How to build climate resilience into integrated planning: Alameda County Water District's Climate Adaptation Plan

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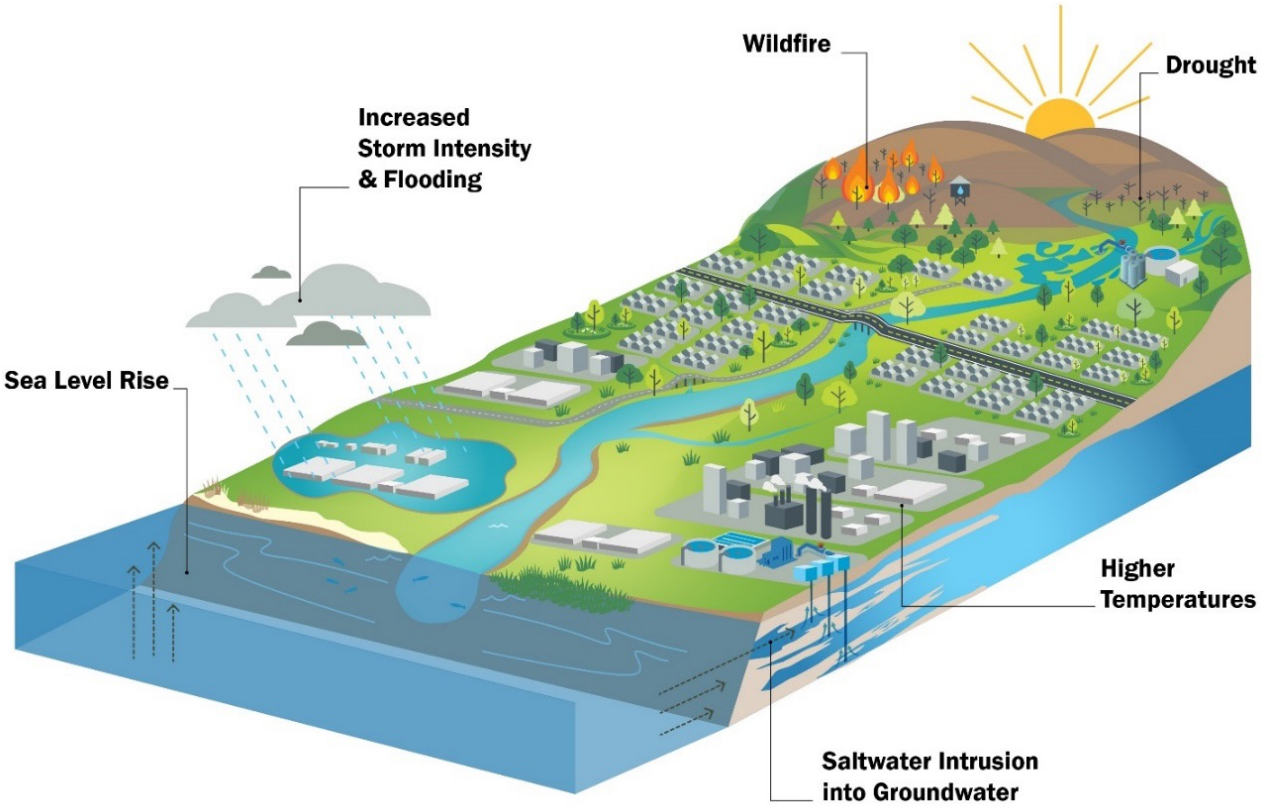

Agenda

1) Alameda County Water District (ACWD) Climate Adaptation Plan (CAP)
   - ACWD Introduction & Objectives
   - CAP Process & Results
     - Aligning district policy
     - Understanding vulnerability & risk
     - Pursuing adaptation strategies
     - Guiding adaptation pathways
2) Q&A

Introduction & Objectives

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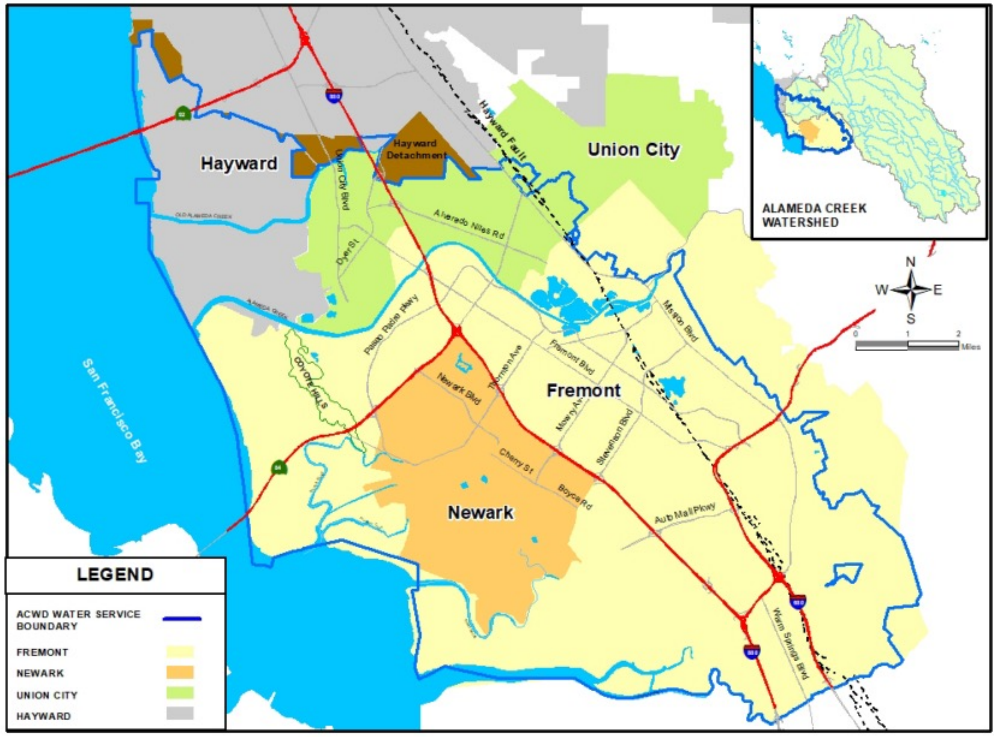
Introduction: Alameda County Water District (ACWD)



Project Objectives

- Foster alignment across planning efforts

- Identify and prioritize climate risks and vulnerabilities

- Prioritize actions for achieving climate readiness

> To be "climate ready" means to proactively anticipate, plan for, and overcome challenges from climate change impacts.

- Communicate findings publicly

Aligning District Policy

Reviewing District policies

Identifies:

- Existing progress
- Gaps in current planning and policy
- Opportunities for better internal and external alignment

District policies: Opportunities for internal alignment

Themes & Patterns

- Common planning criteria & priorities
- Potential adaptation strategies
- Documentation of climate risks and impacts

Areas for Growth

- Equity, environmental stewardship goals, & measures of success
- Common use of “climate readiness”

Actions

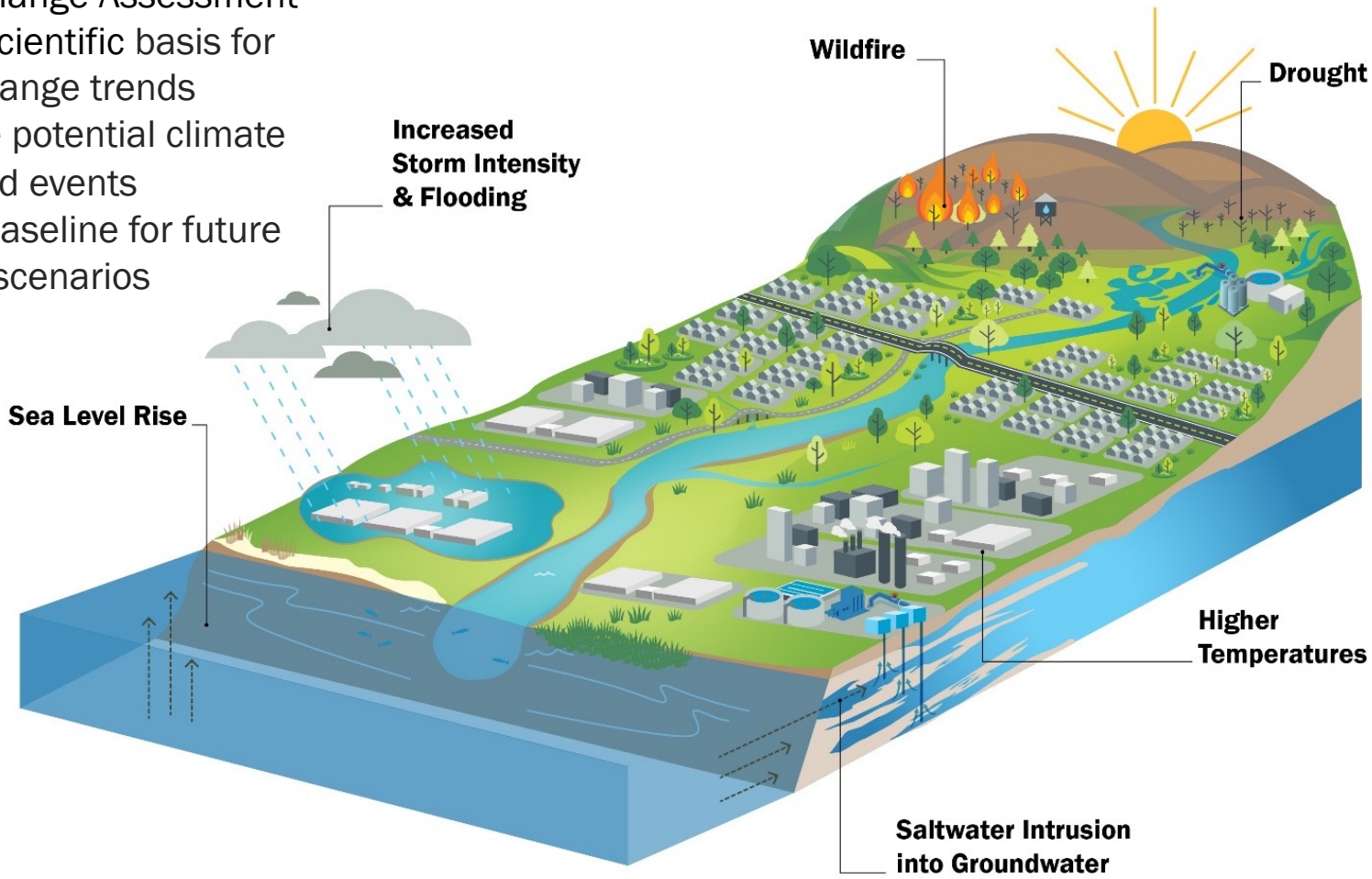
- Update criteria & refine priorities
- Elaborate on sea level rise impacts & seek partnerships
- Expand uncertainty scenarios

