Local Climate Action Options for the Quad Cities Region

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.*

1. Water Resources
2. Wildfire Protection, Healthy Forests and Grasslands
3. Flooding
4. Energy Use
5. Agriculture & Land Use
6. Community & Organizational Capacity-Building

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.

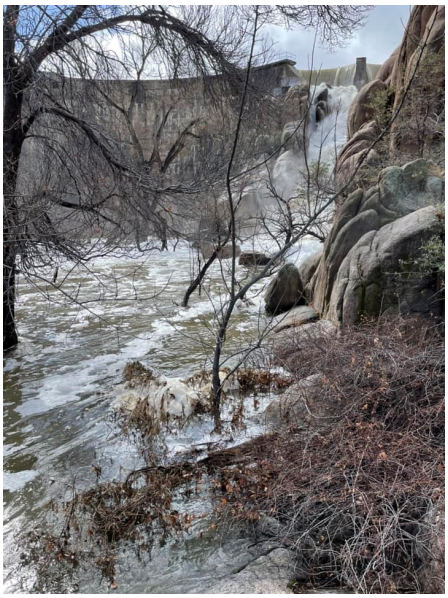
e. Focus attention on vulnerable populations (including livestock and pets, when evacuation is necessary) to be impacted by increased wildfire risks (as well as higher temperature impacts).

[1] 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 and 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.