MAY 8, 2026

Adaptation Planning for a New Era: Why Every Utility Needs a Resilience Strategy

FROM WILDFIRES TO EARTHQUAKES—BUILDING SYSTEMS THAT CAN WITHSTAND WHAT'S NEXT

ROOM 315



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Agenda

- Objective
- WA Climate Impacts and Projections
- Process of Adaptation Planning
- Closing
- Q&A

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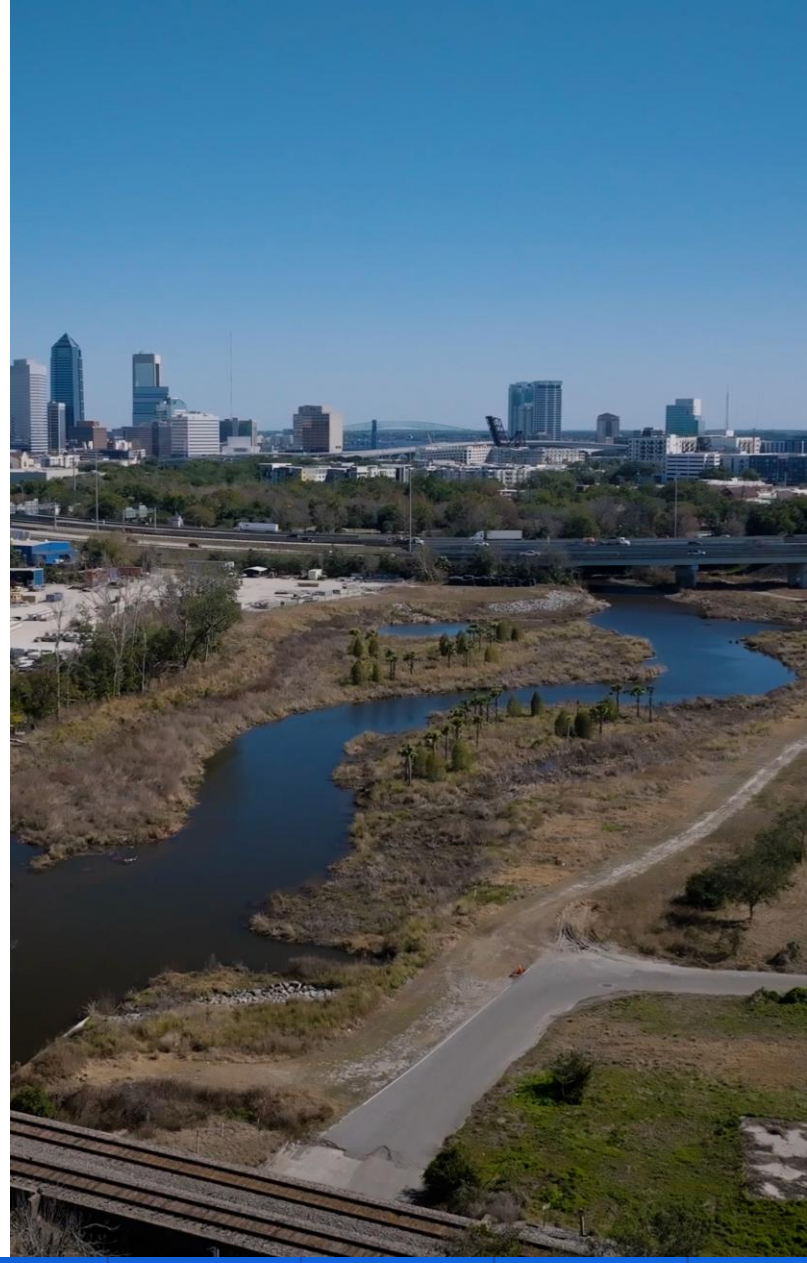
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Presentation Objective

Adaptation planning is critical for a resilient water business

Target Outcomes:

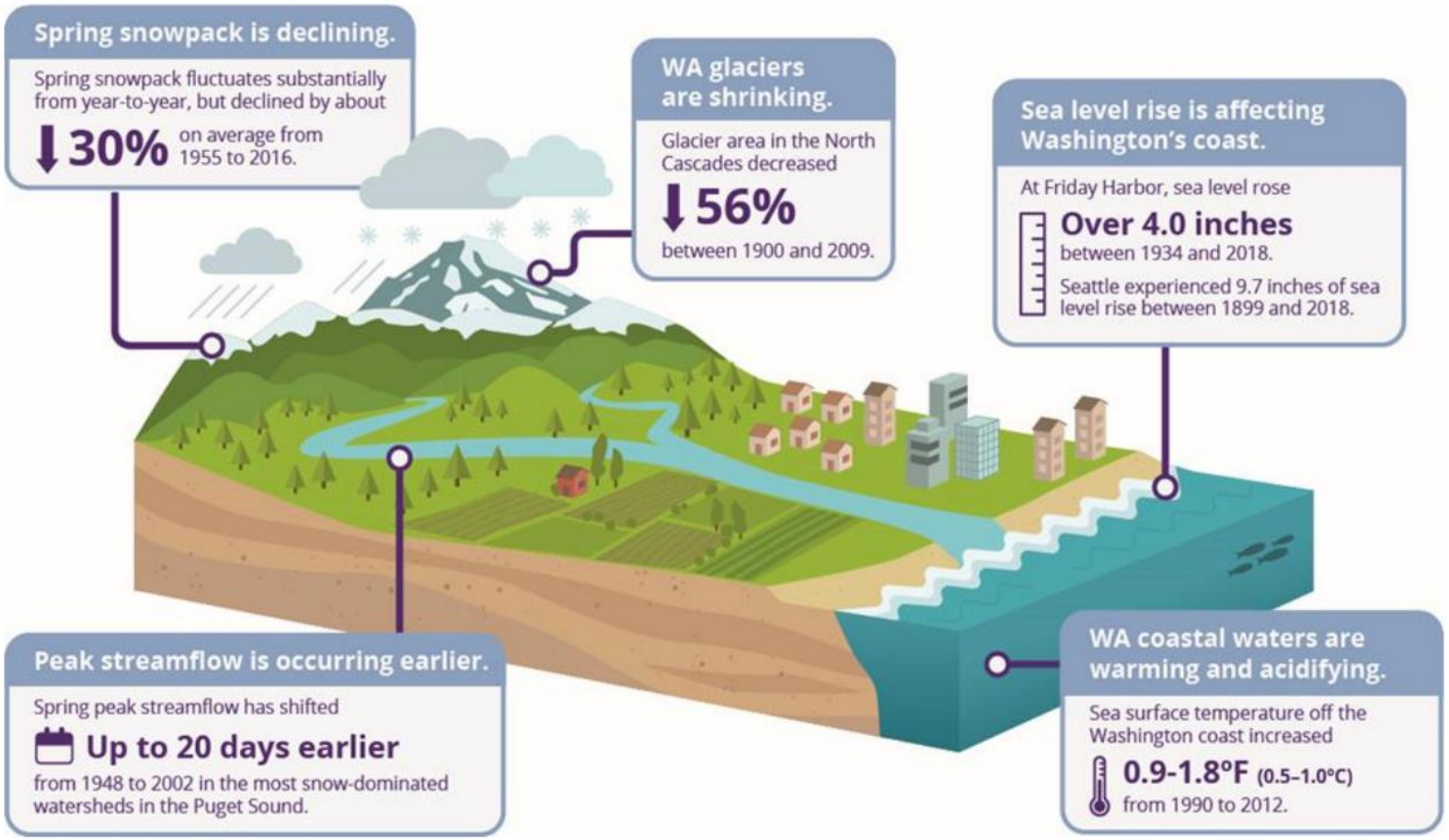
- Ensure a safe, reliable, high-quality water supply
- Deliver strong customer service
- Ensure financial stability



