

CALIFORNIA DEPARTMENT OF WATER RESOURCES

# **SWP Delivery Capability Report and Climate Adaptation Plan**

**California Water Commission**

**July 17, 2024**



Andrew Schwarz, P.E.  
SWP Climate Action Manager

# SWP Strategic Plan

## Goal 3: Accelerate adaptation and strengthen resiliency for a changing climate

- 3.1 Improve long-term project planning to anticipate and adapt to climate change.
- 3.2 Promote a culture of accountability to increase climate change resilience.
- 3.3 Be a leader in achieving California's climate goals.

### Key 2024 Initiatives

- Enhance the Delivery Capability Report
- Implement Climate Adaptation Planning Analyses



# SWP Climate Action Planning

- **SWP Delivery Capability Report (July 2024)**

Shows future delivery capability if we continue business as usual. No major adaptations, no changes in regulation, but climate continues to warm and precipitation becomes more extreme.

**11-21% Declines in average annual deliveries**

- **SWP Climate Adaptation Plan (Winter 2024/25)**

Shows future delivery capability if we implement key strategies that we are already working on. Shows how new infrastructure and science-based operations can improve reliability.

**How can DCP, FIRO, and storage work together to improve the future?**



# SWP Delivery Capability Report

- Part of the Monterey Plus Settlement Agreement
- Bi-annual report of Existing delivery capability
  - Over a range of hydrologic conditions
    - Historic extended dry cycle
    - Long-term average
- Future delivery capability added in 2007 looking 20-years into the future (business as usual+ climate change)



# The DCR serves as the key planning information for SWP water users:

- Sustainable Groundwater Management Plans
- Urban Water Management Plans
- Agricultural Water Management Plans
- Integrated Regional Water Management Plans
- Integrated Resource Plans



# The DCR serves as the default climate change scenario for SWP planning:



- Future energy resource planning
- Asset maintenance and management studies
- Environmental Impact Reports
- Various longer-range operations studies



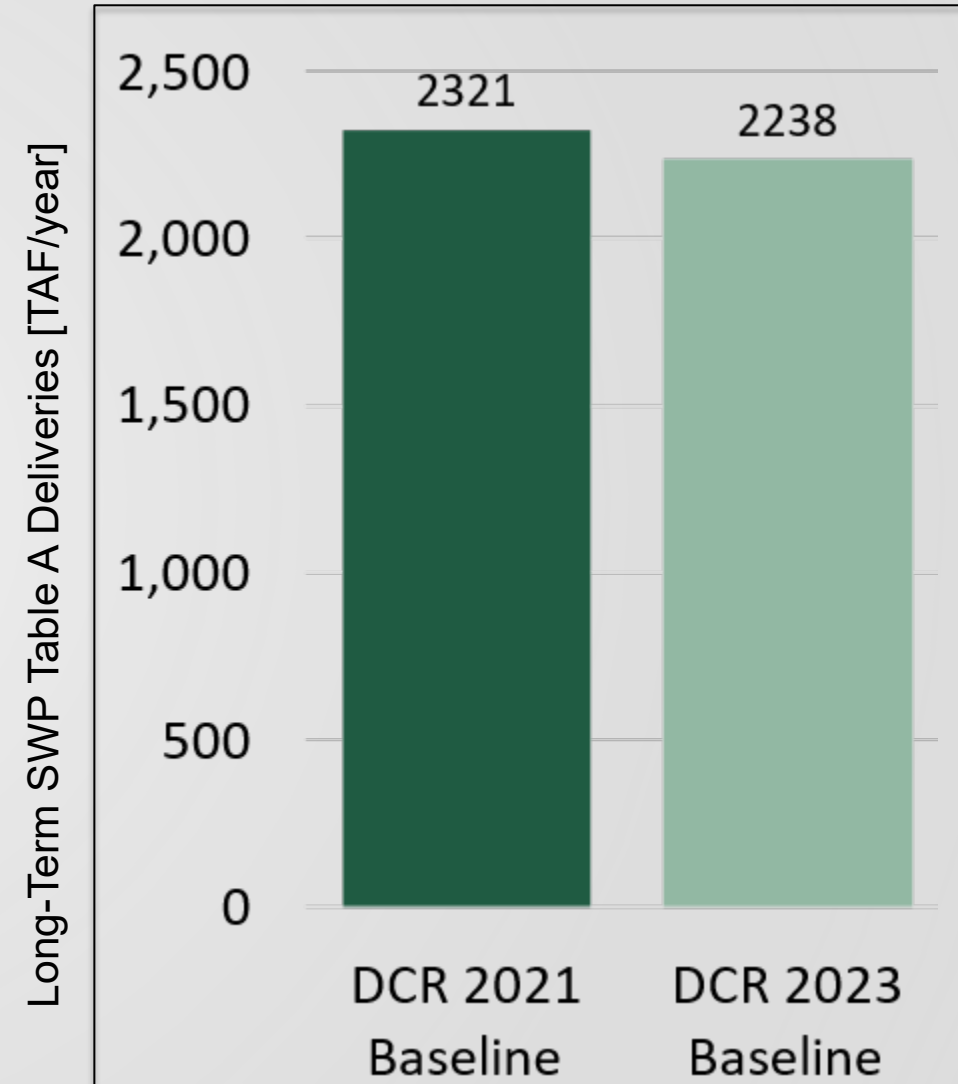
# DCR 2023 Enhancements

- ✓ Account for climate changes that have already occurred
- ✓ New risk-informed future climate scenarios
- ✓ Peer review
- ✓ Greater alignment with other activities



# Climate Impacts on Current Capability

- More variability in year-year runoff
- More seasonal variability
- Higher winter flows
- Lower spring flows
- **About 2% loss of long-term average annual allocation (3.5% by volume)**



