

Arizona Runs on Water

Water Conservation Approaches

McMillan Bank & Hotel- 1900



Ca. 1890. Photo Credit: Northern Arizona University Cline Library [NAU.PH.676.8]



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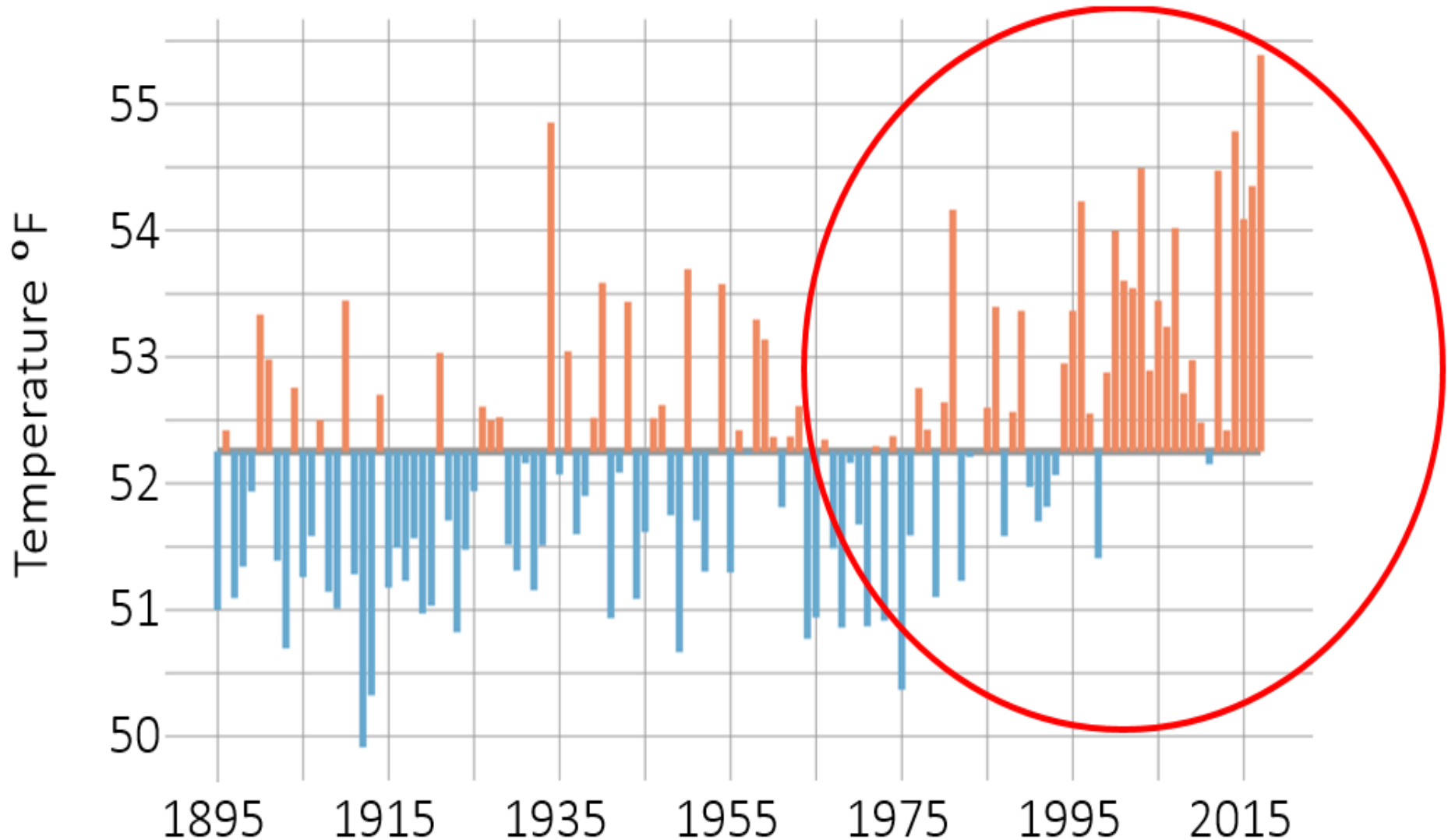


University of Arizona
Water Resources Research Center
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Northern Arizona is impacted too


Average Annual Temperature: Coconino County: 1895 - 2017



A thing of the past?