WA Climate Impacts and Projections

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Climate impact data must be localized to be impactful



When communicating with stakeholders, visualization is key.

The PNW water year of 2025 shows strain on water supply

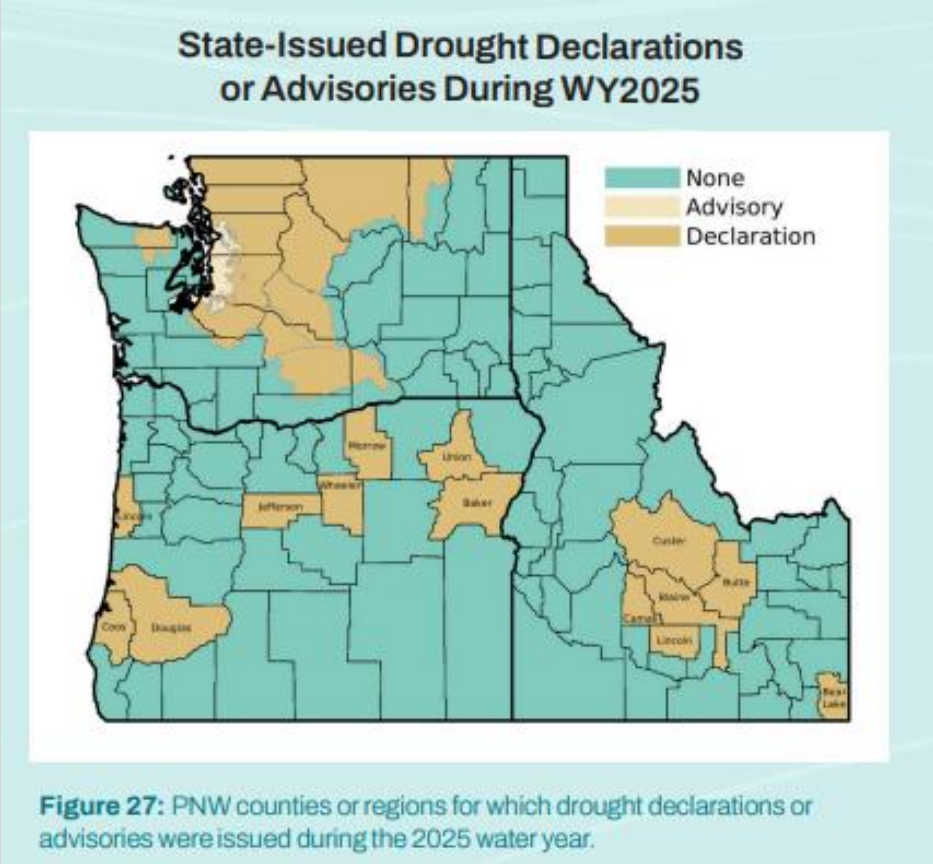
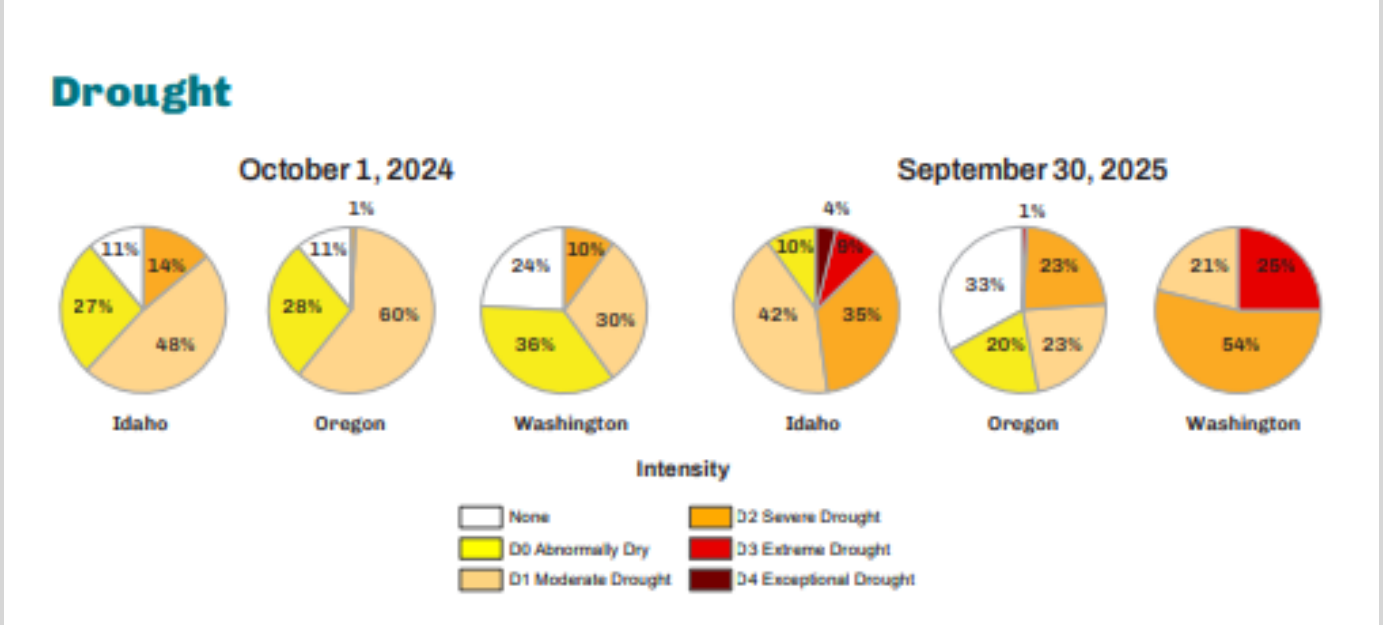


