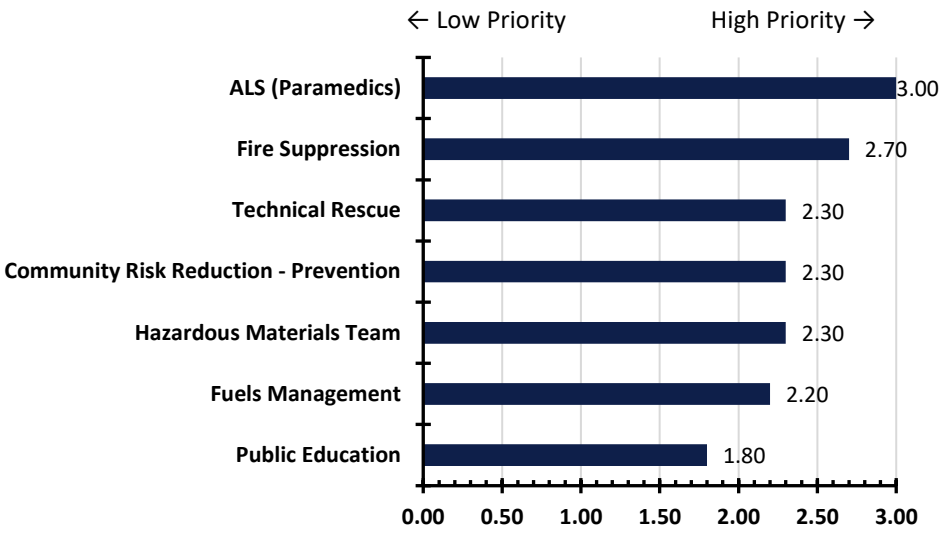
Figure 5. Citizen Planning Priorities



As with the business community, citizen stakeholders were given the list of values or planning elements and given a forced choice: comparing each element to all the others, deciding which is the most important. The total value possible cumulatively for any single planning element is 50. The results are illustrated in Figure 5, reflecting that the group prioritized improving response time over every other planning element, followed by expanding staffing and deployment, ensuring the technical competence of PFD personnel, and having reliable equipment and facilities. Maintaining response time and containing taxpayer costs were given the lowest priority.

In the same session, the attendees were given a list of current services provided by the fire department. As with the business community, the choices were to assign a 3 (critical priority), a 2 (important priority), or a 1 (low priority) to the list of services. The respondents were allowed to strike through any service they felt the fire department should not be providing or add a service the individual respondents believed was missing from what should be provided by the fire department. No services were struck or added.

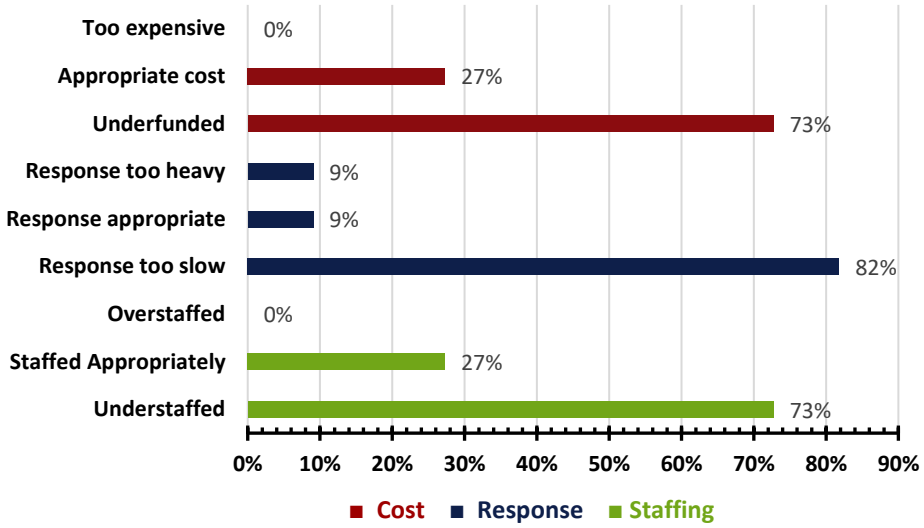
Figure 6. Citizen Service Priorities



As with the business community, the citizen stakeholders prioritized advanced life support (paramedic) services as the most critical service offered by PFD, followed by fire suppression. The citizens' remaining priorities differed slightly in order from the business community, but public education was scored lowest in priority for both groups.

Finally, the attendees were given an opinion poll, where they were asked to check the one box under each of the headings in Figure 7.

Figure 7. Citizen Staff/Response/Cost Opinion Poll Results



As with the business community, the citizen respondents agreed most that PFD was underfunded, that response was too slow, and that it was understaffed. In all three categories, the citizens in attendance weighed their responses heavily in the deficit (underfunded, understaffed, and slow response time).

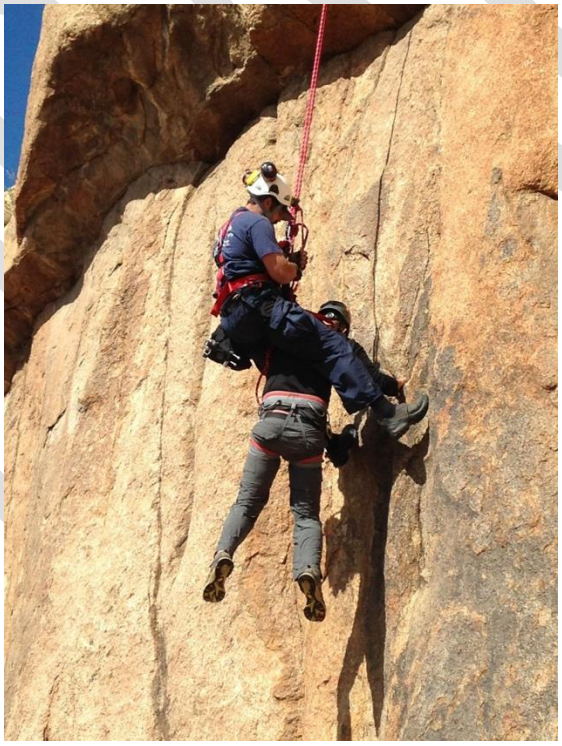
2022 Stakeholder Outreach – Subjective Factors

The department's first step for stakeholder engagement during the 2022 strategic planning process was a thorough examination of where the department is positioned as a group of emergency response professionals, as an asset in the community, and what the challenges and opportunities were that are facing the department. This was to determine if the mission, vision, and values needed to be updated, and if so, what that should be. Below are the key findings from that process:

- **Key Finding #1: Duty to serve – Hopeful for the future:** Prescott firefighters will answer the call and fulfill the fundamental mission of providing the fire/emergency services that keep the community safe. However, their goodwill has been stretched thin by a resource model that has not kept pace for the current environment and is insufficient for the growth of the community. Their outlook is *temporarily buoyed* by the arrival of new leadership and a collaborative approach to rethinking the organization for that future. But the progress on that future will need to be tangible to reinforce that PFD is making the investments in facilities, systems and people to align with the desired organizational vision and identity for the future.
- **Key Finding #2: Inability to keep up with growth – Ready for change** The challenge for PFD is that the department is playing catch-up relative to the *current environment* in terms of resource, facilities, compensation and planning. The *future environment* is already arriving which means that PFD has to execute at a faster rate than the rate of change happening in the community. That means that the leadership style, values and culture have to support a willingness and ability to change. The good news is the outlook of the staff of the PFD related to how they see the current state of the organization, and that they are ready (way past ready) for that change. This indeed creates the need and the opportunity to advance a new organizational identity for PFD—embodied with a refreshed mission, vision, values, culture and sense of that this organization could really look like in the future.
- **Key Finding #3: Be succinct in words and action – Lead with compassion:** The general feedback spirit from the internal stakeholders is to keep the mission simple—emergency services, community context, delivered with skill and compassion.
- **Key Finding #4: Be bold and build the future:** The vision is not just for those that are here today, it is also relevant for the next generation that will join PFD. To be "the best in the west" is a seriously high standard. More important are proactivity, regional leadership, and a leader in the community. The core elements of respect, admiration by peers, and community engagement and *preservation* of the family culture all seem to connect. This vision, regardless of final language, will need to be guided by the values and cultural components to be viewed as credible.
- **Key Finding #5: Innovation and push forward - Challenge the status quo:** Looking forward with innovation, a drive for constant (or continual) improvement is an element that represents a bridge to the future—"don't be stuck in the past", don't do it this way just "because we always have".

- **Key Finding #6: Rooted in a values-oriented culture:** PFD has a strong and distinct culture, and the majority of the elements serve PFD well and should be sustained for the future. Values around leadership are important and to be placed in the right context within the culture.
- **Key Finding #7: Operationalize the Vision:** The strategic plan must create action plans that establish a bold path for change. This begins to paint a picture of the future that is very attractive to the workforce today and would be well-positioned for the next generation.
- **Key Finding #8: Use the values to build the future:** The survey pointed to the idea of a new Prescott Fire Department that values its history and heritage but is ready to move on as a leadership-driven organization, forward-thinking, progressive, open and transparent, accountable and community-focused.
- **Key Finding #9: Purpose and Identity:** Purpose is a powerful concept but will require more education to differentiate purpose from the mission and to see the real difference, over time and with the right resources, that the PFD makes in the lives of our community members. At the end of the day, it is to support that safe environment and know that you are protected. A focus on identity is important.