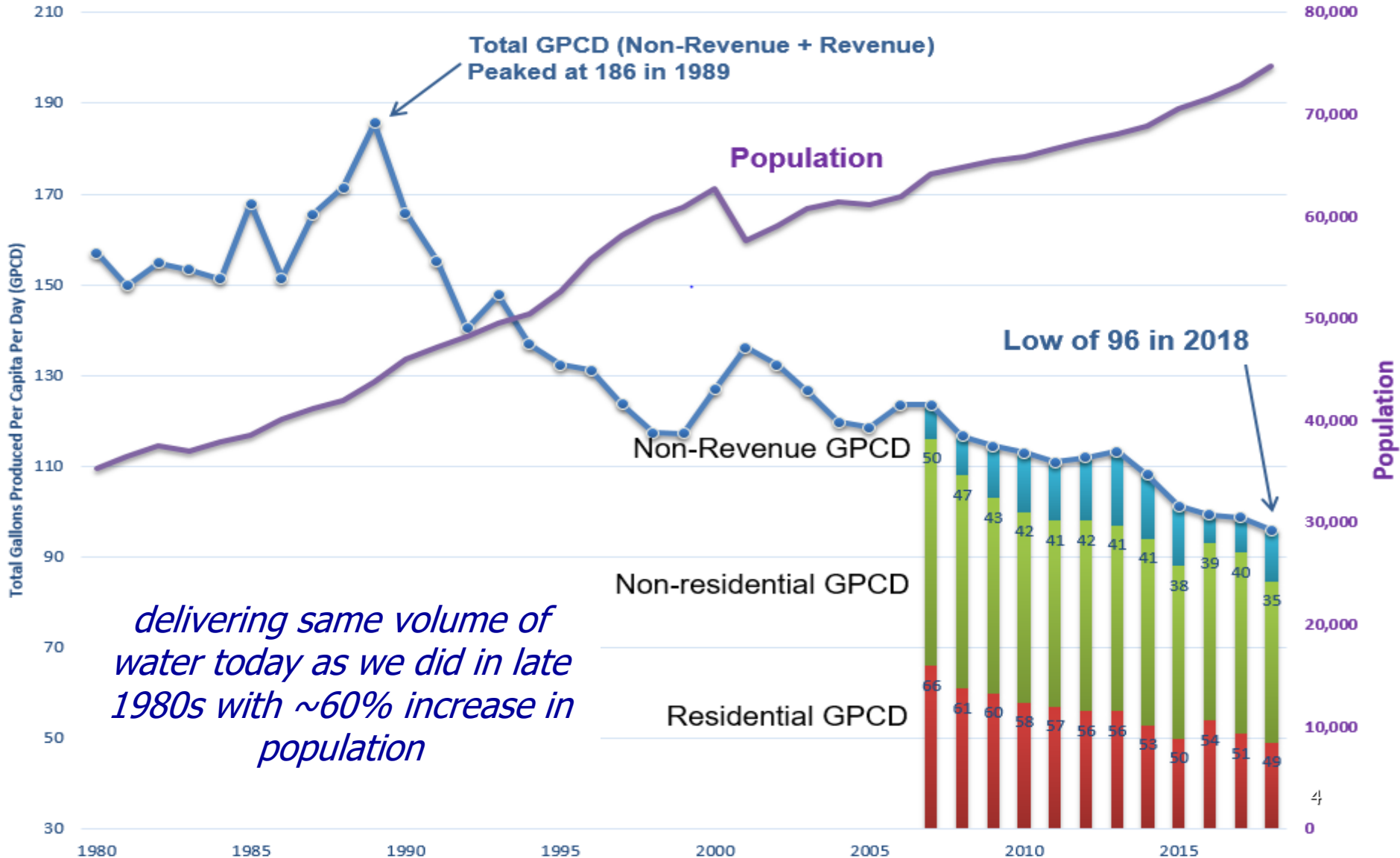
Upper Lake Mary constructed in 1941
16,300 AF storage or ~3 years of water

2019 - 25% full
2017 - 100% full
2010 - last time
5x in last 30 years

A wide-angle photograph of a concrete dam with water cascading over its spillway. The dam is situated in a natural setting with a dense forest of evergreen trees in the background. The sky is clear and blue. The foreground shows a rocky and grassy bank. The water is a brownish color, likely due to sediment. The dam has a small structure in the middle of its spillway.