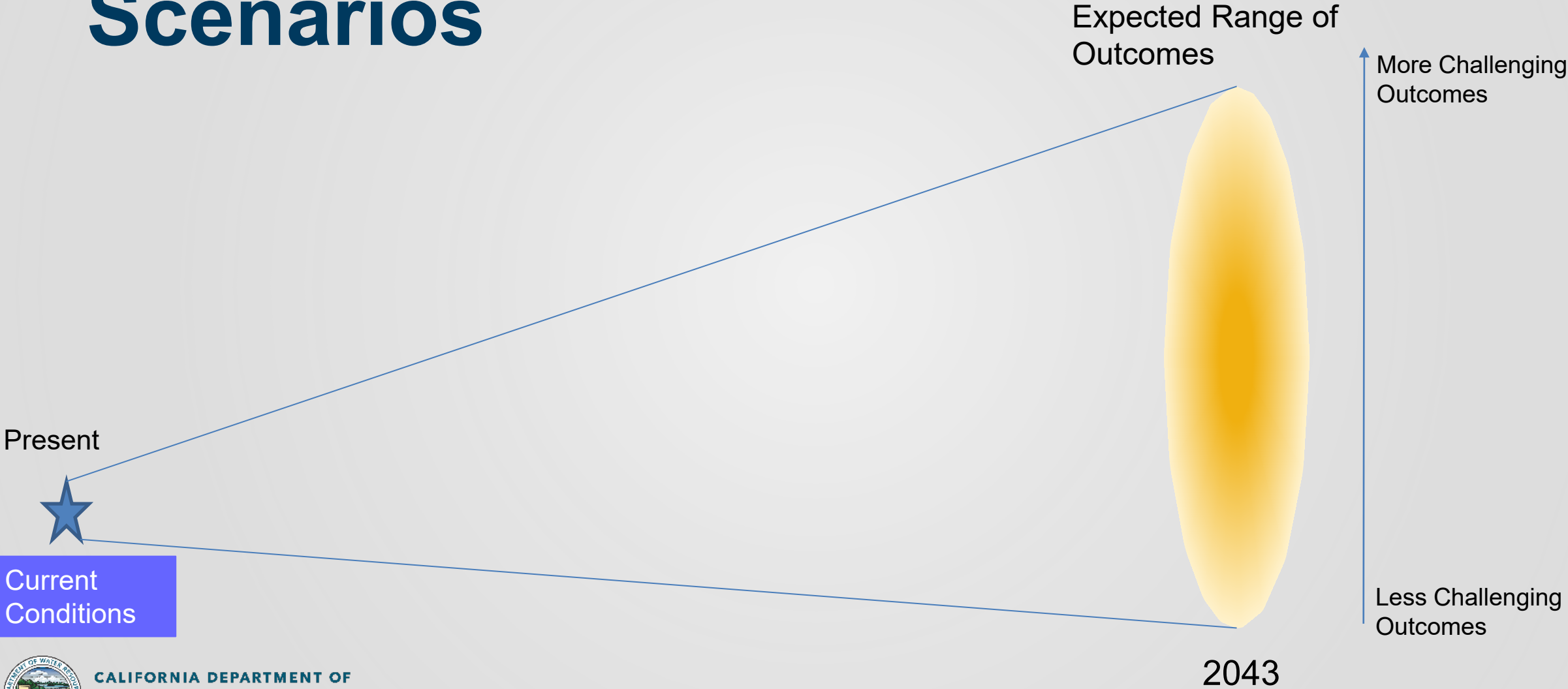


# New Risk Informed Future Climate Scenarios

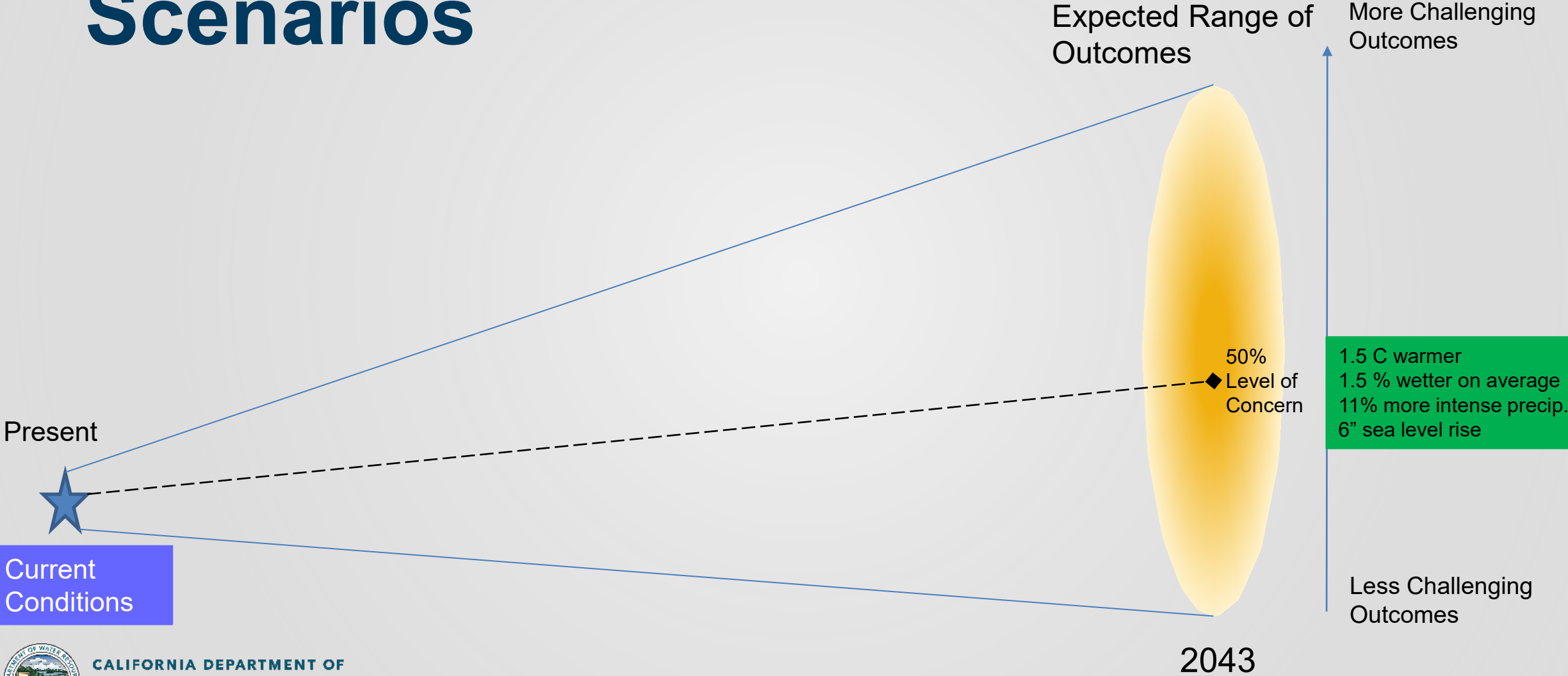
- Future conditions scenarios evaluate combinations of climate changes (temperature, precipitation, and sea level rise) that represent different levels of risk- the “**Level of Concern**” percent number describes the percent of model informed climate outcomes that would result in better system performance.