These findings were thoroughly reviewed, and the department's command staff and key leading members met to finalize the mission, vision, and values which determined the new organizational identity and set the stage for the business strategic plan.



The Forging Factors for the Future

Participants were asked where they felt the organization was moving forward in the leadership workshop and validation survey. This defines the foundation for the organization and the future. It is a *shared future,* and the internal team helped to define that future identity and the key strategies. These key themes are the foundation for the department's updated mission, vision, and values and the origin of the new core identity and attitude. Collectively, they present the foundation for all implementation efforts.

The Foundation of Our Vision

- **THE PROCESS MATTERS:** PFD has begun a serious change management process to redefine the organization and its support for the future. The department members are committed to the process and are committed to leadership in being part of the process.
- **YOU HAVE HELD THE LINE:** The only reason PFD can move forward is that its members have held the line and done their jobs in an extremely challenging environment. While the community appreciates this, PFD members recognize they must change that environment for themselves and for the community.
- **WE WILL GROW WITH THE COMMUNITY:** Prescott and this region are growing and growing for good reasons. It's a desirable place to be. PFD will grow with the community and be a leader in providing the safe environment our community needs.
- **HONOR THE PAST, MOVE TO THE FUTURE**: PFD has proud people and proud tradition/heritage and will always honor that, but must reset the future. Departmental members need to be willing to rethink nearly everything about what they do to serve this community in the future. Our members are that future.
- **VALUE OUR VALUES**: PFD is a values-based organization and operates as a family. The department's collective values and culture are the foundation for the future. As PFD moves forward, members will stay true to the values and attract like-minded people that have the same commitment.
- **WE ARE READY:** At every key point, the stakeholders show evidence of City support, tangible desire for resource investment, and community buy-in. The organization is ready for the leadership is in place to create the future. Members of the department will be engaged and are ready.

Environmental Scan – Objective Factors

While the first phase of the stakeholder process assessed the "heart" of the organization, the environmental scan is the "head" of this effort. This is a more rigorous process in terms of finding factual features in the community that impact the future ability of the city to provide services. The first step is to evaluate the external and internal organizational environment. The internal planning team combined feedback from the citizen forum, the internal survey results, and their collective knowledge of the organization and the community to assess the environment in which the district operates. The 2019 and 2022 process found very similar results and further validate the environmental factors in play.

2019 Strategic Plan SWOT Analysis

To properly formulate strategic initiatives, the internal planning team had to evaluate the external and internal organizational environment. The internal planning team combined feedback from the citizen forum, the internal survey results, and their collective knowledge of the organization and the community to assess the environment in which the district operates. Analyzing the organization's strengths, weaknesses, opportunities, and threats (SWOT) is the first step in identifying actionable strategies for the future. The internal survey results of the SWOT were condensed and prioritized by the internal planning team.

Strengths

The identification of organizational strengths is the first step in the environment scan. An organization's strengths identify its capability of providing the services requested by its customers. The organization needs to make certain that its strengths are consistent with the issues it faces. Programs that do not match organizational strengths or primary functions should be reviewed to evaluate the rate of return on precious staff time. The internal planning team identified the following core department strengths:

Human Capital ***Resilience /Adaptability*** ***Reputation/Community Perception***

Weaknesses

Organizational weaknesses, or lack of performance, are also an important environmental scan element. To move forward, the organization must honestly identify the issues that have created barriers to success in the past. Weak areas needing improvement are not the same as challenges, which will be identified later, but rather those day-to-day issues and concerns that may slow or inhibit progress. Internal organizational issues, as identified by the planning team, are typically issues that are at the heart of an agency's problems. The internal planning team identified the following core department weaknesses:

Financial ***Lack of Sufficient Personnel***

Number and Conditions of Stations ***Ability to Conduct Training***

Increased workload

Opportunities

An organization's opportunities and threats are generally derived from the external environment. Opportunities are focused on existing services and on expanding and developing new possibilities inside and beyond the traditional service area. Opportunities exist for the Prescott Fire Department as was evidenced by the feedback from the internal survey as follows:

Increase capacity in current growth period ***CON/Community Paramedicine***

Use strategic plan, accreditation, CRA: SOC to educate elected officials and public.

Challenges

The challenges are different than the weaknesses in that they are obstacles that must be overcome as opposed to shoring up a weakness. The obstacles may be internal or external but nonetheless must be addressed to position the department to take advantage of opportunities in the future. Challenges are plentiful for the Prescott Fire Department as evidenced by the feedback from the internal survey as follows:

Maintaining response times ***Emergency Medical Services*** ***Delivery of Training***

Workload ***Growth without Planning*** ***Employee Health/Wellness***

Running our Business with Limited Resources (burnout and inconsistency)

Threats

There are conditions in the external environment that are not under the organization's control. The identification of these conditions allows the organization to develop plans to mitigate or respond when a threat becomes a barrier. By recognizing these issues, an organization can greatly reduce the potential for loss. The internal planning team identified the following core threats:

Funding cuts, grant cuts, no increase ***Mental health***

Community Growth without corresponding agency growth

Strategic Issue Statements

The stakeholder outreach from both 2019 and 2022, diligent work on the formation of a defined organizational identity, and the department's Community Risk Assessment and Standards of Cover were the foundation of formulating the key issues influencing the planning needs of the Prescott Fire Department for the next five years. This area is representative of a departure from traditional planning methods as not only are the key issues identified, but an analysis of the impact of inaction is also represented to show the impact on the community for prioritizing needs of the department.

It is important to note that these statements are not the result of an individual lack of action in the past or that a stakeholder group failed to act. Instead, they are a realistic and fact-based assessment of the current conditions that are influencing the strategic objectives contained in this plan. Therefore, the focus of these statements must be to motivate future initiatives and not to look retrospectively at prior efforts to influence these factors. They are a call to solving collective problems that the community shares, along with a wide-ranging set of issues facing the community beyond emergency services.

The following statements represent the seven most significant strategic issues that impact the ability of the Prescott Fire Department to meet the current and expected community demand for emergency response and risk mitigation services.

Issue 1: Staffing and Infrastructure

The needs of the department for staffing and infrastructure have not been effectively communicated, resulting in a lack of understanding and prioritization by fiscal decision-makers and the community, which, if it continues, will result in:

- Continued inadequate staffing levels to meet service demands
- Continued inadequate infrastructure and equipment to meet community expectations and risk
- Poor patient outcomes
- Negative social and economic results from a devastating event
- Negative impact on the wellness of our first responders

Issue 2: Occupational Safety

Due to a changing emergency response environment coupled with inadequate facilities, equipment, and policies for Prescott Fire, members face increased exposure to chemicals, violent incidents, workloads, and stress. If national standards, codes, and recommendations are not addressed, exposures will continue to be imposed on our personnel, resulting in:

- Increased rates of injury, illness, and cancer
- Increased mental health issues
- Increased healthcare costs
- Loss of personnel

Issue 3: Data Collection and Analysis

Continued inefficient data collection and the lack of capacity for analysis, if unaddressed, will result in:

- Lack of strategic location of assets
- Policymakers not having the data to make strategic decisions about the fire service
- Potential financial and legal implications for non-compliance with national standards and industry best practices
- The department's ability to meet response times included in the City's adopted Standards of Cover to 9-1-1 calls will continue to decline

Issue 4: Community Growth

In the past 25 years, demand for Prescott Fire Department services doubled along with the population and continues to grow, while staffing levels are virtually unchanged, which, if unaddressed, will result in:

- Limited administrative office hours, delayed response to the public
- Delayed plan reviews affecting the construction industry, fewer inspections completed, preplanning no longer addressed which affects citizen and firefighter safety, ineffective permit process
- Slower response times, personnel unprepared for response, equipment failures more frequent
- Delayed call processing at the Prescott Regional Communications Center and inappropriate resource allocation

Issue 5: Sustainable Funding

The funding provided by the General Fund is inadequate for the Fire Department to meet the City's adopted Standards of Cover, which, if unaddressed, will result in:

- Continued insufficient staffing/capital to meet the demands of the community
- Continued inability to implement innovative service measures for the community
- Difficulty exercising flexibility that would benefit the community
- An increase in facility and equipment disrepair that will further impede service delivery to the customer
- Heightened risk of not being able to respond to and mitigate a catastrophic wildland fire event
- Insurance ratings will degrade, leading to increase costs to citizens or canceled policies

Issue 6: Resource Viability

The human, infrastructural and technical resources appropriated to the PFD do not adequately meet the demands of the citizens/visitors of Prescott and will not be positioned to ensure future stability, if continued will result in:

- Response to incidents is long and will worsen
- Infrastructure costs are unmanageable and will increase
- Premature disability/death of citizens/visitors will occur
- Increased workload-related stress to employees

Issue 7: Workforce Development

A lack of cohesive planning related to recruitment, retention, and workforce development; as well as an associated insufficient trend analysis, if continued will result in:

- Increased turnover
- The lack of a succession plan
- Erosion of a community-oriented departmental culture
- Fewer interested applicants
- An ineffective workforce
- An unengaged workforce that does not feel appreciated or supported

2002 Indian Creek Fire

Section 3 - Strategic Business Plan

Performance-Based Budget Structure

To address these seven strategic issues, the department's budget structure has been divided into 4 Executive Sections that oversee 15 Functional Groups (strategic programs) that direct current and required resources in a targeted manner to reduce the negative impact of the community's public safety issues.