Most Cities have this same story

Water use trends through 2018



Old Paradigms are shifting

...phrases like....

We are delivering same volume of water today as in 1980s, despite ~60% increase in population

or

Metric of TOTAL GPCD 96 / Residential only 49

or

1 AF/year of water = enough for 5 homes in Flagstaff

Are no longer "Good Enough" for our community, they want to do more



New Paradigm

City Council and Community Driven

Policy Questions being asked on Water Conservation
(its not just about supply augmentation anymore)



"How low Can we go?"

"How low Should we go?"



Water Resource Planning

We are all doing this, but...

Step 1. Supply Alternatives

- Stormwater
- Water Conservation
- Reuse Advanced Treatment
- Local Groundwater
- Red Gap Ranch
- Colorado River Water

Step 2. Studies & Analysis

Updated Water Resources Master Plan

City of Flagstaff
Water Supplies Development

**TECHNICAL MEMORANDUM -
WATER SUPPLY ALTERNATIVES
COSTS**

FINAL | October 2017

Step 3. Community Input & Decision



Water Conservation

- Low hanging fruit almost done, what's next?
 - Retrofitting hotels & other non-residential
- Conservation Strategic Plan: Quantitative analysis of further conservation opportunities
- Reclaimed Water no longer a conservation tool (conversion of use from potable), but a water supply (direct potable reuse)



Water Conservation

- Quantitative Analysis
 - Deploying Decision Support System tool
 - Goal of developing of future new conservation scenarios that the community could employ



Water Conservation

- Quantitative Analysis
 - Considering total volume of new water saved, \$/gallon and other factors such as: *conservation targets & goals, end water uses, plumbing fixture types (SF, MF), market penetration,, staff time to implement, cost benefit of each new program, enforcement requirements...*



What is Flagstaff going to do about it?

This Climate Action and Adaptation Plan will guide the Flagstaff community in preparing for climate risks, reducing greenhouse gas emissions, and protecting the wellbeing of residents for decades to come.

OUR GOALS

Reduce greenhouse gas emissions by **80%** by 2050, compared to the 2016 emissions baseline.

Make sure that our neighborhoods, resources and economy are more resilient to climate change impacts.

Address climate change impacts in a manner that prioritizes those most impacted.

To meet these goals, we are taking action across sectors:



9 equity considerations will guide the Plan and ensure it is accessible to the entire Flagstaff community.

The Climate Action and Adaptation Plan will be updated every **5** years



How will the City's recently adopted Climate Action & Adaptation Plan influence our water conservation decisions moving forward?



Hotter temperatures

- Longer and hotter summers
- Difficulty for sensitive populations and those without air conditioning
- Increased risk of disease or illness from mosquitoes and other pests



Less snowpack

- More rainfall instead of snowfall
- Increased flooding of infrastructure and buildings from more intense rainstorms
- Increased risk of post-wildfire floods



Less healthy forests

- Increased wildfire risk for local forests
- Increased damage from forest pests due to hotter temperatures and drought-stressed trees



Drier conditions

- More severe drought conditions as temperatures rise
- Lower water quality of reservoirs