Figure 27: PNW counties or regions for which drought declarations or advisories were issued during the 2025 water year.



Drought conditions worsened substantially during water year 2025 across Washington, northern and southeastern Idaho, and western Oregon.

Heat is an emerging threat

Statewide Summer (JJA) Temperature Trends

- Statewide warming observed across both summer maximums and summer minimums
- Minimums have warmed more than twice as much since 1895
- Warming trend in minimums is significant for nearly every station statewide; not the case for maximums yet.

Summer Maximums (daytime)
↑ 1.42°F

Summer Minimums (nighttime)
↑ 3.35°F

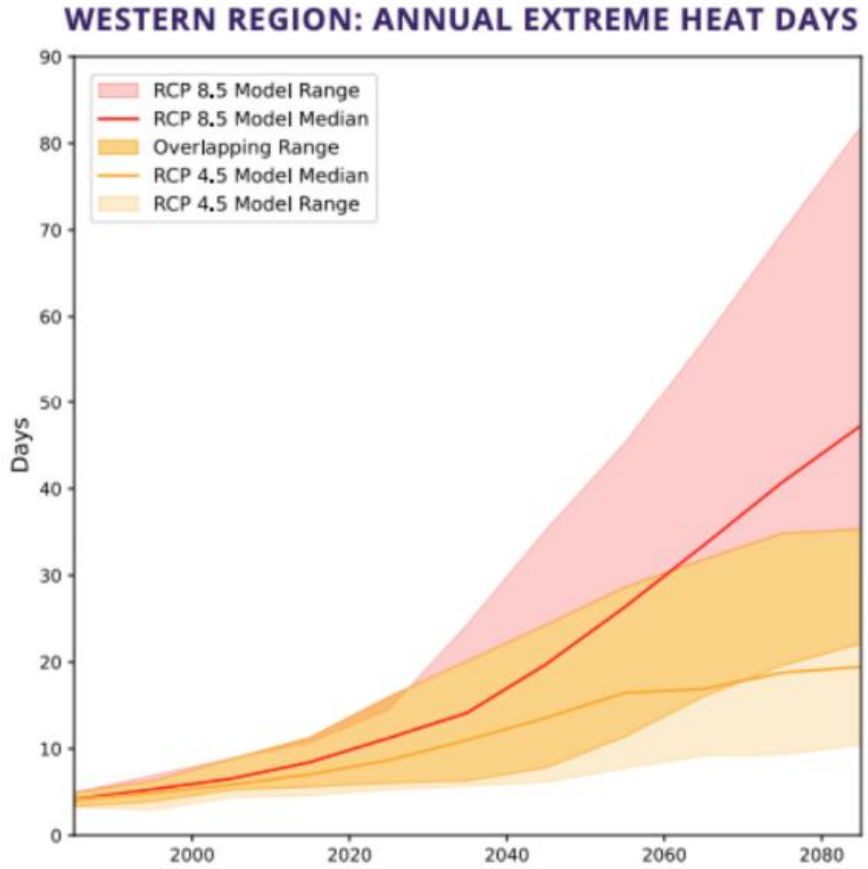
Source: Front and Centered

WASCO

Higher summer nighttime minimums mean it's harder to cool at night and recovery is a bigger issue.