1.0 Section: Office of the Chief

1.1 Group: Administration

1.2 Group: Leadership and Management

1.3 Group: Research and Development

1.4 Group: Capital Investments

1.5. Group: Organizational Performance Management

2.0 Emergency Operations Section

2.1 Group: Fire Suppression

2.2 Group: Special Operations

2.3 Group: Emergency Medical Services

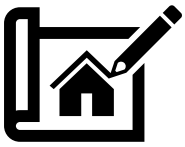
2.4. Group: Readiness and Logistics

3.0 Community Risk Management Section

3.1 Group: Risk Reduction and Planning Services

3.2 Group: Emergency Management

3.3 Group: Community and Public Information



4.0 Essential Services Section

4.1 Group: Training and Skills Development

4.2 Group: Health and Safety

4.3 Group: Employee Development

Executive Sections – Strategic Purpose and Key Results

The key results for the department are represented here by Section. These are considered outcome measures that flow logically from each group function that report to them.

1 - Office of the Chief	
Purpose Statement	The purpose of the Office of the Chief is to provide strategic planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.
Key Results	• % Operational Groups that are on or below budget (measured quarterly) • % Stakeholders who report they have confidence in PFD • % Departmental strategic results achieved • % Response times within the Standards of Cover adopted by the City • % Of IT Projects Successfully Implemented

2 - Emergency Operations Section	
Purpose Statement	The purpose of the Operations Section is to provide all-risk response services to the public so they can live, work, and recreate in a safe community.
Key Results	• % Call responses provided within the time frames in the Standards of Cover adopted by the City • % Special Operations responses within the time frames in the Standards of Cover adopted by the City. • % Medical emergency responses provided per the Standards of Cover adopted by the City by risk category • % Responses provided within the Standards of Cover adopted by the City

3 - Community Risk Management Section	
Purpose Statement	The purpose of the Community Risk Management Section is to provide proactive risk identification, mitigation, and management services to people who live, work, and visit the Prescott area so they can enjoy a safe, resilient, and economically vibrant community.
Key Results	• % Change in unplanned/unexpected fire events • Annual Assessment of *community connectedness*, which is a key predictor of resilience and recovery, will be assessed annually. • % Surveyed respondents who report that they are informed about the activities of the Prescott Fire Department

4 - Essential Services Section	
Purpose Statement	The purpose of the Essential Services Section is to provide professional and wellness development services to employees so they can succeed in their career paths and beyond.
Key Results	• Firefighter work-related injury rate • % Employees who are meeting benchmarks as defined in their career development plan • % FF the on the force with increased task performance year over year

Performance-Based Strategic Results

To ensure organizational effort and progress are continuously assessed, five strategic focus areas have been established to measure and report results. These directly align with the department's performance-based budget structure. A cost analysis of potential initiatives is presented here to project the potential fiscal impact of the plan. It should be noted that these initiatives are not the only manner in which progress towards these results can be achieved. The department intends to update these initiatives as future opportunities or constraints are recognized.

Strategic Result 1: Emergency Response

Achieving Effective Response and Mitigation Solutions

The Prescott Fire Department (PFD) will reduce the negative consequences of life-threatening emergencies experienced by the community, as evidenced by:

A. *Beginning in FY2023, the department will strive to achieve a 3% year-over-year reduction in Effective Response Force (ERF) response times to incidents categorized as moderate or high risk.*
   - **Strategic Issues Impacted:**
     - Data Collection and Analysis
     - Community Growth
     - Sustainable Funding
     - Workforce Development
   - **Key Results Ownership: Emergency Operations Section Chief**
   - **Contributing Performance Groups:**
     - Fire Suppression
     - Emergency Medical Services
     - Special Operations

B. *By the end of FY2024, a baseline measure for cardiac arrest patients discharged from the hospital neurologically intact will be established.*
   - **Strategic Issue Impact:**
     - Staffing and Infrastructure
     - Data Collection and Analysis
     - Sustainable Funding
   - **Key Results Ownership: Emergency Operations Section Chief**
   - **Contributing Performance Group:**
     - Emergency Medical Services

C. *Building on past assessments, and continuing in FY2024, the Community Risk Assessment (CRA) will be conducted, with particular emphasis on wildland fire risk, followed by a mitigation plan to be approved by City Council.*
   - **Strategic Issue Impact:**
     - Data Collection and Analysis
     - Community Growth
     - Sustainable Funding
   - **Key Results Ownership: Community Risk Management Section Chief**

- **Contributing Performance Group:** Organizational Performance Management

Strategic Result 1 Emergency Response– Potential Initiatives and Projected Costs[1]				
Initiative		**One Time Cost**	**Ongoing Costs**	**Fiscal Year**
Modernize Station Alerting		$350,000	$75,000	FY24/FY25
Engine Move-up Module		$100,000	$25,000	FY23/FY24
Low-Acuity Call Countermeasures (itemized)	*Community Paramedic Staffing*	*$15,000*	*$160,000*	TBD
	Paramedic Vehicle	*$65,000*	*$20,000*	
	Equipment and Marketing	*$35,000*	*$20,000*	
	Nurse Navigator Call Diversion Program	*$35,000*	*$25,000*	FY26
Low-Acuity Call Countermeasures Total		$150,000	$225,000	
Potential Limited CON (itemized)	*Legal Fees*	*$150,000*	*$150,000*	TBD
	Ambulances	*$350,000*	*$25,000*	
	Equipment	*$200,000*	*$20,000*	
	Staffing (16.5 FTE's)[2]	*$170,000*	*$1.7 million*	
	Facility Remodels	*$500,000*	*N/A*	
Potential Limited CON Total		$1.35 million	$1.55 million	
Public Access Defibrillation Initiatives		$150,000	$25,000	
Incident and Emergency Management Staffing		$65,000	$150,000	FY26
Fire Adaptive Community Transition		N/A	$25,000	FY24/FY25
Total		**$2.17 million**	**$2.1 million**	

[1]Fire Station Infrastructure expenses carried in Result 2

[2]Limited CON personnel expenses include 40-hour support staff additions (0.1 FTE per uniformed position).

<u>No-cost or Existing Initiatives</u>

- Turnout time continuous improvement
- Call-processing time improvement
- Lifeline contract optimization
- Emergency management collaboration
- Active PAWUIC participation
- Improve QA/QI process

Strategic Result 2: Infrastructure

Positioning Critical Infrastructure to Deliver Strategic Results

The Prescott community will experience a customer-focused, responsive Fire Department capable of delivering services consistent with the City's adopted Standards of Cover as evidenced by:

B. By the end of FY2024, __%[1] of respondents surveyed will rate PFD services as very good or excellent and assessed by geographical planning zones connected to the Community Risk Assessment/Standards of Cover (CRA/SOC).

- **Strategic Issue Impact:**
  - Data Collection and Analysis
  - Community Growth
  - Sustainable Funding
  - Resource Viability
  - Workforce Development
- **Key Results Ownership: Office of the Chief**
- **Contributing Performance Group:**
  - Organizational Performance Management

[1] *A target will be established when a baseline is known*

C. By the end of FY2025, one new strategically located station will be staffed and operational.

D. By the end of FY2025, a second new strategically located fire station will be shovel-ready.

E. By the end of FY2027, the second station will be fully staffed and operational.

- **Strategic Issue Impact:**
  - Staffing and Infrastructure
  - Occupational Safety
  - Data Collection and Analysis
  - Community Growth
  - Sustainable Funding
  - Resource Viability
  - Workforce Development
- **Key Results Ownership: Office of the Chief**
- **Contributing Performance Groups:**
  - Organizational Performance Management
  - Capital Investments

