

# Chino Basin Watermaster

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CHINO BASIN SUSTAINABILITY BOARD DISCUSSION

OCTOBER 13, 2021





# Purpose of this discussion

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To elicit the Watermaster Board's input on Chino Basin stewardship, in preparation of "The Big Picture in 2021: Chino Basin Sustainability Report"



# Workshop Outline

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1. Background
  1. Chino Basin Timeline
  2. OBMP Investments and Benefits
  3. Chino Basin Management Drivers:
    1. Salt and Nutrient Management
    2. Legislation, Regulation, and Agreements
    3. Outside Interest in Chino Basin Operations
    4. Changes in Hydrology Over Time
    5. Funding Opportunities
  4. Watermaster/Sustainability/Stewardship
2. Chino Basin Stewardship Efforts



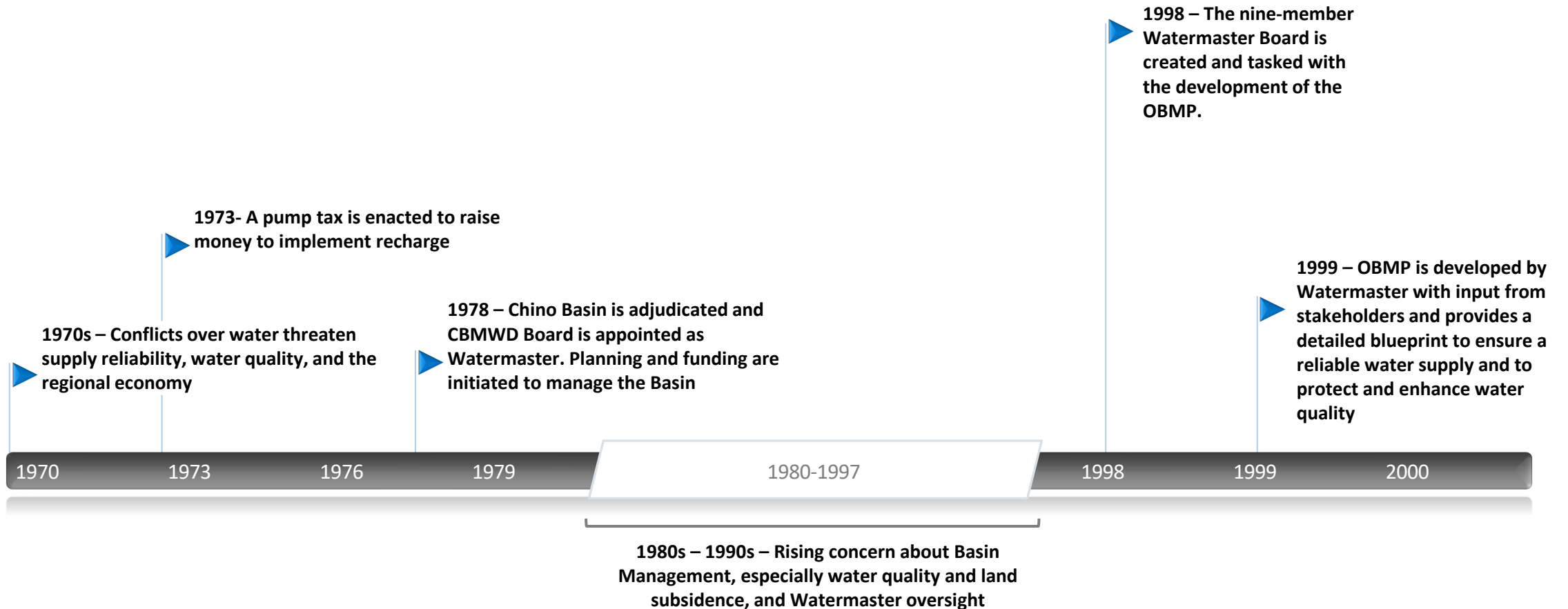
# Background: Chino Basin Timeline

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WHERE WE ARE NOW AND HOW WE GOT HERE