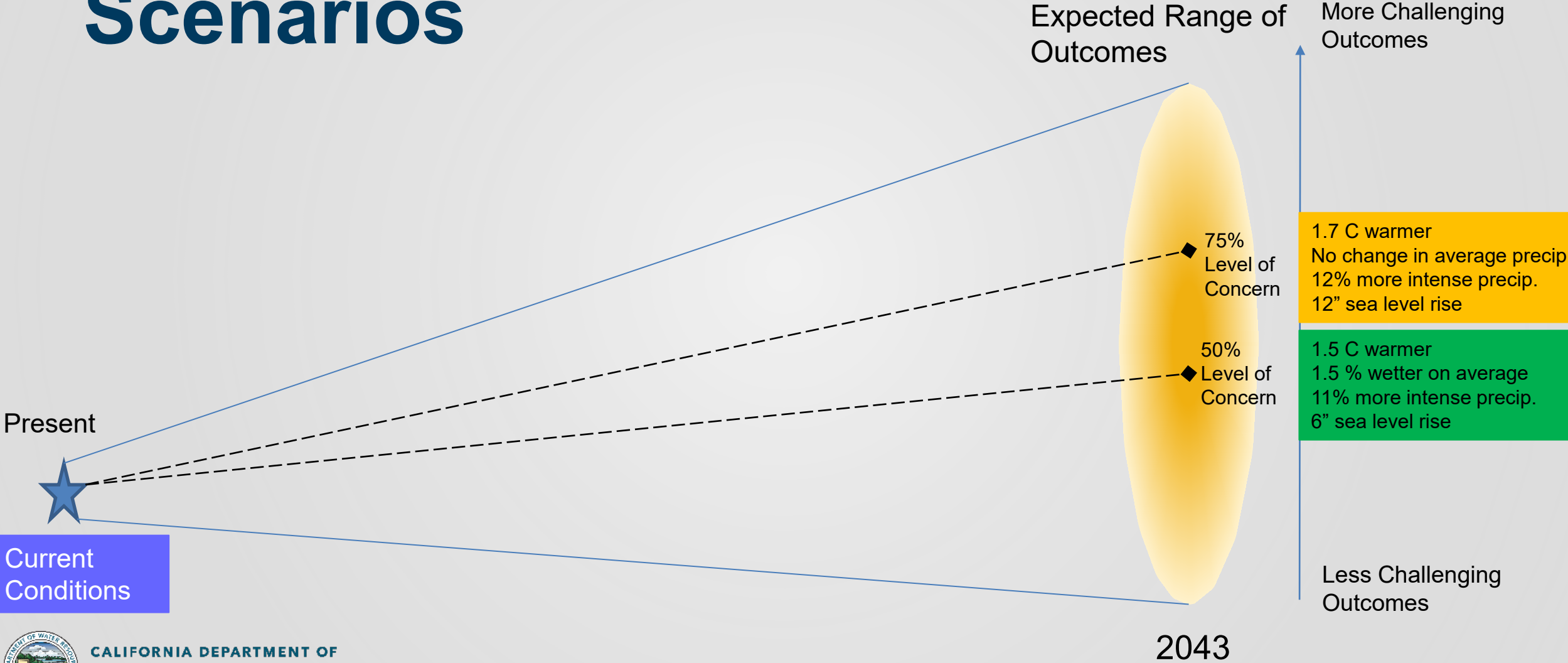
# New Risk Informed Future Climate Scenarios



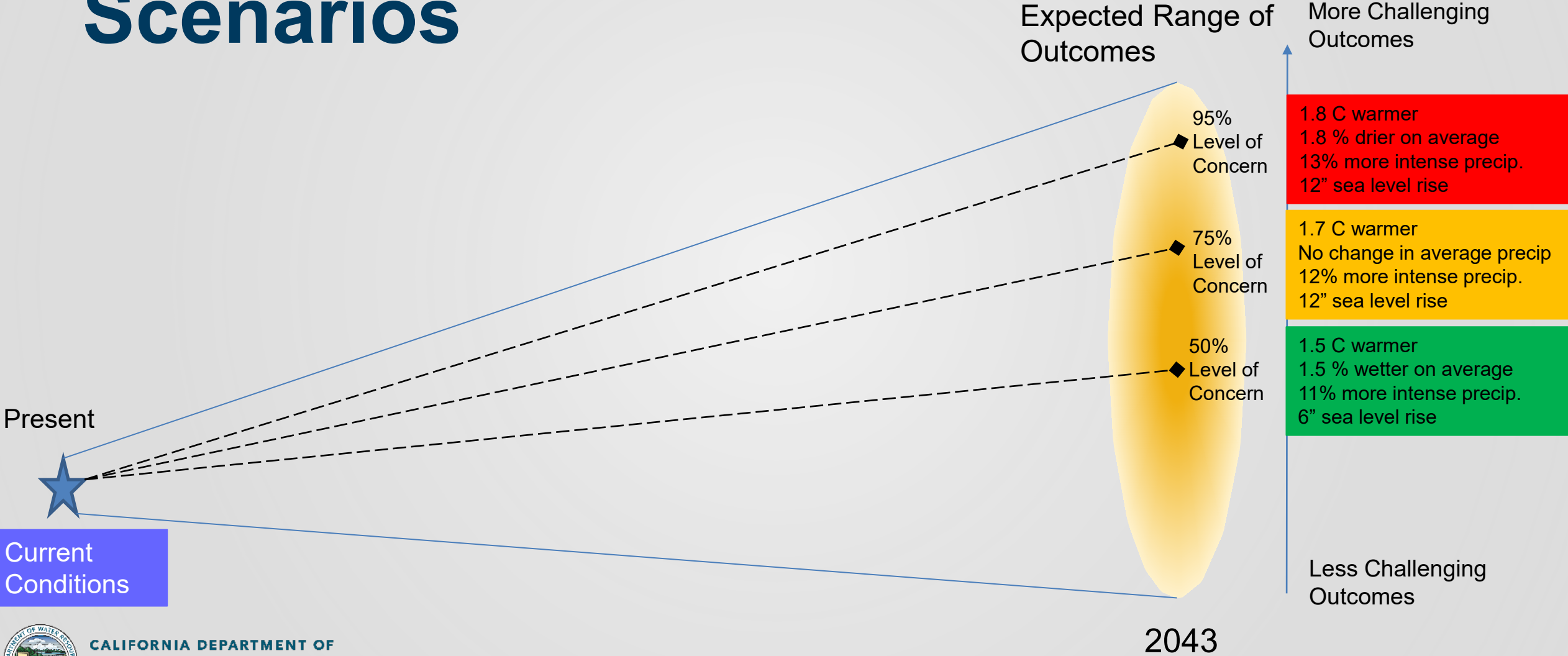
# New Risk Informed Future Climate Scenarios