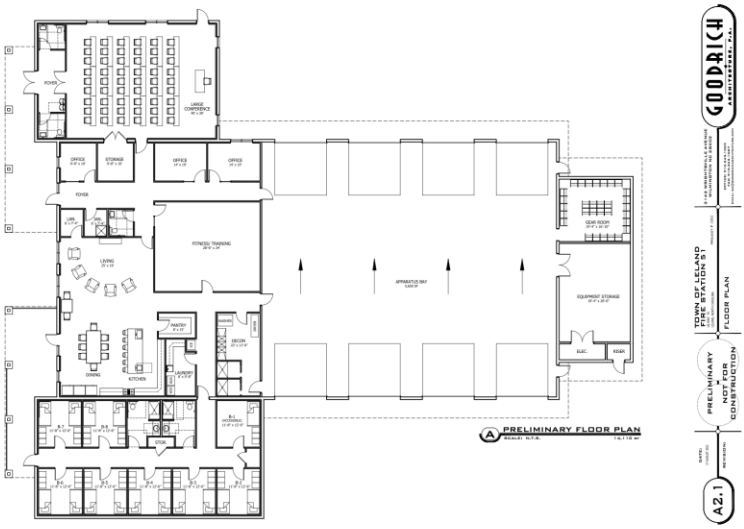
Strategic Result 2 Infrastructure – Potential Initiatives and Projected Costs				
Initiative		**One Time Cost**	**Ongoing Costs**	**Fiscal Year**
Customer Survey		10,000	5,000	FY24
Fire Station 76 (itemized)	Land & Design	*$1,000,000*	*N/A*	FY24/FY25
	Construction[1]	*$6,000,000*	*N/A*	
	Engine 76	*$900,000*	*$90,000*	
	Staffing (16.5 FTE's)	*$170,000*	*$1.7 million*	
Fire Station 76 Total		$8.1 million	$1.79 million	
Fire Station 77 (itemized)[2]	Land & Design	*$1.1 million*	*N/A*	FY26/FY27
	Construction	*$6.6 million*	*N/A*	
	Engine 77	*$990,000*	*$99,000*	
	Staffing (16.5 FTE's)	*$187,000*	*$1.8 million*	
Fire Station 77 Total		$8.9 million	$1.9 million	
Total		**$19.2 million**	**$3.7 million**	

[1]Assumes a 14,000 square foot facility at approximately $425/sq.ft.

[2]Assumes inflation rate of 5% per year for capital and 3% in personnel expenses

No-cost or Existing Initiatives

- N/A



Example Fire Station Floor Plan (14,000 sq. ft. Facility)

Strategic Result 3: Workforce

Supporting our People

All PFD members will have an opportunity to have their health and safety needs met, experience personal and career development opportunities, and work in an inclusive organizational culture focused on achieving results for the community, as evidenced by:

A. *Beginning in FY2023, the PFD injury rate will be reduced by 3% year-over-year.*
   - **Strategic Issue Impact:**
     - Occupational Safety
     - Data Collection and Analysis
     - Workforce Development
   - **Key Results Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Health and Safety

B. *By the end of FY2024, 100% of eligible PFD members will complete the annual department physical.*
   - **Strategic Issue Impact:**
     - Occupational Safety
     - Resource Viability
     - Workforce Development
   - **Key Results Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Health and Safety

C. *By the end of FY2024, all PFD members will have the opportunity to establish a career development plan.*
   - **Strategic Issue Impact:**
     - Staffing and Infrastructure
     - Resource Viability
     - Workforce Development
     - Employee Development
   - **Key Results Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Health and Safety

D. *By the end of FY2023, PFD will have an organizational succession plan in place identifying roles from Engineer through Fire Chief.*
   - **Strategic Issue Impact:**
     - Staffing and Infrastructure
     - Community Growth
     - Sustainable Funding
     - Resource Viability
     - Workforce Development
   - **Key Results Ownership: Office of the Chief**
   - **Contributing Performance Group:**

- Leadership and Management

E. *By 2024, 2 qualified applicants will reach the Chief's panel for each open position for every recruitment and promotional opportunity.*
   - **Strategic Issue Impact:**
     - Workforce Development
   - **Key Results Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Training and Skills Development
     - Employee Development

Strategic Result 3 Workforce – Potential Initiatives and Projected Costs			
Initiative	**One Time Cost**	**Ongoing Costs**	**Fiscal Year**
NFPA 1582 Physicals	N/A	$80,000	FY24
Career Development Initiatives	N/A	$100,000	FY 25
Existing Station Renovations	$2 million	N/A	FY27/FY28
Total	**$2 million**	**$180,000**	

No-cost or Existing Initiatives

- Utilize existing HR resources
- Promote culture and live by the organizational values
- Collaborate with Yavapai College
- Extensive use of risk pool resources
- Utilize industry competent physical therapy resources

Strategic Result 4: Performance Measurement

Leveraging the Value of Data

PFD will establish a performance management system to measure, report, and act based on data from cross-disciplinary databases as evidenced by:

A. *During FY2024, resources for data analysis will be operational, and systems integration will be underway as measured by the availability and relevant information.*
   - **Strategic Issue Impact:**
     - Data Collection and Analysis
     - Resource Viability
   - **Key Results Ownership: Office of the Chief**
   - **Contributing Performance Group:**
     - Organizational Performance Management

B. *By the end of FY2025, the majority of operational, policy, and budget decisions regarding the Fire Department will be informed by results-oriented performance measures.*
   - **Strategic Issue Impact:**
     - Staffing and Infrastructure
     - Sustainable Funding
     - Data Collection and Analysis
     - Resource Viability
   - **Key Results Ownership: Office of the Chief**
   - **Contributing Performance Group:**
     - Organizational Performance Management

C. *By 2025, the PFD will earn an ICMA certificate of achievement in performance management; by 2026, a certificate of distinction; and by 2027, a certificate of excellence (Issue*
   - Strategic issue Impact:
     - Staffing and Infrastructure
     - Data Collection and Analysis
     - Resource Viability
   - **Key Results Ownership: Office of the Chief**
   - **Contributing Performance Group:**
     - Organizational Performance Management

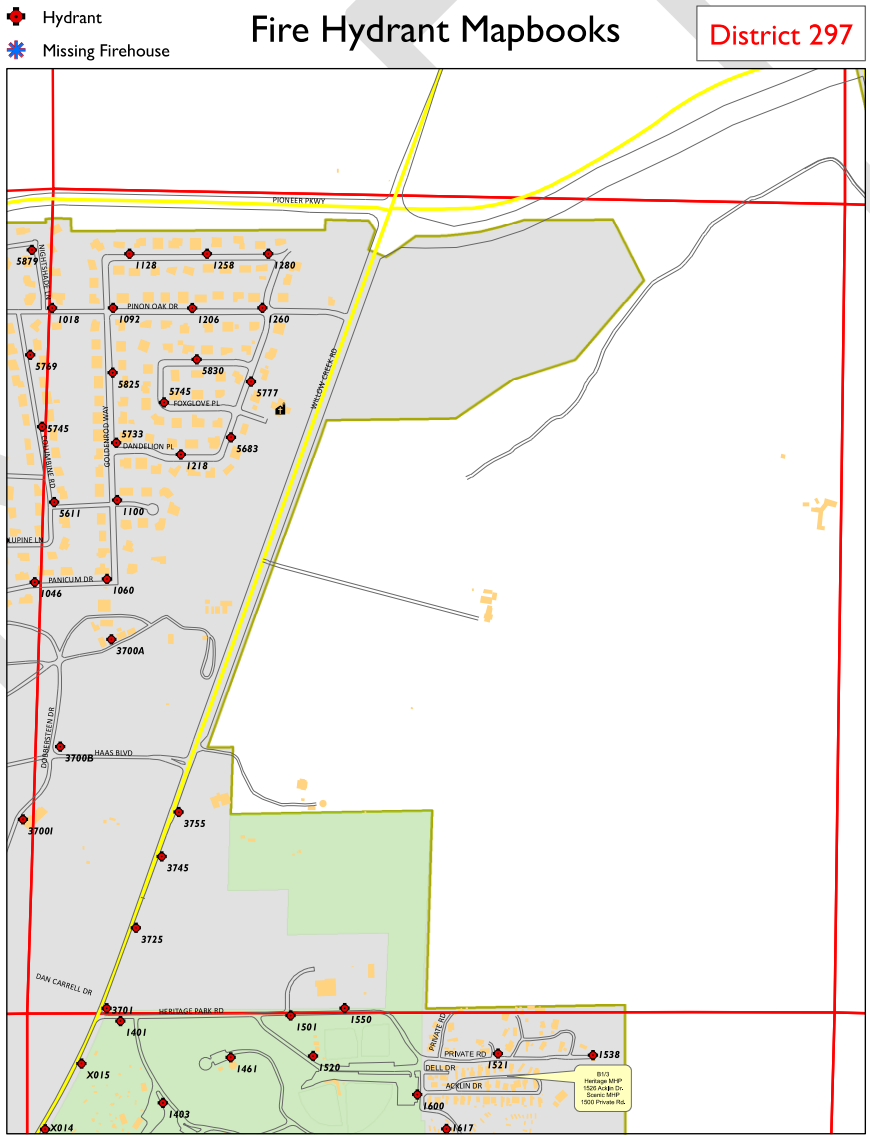
A. *Building on past assessments, and continuing in FY2024, the Community Risk Assessment (CRA) will be conducted, with particular emphasis on wildland fire risk, followed by a mitigation plan to be approved by City Council*
   - **Strategic Issue Impact:**
     - Data Collection and Analysis
     - Community Growth
     - Sustainable Funding
   - **Key Results Ownership: Community Risk Management Section Chief**
   - **Contributing Performance Group:**
     - Organizational Performance Management