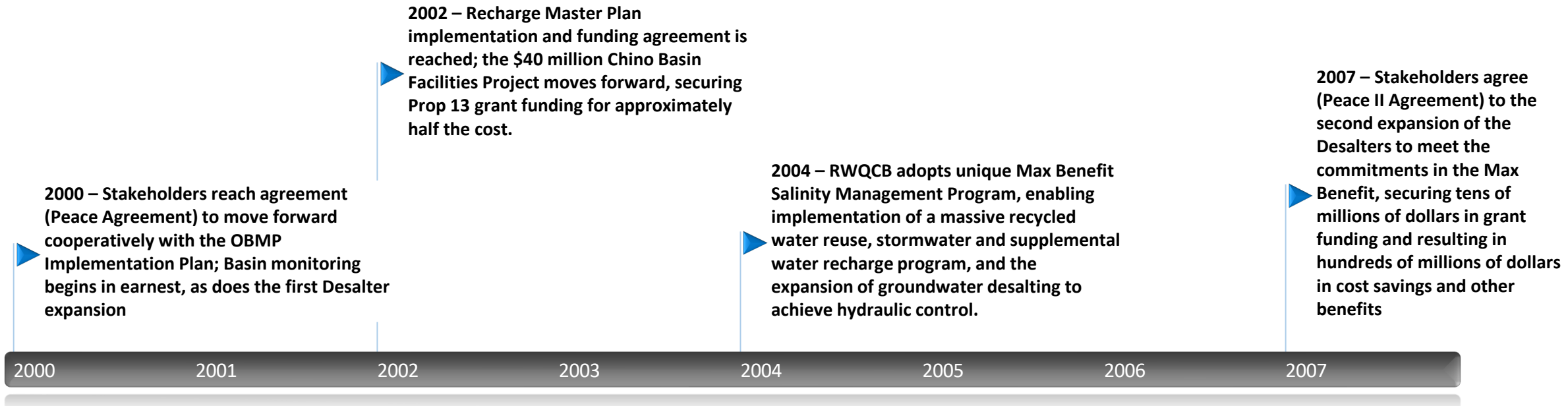
# 1970-1999





# 2000-2010

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# 2011-2021





# Background: Managing with the 2000 OBMP

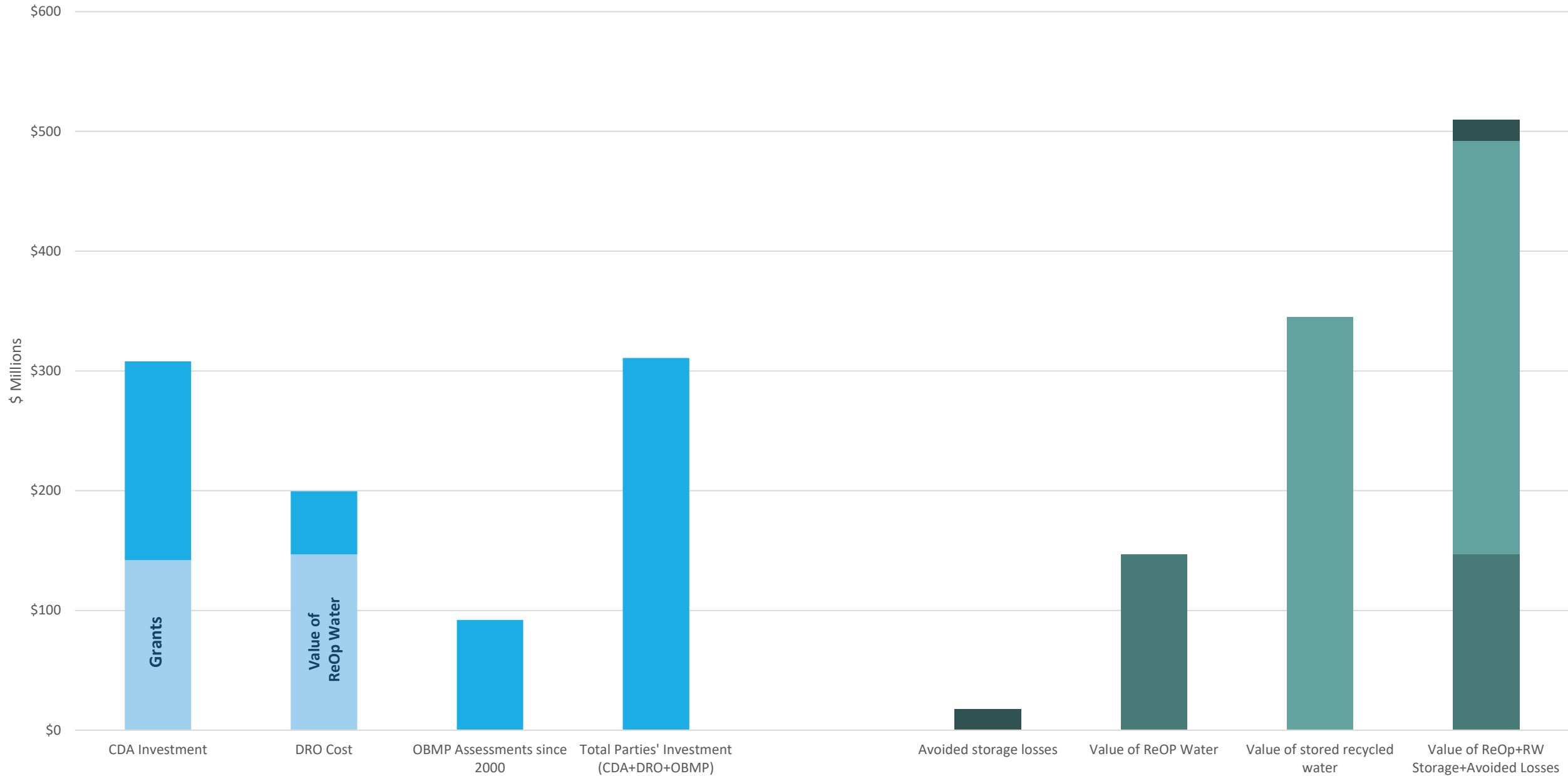
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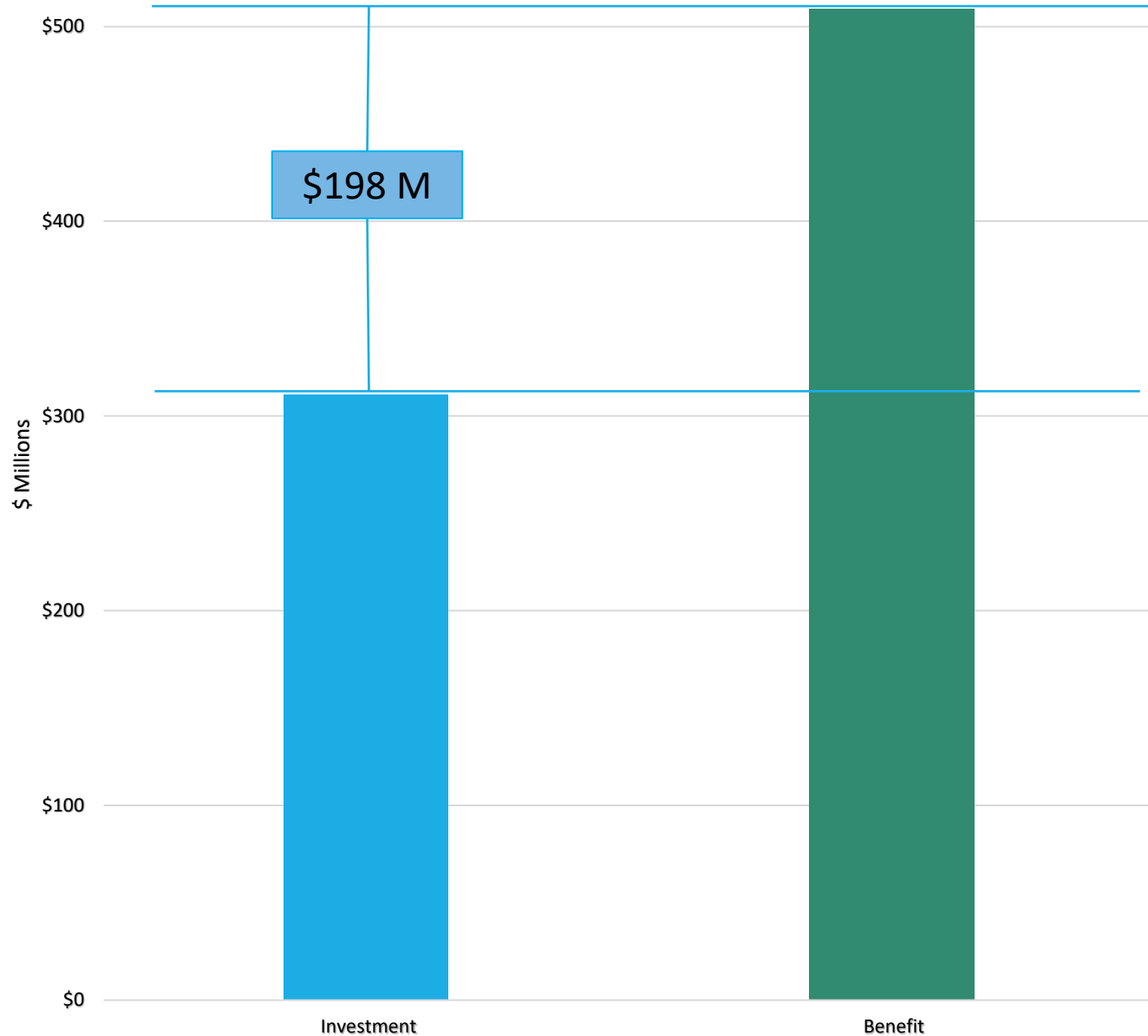
INVESTMENTS AND BENEFITS





# OBMP Investment and Benefits





## OBMP Investments and Benefits

- Cumulative transfers of water between parties: ~766k AF
- Cumulative water produced by the CDA: ~449k AF
- Cumulative water recharged through DYY: ~420k AF
- Avoided conflict due to water quality
- Avoided conflict due to land subsidence
- Improved resilience to drought
- Subsidence management and improved water quality in MZ1.

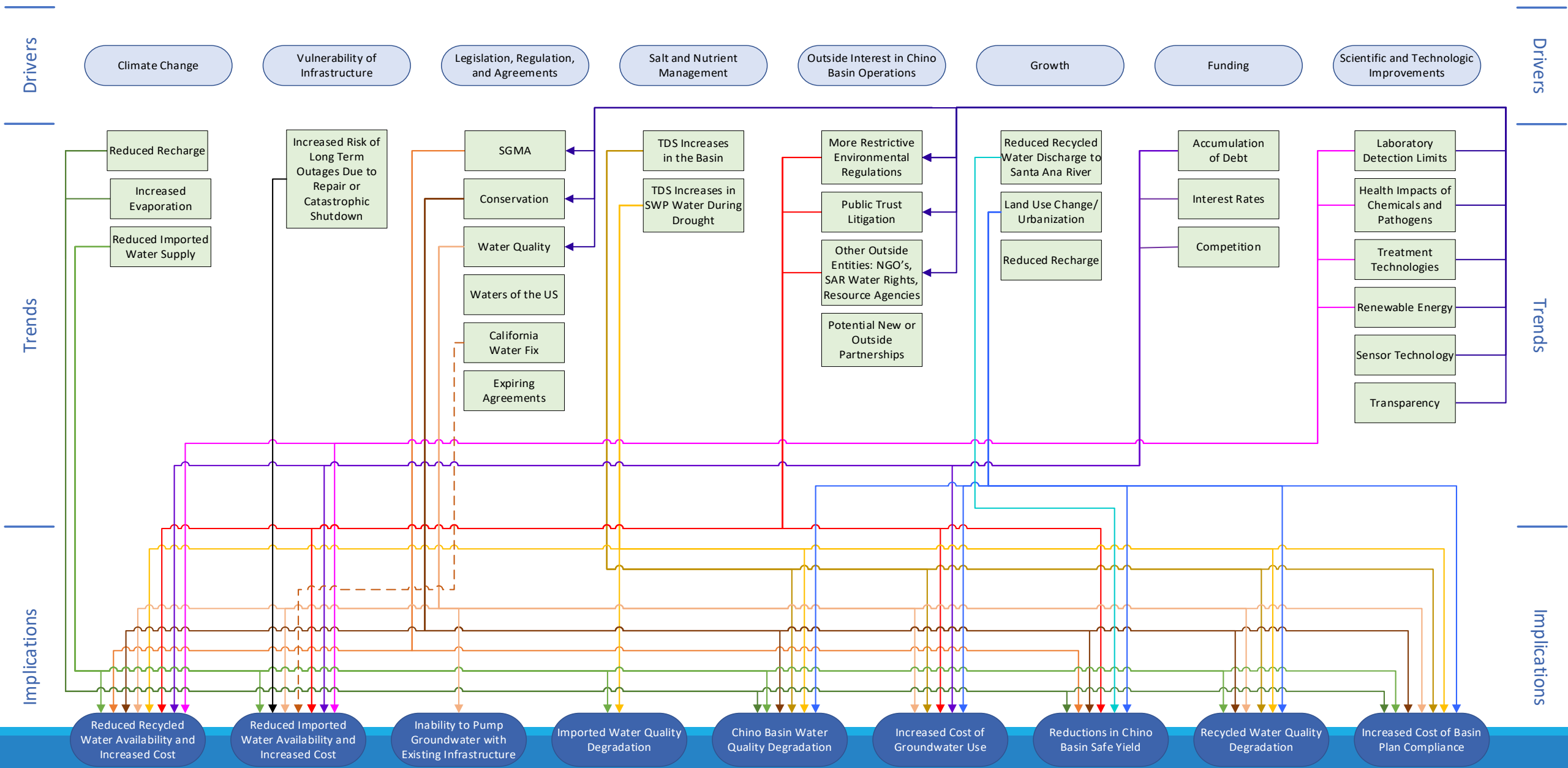


# Background: Basin Management Drivers

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EXTERNAL DRIVERS AND THEIR IMPLICATIONS FOR CHINO BASIN  
MANAGEMENT