Extreme heat impacts water supply and customer behavior

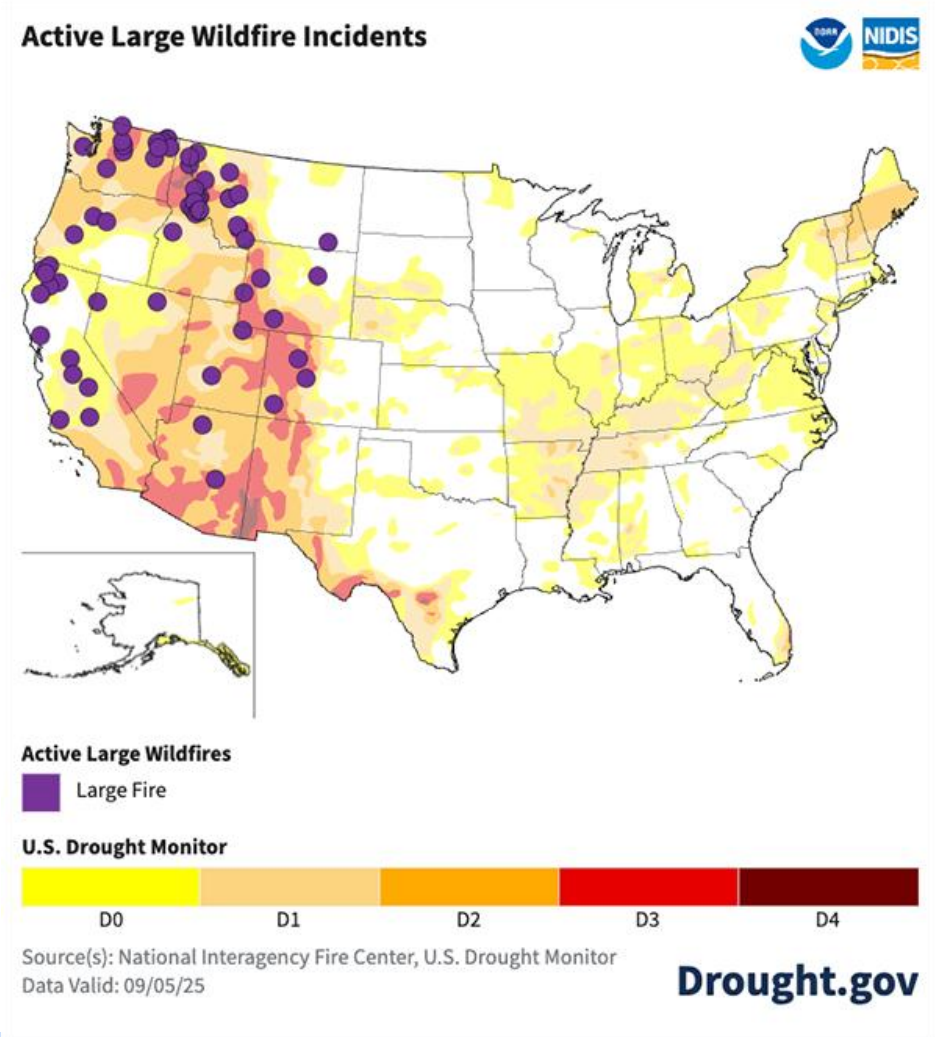
More frequent extreme heat days can lead to greater frequency and severity of heat waves. This can lead to increased energy demand and decrease in water supplies during prolonged periods of extreme heat.

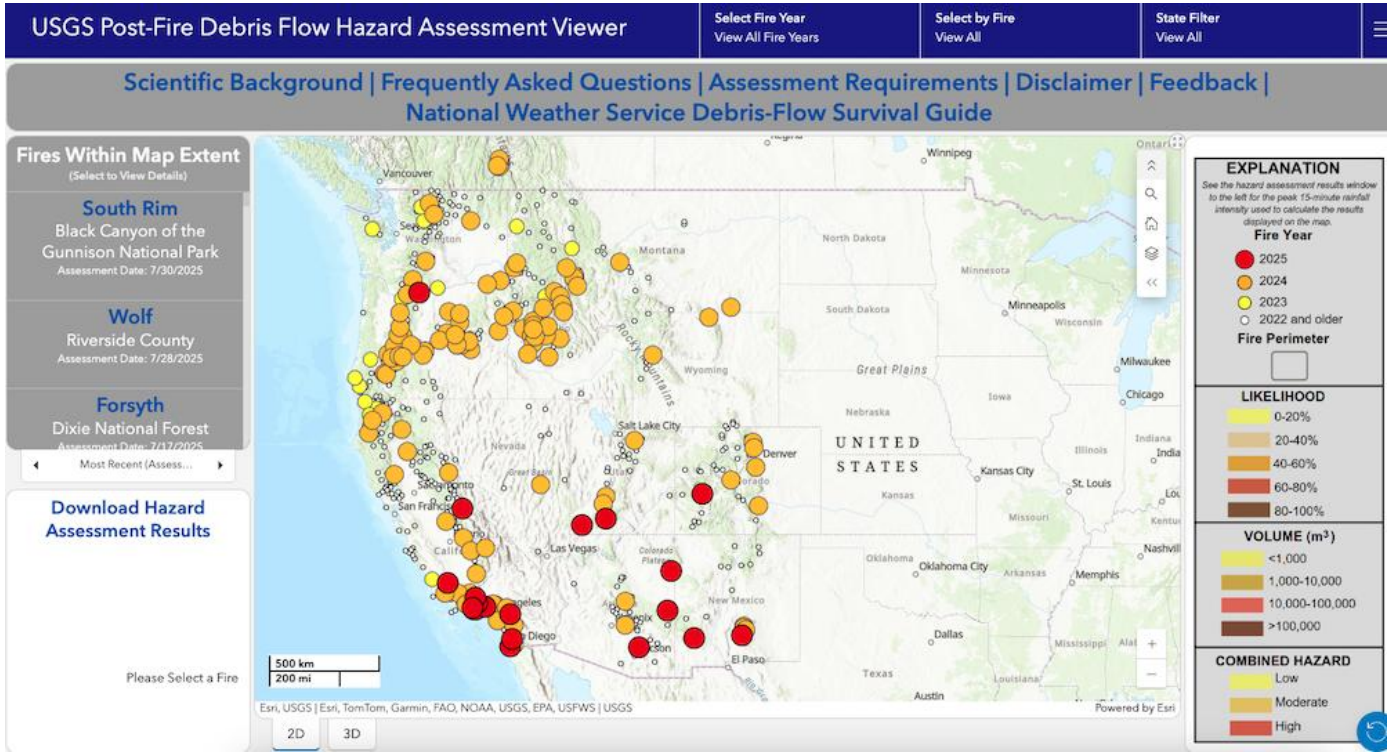


Data from CMIP5.
Source: In the Hot Seat (CIG)

By the 2050s, there will be between 17-27 extreme heat days on average for western Washington (up from 3 between 1971 and 2021).