District Climate Readiness

Understanding Vulnerability & Risk

Climate scenarios

- IPCC AR6* and CA Fourth Climate Change Assessment provides scientific basis for climate change trends
- Determine potential climate threats and events
- Provides baseline for future condition scenarios



*IPCC AR6: Intergovernmental Panel on Climate Change Assessment Report 6

Climate risk scenarios

climate threat + risk event = future scenario

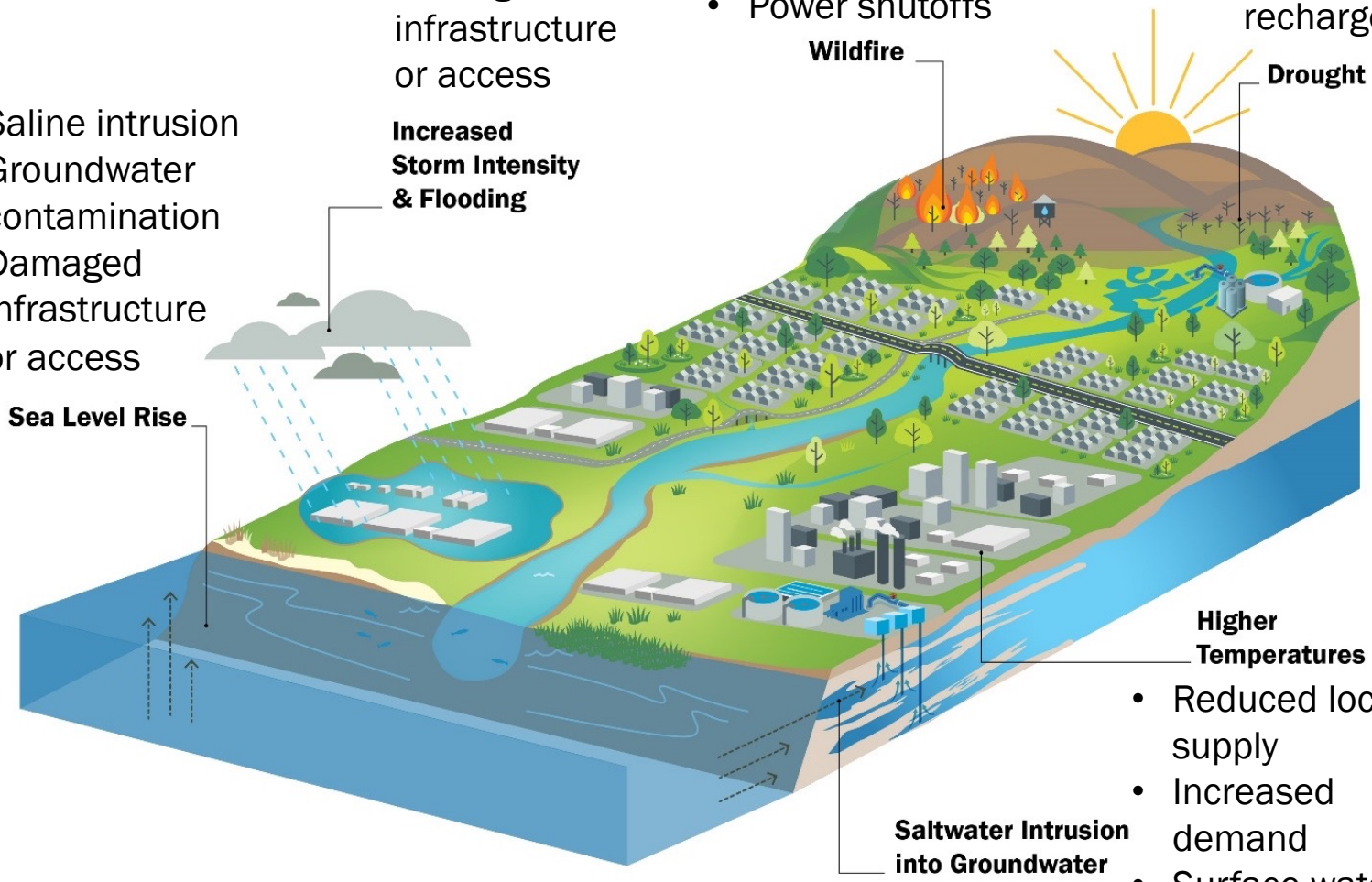
- 15 scenarios created

- Damaged infrastructure or access

- Surface water quality degradation
- Damaged infrastructure or access
- Power shutoffs

- Reduced supply
- Reduced groundwater recharge

- Saline intrusion
- Groundwater contamination
- Damaged infrastructure or access

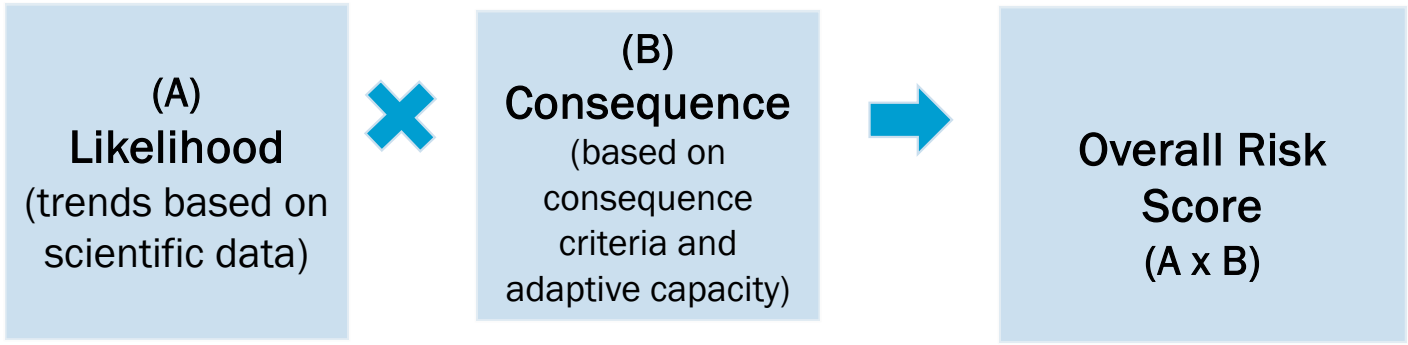


- Reduced local supply
- Increased demand
- Surface water quality degradation

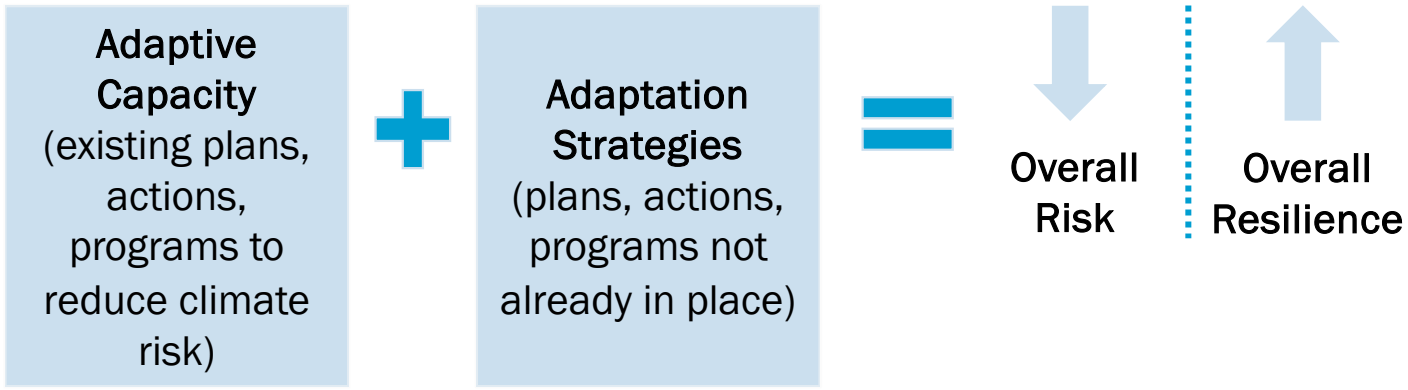
- Reduced local supply
- Increased demand
- Surface water quality degradation

Risk assessment

The **overall risk score** is based on the likelihood of occurrence within mid- and long-term planning horizons (2050 and 2100) and potential consequences



Current adaptive capacity and future adaptation strategies can reduce risk and increase resilience.