# Exhibit 1 – Drivers and Trends and Their Implications 2020 OBMP Update

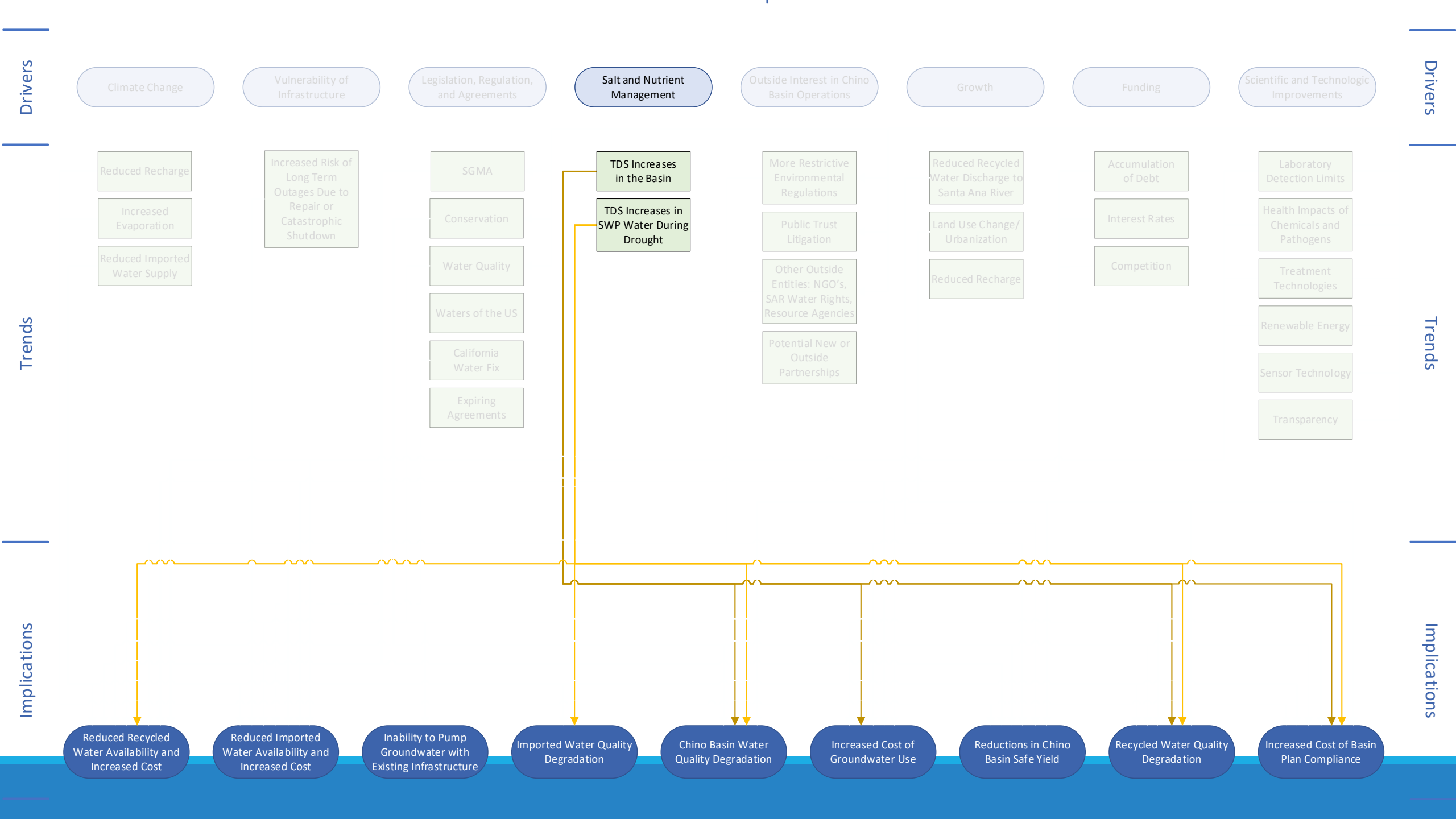




# Background: Basin Management Drivers

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SALT AND NUTRIENT MANAGEMENT

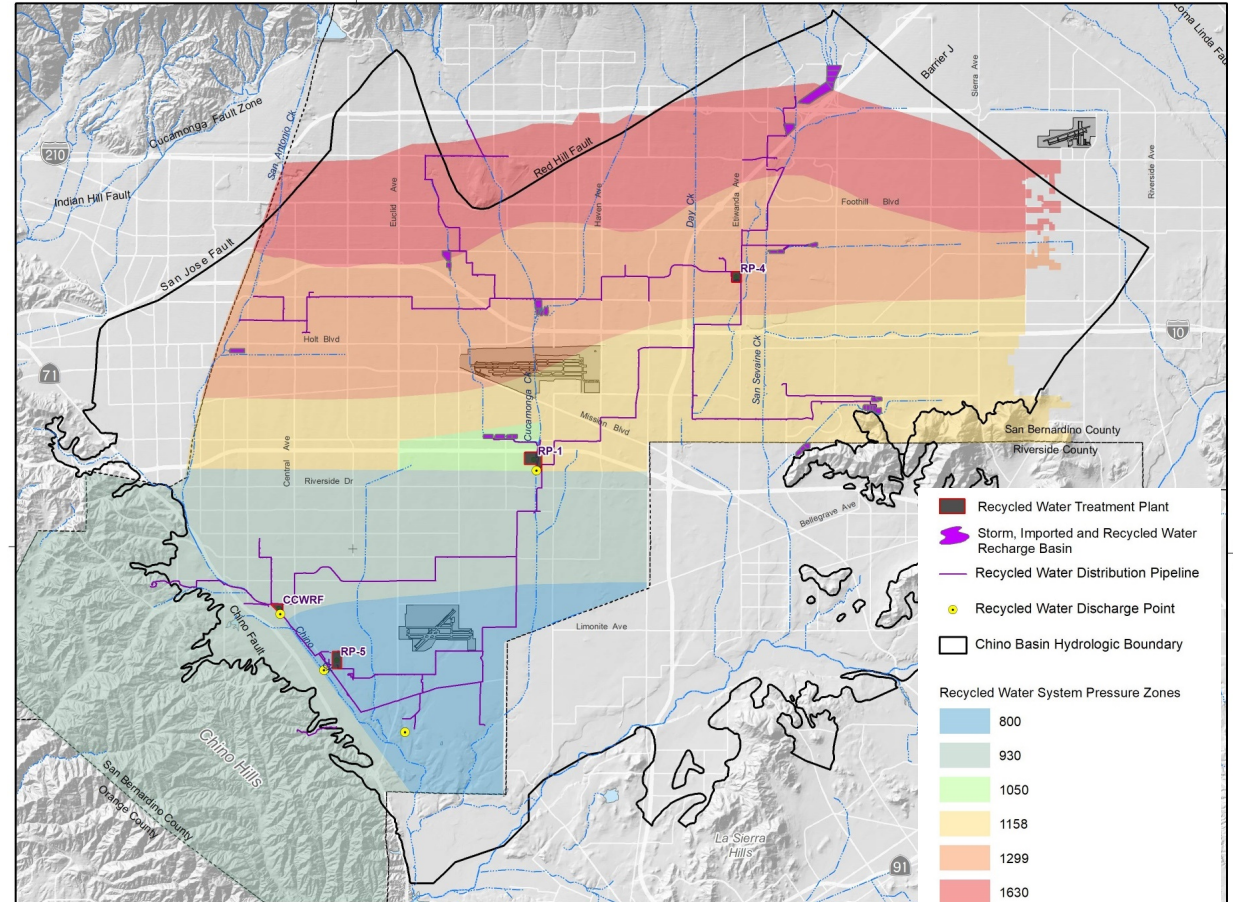




# Salt and Nutrient Management

## Trends:

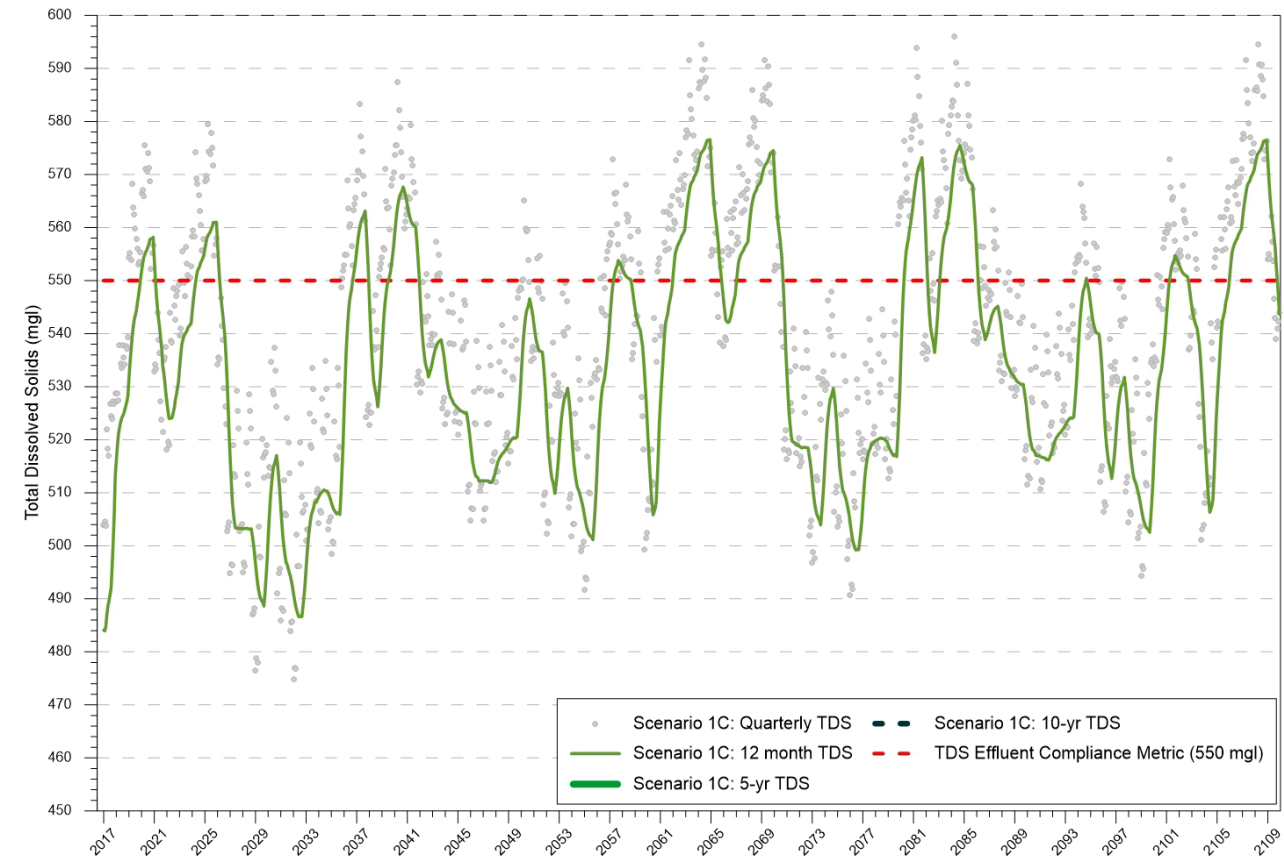
- Increasing TDS concentrations in water supplies:
  - State Project Water during drought periods
  - Chino Basin Groundwater