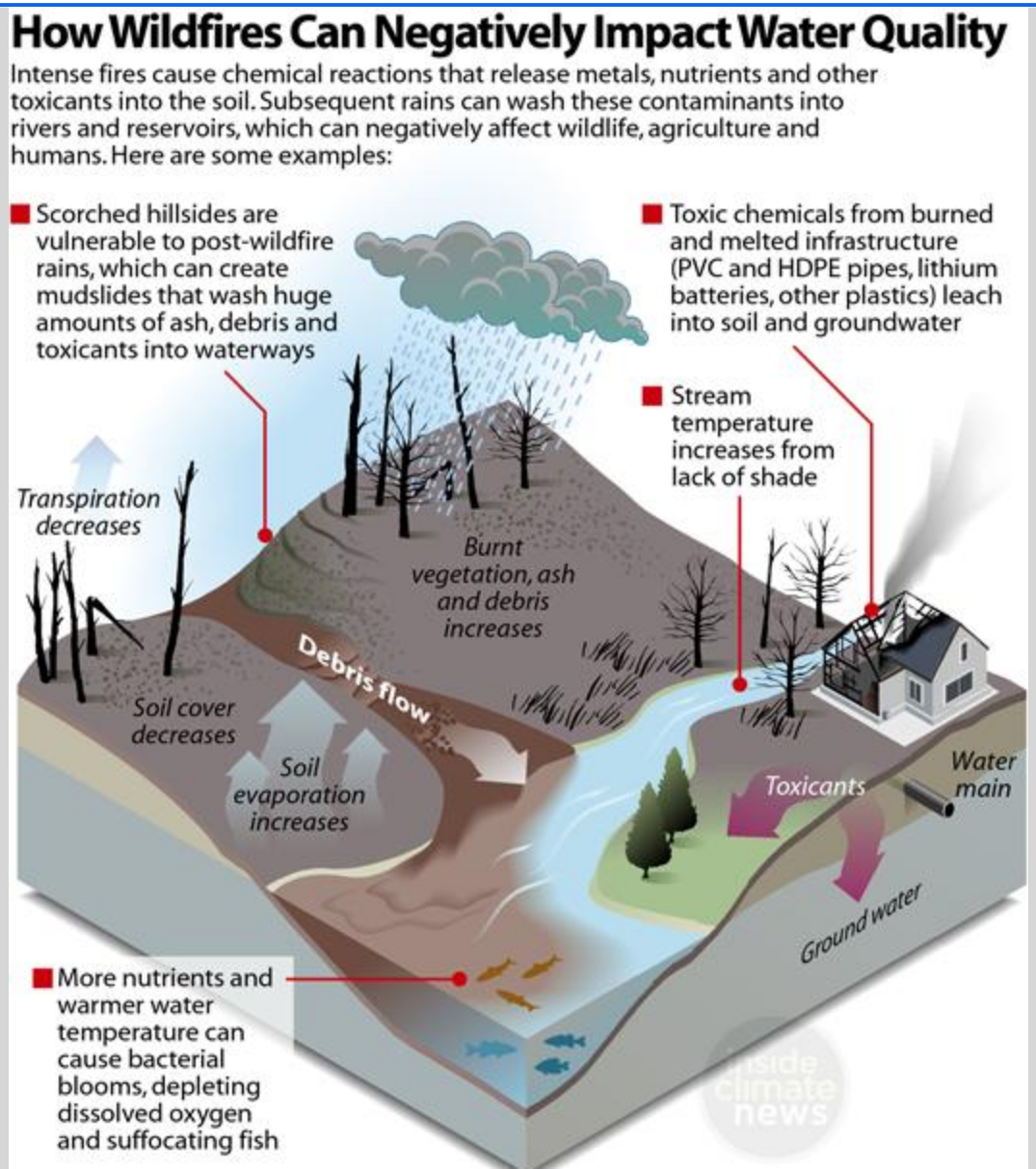
Wildfires in the Pacific Northwest have been immense in recent years.





Climate change will bring warmer and drier conditions that will likely lead to larger wildfires, droughts and insect outbreaks that stress our forests

Planning needed to mitigate wildfire impacts on water systems



Frontline communities face the greatest risk

An Unfair Share: Exploring the Disproportionate Risks from Climate Change Facing Washington State Communities



Community listening sessions helped identify the ways that community members perceive climate risks, providing critical input to the structure and content of this report.