Likelihood values

Scale of 1 (low) to 5 (high)

Likelihood × Consequence = Risk Score

Climate Threat	Mid-Term Likelihood (2050)	Long-Term Likelihood (2100)
Increasing Temperatures	5	5
Droughts	5	5
Wildfire	5	5
Flood	4	4
Storms	4	4
Sea Level Rise	4	5
Regulatory Change	3	4

Consequence scores

Likelihood × Consequence = Risk Score

For each scenario, a score of 1 (negligible) to 5 (severe) was applied for each consequence criterion.

EXAMPLE SCENARIO :
Drought (climate risk threat) resulting in potential imported water supply reductions (risk

Water Delivery: 2

Distribution system (storage) impacts

Water Quality: 3

Reduced flexibility of water source used

Water Supply: 4

Substantial stress on water supplies, although adaptive capacities exist for conservation and alternative supplies

Production Facility Reliability & Redundancy: 1

Limited impact to water production and treatment

Financing: 4

Need for new infrastructure

Environmental Stewardship: 3

Substantial impact to watershed and local ecosystems

Safety: 1

Limited employee safety concerns except for high temperatures

Equitable Service: 2

Maintaining affordable rates

Vulnerability assessment: EXAMPLE

Likelihood × Consequence = Risk Score

Scenario	
Climate Risk Threat	**Climate Risk Event**
Sea Level Rise	Loss of access to facilities

Vulnerability Assessment (per above scenario)		
Description of Potential Impacts	**Asset(s) or Operations Impacted**	**Relevant Hot Spot Map**
If sea level rise (anticipated slow onset over time) blocks or erodes roadways, then may restrict or prevent access to facilities.	Westerly wells	Figure 4-3 (see right)

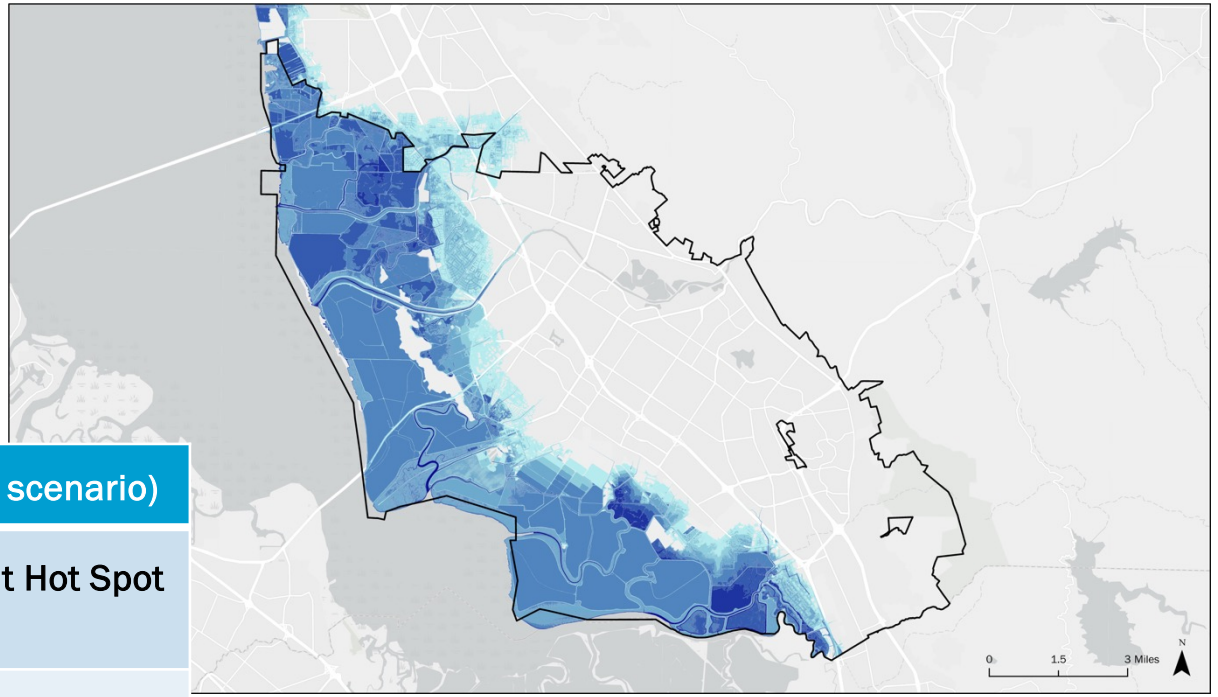


Figure 4-3. Sea level rise hot spot map – year 2100 (84-inch scenario under medium-high risk aversion and high emissions scenario) *Source: Adapting to Rising Tides*

Adaptive capacity: Example for Sea Level Rise

Sea Level Rise Scenarios:

1. Saline intrusion
2. Non-salinity groundwater contamination mobilization in groundwater
3. Damaged infrastructure or loss of access

Adaptive capacity includes:

- Groundwater recharge using surface water infiltration
- Groundwater recharge using injection wells
- Corrosion control
- Destroy old wells (prevent further saline intrusion)
- Use groundwater higher in the watershed (avoid saline areas)
- Groundwater Protection Program/Well Ordinance Administration

Quarry Lakes groundwater recharge

Risk score calculation

Key components

Scenario	Likelihood: Mid-Term	Likelihood: Long-Term	Consequence	Risk Score: Mid-Term	Risk Score: Long-Term
Scenario 1: Increasing Temperature: Reduced local supply	5	5	3.4	16.9	16.9
Scenario 2: Increasing Temperature: Increased demand	5	5	2.9	14.4	14.4
Scenario 3: Drought: Imported supply reductions (SFPUC)	5	5	2.6	13.1	13.1
Scenario 4: Drought: Imported supply reductions (SWP)	5	5	2.5	12.5	12.5
Scenario 5: Wildfire: Non-salinity water quality degradation in local surface water (e.g., wildfire)	5	5	2.6	13.1	13.1
Scenario 6: Increasing Temperature: Non-salinity water quality degradation in the Delta	4	5	3.0	12.0	15.0
Scenario 7: Flooding: Saline intrusion in the Delta	4	5	2.9	11.5	14.4
Scenario 8: SLR: Non-salinity groundwater contamination in Niles Cone	4	5	2.9	11.5	14.4
Scenario 9: SLR: Saltwater intrusion in Niles Cone	5	5	2.8	13.8	13.8
Scenario 10: Drought: Reduced groundwater recharge to Niles Cone	4	5	3.1	12.5	15.6
Scenario 11: SLR: Sea level rise damaging infrastructure or loss of access	4	5	2.3	9.0	11.3
Scenario 12: Storm intensity damaging infrastructure or loss of access	4	4	2.3	9.0	9.0
Scenario 13: Wildfire: Wildfire damaging infrastructure or loss of access	4	4	1.9	7.5	7.5
Scenario 14: Wildfire: Public Safety Power Shutoff	4	4	2.3	9.0	9.0
Scenario 15: Regulatory/legislative changes	4	5	4.4	17.5	21.9

Risk assessment scoring

mid-term vs. long-term risk scores

Considerations over next 25 years (mid-term)

Within Top 10 Risks

- Regulatory changes
- Reduced local supply
- Increased demand
- Saltwater intrusion into Niles Cone
- Water quality impacts from wildfire
- Drought reducing imported supply (SFPUC & SWP)
- Drought reducing supply for Niles Cone groundwater recharge
- Increasing temperature impacting the Delta
- Saline intrusion impacting the Delta
- Groundwater contamination mobilization in Niles Cone

Considerations for next 50+ years (long-term)

Within Top 10 Risks

- Regulatory changes
- Reduced local supply
- Drought reducing supply for Niles Cone groundwater recharge
- Increasing temperature impacting the Delta
- Increased demand
- Saline intrusion impacting the Delta
- Groundwater contamination mobilization in Niles Cone
- Saltwater intrusion into Niles Cone
- Water quality impacts from wildfire
- Drought reducing imported supply (SFPUC & SWP)

