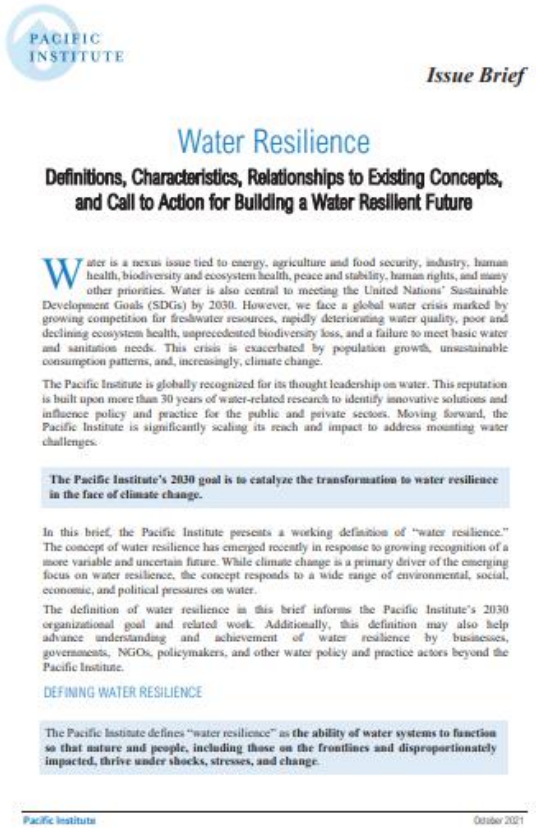
The Untapped Potential of California's Urban Water Supply:

Water Efficiency
Water Reuse
Stormwater Capture

PACIFIC INSTITUTE

About Pacific Institute

- The Pacific Institute is an independent, non-partisan think tank based in Oakland, CA, with staff around the world.
- Our mission is to create and advance solutions to the world's most pressing water challenges.
- We adopted a 2030 organizational goal to **catalyze the transformation to water resilience in the face of climate change**.
  - Water Resilience - "The ability of water systems to function so that nature and people, including those on the frontlines and disproportionately impacted, thrive under shocks, stresses, and change."



PACIFIC INSTITUTE

Issue Brief

Water Resilience

Definitions, Characteristics, Relationships to Existing Concepts, and Call to Action for Building a Water Resilient Future

Water is a nexus issue tied to energy, agriculture and food security, industry, human health, biodiversity and ecosystem health, peace and stability, human rights, and many other priorities. Water is also central to meeting the United Nations' Sustainable Development Goals (SDGs) by 2030. However, we face a global water crisis marked by growing competition for freshwater resources, rapidly deteriorating water quality, poor and declining ecosystem health, unprecedented biodiversity loss, and a failure to meet basic water and sanitation needs. This crisis is exacerbated by population growth, unsustainable consumption patterns, and, increasingly, climate change.

The Pacific Institute is globally recognized for its thought leadership on water. This reputation is built upon more than 30 years of water-related research to identify innovative solutions and influence policy and practice for the public and private sectors. Moving forward, the Pacific Institute is significantly scaling its reach and impact to address mounting water challenges.

The Pacific Institute's 2030 goal is to catalyze the transformation to water resilience in the face of climate change.

In this brief, the Pacific Institute presents a working definition of "water resilience." The concept of water resilience has emerged recently in response to growing recognition of a more variable and uncertain future. While climate change is a primary driver of the emerging focus on water resilience, the concept responds to a wide range of environmental, social, economic, and political pressures on water.

The definition of water resilience in this brief informs the Pacific Institute's 2030 organizational goal and related work. Additionally, this definition may also help advance understanding and achievement of water resilience by businesses, governments, NGOs, policymakers, and other water policy and practice actors beyond the Pacific Institute.

DEFINING WATER RESILIENCE

The Pacific Institute defines "water resilience" as **the ability of water systems to function so that nature and people, including those on the frontlines and disproportionately impacted, thrive under shocks, stresses, and change**.