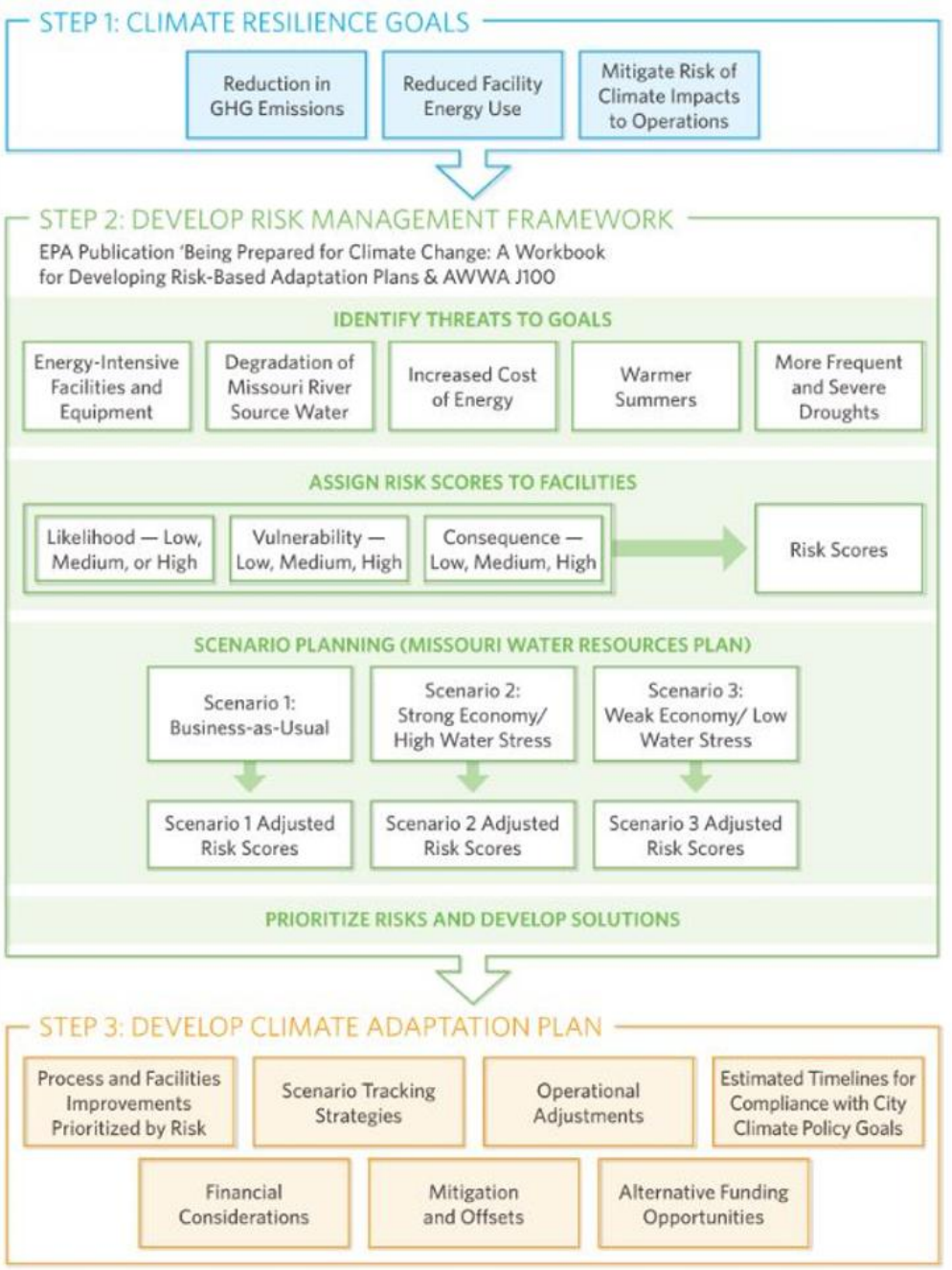
Source: Front and Centered

People of color, indigenous peoples, and people with lower incomes face greater risks from climate change.

Process of Adaptation Planning

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Risk Management Framework

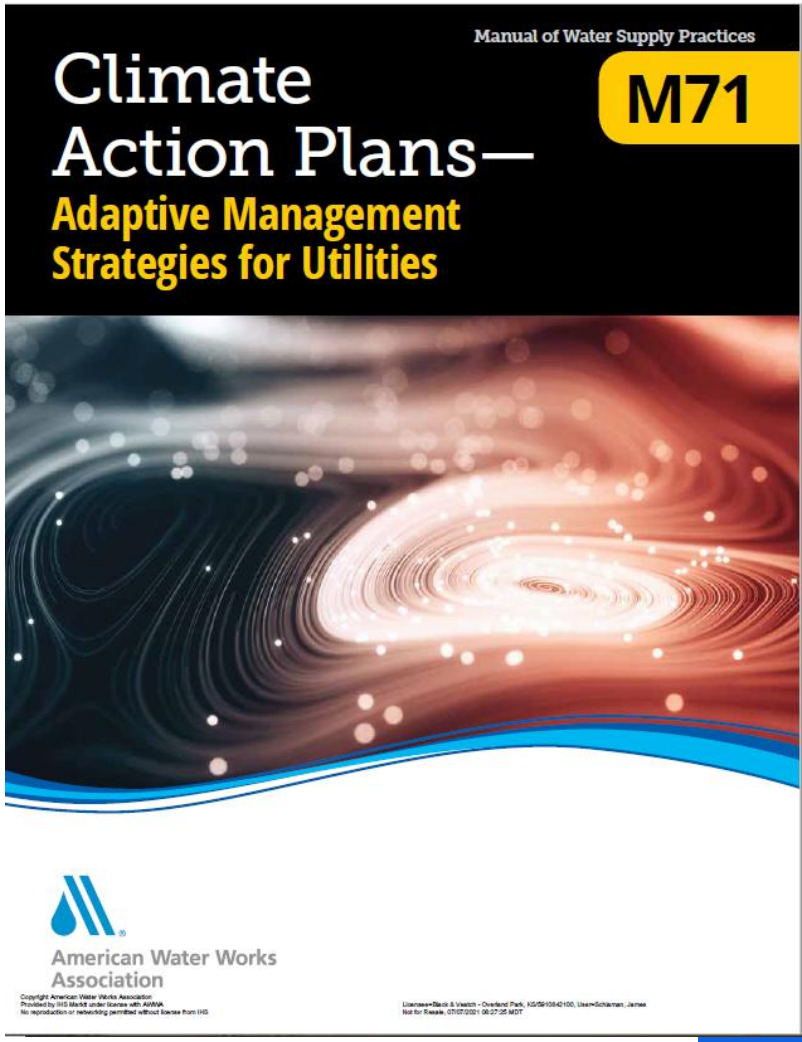


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Climate impacts are felt by all utility stakeholders: customers, employees, board

- Water Quantity Effects
- Water Quality Effects
- Operational Reliability Effects
- Supply Chain
- Financial and Institutional Effects
- Workforce Effects



Process serves as an education tool for org to integrate climate into planning and operations



Figure 1. Hazard, Vulnerability, and Risk

Source: Adapted from Climate Element Planning Guidance (WA Department of Commerce, 2023.)

Many planning documents exist that can inform climate resilience planning

Direct Threat


Drought


Extreme Cold


Extreme Heat


Flood


Severe Storm and High Wind


Wildfire

Indirect Threat


Parts/Supply Chain


Power Reliability


Water Quality/Algal Bloom

Discussion questions can encourage engagement in process

- What types of hazards have caused significant challenges for your water system?
- In the past, how frequently have extreme events and/or changes in weather caused significant challenges to your water system (e.g., monthly, seasonally, yearly, decade)?
- What challenges have these events caused for your system?
- What would help mitigate the impacts of these challenges moving forward?
- Do you anticipate the frequency, severity, and/or impacts of these types of events changing with climate change?