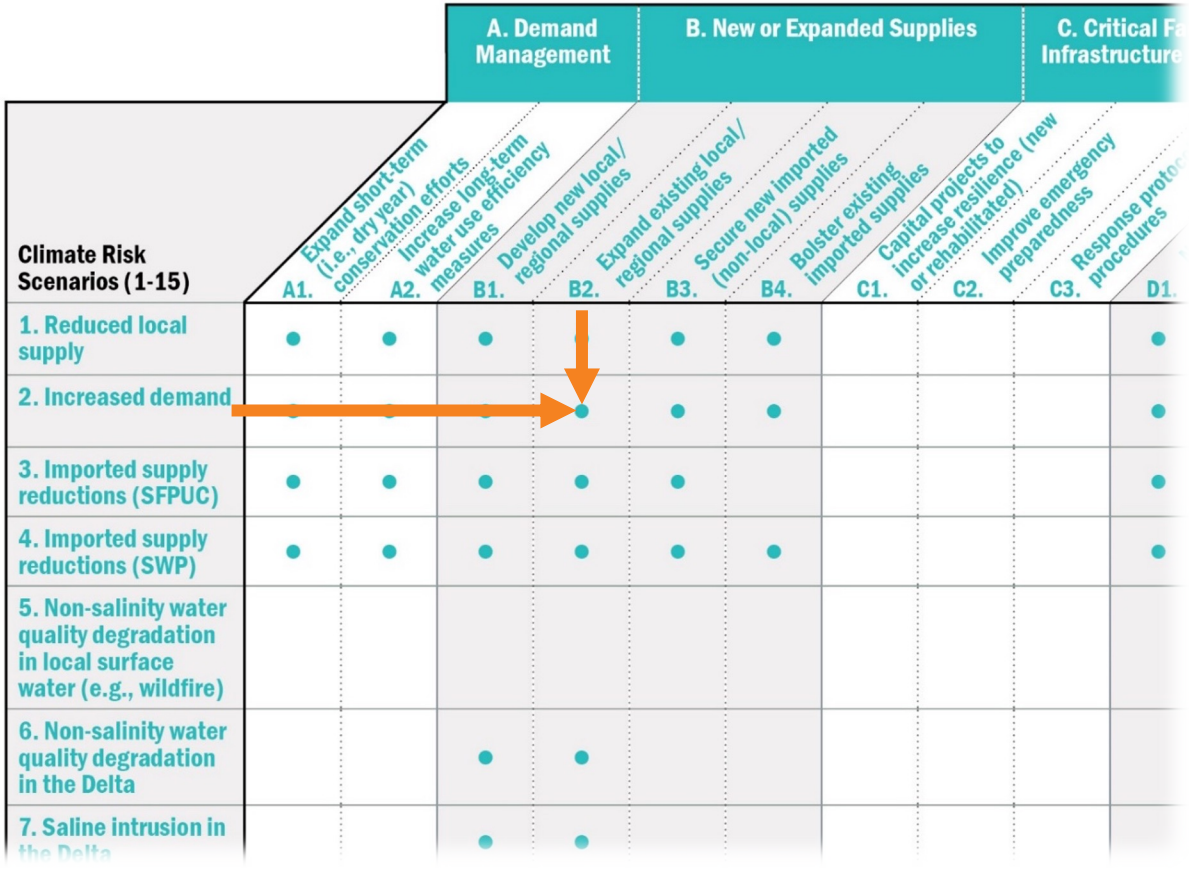
Pursuing Adaptation Strategies

Potential strategies to reduce risk

Note: these adaptation strategies go above and beyond the current actions ACWD already has in place

Adaptation Categories:

1. Demand Management
2. New or Expanded Supplies
3. Critical Facilities & Infrastructure Protection
4. Operations
5. Water Quality & Treatment
6. Modeling, Research & Innovation
7. Watershed and Ecosystem Management
8. Regional Partnerships



Adaptation strategies reduce consequence scores
(relative to the baseline – or "current actions only" condition)

EXAMPLE: Scenario 1: Increasing temperatures (climate risk threat) resulting in potential reduced local supply (risk event)

Adaptation Strategy	Water Delivery	Water Quality
Current Actions Only	4	3
SCORE AS DIFFERENCE FROM "CURRENT ACTIONS ONLY" STRATEGY		
A1. Expand short-term (i.e., dry year) conservation efforts	1	0
A2. Increase long-term water use efficiency measures	1	0
B1. Develop new local/regional supplies	0	1
B2. Expand existing local/regional supplies	0	1
B3. Secure new imported (non-local) supplies	0	1
B4. Bolster existing imported supplies	0	1
C1. Capital projects to increase resilience (new or rehabilitated)	-	-
ergency preparedness	-	-
se protocol/procedures	-	-
r expanded surface storage	1	1
se groundwater recharge/storage: Local (Niles Cone)	0	
se groundwater recharge/storage: Banked (Semitropic)	0	
D4. Adjust dry year operating rules	0	
D5. Improve distribution system flexibility	2	

Original consequence scores with current actions (incl. adaptive capacity)

Adaptation strategies (applicable for scenario)

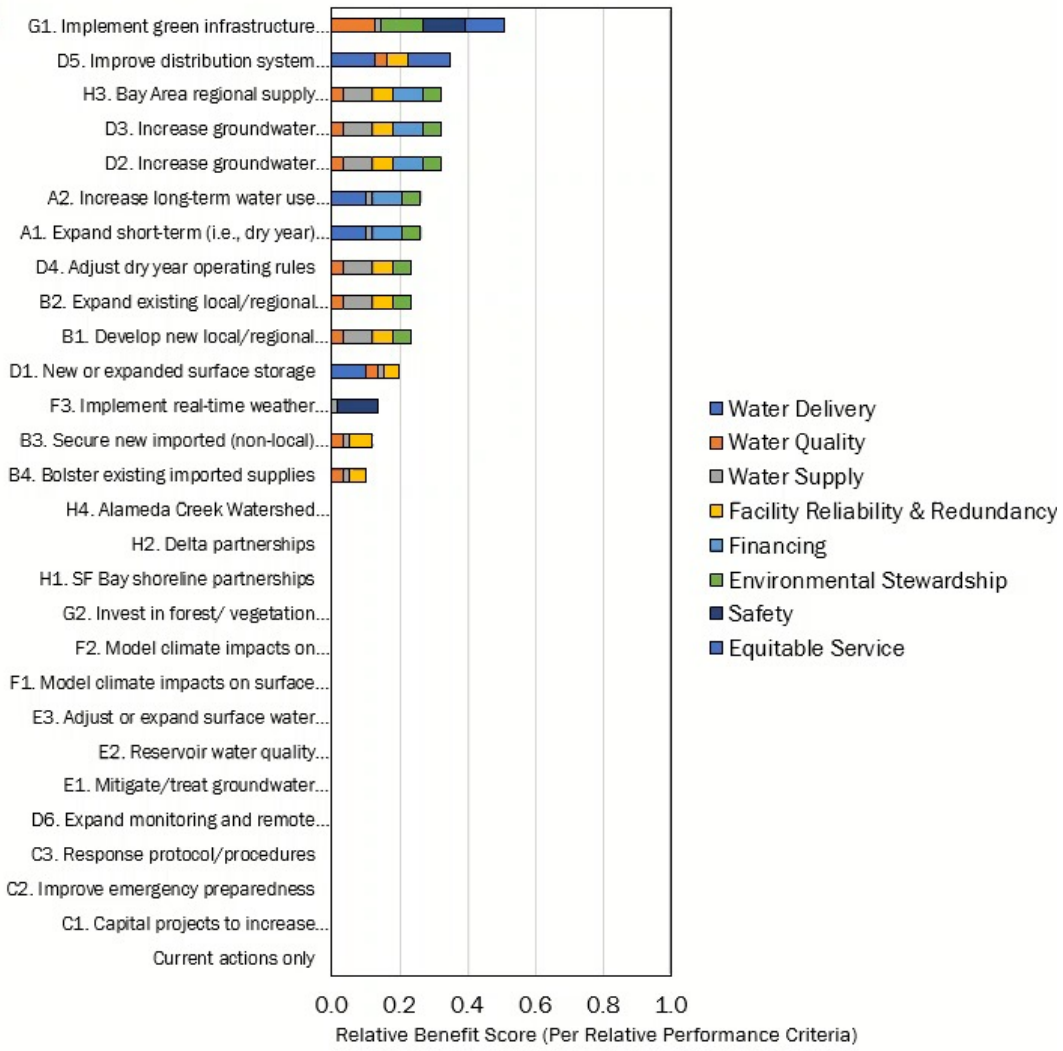
Assumed **reduction in score** with adaptation strategy (some improvement = 1, substantial improvement = 2)

Adaptation Strategies: Prioritized for each scenario

Overall "benefit score" based on relative reduction of consequence scores.