# New Risk Informed Future Climate Scenarios

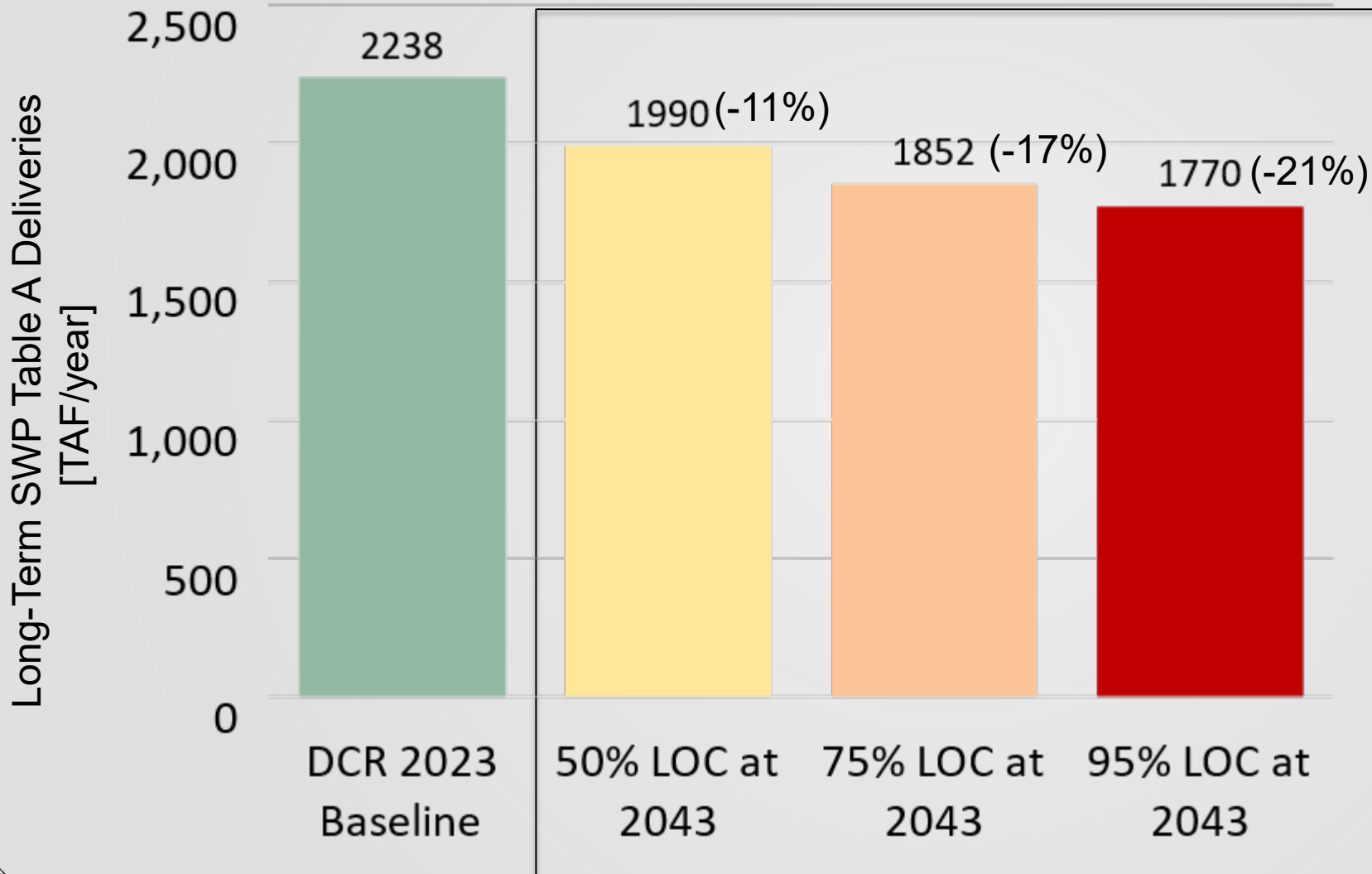


# New Risk Informed Future Climate Scenarios



# Average Annual SWP Table A Deliveries

(DRAFT DCR)

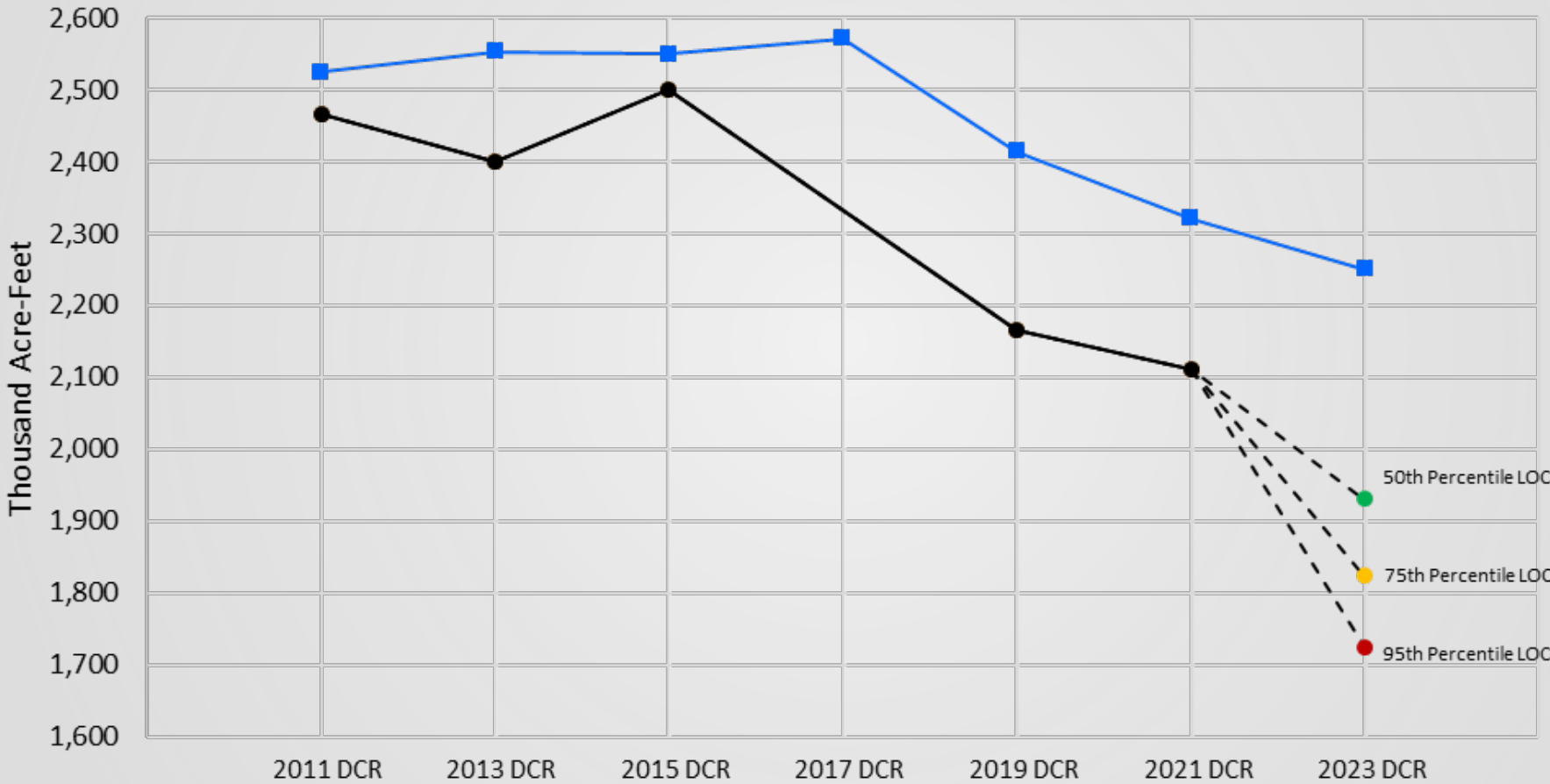


Climate change with NO adaptation likely to decrease average long-term deliveries by 11-21%