Pacific Institute October 2021

Key Findings

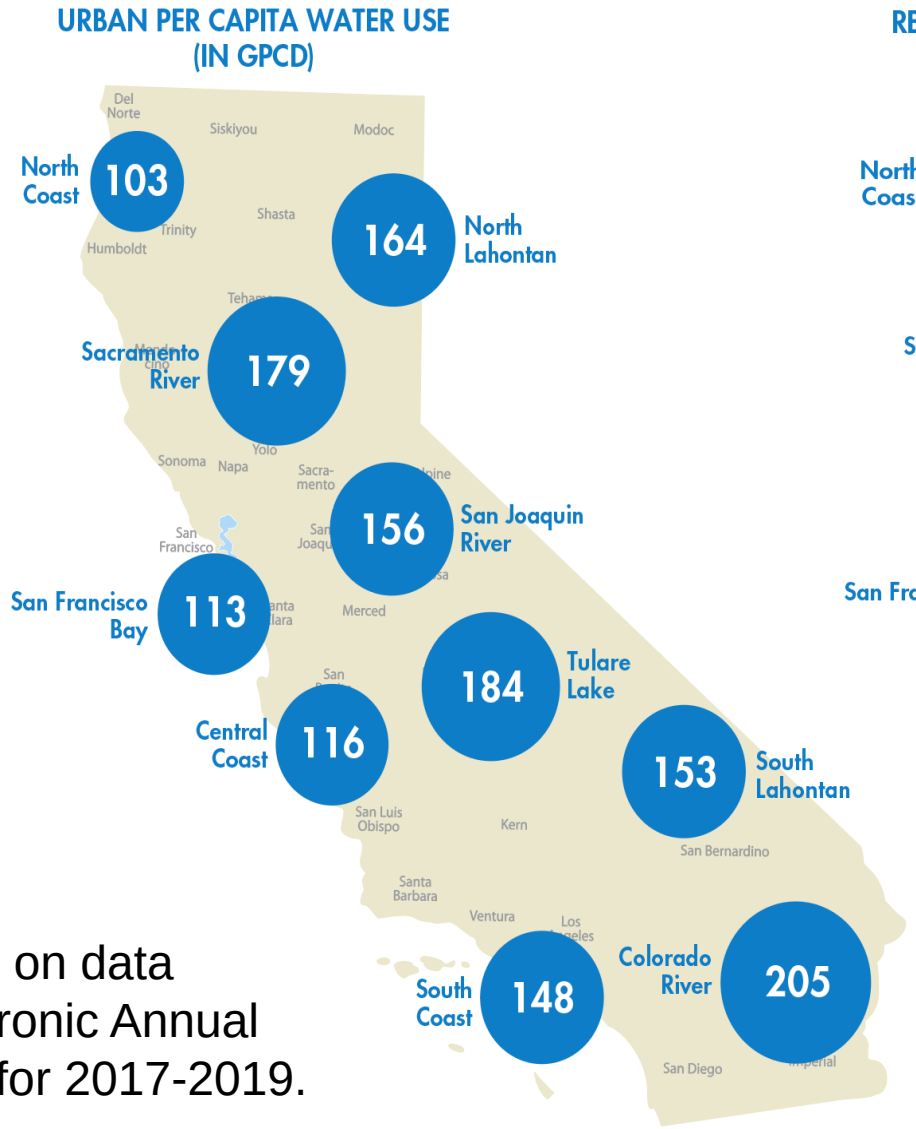
- Southern California has made laudable progress in recent years to reduce water use and augment local supplies, but more is needed to advance water resilience in the face of climate change.
- Proven water efficiency technologies and practices could reduce urban water use in the South Coast by **1.1 million to 1.7 million AFY**.
- Reuse of municipal wastewater could boost local water supplies in the South Coast by up to **1.1 million AFY**, tripling current reuse levels.
- Urban stormwater capture in areas overlying public supply aquifers could boost local water supplies in the South Coast by **260,000 AF in a dry year to 1.4 million AF in a wet year**.
- These strategies are essential for meeting water goals, as well as energy and greenhouse gas goals.