Strategic Result 4 - Performance Measurement – Potential Initiatives and Projected Costs[1]			
Initiative	**One Time Cost**	**Ongoing Costs**	**Fiscal Year**
Performance Management Costs	$10,000	$10,000	FY 25
Data Analysis Tools	$100,000	$30,000	FY 26
Dedicated Data Analysis Staffing	$10,000	$110,000	FY 25
Total	**$120,000**	**$150,000**	

[1]Wildfire Risk Mitigation expenses carried in Result 1

No-cost or Existing Initiatives

- IT Collaboration
- Departmental data-informed decision-making



Strategic Result 5: Organizational Culture

Forged by Values/Energized by Vision

The firefighters and civilian staff of the Prescott Fire Department bring strong values and a forward-looking commitment to the work. The department seeks and is committed to creating an organizational culture consistent with and aligned with its members and values, characterized by:

A. *By 2023, members will experience leadership messages, behaviors, and beliefs consistent with our customer-focused culture.*
   - **Strategic Issue Impact:**
     - Staffing and Infrastructure
     - Community Growth
     - Resource Viability
     - Workforce Development
   - **Key Result Ownership: Office of the Chief**
   - **Contributing Performance Group:**
     - Leadership and Management

B. *By the end of FY2024, PFD will establish expectations and support systems for supervisors to reward, manage, and promote organizational values and expectations.*
   - **Strategic Issue Impact:**
     - Workforce Development
     - Employee Development
   - **Key Result Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Employee Development

C. *By the end of FY2025, PFD will evaluate organizational culture through an employee engagement survey that measures adherence to organizational values and expectations.*
   - **Strategic Issue Impact:**
     - Workforce Development
   - **Key Result Ownership: Office of the Chief**
     - Leadership and Management
     - Organizational Performance Management

D. By FY2024, each member and their supervisor will have a conversation about the members contribution to the organizational culture at a 6-month check-in and the annual evaluation.
   Strategic Issue Impact:
     - Workforce Development
   - **Key Result Ownership: Essential Services Section Chief**
   - **Contributing Performance Group:**
     - Employee Development

Strategic Result 5 Organizational Culture – Potential Initiatives and Projected Costs			
Initiative	**One Time Cost**	**Ongoing Costs**	**Fiscal Year**
Internal Communication Enhancements	$5,000	$5,000	FY 24
Organizational Development Initiatives	N/A	$20,000	FY24
Total	**$5,000**	**$25,000**	

No-cost or Existing Initiatives

- Internal Communications (Station Visits, Video Updates)
- Departmental follow-through

Section 4 –Group Performance Measure Worksheets

1.1 Administration Group (Office of the Chief)

***Section Purpose**:* The purpose of the Office of the Chief is to provide strategy planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.

Group Purpose Statement

The purpose of the Administrative Group is to provide financial, budgetary and administrative support services to the Fire Department and the City so they can have the information necessary to make informed decisions.

Administration - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Program Budgets that are on or below budget (tracked quarterly)					
% Invoices above $5,000 paid within 30 days					
% Timesheets submitted in an accurate and timely manner					
% Accounts Receivable invoices issued within 30 days of prior month					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Invoices processed					
# Timesheet reviews conducted					
# Group budget reports delivered					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Invoice payments expected to be requested					
# Group/Program budget reports expected to be requested					
# Of grants administered per fiscal year					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Ratio: Group Expenditures: Department Budget					

% Operational budget supported by grant funding					
% Accounts Receivables collected within 90 days					

Inventory of Core Administration Services and Programs Delivered (32 Services)
• Accounts Payable • Administration Budget • IGA Monitoring Reports (YRMC Base Hospital, Ambulance Transportation, Training) • Airport-Suppression Budget • Annual Reports • Monthly Budget Reports • Capital Budgets • Community Risk Reduction Budget • Customer Invoices/Bills • Emergency Management Budget • Emergency Medical Services (EMS) EMS Budgets (EMS, EMS Assistance, C.P.R. / First Aid) • Facility / Janitorial Cleanings • Fire Auxiliary Corps • Forestry Budget • Grant Applications • Grant Monitoring Reports • Grant Reimbursement Requests • Honor Guard Budget • Hotshot Administration Budget • Off-District Budget (Wildland Fire Assistance) • Office Supply Management • Paid Invoices • Payroll Reporting • Phone / In-Person / Email Responses • Processed Invoices • Essential Services Section (PSD) Budgets • Public Records Request Responses • Purchasing Card Reconciliation • Records Management Reports (Retain, Destroy, Archive) • Standards Compliance Reports • Suppression Budget • Technical Services Budget (TRT, HazMat, Drone) • Vendor Selections

Administration Group Assignments and Budget Overview					
Section Chief: *Fire Chief Holger Durre*			**Group Manager:** *Jaimie Sventek*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

1.2 Leadership and Management (Office of the Chief)

Section Purpose: The purpose of the Office of the Chief is to provide strategy planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.

Group Purpose Statement

The purpose of the Leadership and Management Group is to provide leadership, direction, and communication services to stakeholders so they can live, work, and recreate with confidence in the City's emergency services.

Leadership and Management - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Stakeholders who report they have confidence in PFD					
% Stakeholders who report that open communications are encouraged					
% PFD members who report that direction is given and understood					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Department-Wide Communication Events and Messages Delivered					
# New Policies Developed/Implemented					
# Council Presentations Given					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Public Events and Ceremonies Requested					
# Intergovernmental Meetings and Events Attended					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Ratio - Fire Department Funding ($$): Value of property within the City of Prescott					

Inventory of Core Leadership and Management Services and Programs Delivered (15 Services)

- Ceremonies
- Honor Guard Program
- Charities Support Activities
- City Committee Participations
- Contracts and Agreements

- Intergovernmental Agreements (IGA's)
- Final Personnel Decisions
- Fire Chaplain
- GMIHC Responsibilities (this is the 19 families)
- Interdepartmental Relations Management
- Intergovernmental Relationship Management
- Labor Relations Management
- Leadership Communications
- Policies and Directives
- Presentations
- Reports

Leadership and Management Group Assignments and Budget Overview					
Section Chief: *Fire Chief Holger Durre*			**Group Manager:** *N/A*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

1.3 Research and Development (Office of the Chief)

Section Purpose: The purpose of the Office of the Chief is to provide strategy planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.

Group Purpose Statement

The purpose of the Research and Development Group is to provide project research and planning services to the Prescott Fire Department and City Leadership so they can make informed decisions and implement solutions that position the Prescott Fire Department to continue to deliver safe, efficient, and effective services.

Research and Development - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Of IT Projects Successfully Implemented					
% Of project proposals approved by City Manager and/or City Council					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Of project/research proposals approved by departmental leadership					
# Of new service delivery programs or enhancements proposed to/by departmental leadership					
# Of major IT and research implementation projects in process					
1 Station optimization/location study completed					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Of ad-hoc research or implementation projects expected to be required/requested					
# Response time reduction technology systems expected to be required					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Ratio – Project Management Cost: Total Purchase Price of Project					
Annual cost savings projected of proposed innovations					

Inventory of Core Research and Development Services and Programs Delivered (10 Services)

- Ad-Hoc Management and Group Research Projects
- Best Practices Research Reports

- Fire Code Integrations
- Information Technology (IT) Collaborations
- Information Technology Systems Integrations
- Inter-Departmental Fire Consulting Sessions
- Low Acuity Call Mitigations
- Project Proposals
- Project Research Reports
- Resource Location Plans

Research and Development Group Assignments and Budget Overview					
Section Chief: *Fire Chief Holger Durre*			**Group Manager:** *N/A*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

1.4 Capital Investments (Office of the Chief)

Section Purpose: The purpose of the Office of the Chief is to provide strategy planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.

Group Purpose Statement

The purpose of the Capital Investment Group is to provide stewardship of public funds for strategically positioned public safety facilities, equipment, fleet and technology planning services to residents and taxpayers so they can effectively and efficiently access the City's public safety services.

Capital Investments - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Response times within the Standards of Cover adopted by the City					
% Of project proposals approved by City Manager and/or City Council					
% Residents who participate in public outreach at public safety facilities					
% Stations built on time and within budget					
1st Fire Station Built and Open by January 2025					
2nd Fire Station Built and Open during FY2027					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# of response time reduction technology systems implemented					
# Of new service delivery programs or enhancements proposed to/by departmental leadership					
Training Center Capital plan re-assessed and proposed as a regional cooperative facility					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Of capital construction projects demanded					
# Intergovernmental Meetings and Events Attended					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Ratio - Cost of Multi-Use Investments: Total Capital Investments					

Annual cost savings projected of proposed innovations					

Inventory of Core Capital Investment Services and Programs Delivered (15 Services)
• 5-Year Capital Investment Plans (Approved Expenditure List) • Apparatus • Capital Equipment • Co-location Agreements • Facilities Maintenance • Facility Renovations • New Stations • Station Designs • Apparatus Designs • Project Management Services • Response Time Reduction Technology Systems • Station Renovations • New Apparatus and Fleet Purchasing • Training Center Capital Plan Re-assessments • Training Facility Renovations

Capital Investment Group Assignments and Budget Overview					
Section Chief: *Fire Chief Holger Durre*			**Group Manager:** *N/A*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

1.5 Performance Management (Office of the Chief)

Section Purpose: The purpose of the Office of the Chief is to provide strategy planning and support services to PFD stakeholders so they can have confidence in the implementation and stewardship of public safety resources.