# DCR Delivery Trends (2011 – 2023)

## Long-Term South-of-Delta Deliveries



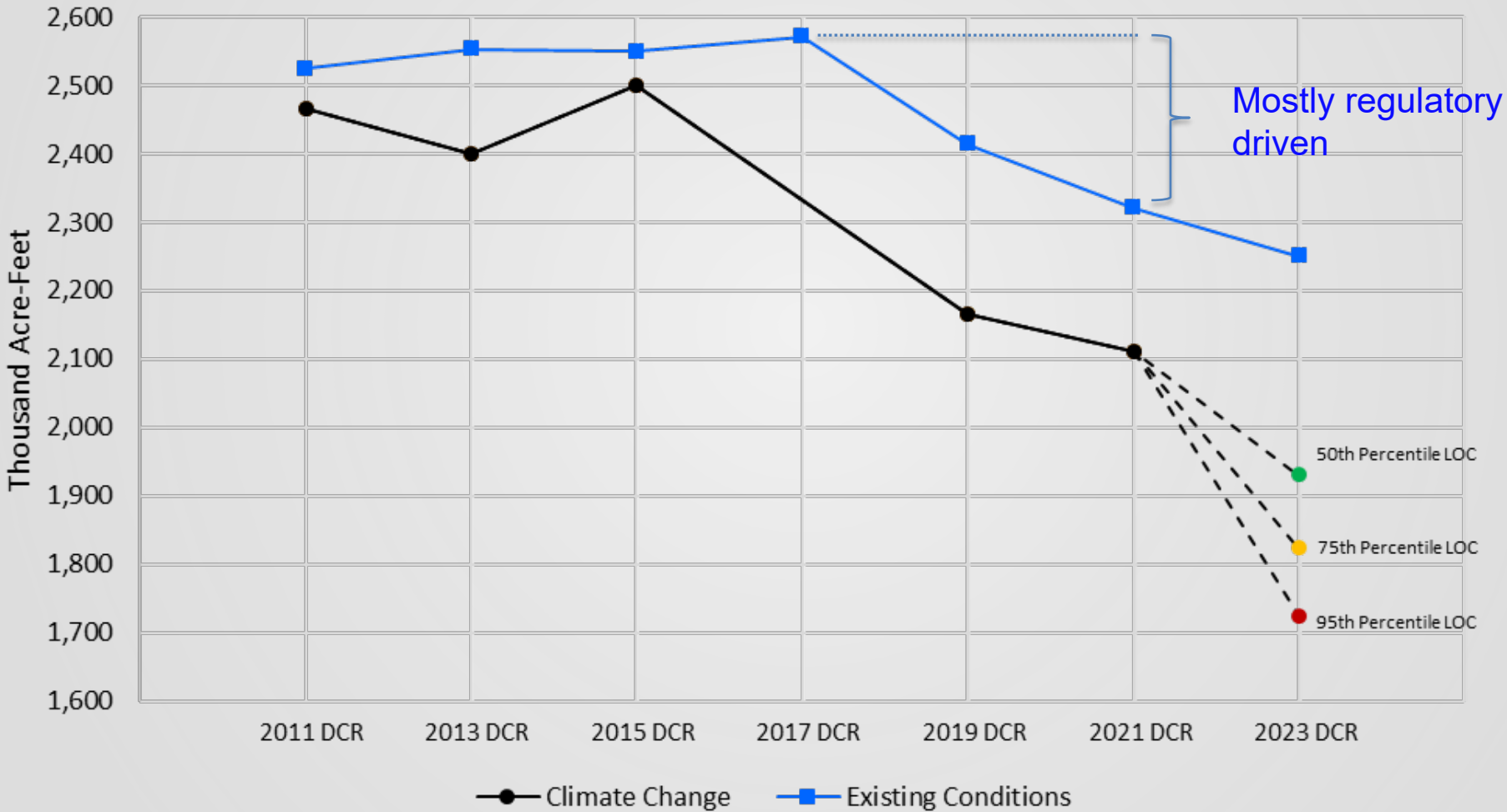
● Climate Change    ■ Existing Conditions