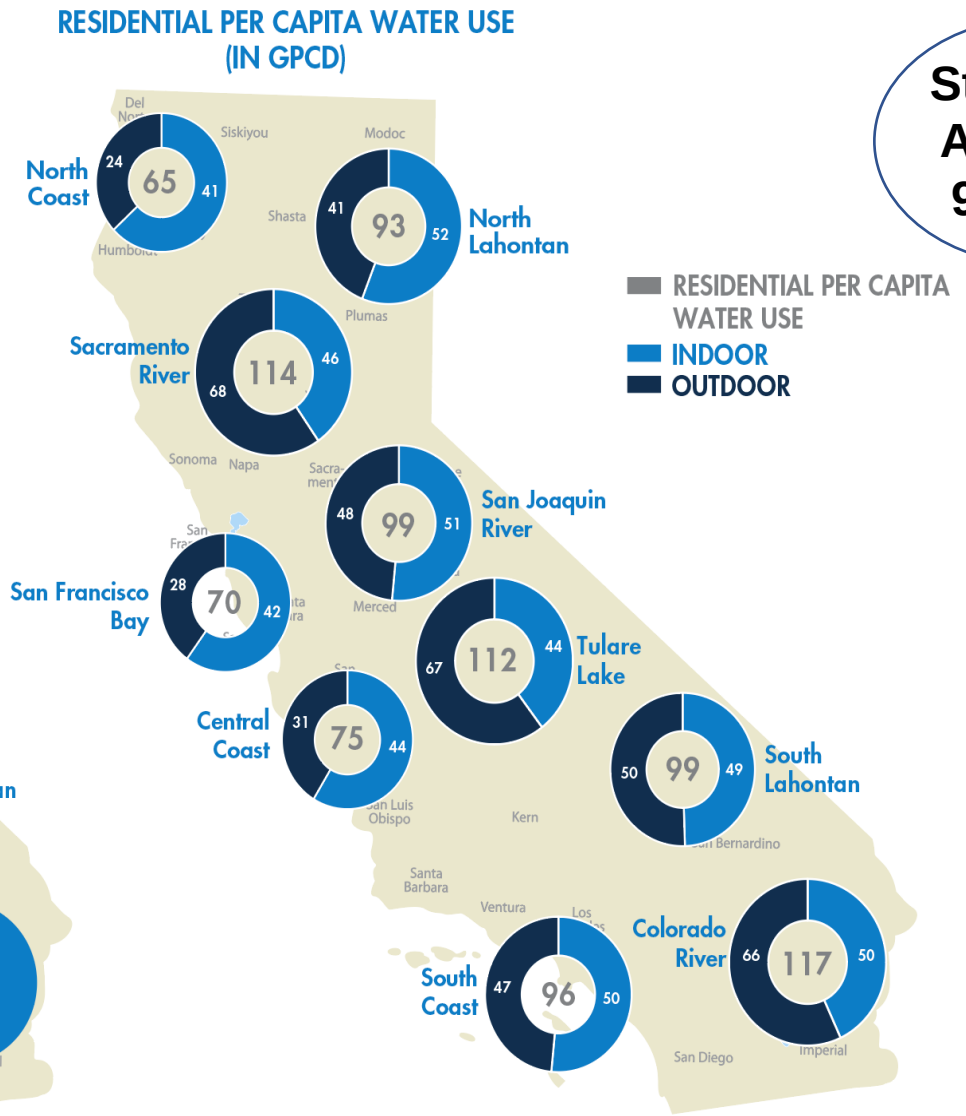
Water Efficiency Potential: Approach

- **Current water use baseline** developed from the **Electronic Annual Reports (EARs)** submitted by water agencies for 2017 to 2019.
- Two water-savings scenarios were developed:
  - **Moderate efficiency** based on full compliance with current standards for appliances and fixtures, landscapes (MWELO), and distribution leaks (SB 555).
  - **High efficiency** based on ***available*** leading-edge technologies and practices that use less water than devices meeting current standards.

Urban and Residential Water Use, 2017-2019

Statewide Average: 152 gpcd





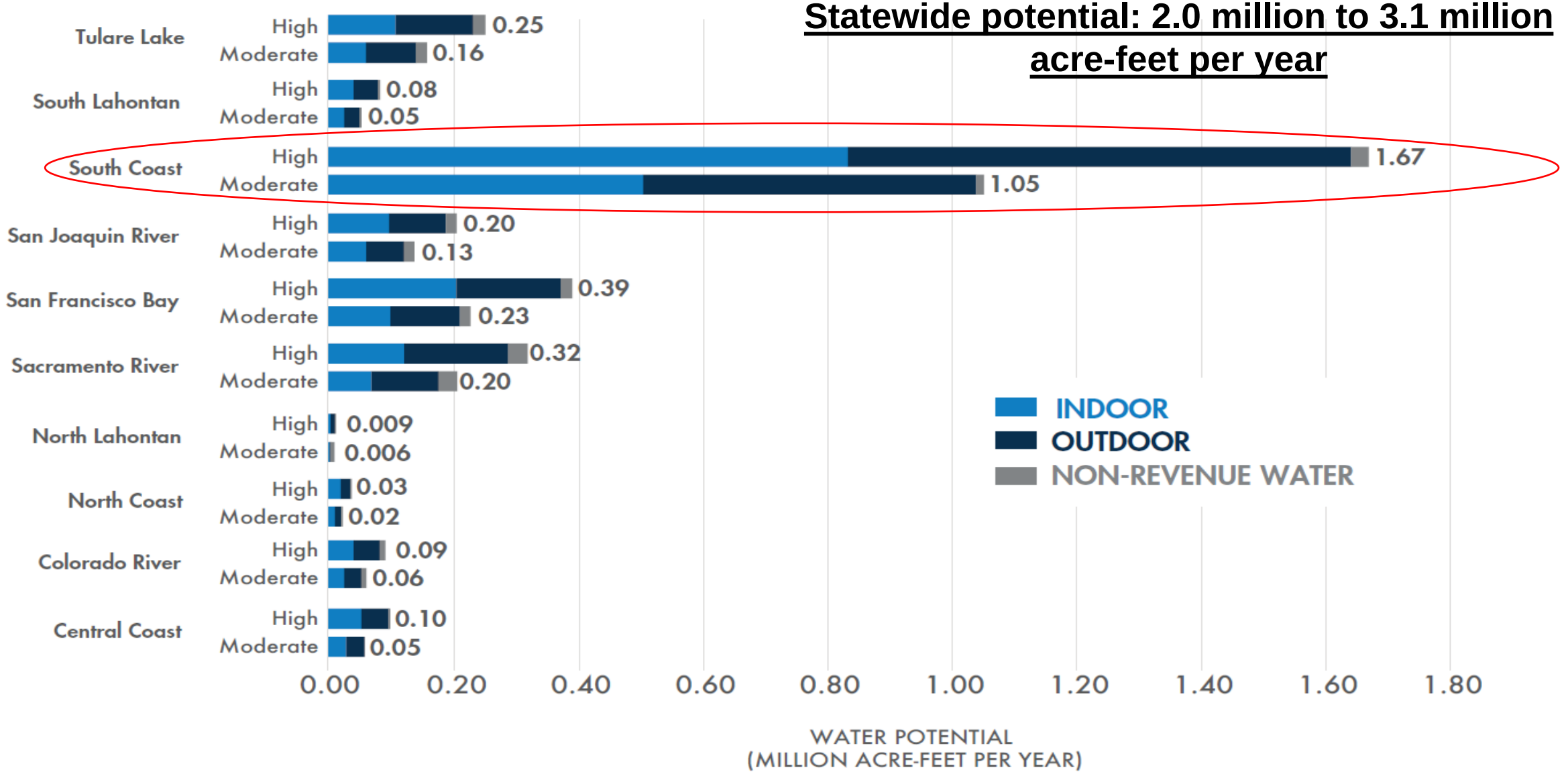
Statewide Average: 94 gpcd

Estimates based on data reported in Electronic Annual Reports (EARs) for 2017-2019.