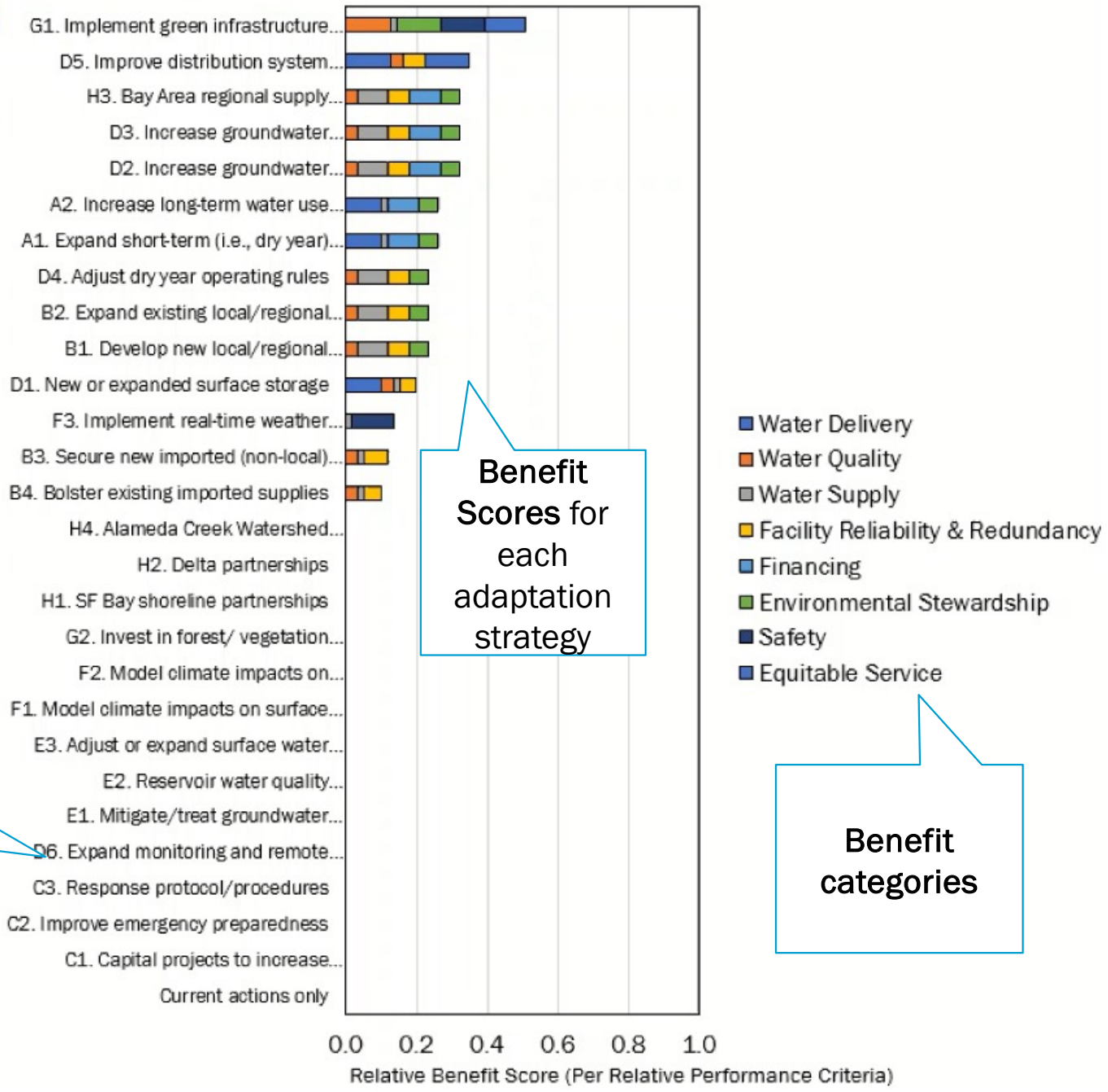
Selected Scoring Scheme --> Scenario 1 Increasing Temperature: Reduced local supply
Planning Horizon --> Mid-term Lik

Alternative	Benefit Score	Rank
Current actions only	0.00	15
A1. Expand short-term (i.e., dry year)	0.26	6
A2. Increase long-term water use eff	0.26	6
B1. Develop new local/regional supp	0.23	8
B2. Expand existing local/regional su	0.23	8
B3. Secure new imported (non-local)	0.12	13
B4. Bolster existing imported supplie	0.10	14
C1. Capital projects to increase resili	0.00	15
C2. Improve emergency preparednes	0.00	15
C3. Response protocol/procedures	0.00	15
D1. New or expanded surface storag	0.20	11
D2. Increase groundwater recharge/s	0.32	3
D3. Increase groundwater recharge/s	0.32	3
D4. Adjust dry year operating rules	0.23	8
D5. Improve distribution system flexi	0.35	2
D6. Expand monitoring and remote c	0.00	15
E1. Mitigate/treat groundwater conta	0.00	15
E2. Reservoir water quality managen	0.00	15
E3. Adjust or expand surface water t	0.00	15
F1. Model climate impacts on surfac	0.00	15
F2. Model climate impacts on groun	0.00	15
F3. Implement real-time weather mo	0.13	12
G1. Implement green infrastructure a	0.51	1
G2. Invest in forest/ vegetation man	0.00	15
H1. SF Bay shoreline partnerships	0.00	15
H2. Delta partnerships	0.00	15
H3. Bay Area regional supply partner	0.32	3
H4. Alameda Creek Watershed partr	0.00	15



Selected Scoring Scheme --> Scenario 1 — Increasing Temperature: Reduced local supply
Planning Horizon --> Mid-term Lik

Alternative	Benefit Score	Rank
Current actions only	0.00	15
A1. Expand short-term (i.e., dry year)	0.26	6
A2. Increase long-term water use eff	0.26	6
B1. Develop new local/regional supp	0.23	8
B2. Expand existing local/regional su	0.23	8
B3. Secure new imported (non-local)	0.12	13
B4. Bolster existing imported supplie	0.10	14
C1. Capital projects to increase resili	0.00	15
C2. Improve emergency preparednes	0.00	15
C3. Response protocol/procedures	0.00	15
D1. New or expanded surface storag	0.20	11
D2. Increase groundwater recharge/s	0.32	3
D3. Increase groundwater recharge/s	0.32	3
D4. Adjust dry year operating rules	0.23	8
D5. Improve distribution system flexi	0.35	2
D6. Expand monitoring and remote c	0.00	15
E1. Mitigate/treat groundwater conta	0.00	15
E2. Reservoir water quality managen	0.00	15
E3. Adjust or expand surface water tr	0.00	15
F1. Model climate impacts on surfac	0.00	15
F2. Model climate impacts on groun	0.00	15
F3. Implement real-time weather mor	0.13	12
G1. Implement green infrastructure ar	0.51	1
G2. Invest in forest/ vegetation man	0.00	15
H1. SF Bay shoreline partnerships	0.00	15
H2. Delta partnerships	0.00	15
H3. Bay Area regional supply partner	0.32	3
H4. Alameda Creek Watershed partr	0.00	15



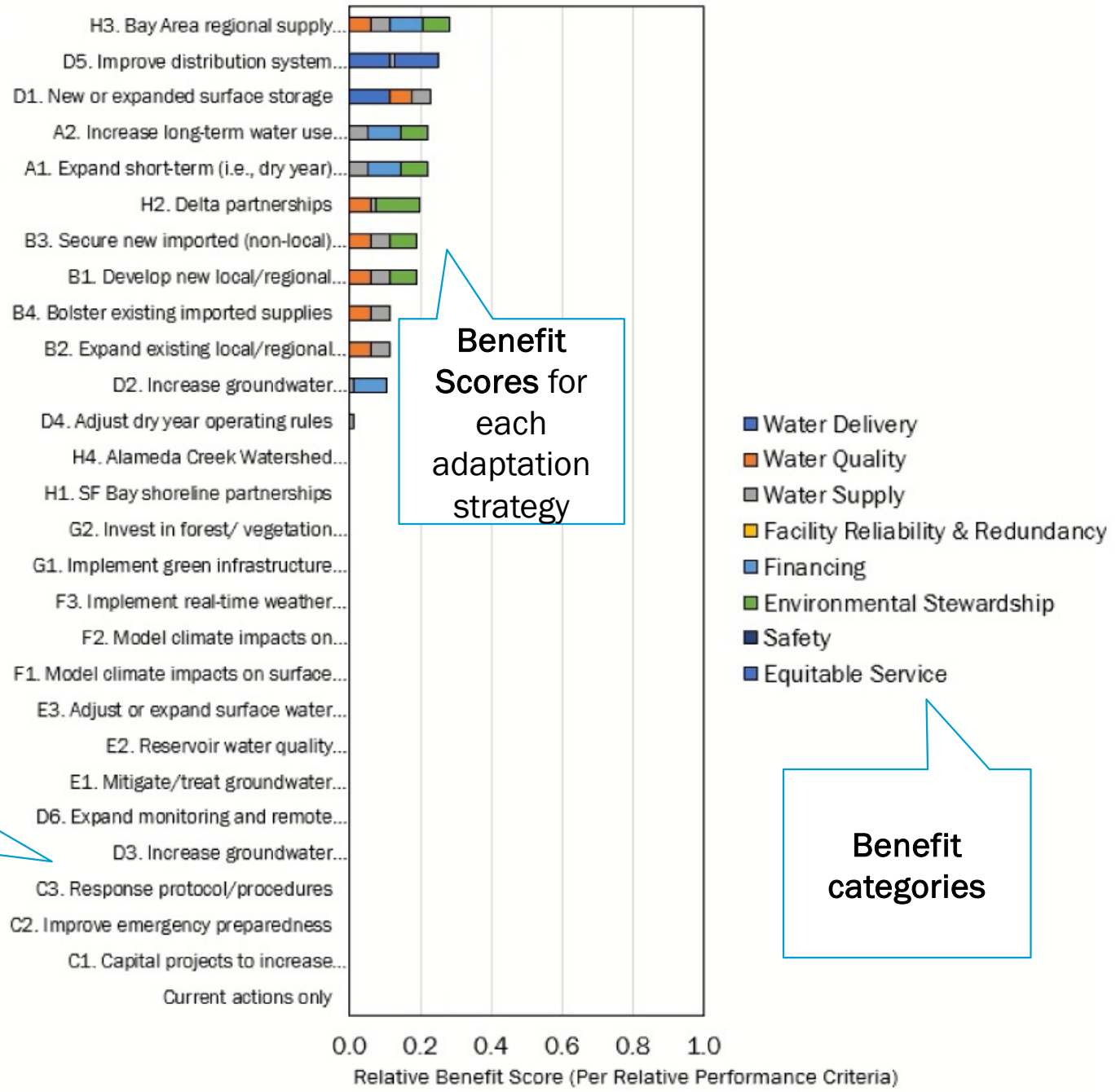
Benefit Scores for each adaptation strategy