CALIFORNIA DEPARTMENT OF WATER RESOURCES

# DCR Delivery Trends (2011 – 2023)

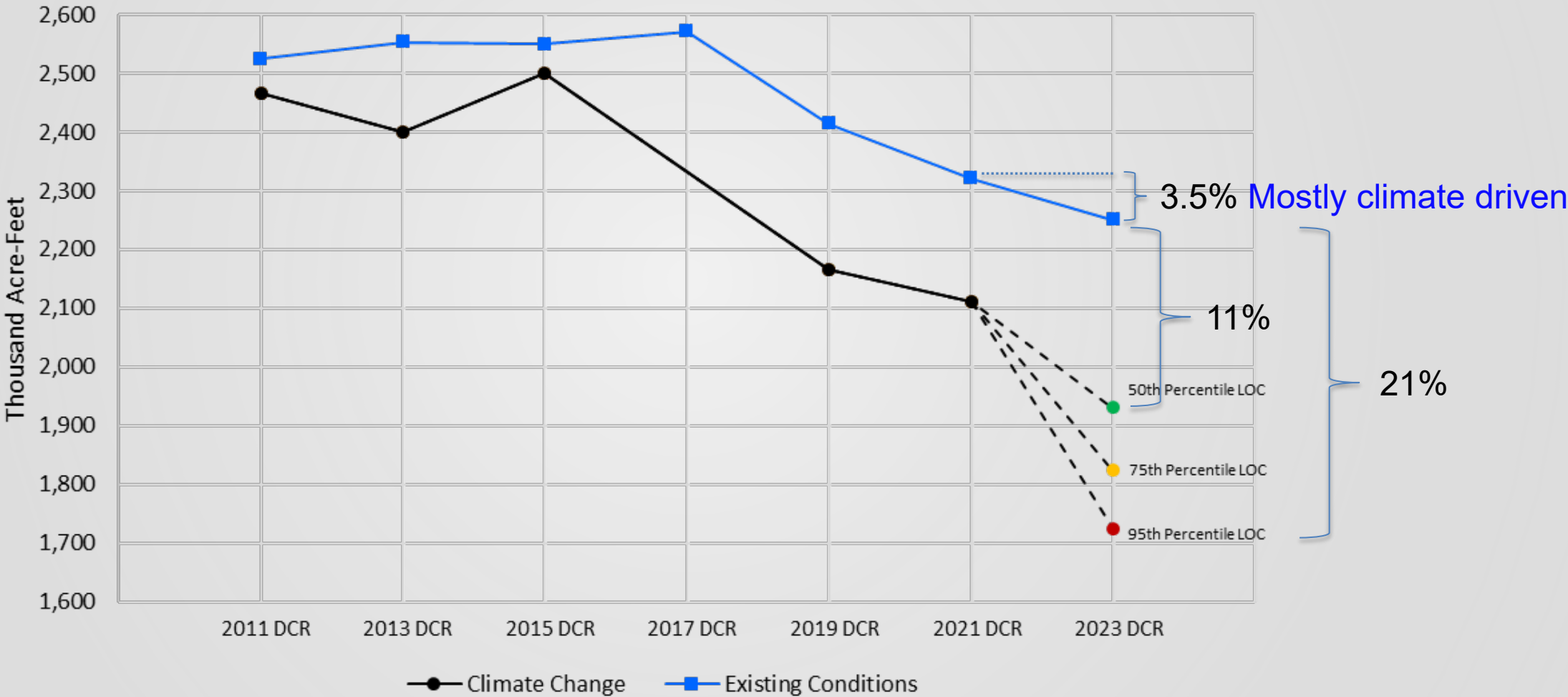
### Long-Term South-of-Delta Deliveries





# DCR Delivery Trends (2011 – 2023)

Long-Term South-of-Delta Deliveries



# SWP Climate Adaptation Plan

We can change to keep up with climate



- **SWP is developing several significant projects that would provide climate adaptation and resilience**
- **Evaluate the current strategies alone and in combination**



# DWR Climate Action Plan

## Reduce Drivers

### Phase 1:

#### Greenhouse Gas Emissions Reduction Plan

DWR activities contribute to continued climate change by emitting greenhouse gasses (GHG). Each project is expected to minimize GHG emissions to the extent possible to help reduce future climate change.

**Key Objective: Contribute to state/federal /global goals**

## Evaluate Risks

### Phase 2:

#### Climate Change Analysis for project evaluation

DWR evaluates and analyzes climate change impacts on projects. This may relate to CEQA or permitting analyses and includes what amount of sea level rise we should be considering or how much change in streamflow we consider for future operations of a project.

**Key Objective: Analysis and cross department coordination and consistency. (WREM 75)**

## Address Risks

### CAP Phase 3:

#### Adaptation Strategy

DWR must adapt to climate change impacts. What infrastructure and operational changes will we need to make and what investments should we be planning for?

**Key Objective: Prepare for the future.**



# Key Benefits of this Study

- Builds on top of DCR work—alternative futures where we have improvements in place by 2045
- Looks further into the future (2085) to the end of the current water supply contracts with and without adaptation
- Shows how combinations of projects are more than the sum of their parts
- Shows how SWP is preparing for a hotter more extreme future



# Current SWP Adaptation Measures

## Structural Measures

- Delta conveyance project
- California aqueduct subsidence project
- Increased south of Delta storage
- Delta barriers
- Pumped storage and other energy benefits identified in flexible resource study

## Operations and Management Measures

- Forecast informed reservoir operations/Lake Oroville flood control manual update
- SWP enhanced asset management
- Improved seasonal forecasting
- Revised carryover storage targets
- Shaping SWP power load and generation
- Enhanced financial management and contract extensions
- SWP Delta islands management
- WSIP project integration
- Reservoir temperature management

## Nature Based Solutions

- Recreation development
- Feather river watershed management
- Environmental restoration



# Key SWP Adaptation Measures

## Structural Measures

- **Delta conveyance project**
- **California aqueduct subsidence project**
- **Increased south of Delta storage**
- Delta barriers
- Pumped storage and other energy benefits identified in flexible resource study

## Operations and Management Measures

- **Forecast informed reservoir operations/Lake Oroville flood control manual update**
- **SWP enhanced asset management**
- Improved seasonal forecasting
- Revised carryover storage targets
- Shaping SWP power load and generation
- Enhanced financial management and contract extensions
- SWP Delta islands management
- WSIP project integration
- Reservoir temperature management

## Nature Based Solutions

- Recreation development
- Feather river watershed management
- Environmental restoration



# Scenario Combinations

## Regulations



## Hydrology

2043 50% LOC	
2043 95% LOC	
2085 50% LOC	
2085 75% LOC	

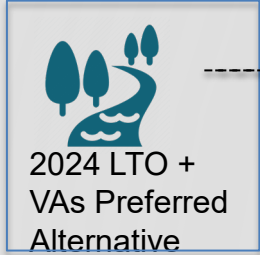


## Infrastructure and Operational Adaptations

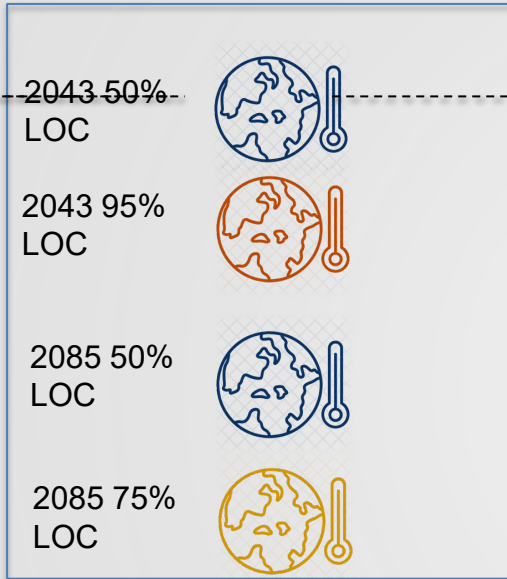
	Deteriorating System	
	Maintenance and Restoration	
	Maintenance and Restoration	DCP
	Maintenance and Restoration	FIRO
	Maintenance and Restoration	South- of-Delta Storage
	Maintenance and Restoration	DCP FIRO Storage