Group Purpose Statement

The purpose of the Organizational Performance Management Group is to provide planning, data collection, analysis, and reporting services to Prescott Fire Department and city leadership, and staff so they can make timely, data-driven decisions.

Organizational Performance Management - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Of key strategic results achieved					
% Of departmental strategic results achieved					
% of program performance reports, including analysis, submitted on time					
Successful CFAI Accreditation Site Visit and Commission approval in FY24					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Strategic business plan performance reports delivered					
# CFAI program accreditation Compliance Reports delivered					
# (Other) performance reports delivered					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Of capital construction projects demanded					
# Intergovernmental Meetings and Events Attended					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Ratio - Performance Management expenditures: Total performance reports delivered					
Annual cost savings projected of proposed innovations					

Inventory of Organizational Performance Management Services and Programs Delivered (9 Services)
• Accreditation Annual Compliance Reports

- CQI / CQA Inquiry Responses
- Department Strategic Plan Reporting
- Digital Document Management Reports
- Mutual & Automatic Aid Agreement Monitoring Reports
- Organizational Effectiveness and Structural Evaluations
- Strategic Business Plan Performance Reports
- Performance Reports (Other)
- Program Accreditation Compliance Reports

Organizational Performance Management Group Assignments and Budget Overview					
Section Chief: *Fire Chief Holger Durre*			**Group Manager:** *Operations Chief Ralph Lucas*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

2.1 Fire Suppression (Emergency Operations Section)

Section Purpose: The purpose of the Operations Section is to provide all-risk response services to the public so they can live, work, and recreate in a safe community.

Group Purpose Statement

The purpose of the Fire Suppression Group is to provide all risk response, incident stabilization and mitigation services to people who live, work and visit the Prescott area so they can live in a safe community supported by consistent, reliable, and timely fire emergency service.

Fire Suppression - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Of fires contained to the room of origin					
% Of wildland incidents contained to the initial complexity					
% of responses provide within turnout time benchmarks					
KEY RESULT - % Call responses provided within the time frames in the Standards of Cover adopted by the City					
% Fires interceded prior to flashover					
Outputs	*FY 2024*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*
# Calls for Service Provided					
Demands	*FY 2024*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*
# Calls for service expected to be requested					
# Intergovernmental Meetings and Events Attended					
Efficiencies	*FY 2024*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*
$ Suppression Expenditure per call for service by response unit					

Inventory of Fire Suppression Services and Programs Delivered (36 Services)

- Bomb Threat Responses
- Broken Water Line Responses
- Burning Aircraft Reponses
- Commercial Structure Fire Responses
- Defective Appliance Responses
- Domestic Violence Responses
- Elevator Rescues
- Explosion Responses

- Fire Alarm Responses
- Fire Extinguishment
- Flooding Responses
- Gas Leak Responses
- Illegal Burn Responses
- Jewelry Removals
- Life Assists
- Lifeline Ambulance Assists
- Line Down Responses
- Lockouts
- Missing Persons Responses
- Off-District Coordination
- Pet Rescues
- Police Assists
- Protection Systems Activation Responses
- Public Assist Responses
- Public Service Assists
- Smoke Detector Battery Changes
- Snake Call Responses
- Snow Removal
- Structure Fire Responses
- Residential Structure Fire Responses
- Trapped Rescue Responses
- Tree Fire Responses
- Vehicle Fire Responses
- Vehicle Locked Out Responses
- Welfare Checks
- Wildland Fire Responses

Fire Suppression Group Assignments and Budget Overview					
Section Chief: *Operations Chief Ralph Lucas*			**Group Manager:** *Shift Battalion Chiefs*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

2.2 Special Operations (Emergency Operations Section)

Section Purpose: The purpose of the Operations Section is to provide all-risk response services to the public so they can live, work, and recreate in a safe community.

Group Purpose Statement

The purpose of the Special Operations Group is to provide hazardous materials mitigation, aircraft emergency response, rope, water, trail and industrial rescue services to people who live, work, and visit the Prescott area so they can work, recreate, and travel safely knowing they are supported by skilled rescue teams.

Special Operations - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
KEY RESULT - % Special Operations responses within the time frames in the Standards of Cover adopted by the City.					
% HAZMAT incidents where adequate numbers of trained personnel are available within the contractually established timelines.					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Confined space entries, utility trench entries, and tower installations and maintenance covered					
# Commercial flight passenger count supported by PFD Special Operations					
# Aircraft rescue firefighting calls for service provided					
# Backcountry lost persons assisted to safety					
# Critical injury backcountry rescue operations completed					
# HAZMAT responses provided					
# Technical Rescues provided					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Commercial passenger flights expected					
# HAZMAT responses expected to be required					
# Technical rescues expected to be requested					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*

$ Expenditures per Special Operation responses					

Inventory of Special Operation Services and Programs Delivered (36 Services)
• Bomb Threat Responses • Broken Water Line Responses • Burning Aircraft Reponses • Commercial Structure Fire Responses • Defective Appliance Responses • Domestic Violence Responses • Elevator Rescues • Explosion Responses • Fire Alarm Responses • Fire Extinguishment • Flooding Responses • Gas Leak Responses • Illegal Burn Responses • Jewelry Removals • Life Assists • Lifeline Ambulance Assists • Line Down Responses • Lockouts • Missing Persons Responses • Off-District Coordination • Pet Rescues • Police Assists • Protection Systems Activation Responses • Public Assist Responses • Public Service Assists • Smoke Detector Battery Changes • Snake Call Responses • Snow Removal • Structure Fire Responses • Residential Structure Fire Responses • Trapped Rescue Responses • Tree Fire Responses • Vehicle Fire Responses • Vehicle Locked Out Responses • Welfare Checks • Wildland Fire Responses

Special Operations Group Assignments and Budget Overview					
Section Chief: *Operations Chief Ralph Lucas*			**Group Manager:** *Special Operations Program Leads*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

2.3 Emergency Medical Services (Emergency Operations)

Section Purpose: The purpose of the Operations Section is to provide all-risk response services to the public so they can live, work, and recreate in a safe community.

Group Purpose Statement

The purpose of the Emergency Medical Services Group is to provide pre-hospital medical readiness, care, treatment, prevention, and education services to people who live, work, and visit the Prescott area so they can experience timely responses to emergency medical calls for service and increased survival rates from preventable death. (Examples: heart attack, stroke, opioid overdose, trauma, cardiac arrest, and other time-sensitive illnesses)

Emergency Medical Services - Family of Measures						
Results	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Medical emergency responses provided per the Standards of Cover adopted by the city by risk category						
% Customers experiencing preventable deaths who survive						
% Cardiac arrest patients discharged from the hospital with no neurological deficits						
% Customers experiencing improved conditions after Prescott Fire Department arrival						
Outputs	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# EMS calls for service provided						
Demands	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# EMS calls for service expected to be requested						
Efficiencies	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Expenditure per call for service						

Inventory of Emergency Medical Services and Programs Delivered (27 Services)

- 'Stop the Bleed' Training Classes
- Active Shooter Responses
- AED Community Consultations
- AED Community Training Classes
- AED Monthly Checks

- ALS Services Medical and Trauma Responses
- Babysitter Training Classes
- Backcountry EMS Responses
- Behavioral Services
- BLS Services Medical and Trauma Responses
- Communicable Disease Responses and Services
- Community Paramedicine
- Continuing Education Classes
- CPS & First Aid Community Classes
- Emergency Medical Responses
- EMS Instruction Training Classes
- EMT Certification Classes
- Hospital Liaisons
- Infectious Disease Plans
- Life Pack Annual Maintenance Checks
- LUCAS Device Annual Maintenance Checks
- Mass Casualty Responses
- Paramedic Certification Classes
- Quality Improvement Assessments
- Recertification Services
- SWAT Medic Responses
- Transport Services Medical and Trauma

Emergency Medical Services Group Assignments and Budget Overview					
Section Chief: *Operations Chief Ralph Lucas*			**Group Manager:** *Captain Dave Haskell*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

2.4 Readiness and Logistics (Emergency Operations Section)

Section Purpose: The purpose of the Operations Section is to provide all-risk response services to the public so they can live, work, and recreate in a safe community.

Group Purpose Statement

The purpose of the Ready-to-Respond Group is to provide and maintain personal protective gear, tools and equipment to our first responders so they can respond to and mitigate the community's calls for service in a safe and timely manner.