# Salt and Nutrient Management

## Implications:

- Increasing TDS concentrations of recycled water used for recharge and irrigation
  - ↓
- Threat to compliance with TDS concentration limits
  - ↓
- Increasing costs of:
  - Basin Plan compliance
  - Mitigation for recycled water use
  - Increased costs of recycled water use





# Salt and Nutrient Management

## Solutions:

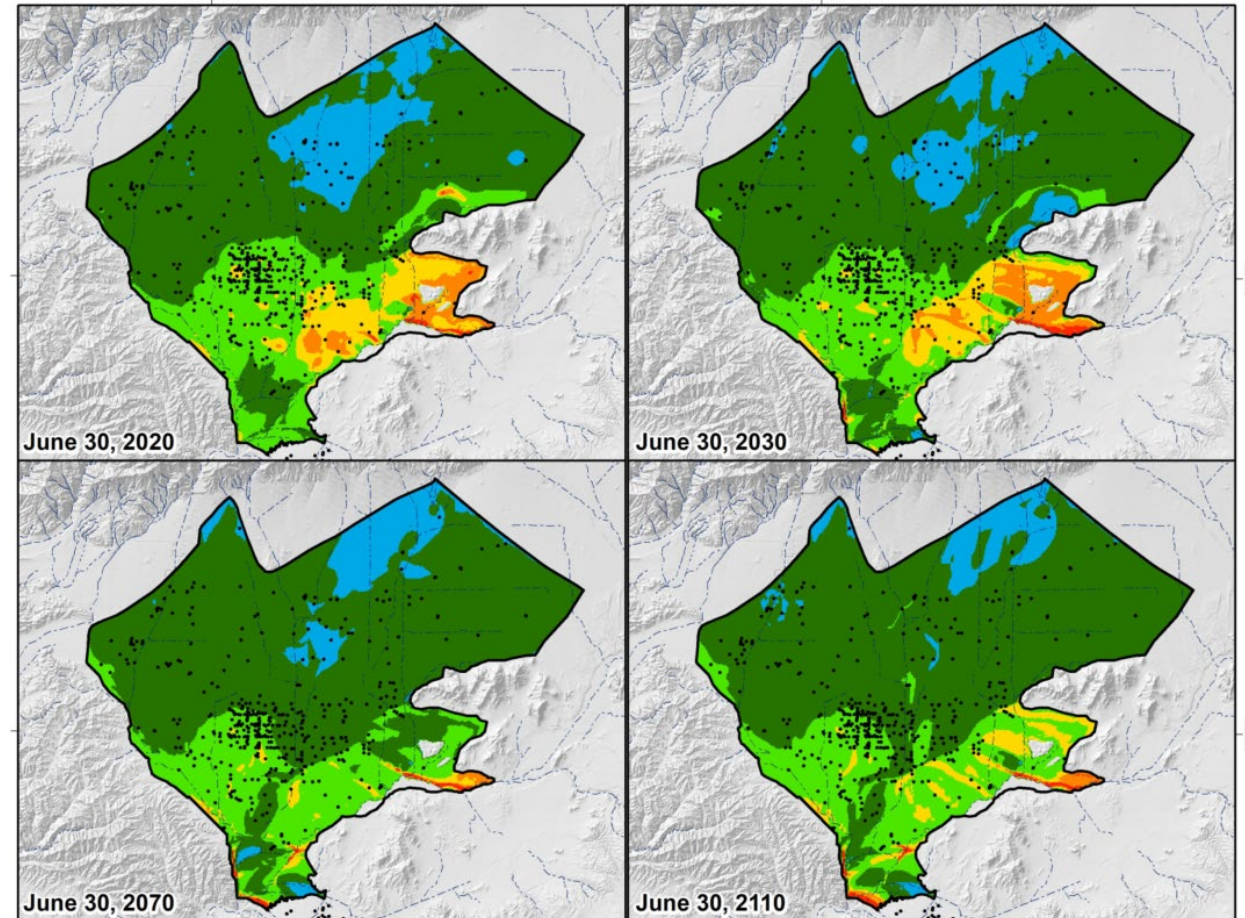
- Continued monitoring to track trends over time



- Improvement of water quality modeling tools to demonstrate benefits of management actions



- Management actions designed to achieve multiple and maximum benefits

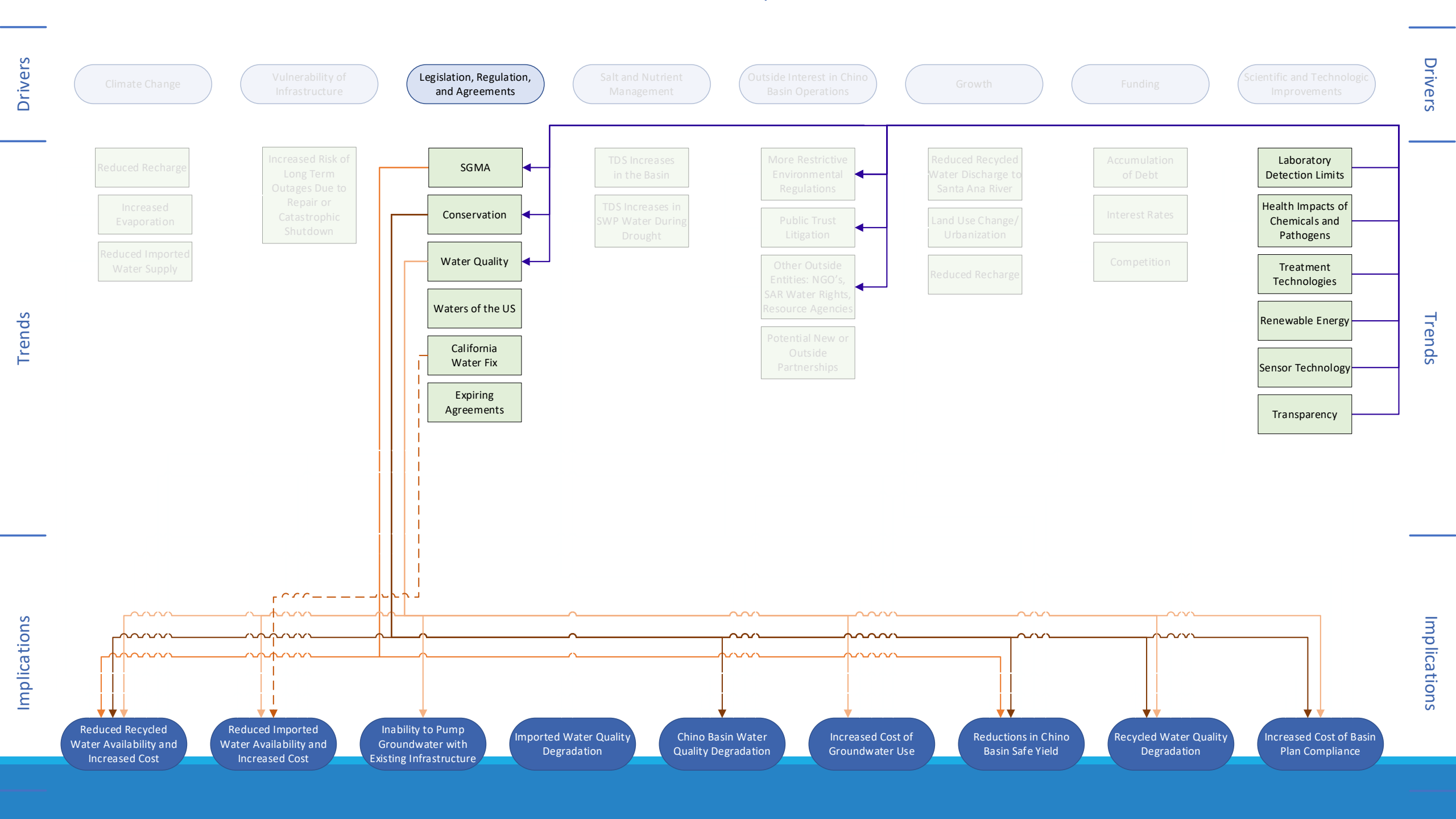




# Background: Basin Management Drivers

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LEGISLATION, REGULATION, AND AGREEMENTS