Adaptation strategies

Benefit categories

Selected Scoring Scheme --> Scenario 4 rought: Imported supply reductions (SWP)
Planning Horizon --> Mid-term

Alternative	Benefit Score	Rank
Current actions only	0.00	13
A1. Expand short-term (i.e., dry year)	0.22	4
A2. Increase long-term water use eff	0.22	4
B1. Develop new local/regional supp	0.19	7
B2. Expand existing local/regional su	0.11	9
B3. Secure new imported (non-local)	0.19	7
B4. Bolster existing imported supplie	0.11	9
C1. Capital projects to increase resili	0.00	13
C2. Improve emergency preparednes	0.00	13
C3. Response protocol/procedures	0.00	13
D1. New or expanded surface storag	0.23	3
D2. Increase groundwater recharge/s	0.10	11
D3. Increase groundwater recharge/s	0.00	13
D4. Adjust dry year operating rules	0.01	12
D5. Improve distribution system flexi	0.25	2
D6. Expand monitoring and remote c	0.00	13
E1. Mitigate/treat groundwater conta	0.00	13
E2. Reservoir water quality managen	0.00	13
E3. Adjust or expand surface water tr	0.00	13
F1. Model climate impacts on surfac	0.00	13
F2. Model climate impacts on groun	0.00	13
F3. Implement real-time weather mor	0.00	13
G1. Implement green infrastructure ar	0.00	13
G2. Invest in forest/ vegetation man	0.00	13
H1. SF Bay shoreline partnerships	0.00	13
H2. Delta partnerships	0.20	6
H3. Bay Area regional supply partner	0.28	1
H4. Alameda Creek Watershed partr	0.00	13



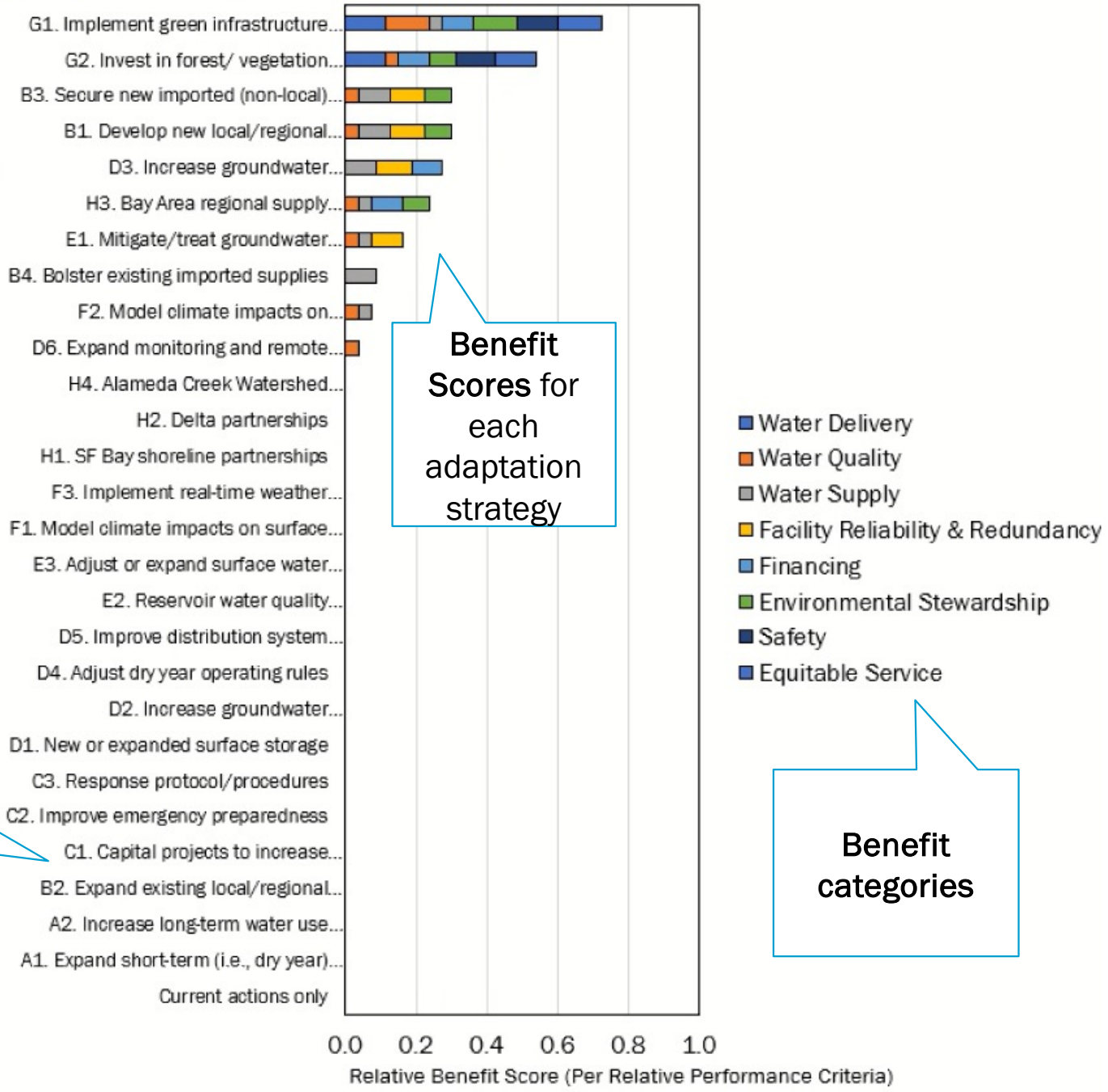
Benefit Scores for each adaptation strategy

Adaptation strategies

Benefit categories

Selected Scoring Scheme --> Scenario 8 LR: Non-salinity groundwater contamination in Nile
Planning Horizon --> Mid-term Like

Alternative	Benefit Score	Rank
Current actions only	0.00	11
A1. Expand short-term (i.e., dry year)	0.00	11
A2. Increase long-term water use eff	0.00	11
B1. Develop new local/regional supp	0.30	3
B2. Expand existing local/regional su	0.00	11
B3. Secure new imported (non-local)	0.30	3
B4. Bolster existing imported supplie	0.09	8
C1. Capital projects to increase resili	0.00	11
C2. Improve emergency preparednes	0.00	11
C3. Response protocol/procedures	0.00	11
D1. New or expanded surface storag	0.00	11
D2. Increase groundwater recharge/s	0.00	11
D3. Increase groundwater recharge/s	0.28	5
D4. Adjust dry year operating rules	0.00	11
D5. Improve distribution system flexi	0.00	11
D6. Expand monitoring and remote c	0.04	10
E1. Mitigate/treat groundwater conta	0.16	7
E2. Reservoir water quality managen	0.00	11
E3. Adjust or expand surface water tr	0.00	11
F1. Model climate impacts on surfac	0.00	11
F2. Model climate impacts on groun	0.08	9
F3. Implement real-time weather mor	0.00	11
G1. Implement green infrastructure a	0.73	1
G2. Invest in forest/ vegetation man	0.54	2
H1. SF Bay shoreline partnerships	0.00	11
H2. Delta partnerships	0.00	11
H3. Bay Area regional supply partner	0.24	6
H4. Alameda Creek Watershed partr	0.00	11



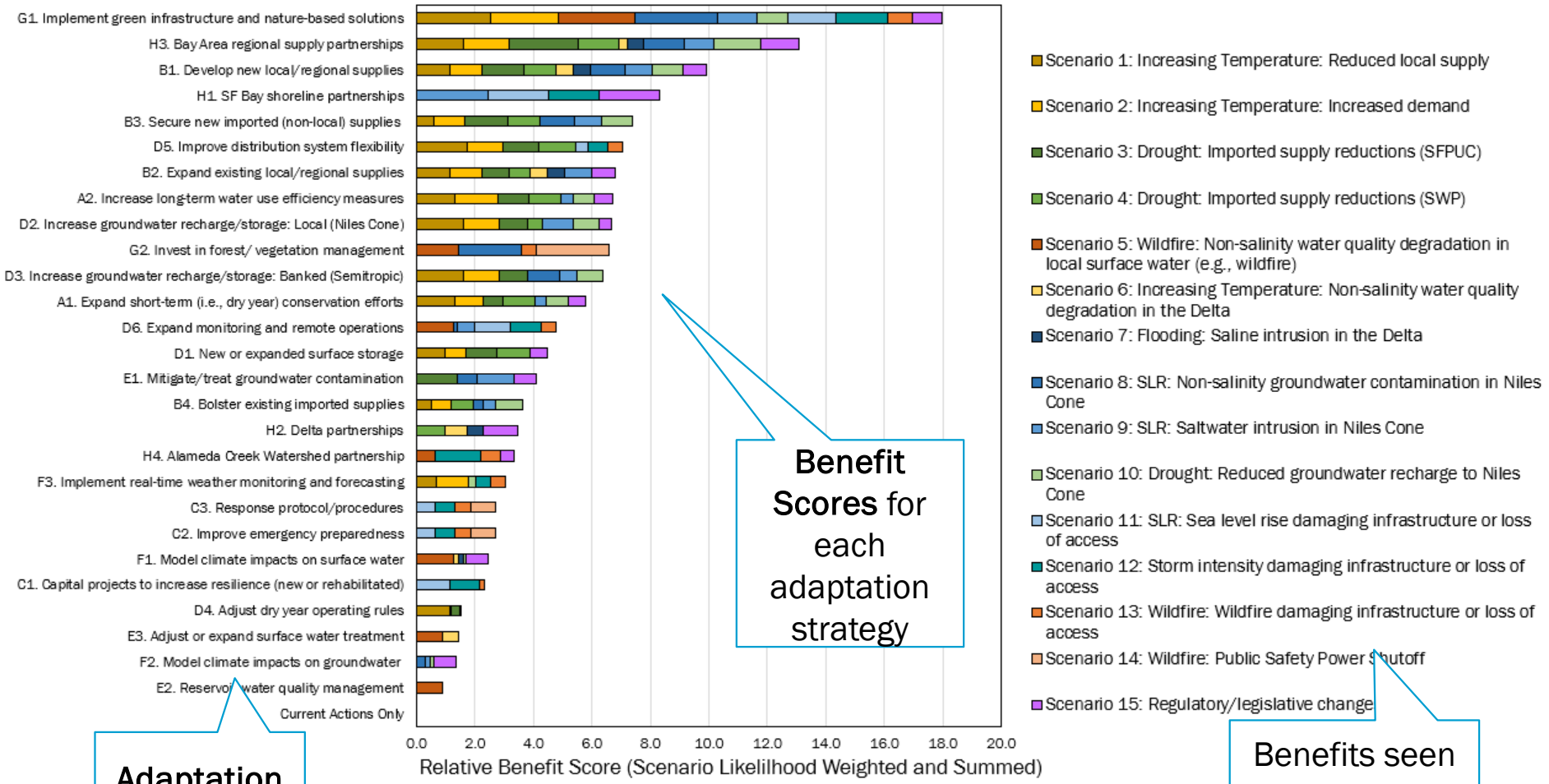
Benefit Scores for each adaptation strategy