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

Table 3. Example Table—Summarizing Significance of Climate-Related Hazards

Hazards	**Is this hazard likely to pose a significant challenge for your system?** *(Yes/No/ Maybe/NA)*	**Brief Description of Anticipated Change in Hazard and Challenges Associated with Hazard** (for all Yes/Maybe responses in previous column)	**Relative Significance of Challenge Posed by Exposure to Hazard** *(High/Med/Low/Not Sure)*	**How was your system's exposure to this hazard evaluated?** (e.g., existing planning effort (specify), local knowledge, CMRW Tool, Modeling/Analysis, Other (specify))
Acute Hazards/Extreme Weather Events				
River Flooding	Maybe	Peak streamflow expected to increase in local tributaries, but not mainstem river; Minimal assets located in floodplain	Low	Local experience/CMRW – 'Peak Streamflow' and '25-year return interval' indicators
Coastal Flooding	N/A			
Drought	Yes	Droughts are expected to become more common and severe in our region. We have had to temporarily take two wells offline and implement mandatory conservation measures during past droughts.	High	Local knowledge/experience during past droughts.
Wildfire	Yes	Local comprehensive plan noted 77% chance of wildfire within the county in the next 30 years (2020-49) (RCP 8.5) (used CMRW).	High	Existing Planning Effort – Comprehensive Plan; Water System Emergency Response Plan
Extreme Heat Events	Yes	Local comprehensive plan noted 52 additional days above 90 degrees by 2070-99 (RCP 8.5)	High	Existing Planning Effort – Comprehensive Plan

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

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Other	N/A			
Long-Term Changes and Hazards				
Air Temperature	Yes	See 'Extreme Heat'	High	Existing Planning Effort – Comprehensive Plan
Precipitation	Yes	CMRW Tool predicts a 10-15% increase in total precipitation (2070-99, RCP 8.5 scenario). (Could create an opportunity for managed aquifer recharge? Is flooding expected to increase?)	Not sure – Consider further in future planning goals	CMRW Tool – 'Total Annual Precipitation' climate indicator
Surface Runoff/ Streamflow	Yes	CMRW Tool predicts a 20-25% decrease in warm season streamflow (2070-99, RCP 8.5 scenario) in the watershed supplying the alluvial aquifer we use as a primary source.	High/Medium	CMRW Tool – 'Warm Season Streamflow' climate indicator
Snowpack	Maybe	CMRW Tool predicts a 40-100% change in April 1 snowpack (2070-99, RCP 8.5). (Greater % reductions at lower elevations, less at higher elevations).	Not Sure – Know snowpack serves as a reservoir, contributes to spring/summer recharge, but uncertain of magnitude	CMRW Tool – 'Snowpack' climate indicator

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

Hazards	Hazard Identified as Significant Challenge in Section A.1	For items marked 'yes' or 'maybe' in the first column, what system components would you anticipate being impacted by the identified hazards? What is the level of potential impact you anticipate associated with each of these hazards (High/Med/Low/NA)?									Please briefly describe the types of impacts you anticipate for impacted system components.
		Water Supply	Water Demand	Source Water Quality and Monitoring	Water Treatment and Monitoring	Physical Infrastructure	Supply Chains/ Procurement	Workforce	Finance	Other	
Wildfire	Yes	Med		Med	High	High			High		Damage to physical infrastructure would be costly. Additional monitoring for distribution system related contamination.
Extreme Heat	Yes	Low	Med	Low	Med			High			Impacts for maintenance staff and ongoing construction projects; Potential impacts on treatment chemistry

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

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		Water Supply	Water Demand	Source Water Quality and Monitoring	Water Treatment and Monitoring	Physical Infrastructure	Supply Chains/ Procurement	Workforce	Finance	Other	
Other											
Long-Term Changes and Hazards											
Air Temperature	Yes		Med		Med			High			See drought and wildfire
Precipitation	Yes	Med				Low					Potential for increased recharge with increased total precipitation, but decrease during critical dry months

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

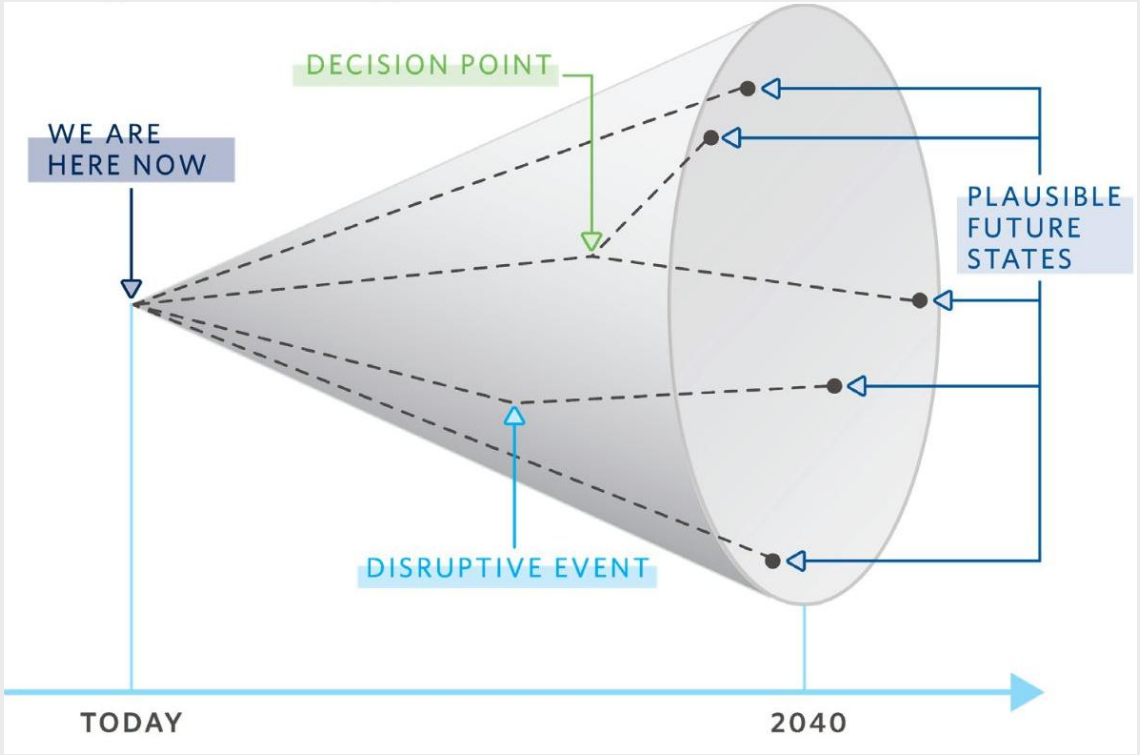
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		Water Supply	Water Demand	Source Water Quality and Monitoring	Water Treatment and Monitoring	Physical Infrastructure	Supply Chains/ Procurement	Workforce	Finance	Other	
Surface Runoff/Streamflow	Yes	High									Decrease in recharge of alluvial aquifer during summer months
Snowpack	Maybe	Med									
Sea Level Rise	N/A										
Changes in Groundwater Recharge/Levels	Yes	High				High					Declining groundwater levels during drought/periods of high demand; Shallow wells offline during severe droughts