# Scenario Combinations

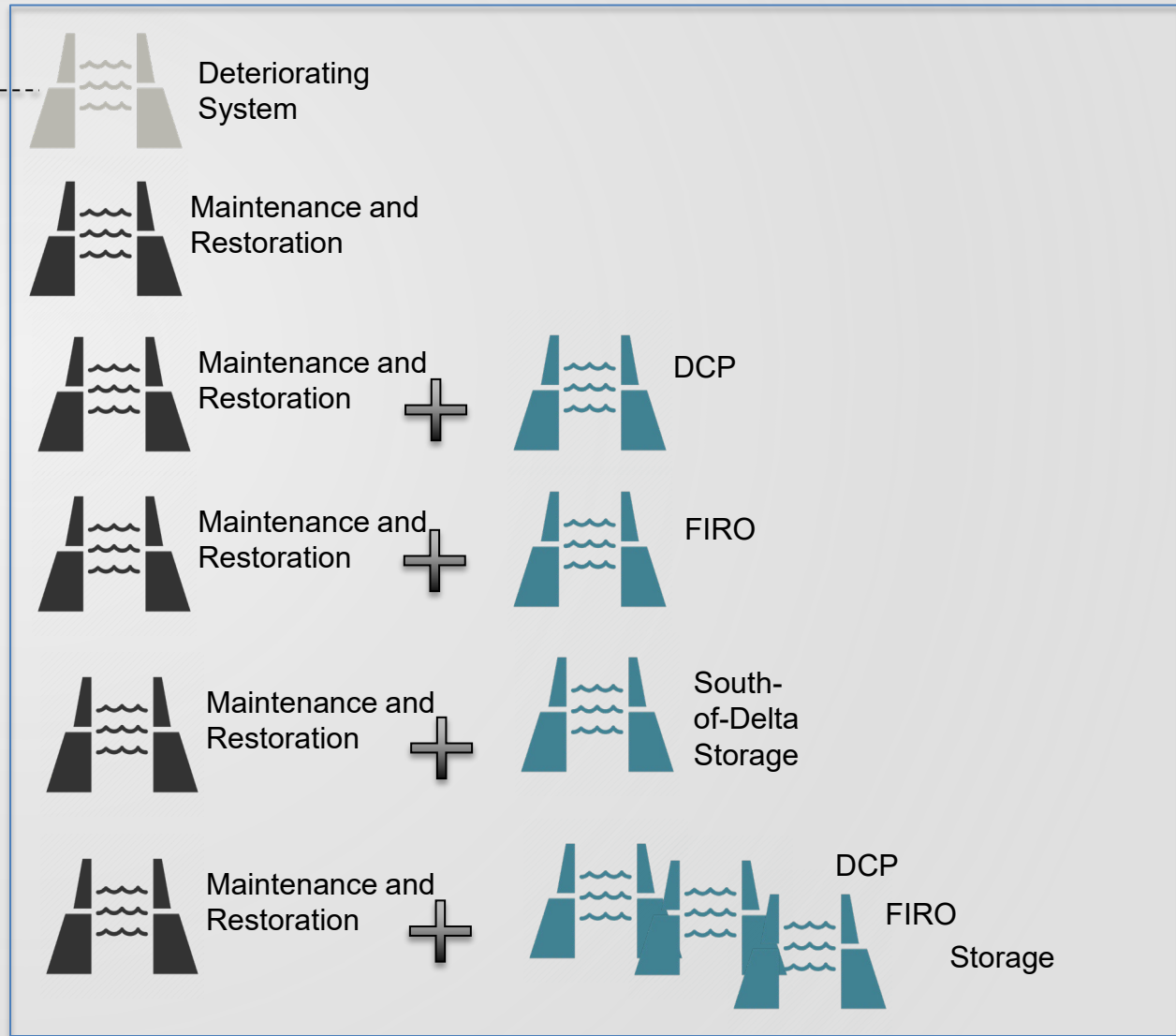
## Regulations



## Hydrology



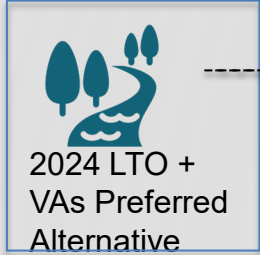
## Infrastructure and Operational Adaptations