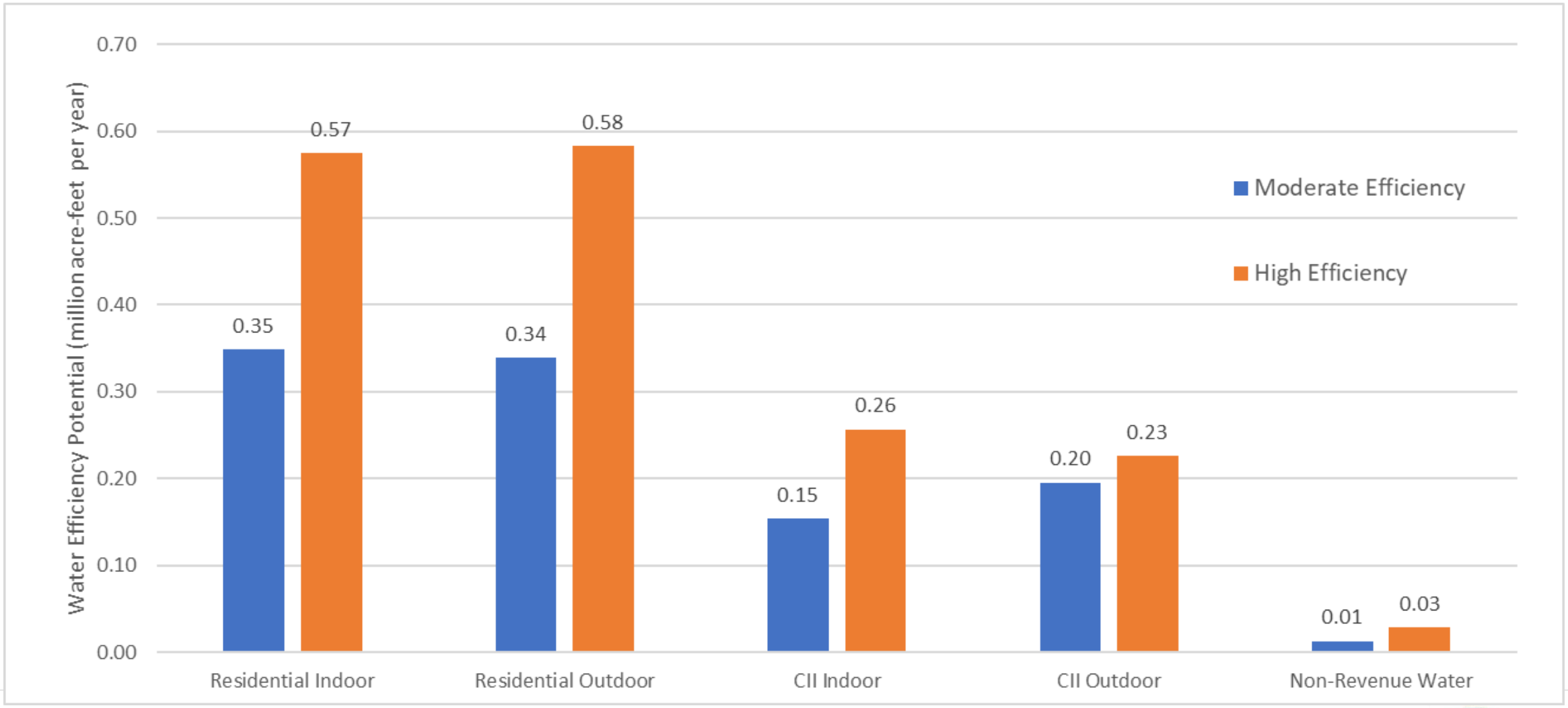
PACIFIC INSTITUTE

Regional Water Efficiency Potential

Statewide potential: 2.0 million to 3.1 million acre-feet per year

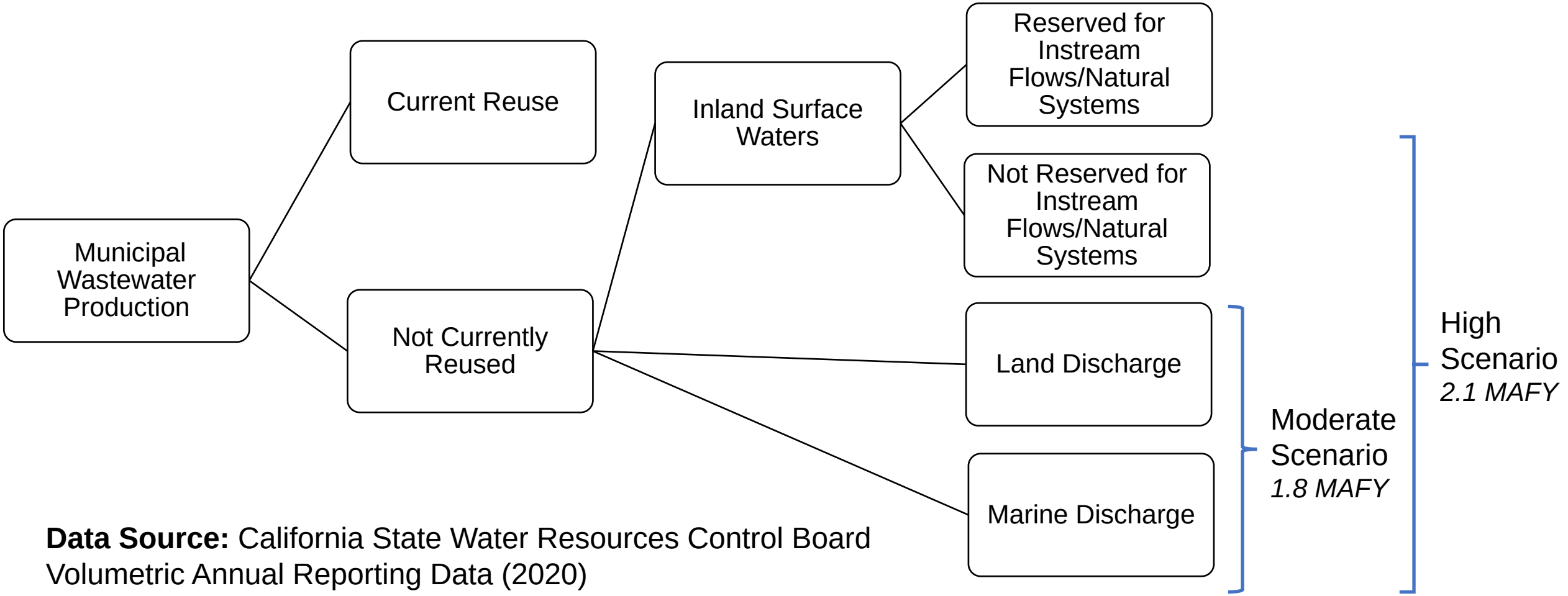


South Coast Water Efficiency Potential by Sector



PACIFIC INSTITUTE

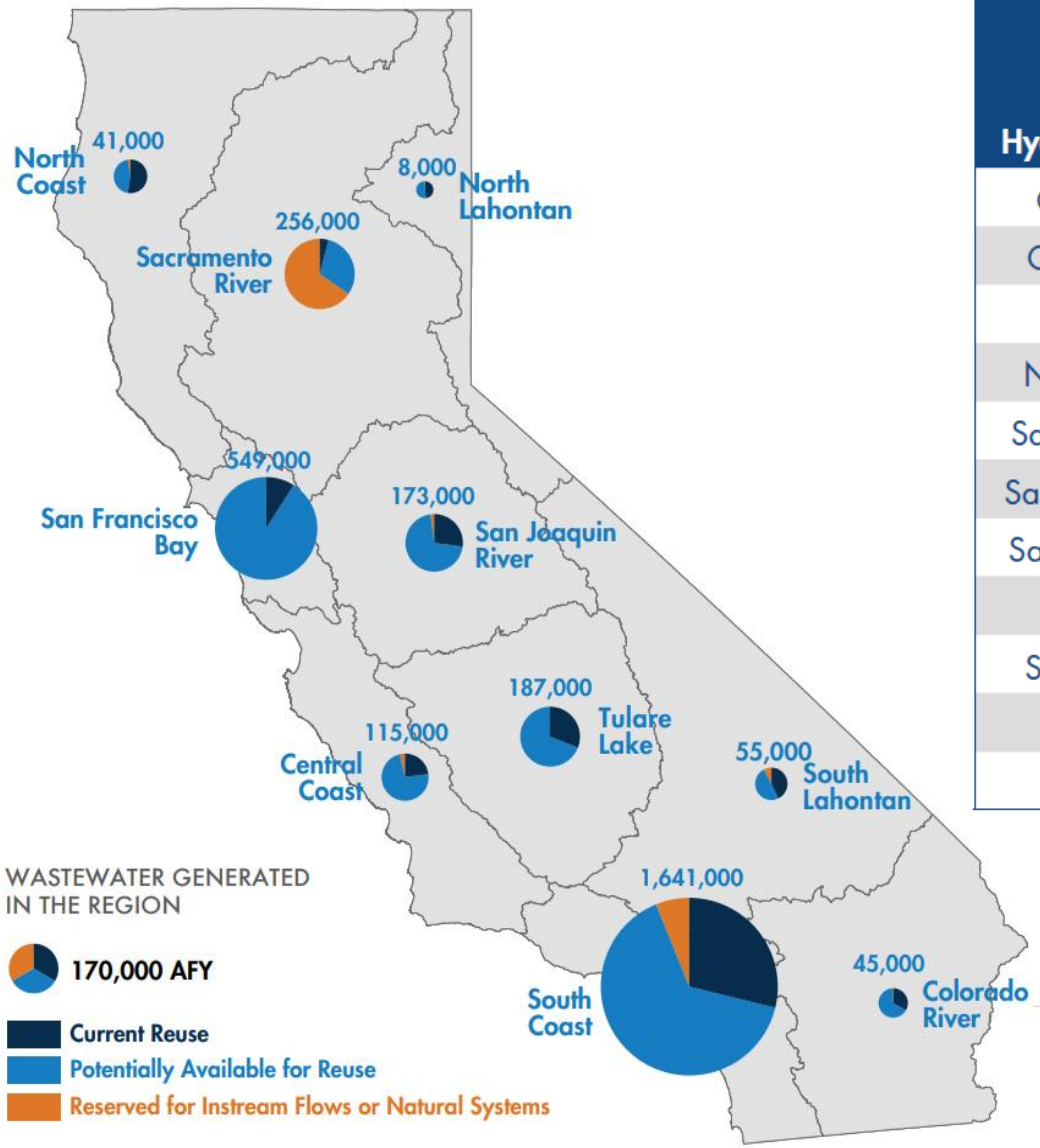
Statewide Water Reuse Potential



Data Source: California State Water Resources Control Board Volumetric Annual Reporting Data (2020)

PACIFIC INSTITUTE

Regional Water Reuse Potential



Hydrologic Region	Currently Reused (AFY)	Effluent Reserved for Instream Flows or Natural Systems (AFY)	Potentially Available for Reuse (AFY)	TOTAL Effluent (AFY)	Currently Reused (%)
Central Coast	26,000	4,000	84,000	**115,000**	23
Colorado River	15,000	0	30,000	**45,000**	33
North Coast	21,000	1,000	18,000	**41,000**	52
North Lahontan	4,000	0	4,000	**8,000**	48
Sacramento River	11,000	168,000	78,000	**256,000**	4
San Francisco Bay	49,000	3,000	497,000	**549,000**	9
San Joaquin River	47,000	4,000	123,000	**173,000**	27
South Coast	473,000	101,000	1,067,000	**1,641,000**	29
South Lahontan	24,000	4,000	27,000	**55,000**	43
Tulare Lake	58,000	0	129,000	**187,000**	31
TOTAL	**729,000**	**285,000**	**2,057,000**	**3,071,000**	**24**