Adaptation strategies

Benefit categories

Prioritization of adaptation strategies (mid-term)

Based on overall benefit across multiple scenarios



Guiding Adaptive Pathways

Brown and Caldwell

Adaptive pathway assumptions

Adaptive pathways: depict phased mid- and long-term adaptation strategies and decision points to inform when to prepare for or enact strategies as conditions change, or when to change strategies

- Developed for the top 6 ranking long-term risk scores
- Strategies help reduce impacts of climate risk events
- Assumes some strategies provide “low to no regret” opportunities (e.g., conservation, water use efficiencies, and partnerships)

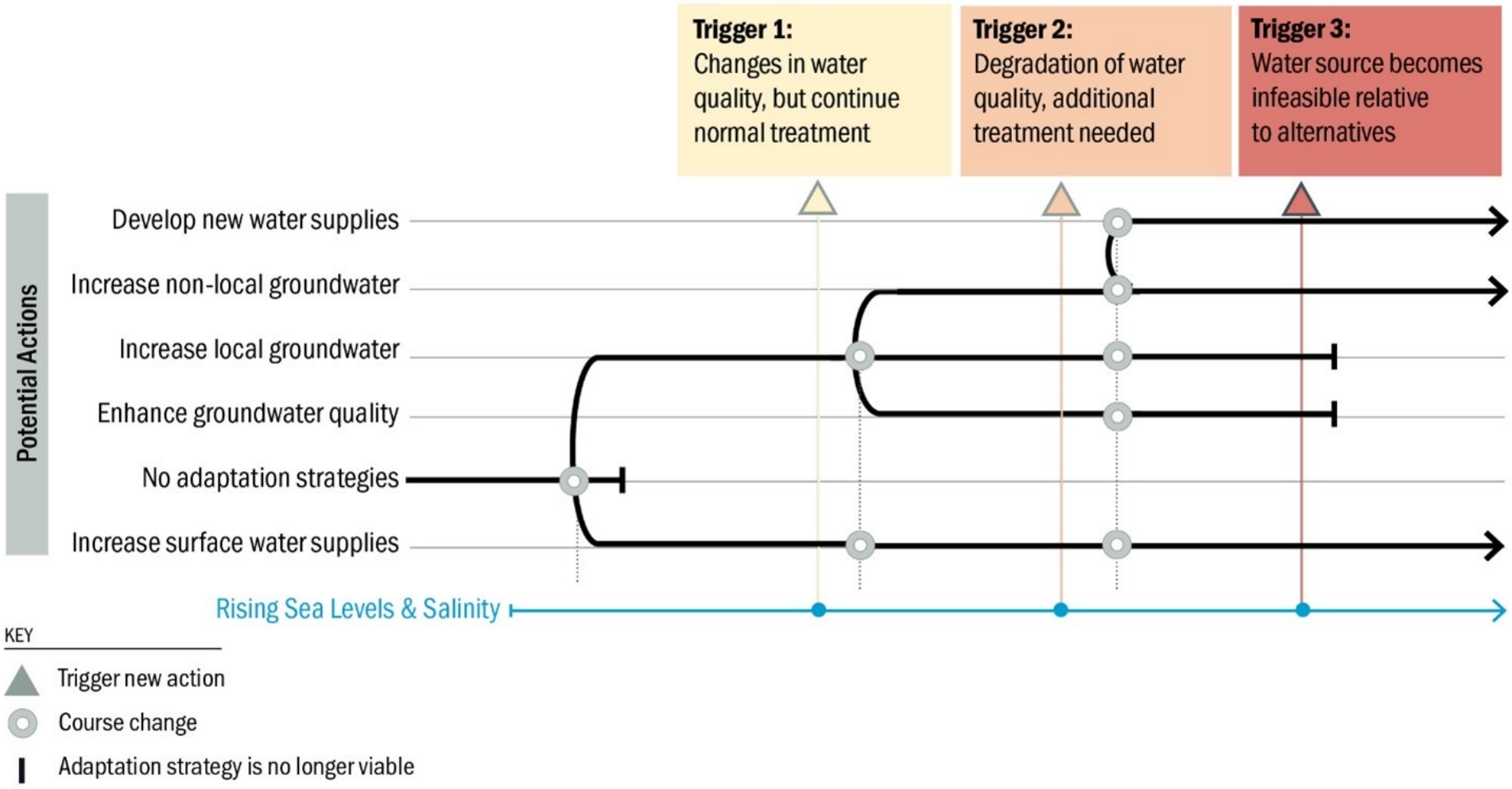
Adaptive pathway triggers

Trigger Point: They indicate a change in existing conditions where a decision will need to be made whether to pursue existing or new strategies

Sea Level Rise Example Triggers:

- Trigger 1 – Quantifiable changes in water quality, but current treatment methods can be used.
- Trigger 2 – Degradation in water quality, additional treatment methods required.
- Trigger 3 – Water source becomes infeasible compared to alternatives.

Adaptation pathway planning // Sea level rise causes saline intrusion in groundwater



Key Takeaways & Next Steps

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Key Takeaways

Foster alignment across planning efforts:

- Identified planning criteria
- Identified alignment opportunities (internal & external)

Identify and prioritize climate risks and vulnerabilities:

- Revealed considerable existing adaptive capacity
- Identified highest risk areas & risks outside of District control (need for partnerships)

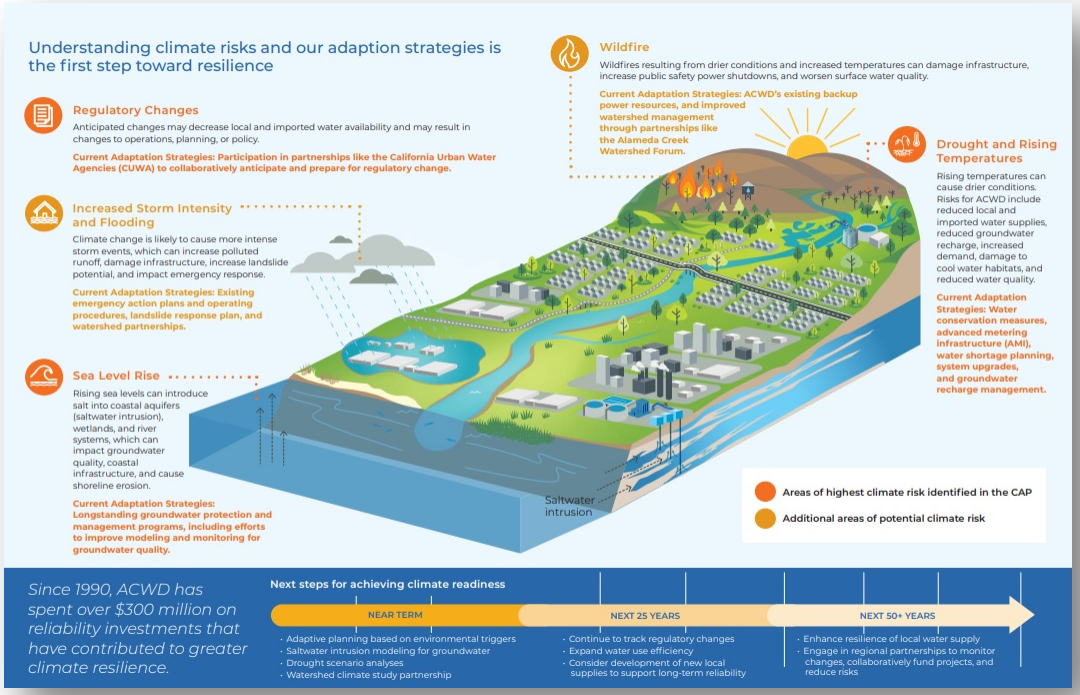
Prioritize actions for achieving climate readiness:

- Identified strategies with greatest benefit
- Demonstrated range of benefits in leveraging of existing partnerships
- Highlighted low regrets strategies from already existing adaptive capacities

Communicate findings:

- Developed Public Summary…

ACWD CAP Public Summary



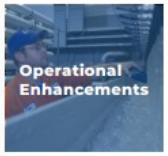
Recommended Strategies for Increased Climate Resilience

The CAP recommends the following strategies for ACWD to reduce climate change impacts; protect ecosystems, watersheds, and water quality; and protect local water supplies while addressing other ACWD priorities.