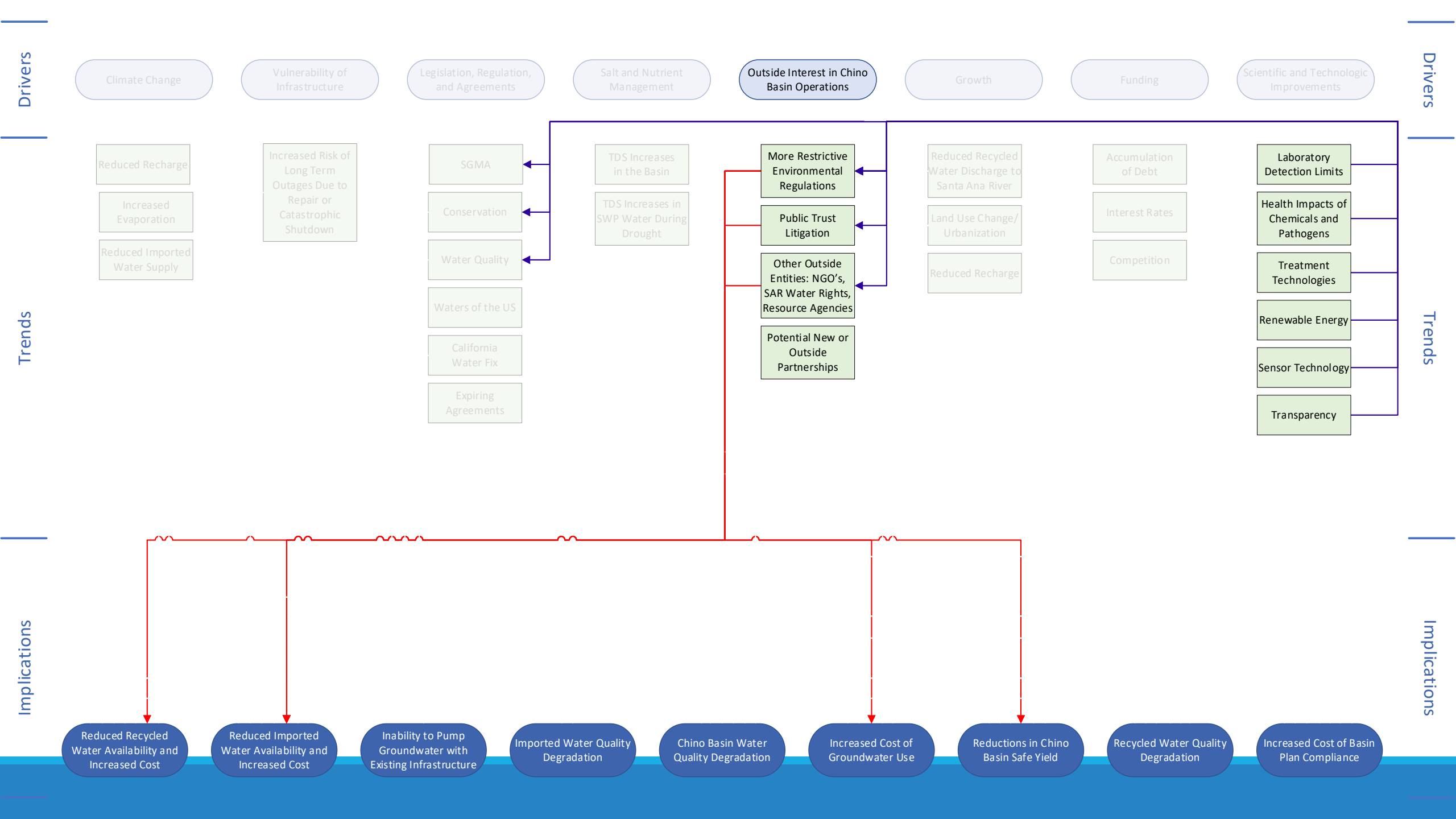




# Background: Basin Management Drivers

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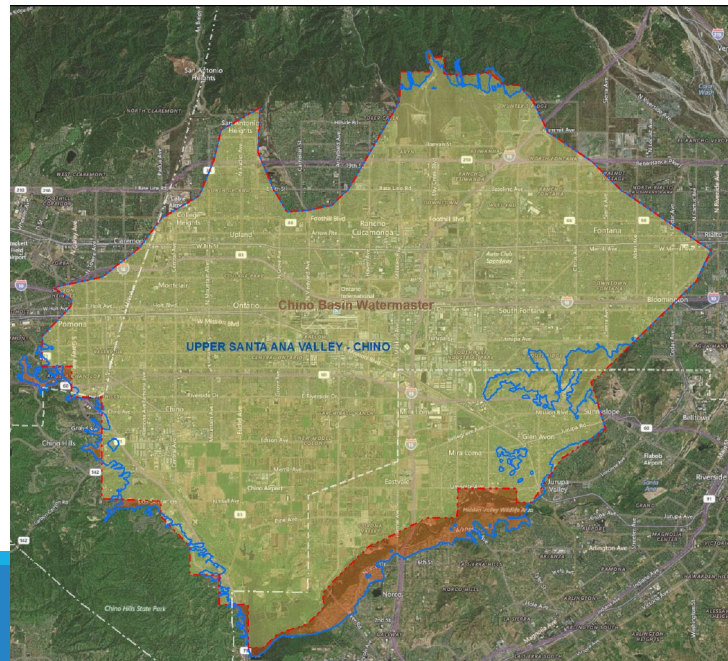
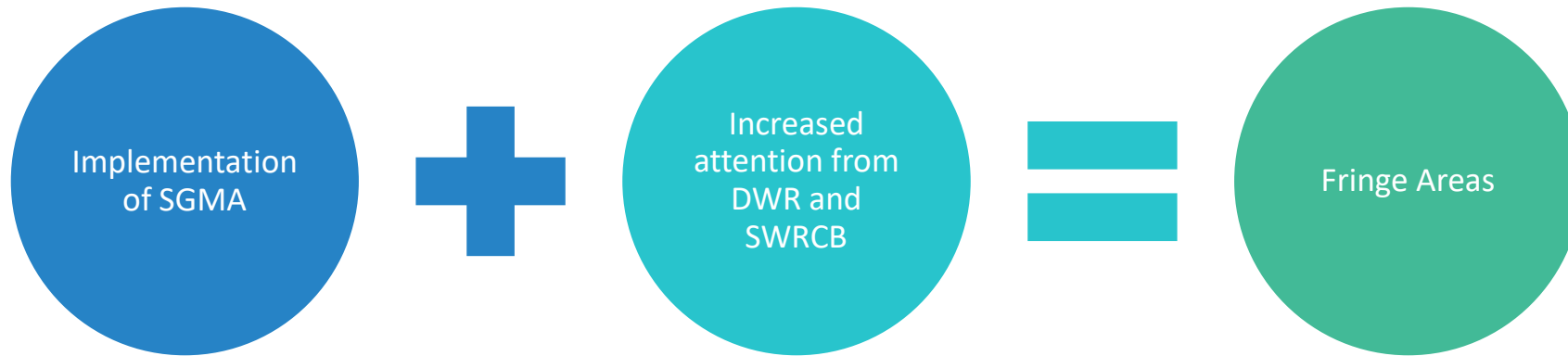
OUTSIDE INTEREST IN CHINO BASIN OPERATIONS







# Outside Interest in Chino Basin Operations





# Background: Basin Management Drivers

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CHANGES IN HYDROLOGY OVER TIME