Source: Washington State Dept of Health: Water System Plan Climate Resilience Element Workbook

Process serves as an education tool for org to integrate climate into planning and operations

Climate Resilience and Adaption Concepts

- Identify vulnerabilities
- High-level solutions to protect water facilities/operations from projected vulnerabilities
- Adaptation Concepts
- Risk Management Framework and Prioritization



Adaptation Strategies – Direct Threats

Drought

- Supply augmentation
- Diversify options for water supply and expand current sources
- Regional transmission scheme
- **Coordination with USACE on water rights**
- Condition assessment of low head dam
- Watershed protection plan
- Expanding collector well network
- Monitor/inspect integrity of existing infrastructure
- Build infrastructure needed for Aquifer Storage and Recovery (ASR)
- Practice demand management through communication to public on water conservation actions
- Update drought contingency plan

Extreme Cold

- Asset management of intakes

Extreme Heat

- Heat management plans
- Conduct an extreme heat asset management condition assessment

Flood

- Flood preparation and infrastructure improvements on wells
- Evaluate access during flood conditions
- **Flood mitigation**
- **Flood study**
- Site modification
- Equipment configuration and enhancements
- Establish remote location for equipment, records, and data backups
- Establish a range of policies/design standard for critical assets

Severe Storm and High Wind

- **Diversify and improve power source redundancy**
- Infrastructure modifications such as structural strengthening

Wildfire

- Prevention maintenance to improve site accessibility when wildfires occur
- Monitor and maintain vegetation

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Adaptation Strategies – Indirect Threats

Parts/ Supply Chain

- **Diversify and improve power source redundancy**
- **Dam inspection**
- Conduct a comprehensive supply parts vulnerability study for the enterprise
- Condition assessment to ensure continuous operation of assets
- Critical Spares and Maintenance Program

Power Reliability

- **Automatic switchgear to switch between two manual feeds and backup generator**
- Improve power reliability by upgrading to larger generators
- Cyber-security vulnerability study
- Coordinate with regional energy provider
- Coordination with utilities to outline communication protocols and establish backup systems

Water Quality/ Algal Bloom

- Algal study and develop algal management plan
- Engage with community partners
- Participate in community planning and regional collaborations
- Water quality management
- Intake modification
- Management and protection plan

Misc.

- Erosion/runoff: Manage water storage for Reservoir
- All hazards:
  - Asset management
  - HMP Integration
  - Explore insurance policies
  - Develop and exercise emergency response plan
- Implement short duration power storage options
- Establish relationship with local power utility and work jointly towards power purchase agreements

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Assets with Highest Risk to Climate Threat

Asset	Climate Threat
Well	Drought, Flood
Reservoir	Drought
River	Water Quality/Algal Bloom
WTP	Flood, Severe Storm and High Wind
River Intake	Drought, Extreme Cold, Flood, Water Quality/Algal Bloom
Infiltration Gallery	Drought
Chain of Lakes	Drought, Flood
Pump Station	Extreme Cold, Flood, Parts/Supply Chain
Recharge Pump	Drought, Extreme Cold, Flood
Pump Station	Drought

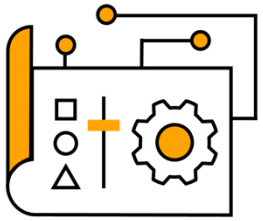
Hazard	Hazard Rating (From Table 3)	Sensitivity of Critical Assets to Impact from Hazard	Impacted Critical Assets	Near (1-5 yrs) - or long-term (5+ yrs) risk?	Mitigating actions
Drought	High	Low	Storage tanks; Distribution infrastructure	Near-term	**Existing:** Upgrade storage capacity with larger volume storage tanks **Proposed:** Expand leak detection and repair program for all distribution infrastructure
Wildfire	High	High	Infrastructure (within wildfire prone areas)	Near-term	**Existing**: Wildfire mitigation and hardening of existing infrastructure within wildfire prone areas. **Proposed**: Develop additional wells that are not within the Wildland Urban Interface
Changes in Groundwater Recharge/ Levels	High	High	Pumping infrastructure; Supply wells	Long-term	**Existing:** Upgrades to pumping systems to improve efficiency and system reliability

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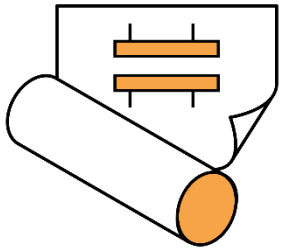
Next Steps



Climate Planning



Funding Evaluation



CIP Integration



Hazard Mitigation Plan Integration

System-wide Efficiency and Climate Resilience

Project	Project Type	Year	Total Project Cost	Anticipated Source of Funding	Classification of Deficiency	Climate Resilience Action (Y/N)?

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Utilities are on the front lines of a changing risk landscape