Scan for full CAP report

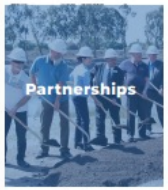
- Capture stormwater for recharge and later use
- Restore native species
- Manage vegetation to help prevent wildfires

- Adjust reservoir management to improve water quality
- Enhance water treatment processes to improve water quality

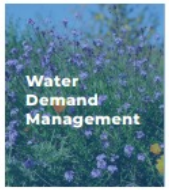


- Adjust operations for drought conditions
- Operate facilities remotely
- Improve system flexibility
- Increase reservoir capacity
- Enhance groundwater recharge

- Expand groundwater desalination facilities
- Develop new local supplies such as water reuse
- Secure new imported water supplies through new projects or water transfers



- Protect regional shoreline
- Maintain a water supply within the Bay Area that is resilient to drought
- Protect habitat and water supply within the Alameda Creek Watershed



- Use advanced metering to identify leaks
- Further engage with customers to help them reduce water use
- Restrict lawn watering
- Provide rebates for turf removal

Stay Connected

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Thank you!

- Questions?

Scan below for ACWD CAP and Public Summary:

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Table 6-2. Summary of Likelihood Scores by Climate Threat Based on Scientific Data Trends			
Climate Threat	Mid-term Likelihood (2050)	Long-term Likelihood (2100)	Justification
Increasing Temperatures	5	5	Annual average temperature anticipated to increase in both mid- and long-term (Cal-Adapt, 2021). Western North America regions have observed increase in hot extremes (IPCC, 2021)
Droughts	5	5	State of CA (and this region) assume continued increase in severity and frequency of droughts (California 4th Climate Change Assessment)
Flood	4	4	Frequency and intensity have increased since 1950; trend likely to continue (IPCC, 2021), though there is less certainty at medium and high emission scenarios for mid and long term (Cal-Adapt, 2021)
Storms	4	4	(Same data and justification for "Flood" above, Cal-Adapt 2021 and IPCC 2021)
Wildfire	5	5	Wildfires already experienced within this region with increasing severity and frequency, trend assumed to continue based on state guidance (California 4th Climate Change Assessment)
Sea Level Rise	4	5	Degree of rise uncertain; however, several estimates include 3 feet by 2050/2060 and potentially 6 feet by 2100 (California Coastal Commission, 2021) (reiterated with NOAA climate data - Sea Level Rise viewer)
Regulatory Change	3	4	Varies by regulation, but higher likelihood to occur with greater passage of time (within 80 years from current year, 2023)

An understanding of how the statements in Table 6-4 support consideration of both current actions and future strategies can be summarized as follows:

- **Water delivery** statements support identifying current actions and future strategies that encourage implementation of robust distribution systems to distribute treated water to customers.
- **Water Quality** statements support identifying current actions and future strategies to secure source water quality.
- **Water Supply** statements address potential current actions and future strategies to secure redundant sources of supply.
- **Production Facility Reliability and Redundancy** statements help identify current actions and future strategies that result in resilient treatment systems.
- **Financing** statements support current actions and future strategies to mitigate monetary costs associated with climate risk events and avoid rate shock.
- **Environmental Stewardship** statements encourage current actions and future strategies to protect sustainable water management for natural systems; they are not supply focused.
- **Safety** statements support identifying current actions and future strategies to protect workers and consumers. These statements are human-health focused (drinking water impacts are accounted for elsewhere).
- **Equitable Service** encourages identifying current actions and future strategies to protect the services for V/DCs in the case of a climate risk event.

Table 6-4. Consequence Criteria Rating Scale from 1 (negligible) to 5 (severe) Impact					
Consequence Criteria (LoS Category)	Negligible = 1	Low = 2	Moderate = 3	High = 4	Severe = 5
Water Delivery	No more than 1 month per year (≤ 8.3% of months) on average with more than 167 accounts disrupted for 0 to 4 hours	More than 1 month per year (> 8.3% of months) on average with more than 167 accounts disrupted for 0 to 4 hours	More than 1 month per year (> 8.3% of months) on average with more than 40 accounts disrupted for 4 to 12 hours	2 months per year (= 16.6% of months) on average with accounts disrupted for 12+ hours	More than 2 months per year (> 16.6% of months) on average with accounts disrupted for 12+ hours
Water Quality	No impact	Some measurable impact but does not affect ability to meet water quality goals and does not require additional treatment	Minor impact to water quality not meeting District water quality goals	Recognizable impact to water quality not meeting District water quality goals but manageable within existing treatment capability	Extended water quality impact exceeding District's current treatment capability
Water Supply	No to minimal impact (approx. < 5% of supply reduced)	Reduced supply (approx. 5% to 10%)	Reduced supply (approx. >10% up to 20%)	Significantly reduced supply (approx. >25% up to 50%)	Severely reduced supply (approx. >50% up to 100% reduced supply); impacts District deliveries and water quality
Production Facility Reliability and Redundancy	Treatment system outage or significant limitation resolved within 1 day	Treatment system outage or significant limitation resolved in less than 1 month	Treatment system outage or significant limitation resolved in 1 to 3 months	Treatment system outage or significant limitation resolved in 3 to 6 months	Treatment system outage or significant limitation takes 6 months or more to resolve
Financing	Costs resulting from the risk event are less than or equal to a 1% single-year impact on rates, or less than or equal to $22M in resulting capital cost	Costs resulting from the risk event are less than or equal to a 2% single-year impact on rates, or greater than $22M but less than $43M in resulting capital cost	Costs resulting from the risk event are less than or equal to a 4% single-year impact on rates, or greater than $43M but less than $87M in resulting capital cost	Costs resulting from the risk event are less than or equal to a 5% single-year impact on rates, or greater than $87M but less than $109M in resulting capital cost	Costs resulting from the risk event are less than or equal to a 7% single-year impact on rates, or greater than $109M in resulting capital cost
Environmental Stewardship	No harm to public or environmental benefits and sustainability	Some measurable impact to public or environmental benefits but does not result in adverse impacts	Reduced public benefits or some adverse impacts to natural systems	Significant reduction in public benefits or significant adverse impacts to natural systems	Loss of public benefits or substantial adverse impacts to natural systems
Safety	No risk of incident or threat to safety	Measurable risk of incident or threat to safety (one facility or site with safety risk for employees or community served)	Limited risk of incident or threat to safety (one to two facilities or sites with safety risk for employees or community served)	Significant risk of incident or threat to safety (one to two facilities or sites with safety risk for employees or community served)	Multiple facilities or sites with safety risk for employees or community served
Equitable Service	No impact to services accessibility	Limited impact to V/DCs within service area (up to 5% without service or with limited service for more than 1 day)	Moderate impact to V/DCs within service area (>5% up to 10% without service or with limited service for more than 1 day)	Significant impact to V/DCs within service area (>10% up to 20% without service or with limited service for more than 1 day)	Substantial impact to V/DCs within service area (>20% without service or with limited service for more than 1 day)

Table 6-3. LoS Goal Statements and Consequence Criteria	
Consequence Criteria	**LoS Statements Developed for the Phase 1 CAP**
Water Delivery	• Maintain reliable and continuous water delivery through the distribution system (from both surface and groundwater resources). • Avoid impacts to revenues associated with water delivery due to planned and unplanned outages from acute climate shocks (e.g., wildfire, storm, flood).
Water Quality	• Maintain drinking water standards and consistent water quality delivered to District customers, regardless of change in temperature and flow for surface water sources. • Maintain groundwater quality and quality monitoring according to minimum threshold criteria per SGMA Five-Year Periodic Evaluation updates.
Water Supply	• Ensure customer demands are met, including current LoS of 90% demand met during drought based on water supply portfolio reliability. • Invest in and collaborate with other agencies on source protection. • Maintain contingency plans for alternative supply options (e.g., transfers/exchanges, recycled water).
Production Facility Reliability and Redundancy	• Provide equipment and facility reliability that minimizes non-emergency downtime and maintains key functions and equipment for system reliability. • Maintain flexibility to meet water quality objectives through multiple facilities and operations.
Financing	• Design, construct, operate, and maintain facilities in a way that minimizes lifecycle costs. • Account for significant facility costs or other unanticipated cost impacts in the case of acute climate shocks (contingency budget and insurance), and costs to prepare for slow-onset climate risks (e.g., drought and SLR).
Environmental Stewardship	• Manage facilities to enable recreational public benefits. • Manage system to support sustainable management of Alameda Creek Watershed.
Safety	• Design, construct, operate, and maintain system facilities to ensure health and safety of workforce and public safety, considering impacts from, for example, enhanced wildfire risk and or flooding.
Equitable Service	• Provide equal access to services across District's service area. • Maintain reasonable water rate pricing.