

# Resilient Strategies for an Uncertain Water Future in Flagstaff, Arizona

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# Flagstaff, Arizona

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Incorporated in 1894

Population 64,000

Elevation 7,000 ft (2130 m)

Largest contiguous  
Ponderosa Pine forest in  
the world

Tourism, education and  
government based  
economy



# The Billion Dollar Question?

How can we reduce our vulnerability and build resilience to climate variability and climate related disasters?





# Forest Vulnerability – 2010 Schultz Fire

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- Burned 23.5 square miles
- Well/pipeline located on USDA
- Severe monsoonal runoff/erosion damaged the Inner Basin pipeline
- City lost oldest and most economical water source
- Pipeline relocation and reconstruction cost millions
- Linked vulnerability of natural systems with infrastructure









# Resiliency and Preparedness

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The events of 2010 forced us to ask:

1. How vulnerable are our operations, infrastructure and economy to climate related disasters?
2. Where does the City lack sufficient capacity to adapt to climate variability?
3. What are the risks if we do not act?



# Strategy #1

## Resiliency and Preparedness Study 2012

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2012 completed Resiliency and Preparedness Study that identified key vulnerable planning areas in need of adaptive strategies: Forest Management, Water Resources, Water Infrastructure, etc.

Collaborative process with multi-agency participation

Identified actions that:

- Protect water supply and watershed

- Maintain safe infrastructure

- Maintain safe mobility in and out of city

- Remember uncertainty in planning decisions

- Strong emergency management

- Incorporate sustainability principles into decisions





# Strategy #2

## Flagstaff Watershed Protection Project 2012

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November 2012 city voters approved a \$10 million bond (74% approval)

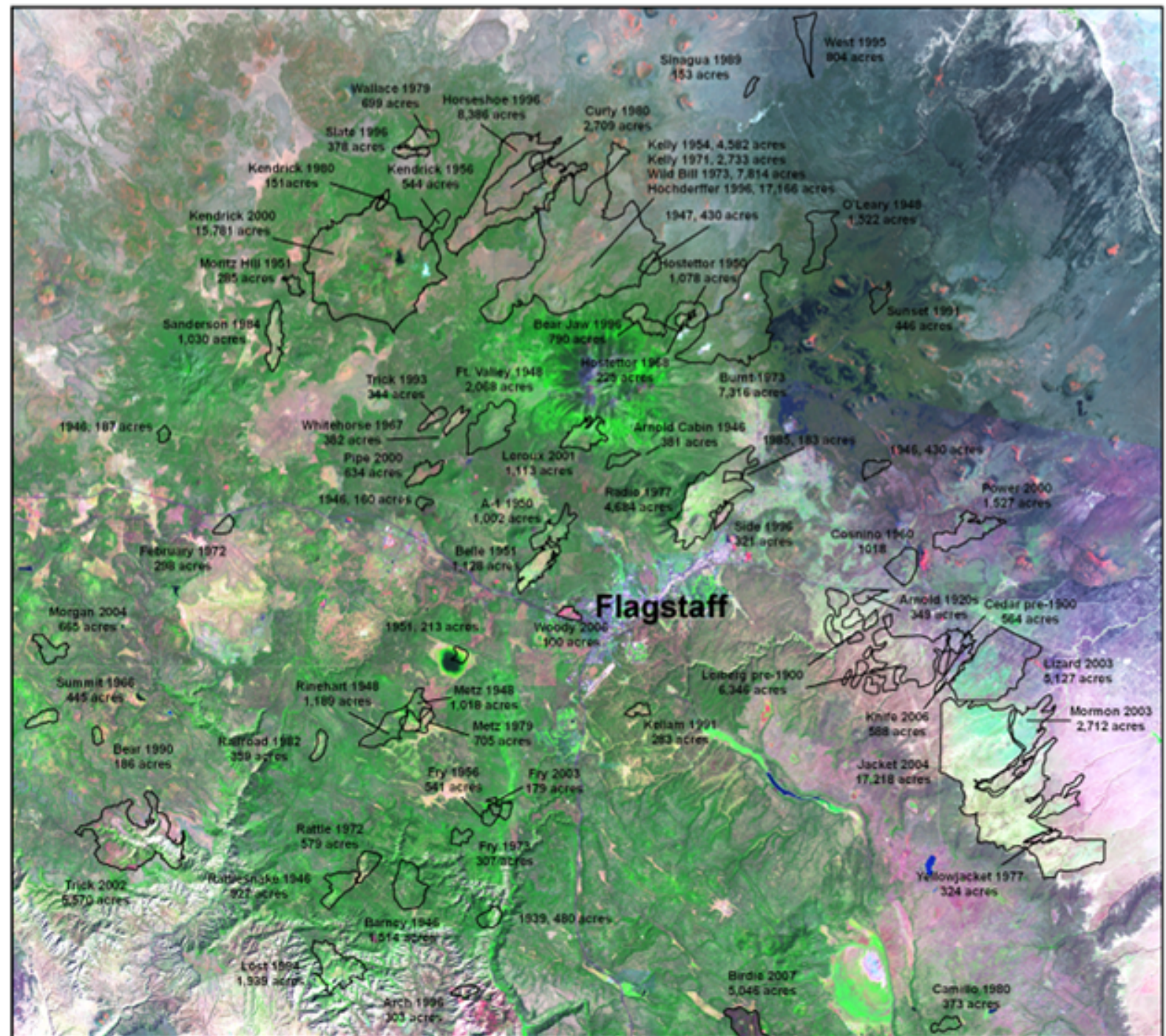
FWPP is designed to reduce the risk of severe wildfires and subsequent post-fire flooding in critical watersheds (that provide up to 50% of the City's drinking water)