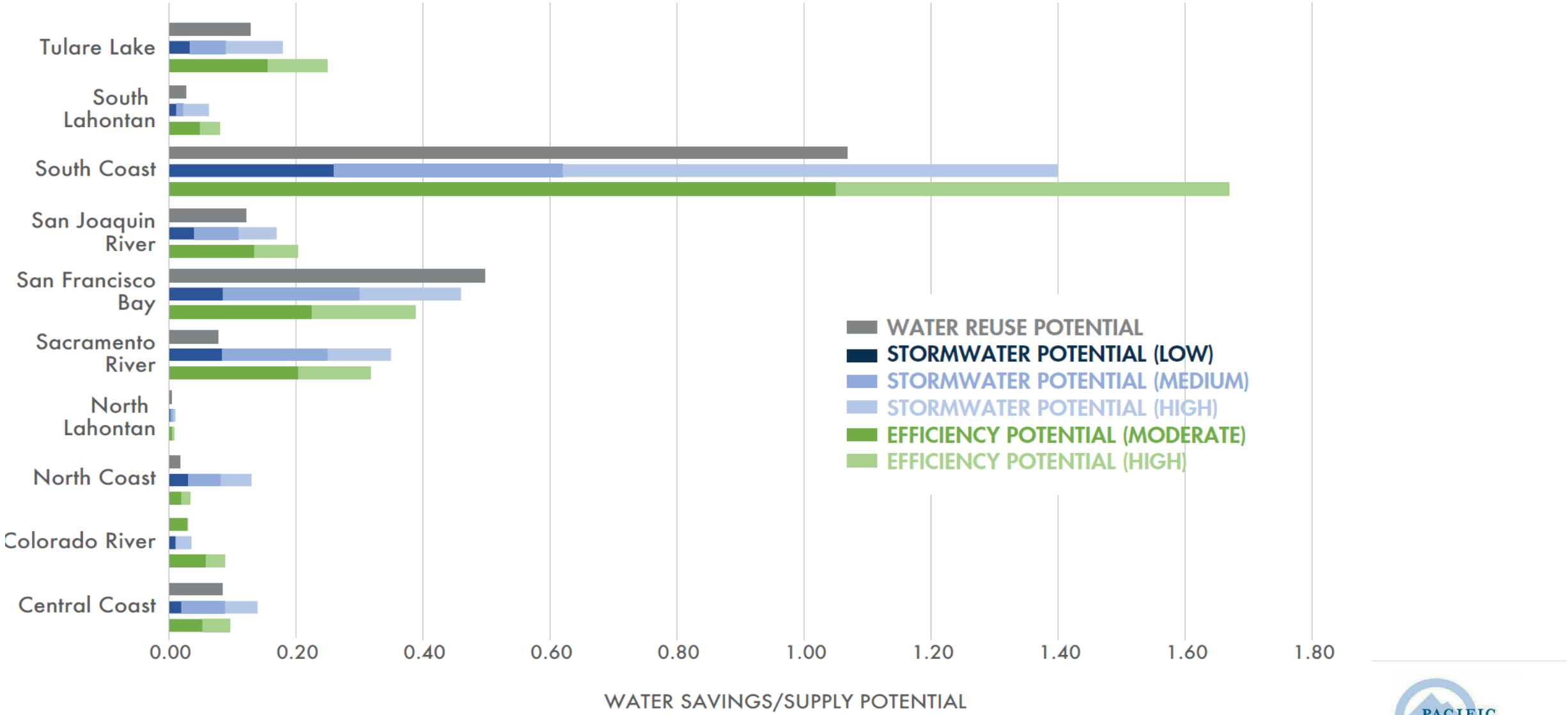
PACIFIC INSTITUTE

Stormwater Capture Potential by Region

Hydrologic Region	Urban Stormwater Capture Potential (AFY)		
	Low Precipitation	Medium Precipitation	High Precipitation
Central Coast	20,000	89,000	140,000
Colorado River	11,000	11,000	36,000
North Coast	31,000	82,000	130,000
North Lahontan	3,000	7,000	10,000
Sacramento River	84,000	250,000	350,000