Equity Checklist identifying key considerations

Mitigation v. Adaptation

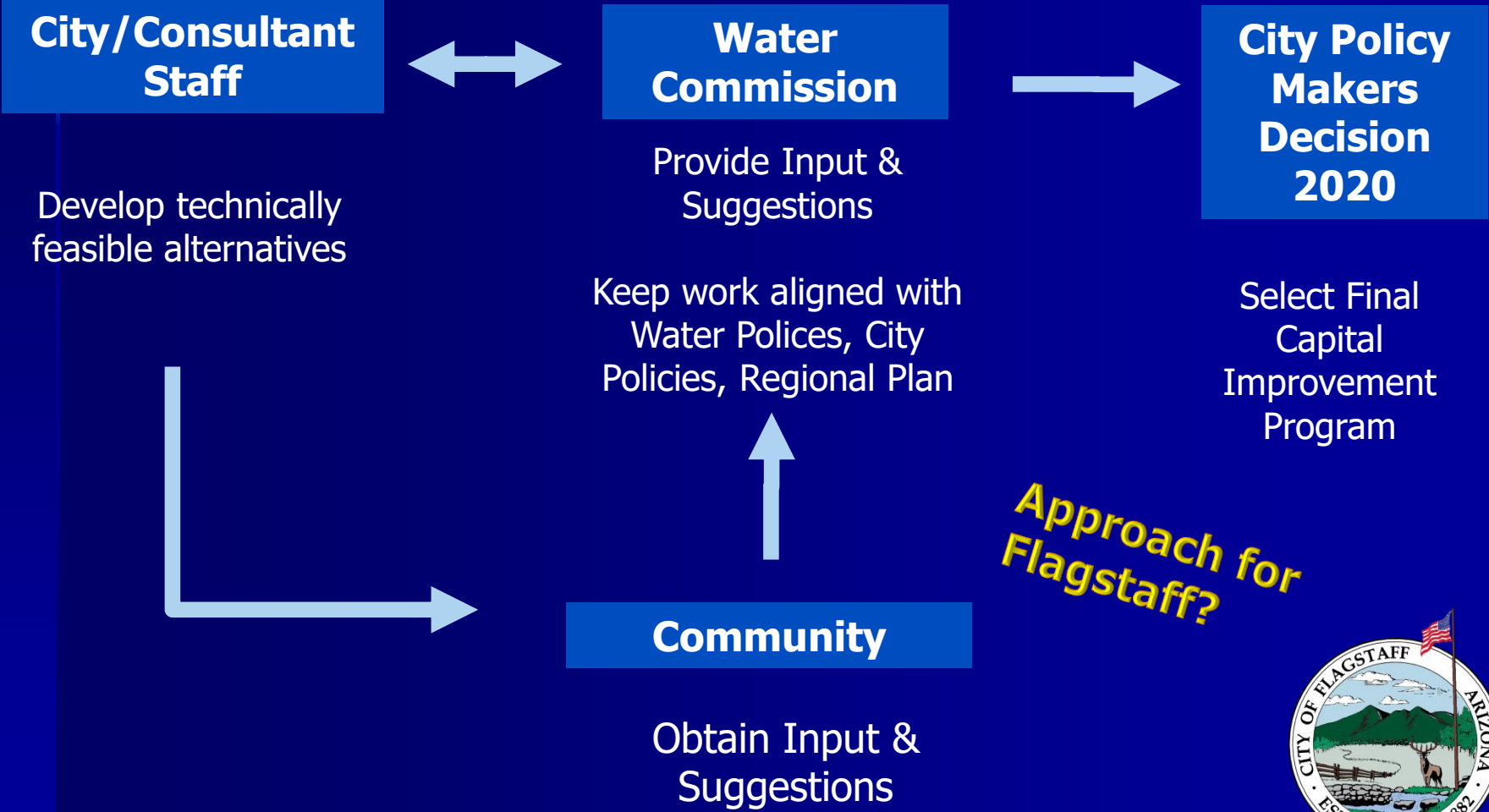
Disproportionate Impacts regarding water rates on businesses that inherently use more water and will they be penalized or should we mitigate?

Accountability to ensure vulnerable, low income populations are not disproportionately be harmed?

Engagement of public stakeholders in ways that are culturally sensitive & involved in implementation



Listening to the Community



Approach for Flagstaff?



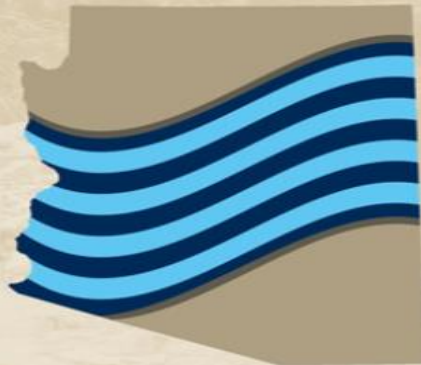


New Paradigm in times of impending shortage?

Community-based Solutions

"How low Should we go?" with additional conservation





ARIZONA RUNS ON WATER™

Scarcity, Challenges,
and Community-based
Solutions



COLLEGE OF AGRICULTURE & LIFE SCIENCES
COOPERATIVE EXTENSION
**WATER RESOURCES
RESEARCH CENTER**



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QUESTIONS?