Drivers

Drivers

Trends

Trends

Implications

Implications

Climate Change

Vulnerability of Infrastructure

Legislation, Regulation, and Agreements

Salt and Nutrient Management

Outside Interest in Chino Basin Operations

Growth

Funding

Scientific and Technologic Improvements

Reduced Recharge

Increased Evaporation

Reduced Imported Water Supply

Increased Risk of Long Term Outages Due to Repair or Catastrophic Shutdown

SGMA

Conservation

Water Quality

Waters of the US

California Water Fix

Expiring Agreements

TDS Increases in the Basin

TDS Increases in SWP Water During Drought

More Restrictive Environmental Regulations

Public Trust Litigation

Other Outside Entities: NGO's, SAR Water Rights, Resource Agencies

Potential New or Outside Partnerships

Reduced Recycled Water Discharge to Santa Ana River

Land Use Change/ Urbanization

Reduced Recharge

Accumulation of Debt

Interest Rates

Competition

Laboratory Detection Limits

Health Impacts of Chemicals and Pathogens

Treatment Technologies

Renewable Energy

Sensor Technology

Transparency

Reduced Recycled Water Availability and Increased Cost

Reduced Imported Water Availability and Increased Cost

Inability to Pump Groundwater with Existing Infrastructure

Imported Water Quality Degradation

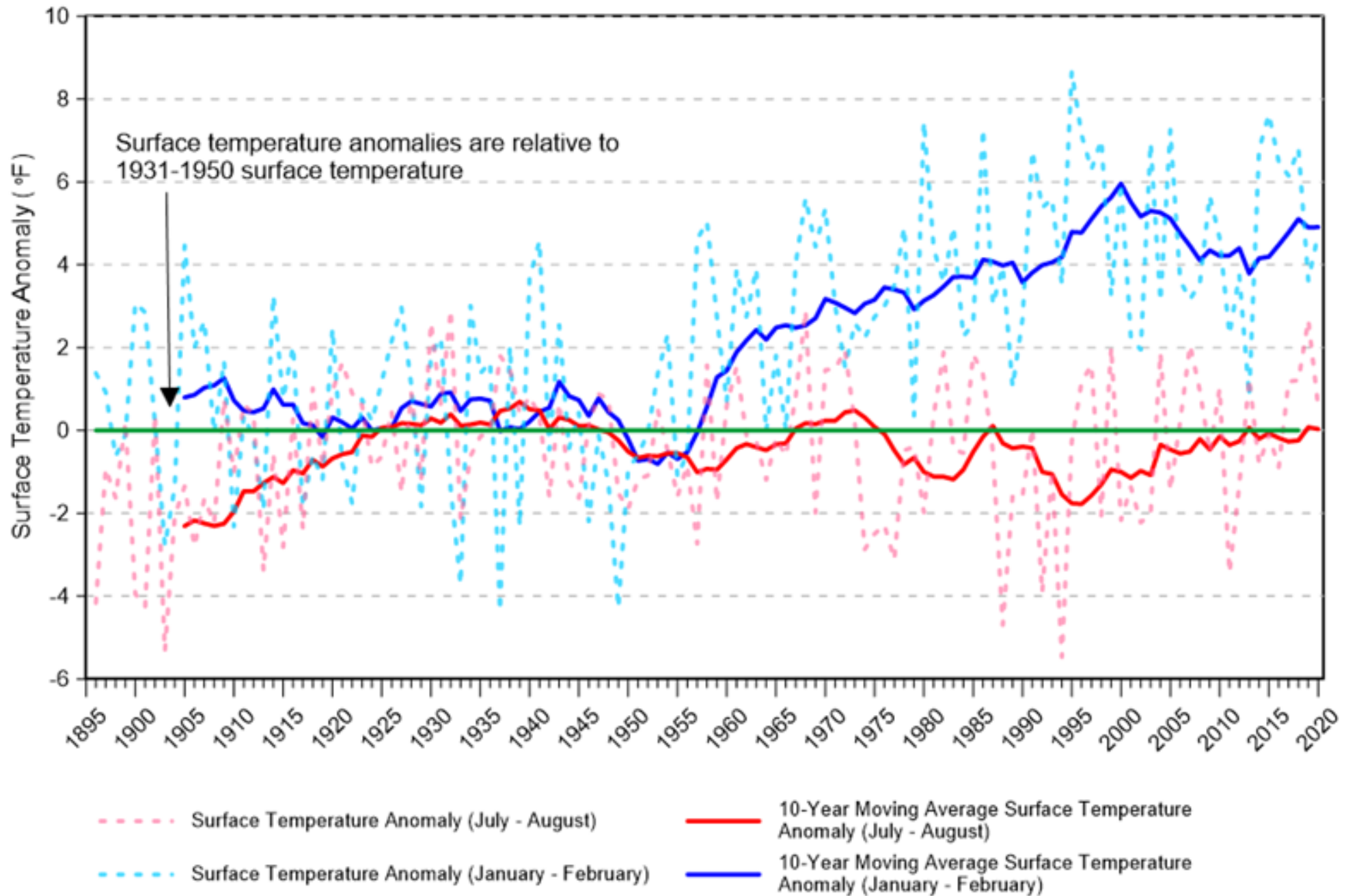
Chino Basin Water Quality Degradation

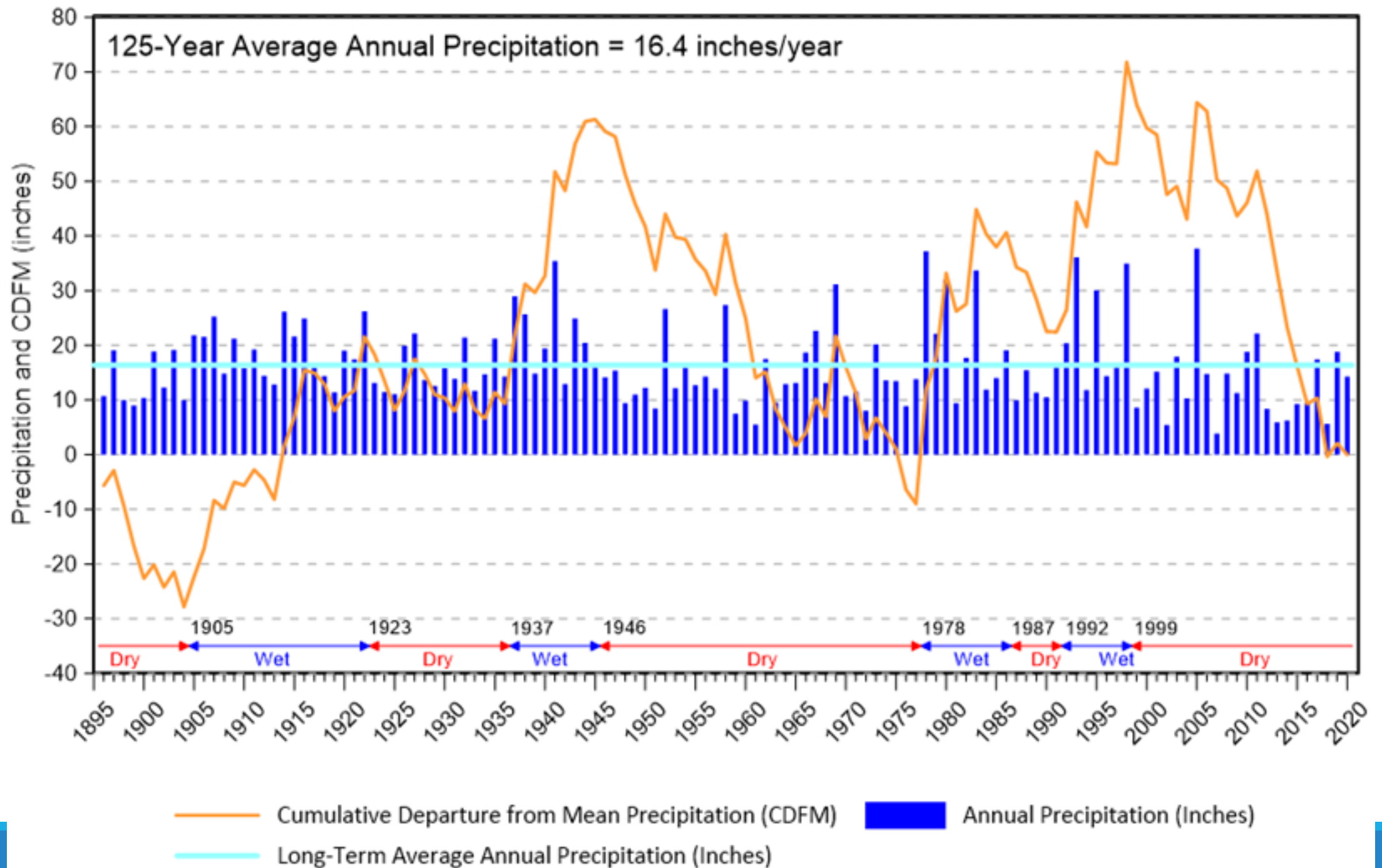
Increased Cost of Groundwater Use

Reductions in Chino Basin Safe Yield

Recycled Water Quality Degradation

Increased Cost of Basin Plan Compliance



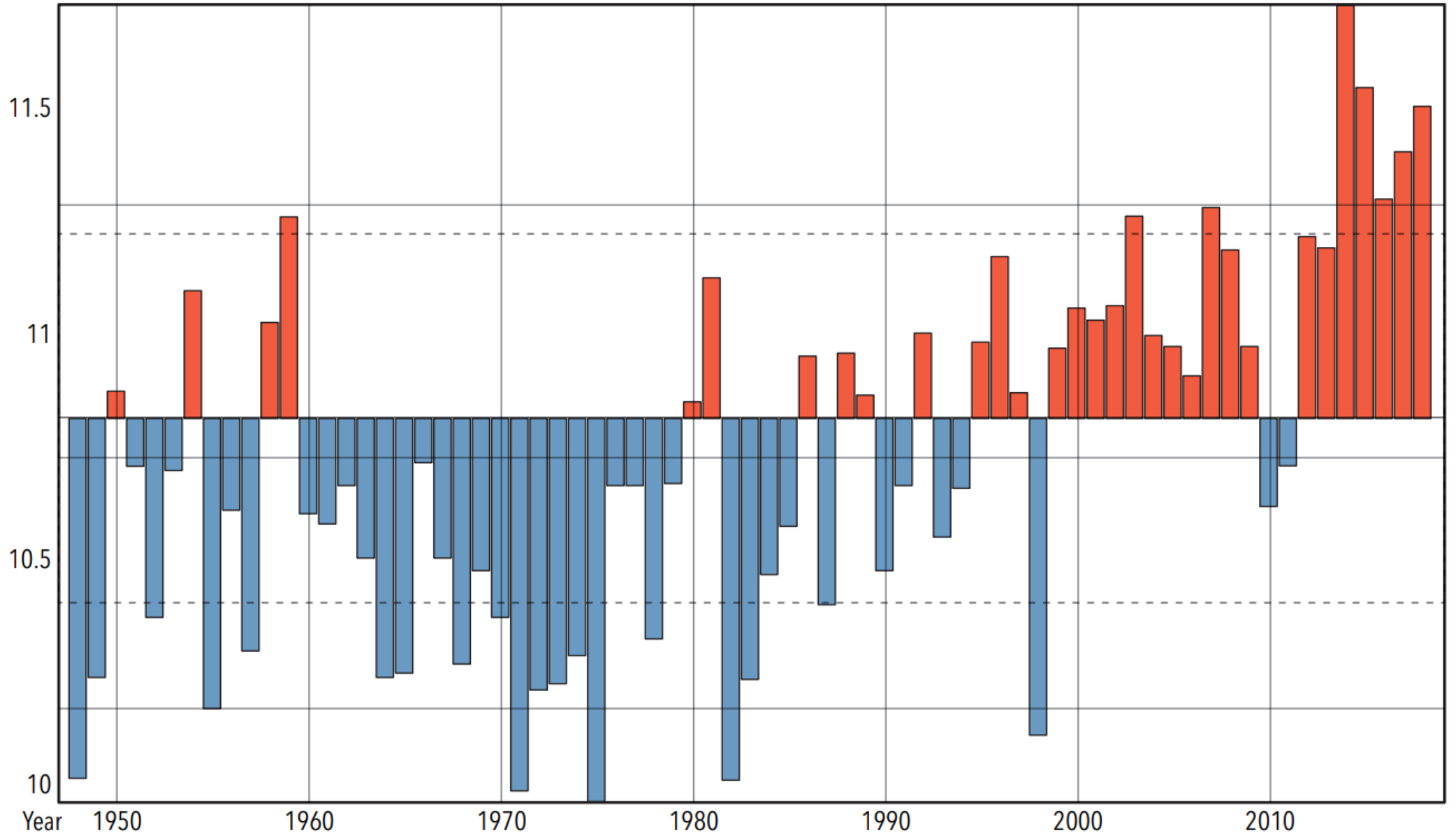




# Annual Elevation of Freezing Level Over Lake Tahoe, Departure From Long-Term Mean

Elevation (feet, thousands)

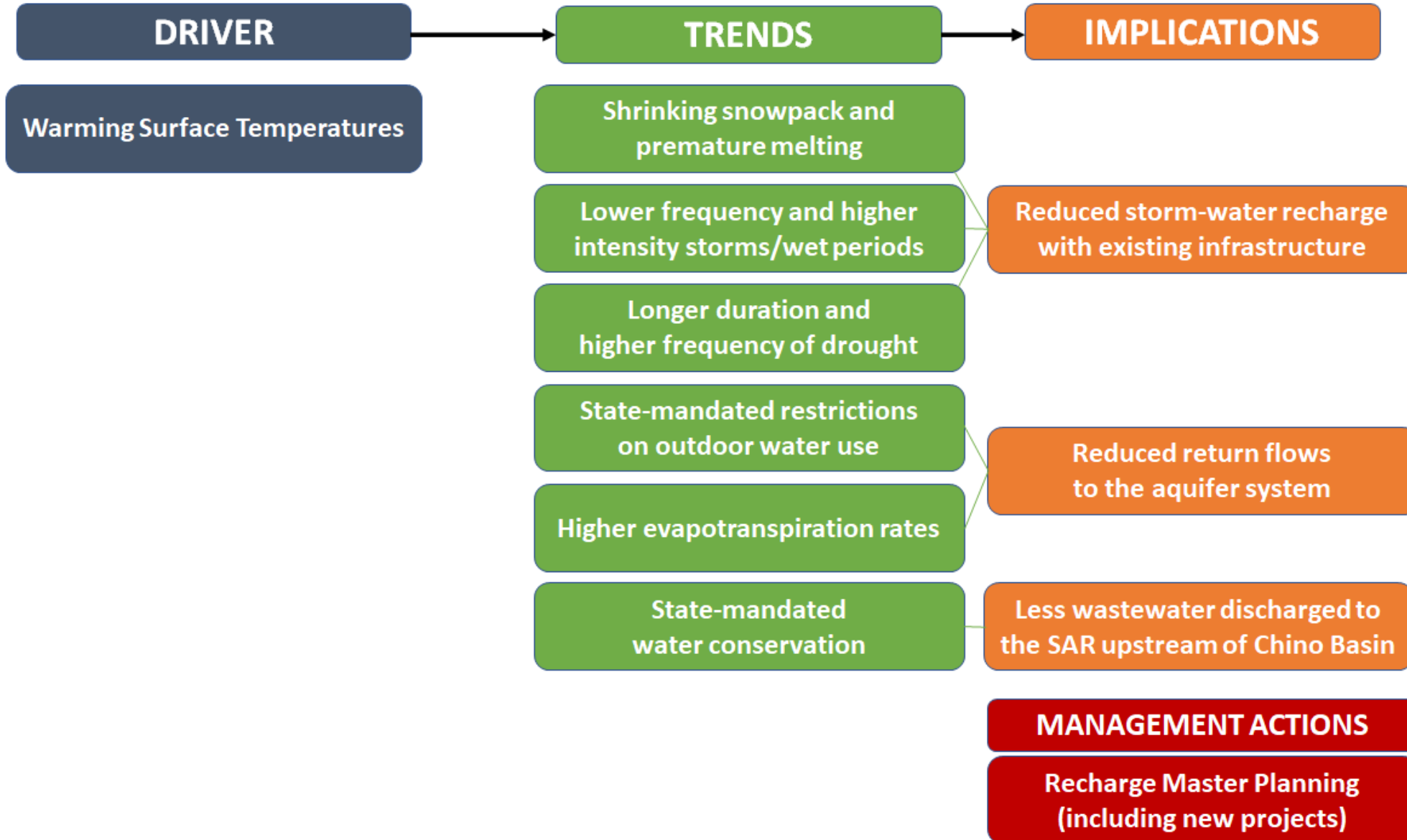
0°C Level at 39.11°N, 120.04°W – 12 Months Ending in December (1948-2018)