San Francisco Bay	85,000	300,000	460,000
San Joaquin River	40,000	110,000	170,000
South Coast	260,000	620,000	1,400,000
South Lahontan	12,000	23,000	63,000
Tulare Lake	34,000	90,000	180,000
Total	**580,000**	**1,600,000**	**3,000,000**

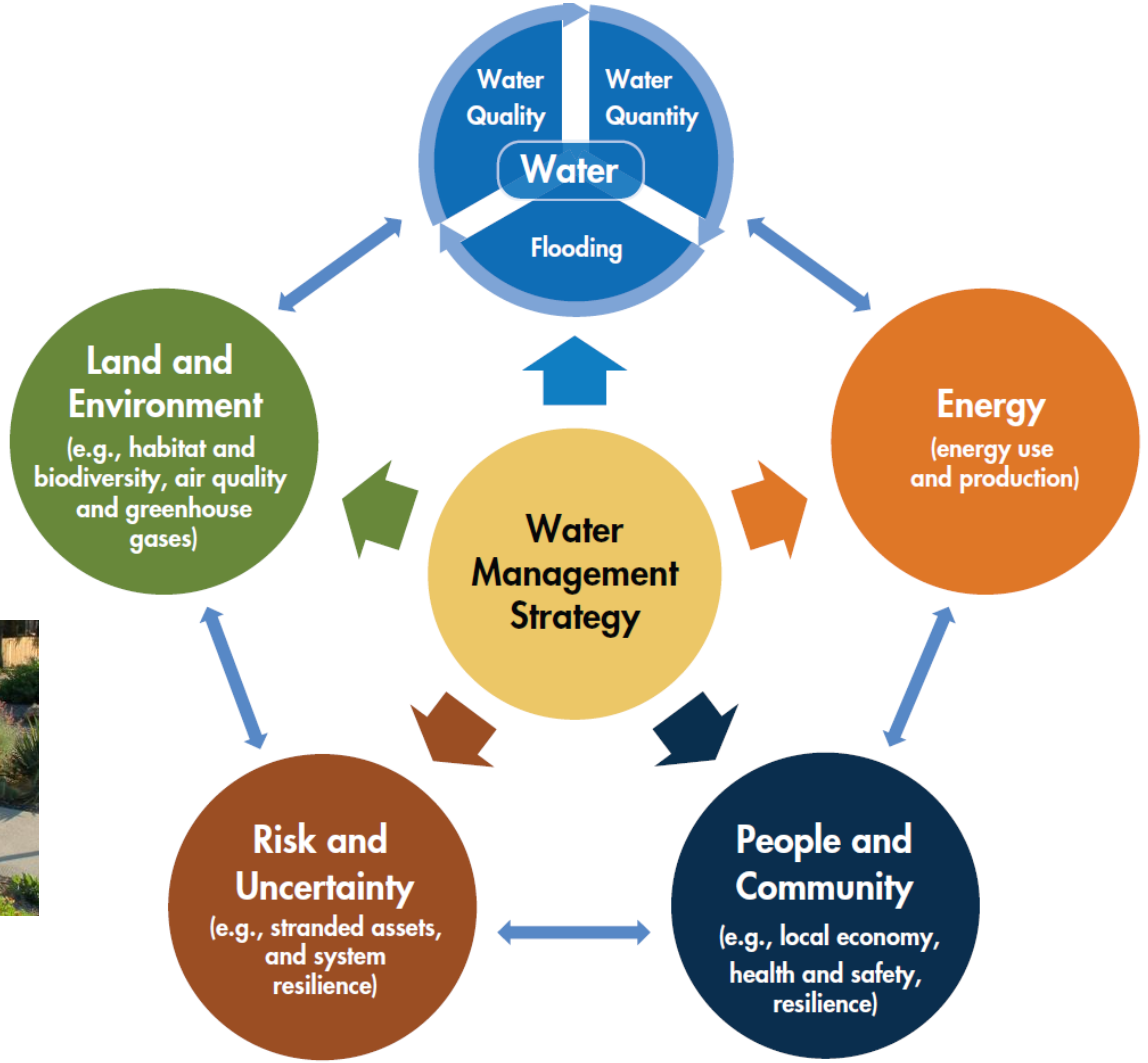
Notes: Numbers are rounded to two significant figures. Totals may not equal column sums due to rounding.