Readiness and Logistics Group - *Family of Measures*					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Responses provided within the Standards of Cover adopted by the City					
% Firefighters who have decontaminated and well-maintained personal protective gear consistent with industry standards					
% Time front line vehicles and apparatus are in service (measured in hours)					
% Fire Department apparatus which exceed mileage and years of service industry standards					
# Tools and equipment which exceed standards set by the manufacturer					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Annually required tools, equipment and apparatus inspections completed					
$ Cost of annually required tool, equipment and apparatus inspections					
$ Spent on repairs of PFD apparatus					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Cost of apparatus repairs expected to be required					
$ Cost of tools, equipment and inspections expected to be required					
# Annual tool, equipment and apparatus inspections expected to be required					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Repair and maintenance expenditures per apparatus					

Inventory of Special Operation Services and Programs Delivered (37 Services)
• Apparatus Maintenance Reports • Apparatus-based Equipment • Chain Saw Repairs • Communications Infrastructure • Dispatch Liaison • Dispatching Services • Employee Portal • Employee Staffing Levels Coordination • EMS Supplies • Equipment Inventories • Equipment Surplus Inventory • Extinguisher Testing and Maintenance Sessions • Fleet Coordination Services • Fleet Management Services • Headsets • Image Trend • Janitorial Services • Ladder Testing Sessions • Mobile Data Computers (MDC's) • Office Supply Orders • Personal Protective Equipment • PPE Supplies • Pump Testing Sessions • PX Trax Software System • Red NMX Software System • SCBA Repairs • SCBA Testing • Station Maintenance Services • Station Repairs • Station Supplies • Supply Management • TeleStaff Services • Turnouts • Uniform Supplies • Uniforms • Vehicle Maintenance • Wildland Firefighting Supplies

Readiness and Logistics Group Assignments and Budget Overview					
Section Chief: *Operations Chief Ralph Lucas*			**Group Manager:** *Captain Chad Dougan*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

21 Risk Reduction and Planning Services (Community Risk Management)

Section Purpose: The purpose of the Community Risk Management Section is to provide proactive risk identification, mitigation, and management services to people who live, work, and visit the Prescott area so they can enjoy a safe, resilient, and economically vibrant community.

Group Purpose Statement

The purpose of the Risk Reduction and Planning Services Group is to provide community services to residents and visitors of Prescott and surrounding communities so they can experience reduced risk to life and property due to unplanned incidents.

Risk Reduction and Planning Services - Family of Measures

Results	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
Fire death rate against the 20-Year average						
KEY RESULT - % Change in unplanned/unexpected fire events						
% Public education training participants who gain in their understanding and awareness per pre and post assessments						
% Change (in tons) of fuels removed						
% Fire investigations that result in a known cause being determined						
Outputs	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Fire inspections conducted						
# Plan reviews conducted						
# Public education sessions/presentations delivered						
# Chipping sessions provided						
# Acres treated (fire mitigation)						
# Tons of debris removed (fire mitigation)						
# Fire investigations conducted						
Demands	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Acres expected to be identified for fire mitigation						
# Tons of debris expected to be removed (fire mitigation)						

# Fire investigations expected to be demanded						
# Fire Inspections expected to be demanded						
# Plan reviews to be expected						
# Public education sessions/presentations expected to be requested						
# Chipping sessions expected to be requested						
Efficiencies	*FY 2023*	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Group expenditure per fire inspection conducted						
$ Group expenditure per acre treated (fire mitigation)						
$ Group expenditure per ton of debris removed (fire mitigation)						

Risk Reduction and Planning Services and Programs Delivered (33 Services)
• Group Services 3rd Party Plan Reviews (Contracted Services) • Assessments • Chipping Sessions • Code Analysis/Reviews (IFC, Commentary and Amendments) • Code Development & Adoptions • Code Enforcements • Commercial Burn Permits • Residential Burn Permits • Community Protection Plans • Department Assists • Emergency Operations Plan Reviews • Fire Board of Appeals Presentations • Fire Investigations • Follow-Up Assessment Reports • Fuel Reduction Projects • Hazardous Materials Management Plans • Hazardous Tree Removals (City-wide) • Industry Partner Code Consultations • Inspections • Plan Reviews • Pre and Post Inspections • Pre-Plans • Public Appearances • Public Education Events • Public Education Groups

- Public Education Sessions/Presentations
- Regional Fuels Coordination
- Regulatory Compliance – Inspections
- Response Maps
- Snow Removals
- Target Hazard Inspections
- Threat and Hazard Identification and Risk Assessment (THIRA)
- Wildland Urban Interface Plans

Risk Reduction and Planning Services Group Assignments and Budget Overview					
Section Chief: *Deputy Chief Tom Knapp*			**Group Manager:** *N/A*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

3.2 Emergency Management (Community Risk Management)

Section Purpose: The purpose of the Community Risk Management Section is to provide proactive risk identification, mitigation, and management services to people who live, work, and visit the Prescott area so they can enjoy a safe, resilient, and economically vibrant community.

Group Purpose Statement

The purpose of the Risk Reduction and Planning Services Group is to provide community services to residents and visitors of Prescott and surrounding communities so they can experience reduced risk to life and property due to unplanned incidents.

Emergency Management Group - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% City of Prescott Departments that implement Continuity of Operations/Government Plans					
% City of Prescott Departments that train personnel on their emergency management roles on an annual basis.					
% Residents that access the City of Prescott's proactive emergency communications					
KEY RESULT - Annual Assessment of *community connectedness*, which is a key predictor of resilience and recovery, will be assessed annually.					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Policies and procedures					
# Identified public events with a developed and communicated incident action plan					
# Training classes and exercises provided					
# Key Emergency Management Plans and documents reviewed annually (and updated every 5 years)					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Identified public events expected to require an incident action plan					
Gap analysis for emergency management training needs					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*

Group expenditure per Prescott daily population					

Inventory of Emergency Management Group Services and Programs Delivered (20 Services)
• City Designated Emergency Management Function Designations • City Emergency Management Plan Updates • City-County Intergovernmental Agreement • Communications Protocols • Community Recovery Plans • Continuity of Operations Plan Updates • Disaster Declarations • Disaster Reimbursements • Emergency Event Exercises • Emergency Management Training Events • Emergency Preparedness Guide • Essential Persons Designations • Incident Management Logistics • Incident Management Team (IMT's) Participation • Interdepartmental Communications • Liaison to State, County, Local Agencies • Public Communications • Public Emergency Communications • Public Event Incident Action Plans (IAP's) • Yavapai County Sheriff / City Memorandum of Understanding (MOU)

Risk Reduction and Planning Services Group Assignments and Budget Overview					
Section Chief: *Deputy Chief Tom Knapp*			**Group Manager:** *Fire Chief Holger Durre*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

3.3 Community and Public Information Group (Community Risk Management)

Section Purpose: The purpose of the Community Risk Management Section is to provide proactive risk identification, mitigation, and management services to people who live, work, and visit the Prescott area so they can enjoy a safe, resilient, and economically vibrant community.

Group Purpose Statement

The purpose of the Communication and Public Information Group is to provide informative, educational and outreach services to our community and the surrounding areas so they can be informed, take necessary action, and understand the value of essential services provided by the Prescott Fire Department.

Community and Public Information Group - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Surveyed respondents who report that they are informed about the activities of the Prescott Fire Department					
% Public event requests that are fulfilled by Prescott Fire Department					
% Prescott residents, visitors, and businesses able to receive applicable emergency notifications					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Followers/subscribers					
# Press releases provided					
# Events conducted/communicated					
# Engagements					
# Social media followers					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Events expected to be requested # Engagements expected to be requested # Social media followers expected to sign up					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Group expenditure per follower/subscriber					

Inventory of Community and Public Information Services and Programs Delivered (12 Services)
• Community Events • Emergency Notifications • Event and Conference Materials • Media Inquiry Responses • Media Interviews • Press Relations / Sessions • Public Service Announcements (PSA's) • Public Education Events • Public Relations / Sessions • Social Media Postings • Station Ride Alongs • Station Tours

Community and Public Information Group Assignments and Budget Overview					
Section Chief: *Deputy Chief Tom Knapp*			**Group Manager:** *Division Chief Scott Luedeman*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

4.1 Training and Skills Development Group (Essential Services Section)

Section Purpose: The purpose of the Essential Services Section is to provide professional and wellness development services to employees so they can succeed in their career paths and beyond.

Group Purpose Statement

The purpose of the Training and Skills Development Group is to provide new and continuous specialized training and instructional services to our employees and partner agencies so they can deliver effective emergency services to our community.