Source: Western Regional Climate Center

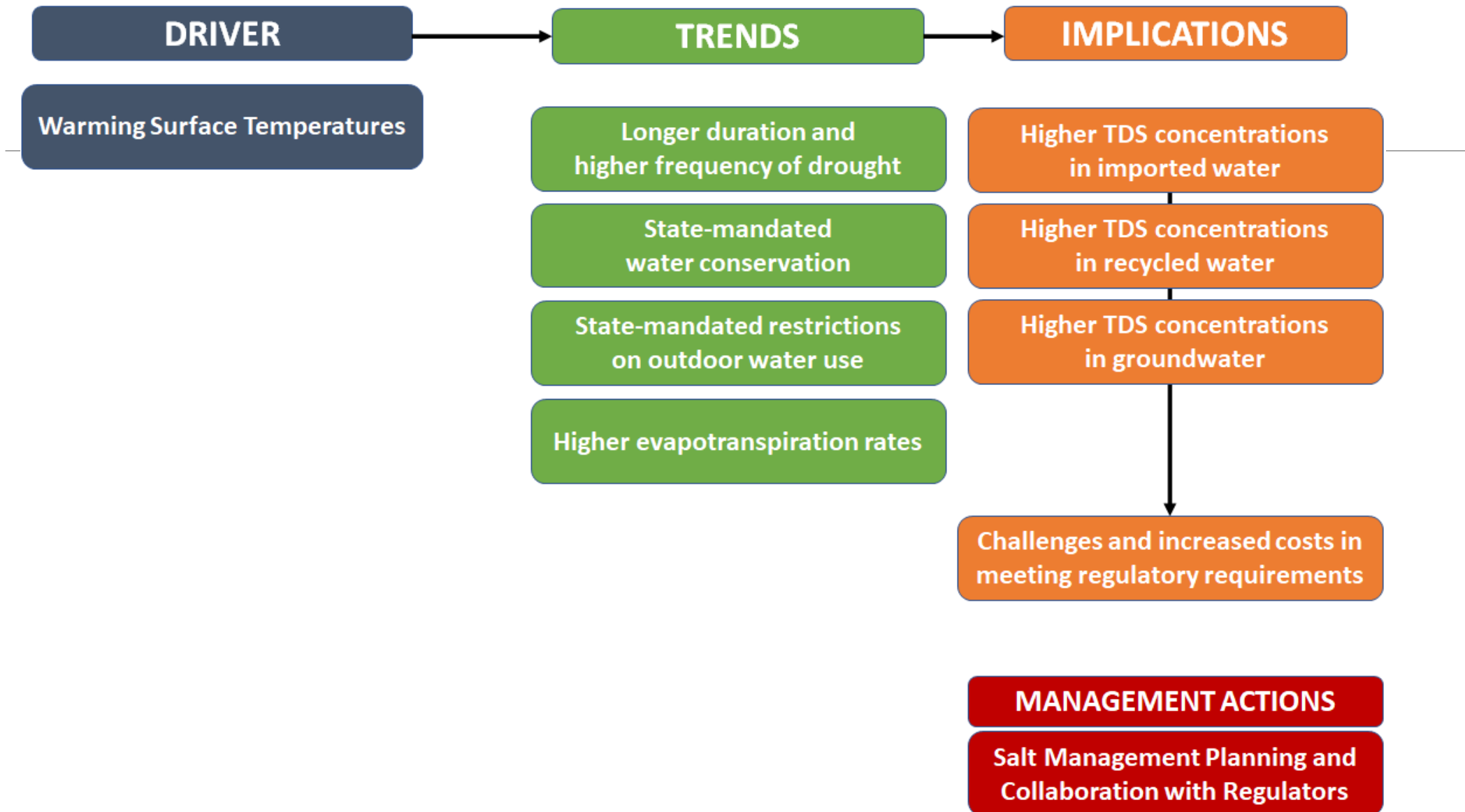


# Reductions in Recharge



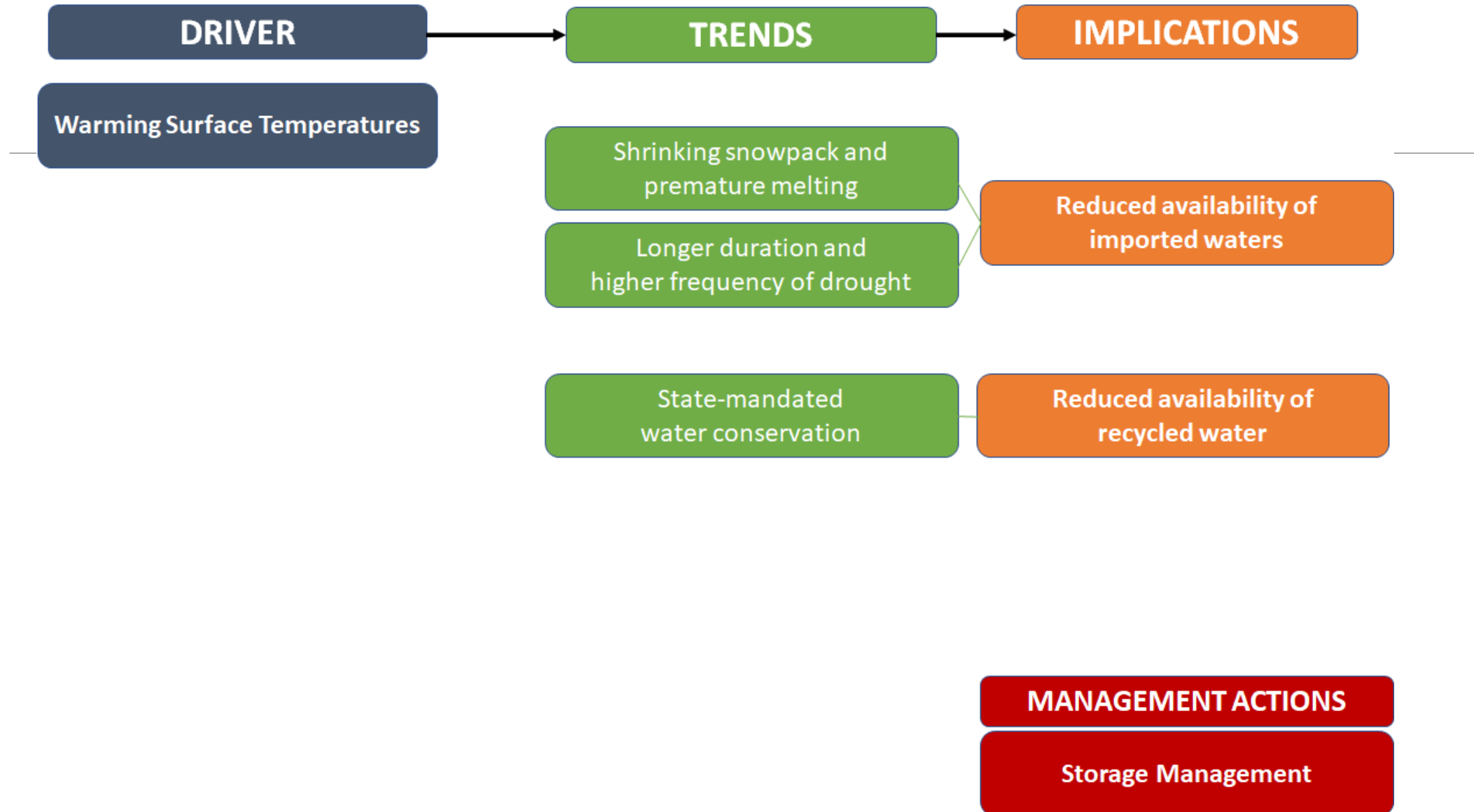


# Water Quality Degradation





# Reduced Availability of Supplemental Water Supplies





# Background: Basin Management Drivers

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FUNDING OPPORTUNITIES



Drivers

- Climate Change
- Vulnerability of Infrastructure
- Legislation, Regulation, and Agreements
- Salt and Nutrient Management
- Outside Interest in Chino Basin Operations
- Growth
- Funding
- Scientific and Technologic Improvements

Drivers

Trends

- Reduced Recharge
- Increased Evaporation
- Reduced Imported Water Supply
- Increased Risk of Long Term Outages Due to Repair or Catastrophic Shutdown
- SGMA
- Conservation
- Water Quality
- Waters of the US
- California Water Fix
- Expiring Agreements
- TDS Increases in the Basin
- TDS Increases in SWP Water During Drought
- More Restrictive Environmental Regulations
- Public Trust Litigation
- Other Outside Entities: NGO's, SAR Water Rights, Resource Agencies
- Potential New or Outside Partnerships
- Reduced Recycled Water Discharge to Santa Ana River
- Land Use Change/Urbanization
- Reduced Recharge
- Accumulation of Debt
- Interest Rates
- Competition
- Laboratory Detection Limits
- Health Impacts of Chemicals and Pathogens
- Treatment Technologies
- Renewable Energy
- Sensor Technology
- Transparency

Trends

Implications

- Reduced Recycled Water Availability and Increased Cost
- Reduced Imported Water Availability and Increased Cost
- Inability to Pump Groundwater with Existing Infrastructure
- Imported Water Quality Degradation
- Chino Basin Water Quality Degradation
- Increased Cost of Groundwater Use
- Reductions in Chino Basin Safe Yield
- Recycled Water Quality Degradation
- Increased Cost of Basin Plan Compliance

Implications





# Funding Opportunities

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- Expansion of recycled water infrastructure
  - Water Recycling Funding Program – up to \$150,000 per project
  
- Groundwater contamination cleanup
  - Site Cleanup Program – up to \$3,400,000 per project
  
- Assisting water infrastructure systems adapting to hydrologic change
  - Proposition 1 – up to \$4,500,000 per project
  
- Projects benefiting disadvantage communities
  - More allocated funds



# Background: Basin Management in the 2020s and Beyond

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WATERMASTER/SUSTAINABILITY/STEWARDSHIP



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*Watermaster's function is to administer and enforce provisions of the Judgment and subsequent orders of the Court, and to develop and implement an Optimum Basin Management Program*



# Sustainable Groundwater Management Act (SGMA)

SGMA GSP Components	Chino Basin Management Components
Computer Simulation model of groundwater	Chino Valley Model
Groundwater conditions description	State of the Basin Report
Hydrologic Budget	Safe Yield Recalculation
Management Areas	Groundwater Management Zones; balance of recharge and discharge
Undesirable Results	Material Physical Injury
Monitoring	Program Element (PE) 1
Reporting	Annual Report, OBMP Semi Annual Reports, State of the Basin Report

Source: [https://cawaterlibrary.net/wp-content/uploads/2018/05/GSP\\_Emergency\\_Regulations.pdf](https://cawaterlibrary.net/wp-content/uploads/2018/05/GSP_Emergency_Regulations.pdf) (October 8, 2021)



# Sustainable Groundwater Management Act (SGMA)

SGMA Sustainability Indicators	OBMP Program Elements
Groundwater-Level Declines	PE 1
Land Subsidence	PE 4
Seawater Intrusion	N/A
Groundwater-Storage Reductions	PE 1, PE 8
Interconnected Surface-Water Depletions	PE 1, PE 3
Water Quality Degradations	PE 3, PE 6

Source: [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT\\_ay\\_19.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT_ay_19.pdf) and Optimum Basin Management Program Phase I Report



# Chino Basin Stewardship Efforts

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HOW WE ARE (AND ARE NOT) MANAGING



# Chino Basin Stewardship Efforts

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## Sustainability

- Monitoring
- Balance of Recharge and Discharge
- Cumulative Effect of Transfers
- Subsidence Management
- Salt and Nutrient Management Plan
- Communication with Neighboring Basins (Spadra, Temescal Basin)
- 2020 OBMP Implementation Plan
  - Water Quality Management Plan
  - Storage and Recovery Plan
- CEQA documentation for the 2020 OBMP IP
- Recharge Master Plan Update
  - Consideration of additional recharge facilities
- Communication with Neighboring Basins (Six Basins, Cucamonga, Rialto Colton)





# Chino Basin Stewardship Efforts

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## Safe Yield

- 2025 Safe Yield Evaluation
- Safe Yield Methodology Evaluation
  - Uncertainty considerations
- Storage Contest
  - Storage Q&A
- Safe Yield Optimization Study



# Discussion

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