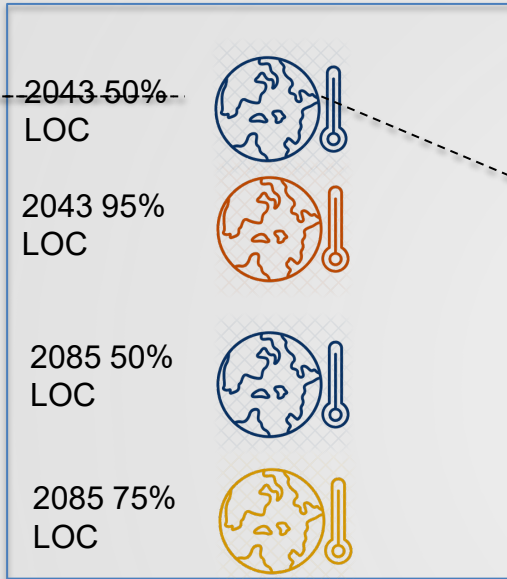


# Scenario Combinations

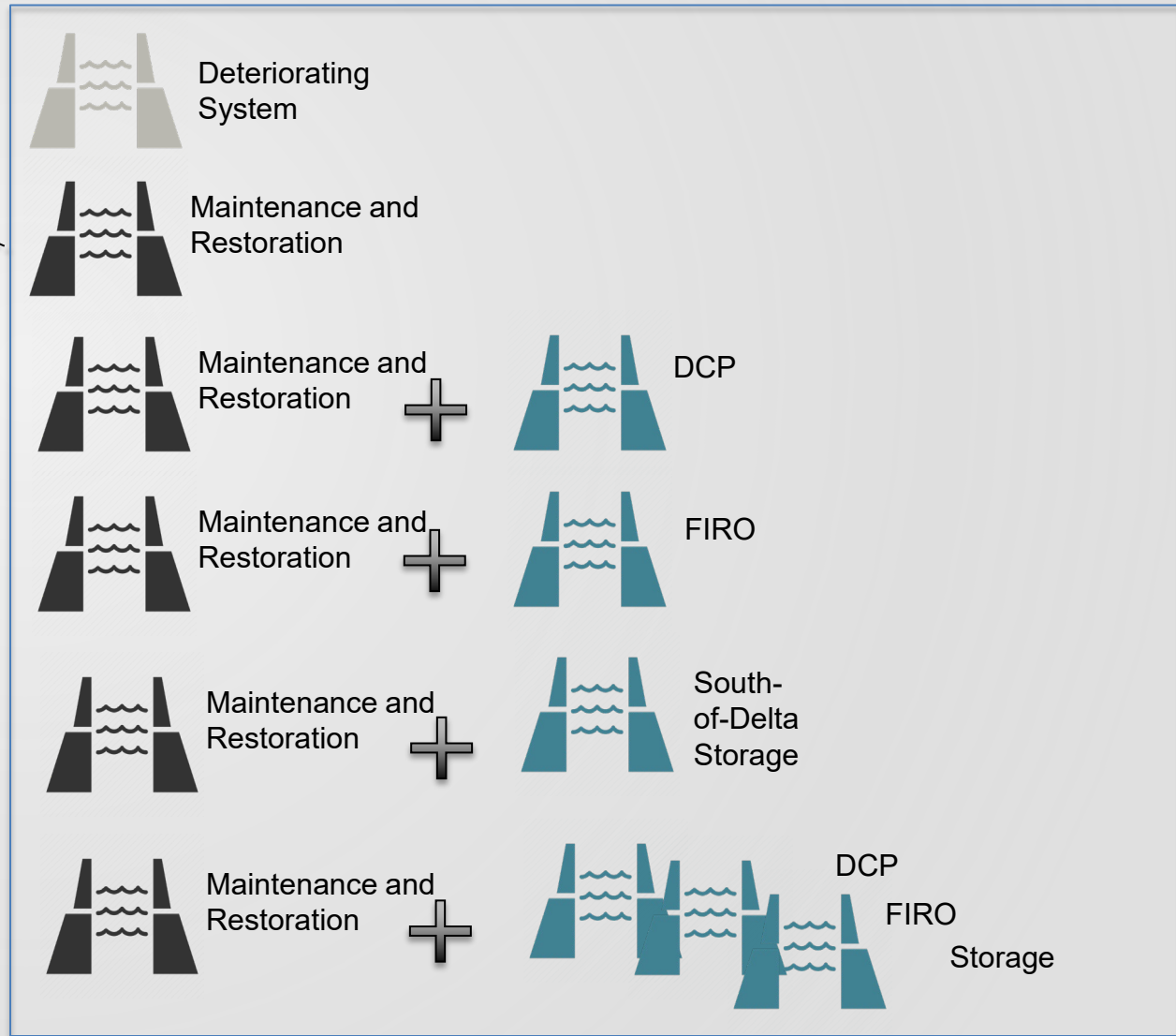
## Regulations



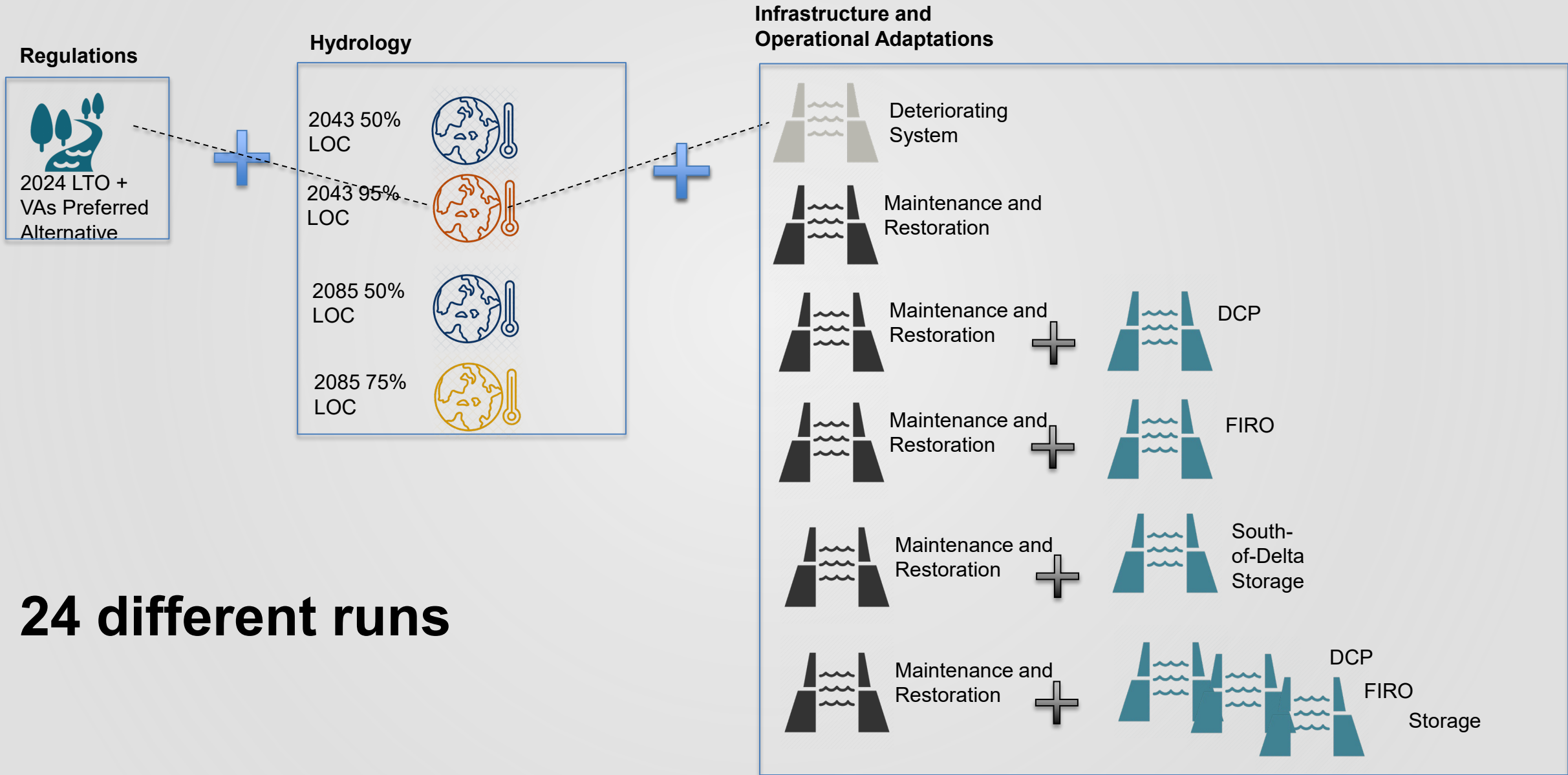
## Hydrology



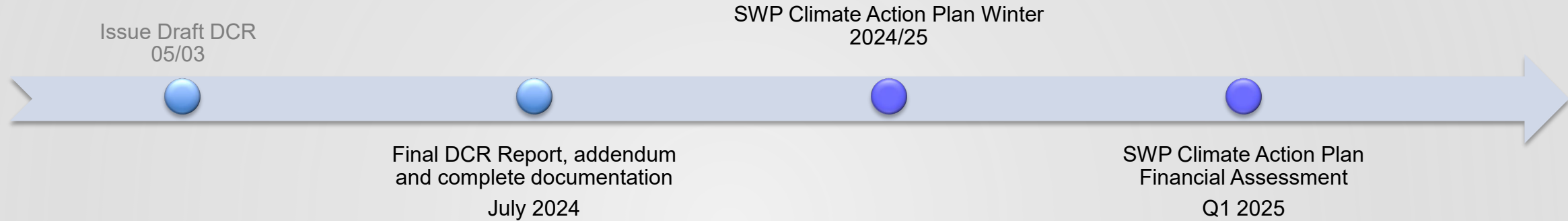
## Infrastructure and Operational Adaptations



# Scenario Combinations



# Milestone Schedule



# DCR Key Take Aways

- If we don't act:
  - Changes in snow accumulation, precipitation, temperature, and sea level will reduce deliveries
  - Average SWP deliveries ↓ by >10% by 2043
  - Dry/Critical Year SWP deliveries ↓ by >20% by 2043
  - **That doesn't mean there isn't water, its just that our current infrastructure wasn't designed for these conditions, we can adapt...**



# Adaptation Plan Key Take Aways

- SWP Adaptation Plan will show:
  - How adaptation can lead to alternative futures and mitigate climate impacts
  - How multiple adaptation strategies work together
  - Residual vulnerabilities



Andrew.Schwarz@water.ca.gov

**THANK YOU**



**CALIFORNIA DEPARTMENT OF**  
**WATER RESOURCES**