Community and Public Information Group - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Employees that meet the required monthly (20) hours of training per national standards					
% Recruits that successfully complete the Prescott Fire Department Training Academy					
% Employees that meet OSHA and state-mandated training requirements					
% Employees in each rank qualified to act in the position above them					
% Of the force with increased task performance year over year					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Specialized training classes that are conducted offsite					
# Specialized training classes that are conducted offsite					
# MCS Tests conducted					
# In-house training classes attended					
# External training classes attended					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# In-house training classes expected to be requested					
# MCS tests expected to be requested					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Group expenditure per department employee					

Inventory of Training and Skills Development Services and Programs Delivered (32 Services)
1. Contracts for Services (Training) 2. Apparatus and Equipment In-Service Classes 3. Cardiac Monitor Classes / Trainings 4. Continuous Education / Certification Maintenance Sessions 5. CPR / 1st Aid Classes 6. Driver Trainings 7. EMS Certification / Re-Certification Classes 8. EMS Classes 9. EMS Recruitment Training Classes 10. Engine Company Trainings 11. Fire Wise Assessor Training Coordination 12. New-Hire Mentorships 13. Minimum Company Standards 14. Online Training Classes 15. National Wildland Coordinating Group (NWCG) Classes 16. Partner Agency Training Sessions 17. Physical Fitness Certs 18. Position Task Books 19. Prescott Area Regional Training Committee Planning Sessions 20. Probation Tests 21. Public Education Classes 22. Quarterly Joint Training CAFMA, Groom Creek, Williamson Valley 23. Rescue Certifications 24. Ride Alongs 25. Safety Classes 26. Safety Committee Representations 27. Self-Contained Breathing Apparatus (SCBA) Training Sessions 28. Special Operations Training Sessions 29. SWAT Medic Training Sessions 30. Training Academies 31. Training Records 32. Training Scheduling / Coordination

Training and Skills Development Group Assignments and Budget Overview					
Section Chief: *Division Chief Scott Luedeman*			**Group Manager:** *N/A*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

4.2 Health and Safety Group (Essential Services Section)

Section Purpose: The purpose of the Professional Support Section is to provide professional and wellness development services to employees so they can succeed in their career paths and beyond.

Group Purpose Statement

The purpose of the Health and Safety Group is to provide physical, mental, and preventive services to Prescott Fire Department members and their families so they can experience a healthy and safe work environment and culture.

Health and Safety Group - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% of time missed in Fire Suppression due to injury / illness					
Firefighter work related injury rate					
% Employees that meet OSHA and state-mandated training requirements					
% Firefighters working no more than 400 hours overtime annually					
% Firefighters indicate on FOCUS Safety Survey they are experiencing stress, burnout, or anxiety					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Injury prevention classes provided					
# Health & safety assessments conducted					
# Counseling/coaching sessions provided					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Injury prevention classes expected to be required					
# Health and safety assessments expected to be required					
# Counseling/coaching sessions expected to be requested					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Health & safety expenditures per Member					

Inventory of Health and Safety Group Services and Programs Delivered (33 Services)
• Air Quality Monitoring • Annual Fit for Duty Exams • Benefit Shield Insurance Coverages • Cancer Awareness Resources • Cancer Screenings • Clean Cab Procedures • Clean PPE Standards • Decontaminations • Exhaust Exposure Prevention Measures • Exposure Reports • Fire Ground Rehab Services • FIT Testing • Fitness Equipment • Health & Safety Surveys • Individual Member Needs Assessments • Injury Prevention Classes • Injury Rehab Services • Injury Reports • Mental Health Contract Services • Mental Health Resource Outreaches • Mental Health Resources • Nutrition Classes • Operational Safety Procedures • Overhaul Air Tests • P.T. Recruit Classes • Peer Counseling/Coaching Sessions • Peer Support Services • Physical Fitness Classes • Physical Fitness Standards • Physical Training Services • Safety Assessments • Station Assessments • Substance Use Treatments Sessions

Health and Safety Group Assignments and Budget Overview					
Section Chief: *Division Chief Scott Luedeman*			**Group Manager:** *Battalion Chief Jeff Moffitt*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

4.3 Employee Development Group (Essential Services Section)

Section Purpose: The purpose of the Professional Support Section is to provide professional and wellness development services to employees so they can succeed in their career paths and beyond.

Group Purpose Statement

The purpose of the Employee Development Group is to provide community services to residents and visitors of Prescott and surrounding communities so they can experience reduced risk to life and property due to unplanned incidents.

Employee Development - Family of Measures					
Results	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
% Open positions where the requisite number of "qualified" applicants will reach the Chief's panel for all recruitment and promotional opportunities					
% Open positions where the requisite number of "qualified" applicants will reach the Chief's panel for all recruitment and promotional opportunities					
% Employees who are meeting benchmarks as defined in their career development plan					
% Surveyed employees who report that the conversation they had with their supervisor at the 6-month check-in was meaningful					
% Each member and their supervisor will have a conversation about the members contribution to the organizational culture at a 6-month check-in and the annual evaluation on time					
% Applicant pools where there are at least X qualified applicants					
Outputs	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Career path classes conducted					
# Non-career path development classes conducted					
# Counseling/coaching sessions provided					
# 6-month evaluations conducted					

# Employees that participate in career path classes					
Demands	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
# Career path classes expected to be conducted					
# Non-career path development classes expected to be requested					
# 6-month evaluations expected to be required					
# Employees expected to sign up for career path classes					
Efficiencies	*FY 2024*	*FY 2025*	*FY 2026*	*FY 2027*	*FY 2028*
$ Group expenditure per department employee					

Inventory of Employee Development Services and Programs Delivered (21 Services)
• 6-Month Check-Ins • Annual Reviews • Career Development Plans – PTBs • Career Path Classes • Crew Evaluations • Disciplinary Actions • Educational Leave Classes • Employee Development Sessions • Employee Development Plans • Employee Promotions • Employee Retention Initiatives • Internal Investigations • New Employee Development Plans • New Hire Testing(s) • Non-Career Path Classes • Performance Evaluations • Promotional Testing • Recruitments • Shift Biddings • Staffing Management Rosters/Plans • Station Assignments

Employee Development Group Assignments and Budget Overview					
Section Chief: *Division Chief Scott Luedeman*			**Group Manager:** *Melissa Fousek (Collaboration with HR)*		
Budget Year	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Total	$	$	$	$	$

Appendix A – Service Partner Analysis

Accomplishment of Strategic and Key Results is not accomplished without seeking out and maintaining cooperative relationships with strategic service partners. The list below describes the type of relationship, formality of the relationship, and their level of participation in decision making related to the PFD's ability to perform. These partners should be actively engaged in helping the PFD maximize efficiencies where possible. This list is not all-inclusive and meant to be a living document.

Prescott Fire - Key Strategic Service Partners								
	Type	Partner's Impact on PFD's Ability to Achieve Key Results	PFD's Impact on Partner's Ability to Achieve Key Results	Emergency Response Partner	Emergency Management Partner	Provides Services to PFD	Regulatory or Contractual Partner	Financial Relationship
City Council and Mayor	Legislative/Policy	High	High		✓		✓	✓
City of Prescott City Manager's Office	City Department	High	High		✓	✓	✓	✓
City of Prescott Human Resources Department	City Department	High	High		✓	✓	✓	
City of Prescott Finance Department	City Department	High	High		✓		✓	✓
City of Prescott Clerk	City Department	High	High		✓	✓	✓	✓
City of Prescott IT Department	City Department	High	High	✓	✓	✓	✓	✓
City of Prescott Public Works Department	City Department	Moderate	Low		✓	✓	✓	
City of Prescott Fleet and Facilities	City Department	High	Moderate		✓	✓		✓
City of Prescott Police/PRCC	City Department	Moderate	Moderate	✓	✓	✓	✓	✓
City of Prescott Community Development Department	City Department	Moderate	Moderate	✓	✓	✓	✓	✓
Central Arizona Fire and Medical Authority	Regional Fire Department	High	High	✓	✓	✓	✓	✓
Center for Public Safety Excellence	Fire Service Accrediting Body	High	N/A			✓	✓	✓
AMR of Arizona	Transport Provider	High	High	✓	✓	✓	✓	✓
Local 3066	Professional firefighters' association	Moderate	Moderate					
AZ State Fire Chiefs	Fire service association	Moderate	Moderate	✓	✓	✓		✓
Granite Mountain IHC Learning and Tribute Center	Non-profit Educational	Moderate	High				✓	

Appendix B – 2019 Stakeholders

- Frank Almendarez, Yavapai Regional Medical Center
- Amore Cianciola, Hassayampa Inn
- Greg Ellingham, Findlay Buick GMC
- Sandy Griffis, Yavapai Co. Contractors Assn.
- Bert Ijams, Meals on Wheels
- Hojat Askari, Thumb Butte Medical Center
- Matthew Phillips, U.S. Vets
- Henry Reyes, Re/Max Mountain Properties
- Lori Sells, Lori Sells Insurance Services, LLC
- Laura Wilson, West Yavapai Guidance Clinic
- Parshalla Wood, Investments
- Bob Betts, PAWUIC
- Mike Gjede, US Air Force (ret.)
- David Klever, Citizen
- Scott Orr, Media
- Michael Orr, PAWUIC
- James Peña, PFD Academy
- Wayne Sutterfield, Citizen
- Richard Unkenholz, Citizen
- Lori Burkeen
- David Haskell
- Shane Arrollado
- Pete Nigh
- Cory Moser
- Dan Morgan
- Jordan Pluimer
- Jeff Moffitt
- Nate Malm
- Jason Beyea
- Scott Luedeman
- Ralph Lucas III
- Don Devendorf
- Dan Bauman
- Isiah Keeme
- Miles Graybill
- Marsha Collier
- Jeff Archer
- Troy Steinbrink Nate Seets
- Dennis Light, Fire Chief

Appendix C – Community Risk Assessment/Standards of Cover

Maintained as a Separate Document

Appendix D – Advanced Strategy Center Final Report

Maintained as a Separate Document