Multiagency partnerships – City of Flagstaff, US Forest Service, State of Arizona, Northern Arizona University, Greater Flagstaff Forest Partnership, Navajo Nation and Coconino County



# Fires of the Flagstaff Region

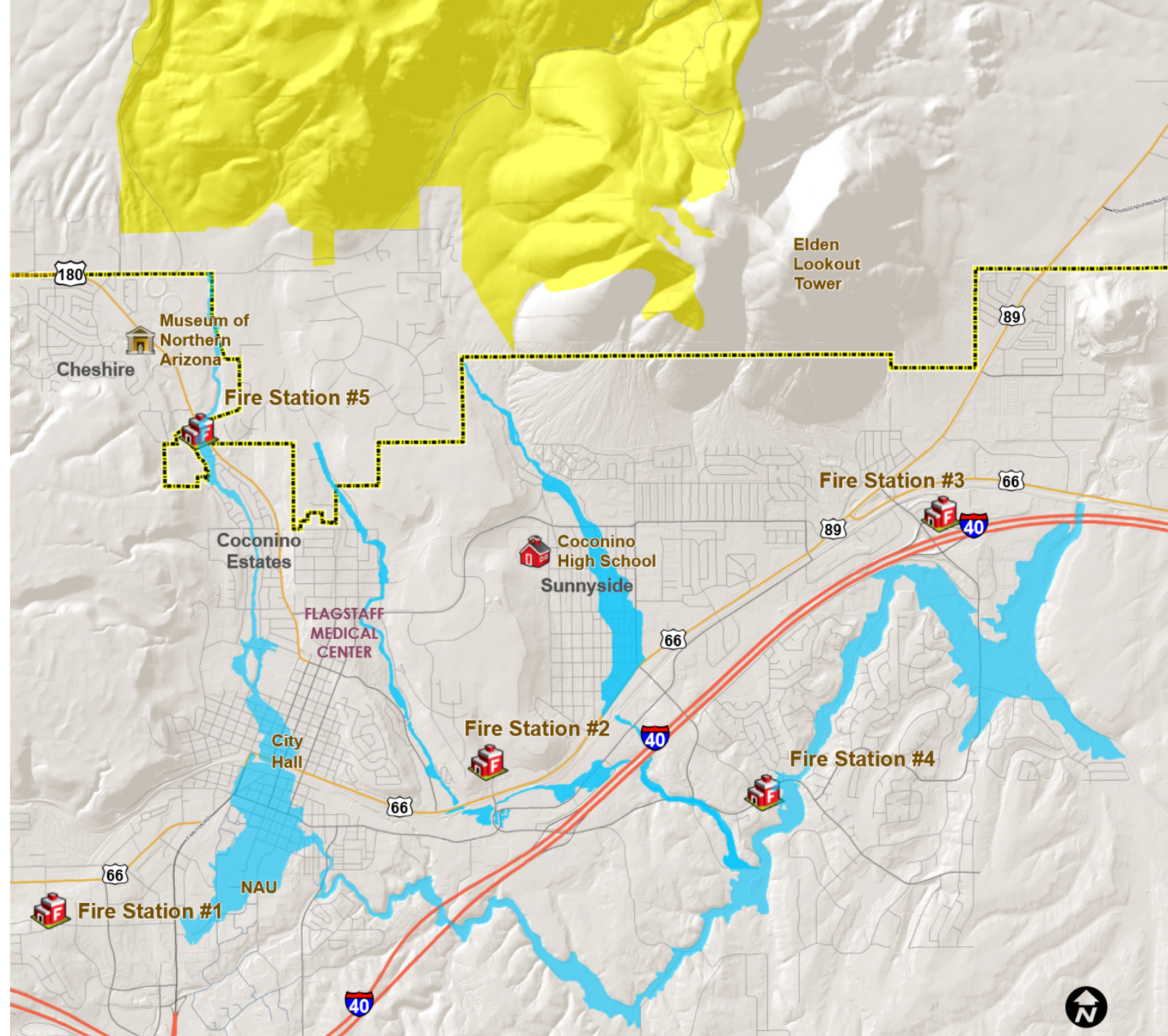
Fires are increasing in intensity, size and economic impact.





# Projected Flood Impacts on Flagstaff

Severe wildfires result in impacts to water supplies, water quality, and water and road infrastructure.





# Strategy #3

## Flagstaff Regional Plan 2014

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Flagstaff Regional Plan adopted in May 2014 incorporates Climate Change and Adaptation Goals and Policies (for the 1<sup>st</sup> time)

Plan drafted by stakeholder committee and vetted through a collaborative process

### *Policy 1: Reduce greenhouse gas emissions*

Encourage the reduction of all energy consumption

Promote investments that strengthen climate resiliency



# Strategy #3

## Flagstaff Regional Plan 2014

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*Policy 2: Strengthen Community and natural environment resiliency through climate adaptation efforts*

Develop and implement a proactive approach to minimize the impacts of climate change

Invest in forest health and watershed protection measures

Increase the regions preparedness for extreme weather events



# Strategy #3

## Flagstaff Regional Plan 2014

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*Policy 3: Integrate available science into policies governing the use and conservation of Flagstaff's natural resources*

Assess vulnerabilities and risks of Flagstaff's natural resources

Develop water use policies that attempt to integrate current best projections of climate change effects on the Colorado Plateau's water resources and emphasize conservation





# Adaptive Strategies – How Are We Doing?

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*#1 Resiliency and Preparedness Study* – Resolution adopted by City Council supporting outcomes, division level vulnerability assessments, updates to Engineering Standards (asphalt), stormwater projects, and ConserveToEnhance (C2E)

*#2 FWPP* – 1,000 acres of City owned land treated, NEPA complete for treatment areas on US Forest Service lands, treatments to begin in 2016

*#3 Regional Plan* – Voter approved plan provides justification to elected officials, trickle down impacts on Zoning Code, Engineering Standards and neighborhood scale plans





Thank you

**Nicole A. Woodman**

nwoodman@flagstaffaz.gov

928.213.2149

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