Water Efficiency, Water Reuse, and Stormwater Capture Potential by Region



PACIFIC INSTITUTE

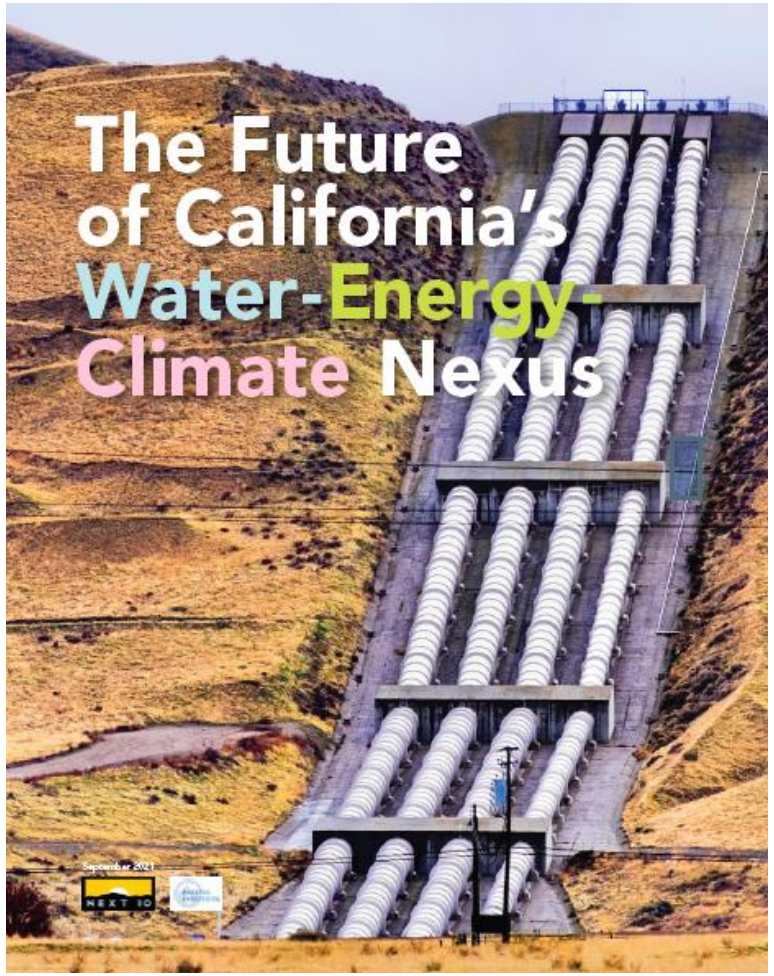
These strategies provide co-benefits, making them more economically viable.



Source: Diringer et al. 2019, Pacific Institute

PACIFIC INSTITUTE

California's Water-Energy-Climate Nexus



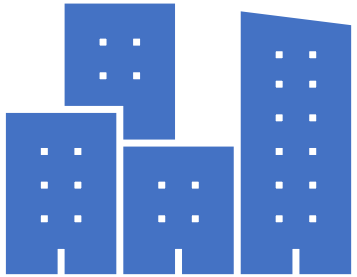
- Saving water saves energy and reduces greenhouse gas emissions.
- Replacing imported water with water reuse and stormwater capture would reduce energy use and greenhouse gas emissions.
- Energy recovery at wastewater facilities would also reduce greenhouse gas emissions.

PACIFIC INSTITUTE

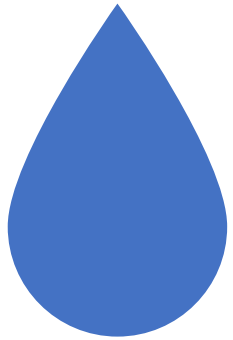
Key Findings

- Southern California has made laudable progress in recent years to reduce water use and augment local supplies, but more is needed to advance water resilience in the face of climate change.
- Proven water efficiency technologies and practices could reduce urban water use in the South Coast by **1.1 million to 1.7 million AFY**.
- Reuse of municipal wastewater could boost local water supplies in the South Coast by up to **1.1 million AFY**, tripling current reuse levels.
- Urban stormwater capture in areas overlying public supply aquifers could boost local water supplies in the South Coast by **260,000 AF in a dry year to 1.4 million AF in a wet year**.
- These strategies are essential for meeting water goals, as well as energy and greenhouse gas goals.

What can Metropolitan Water District of Southern California do to help realize this potential?



Urban water efficiency



Water reuse and stormwater capture

PACIFIC INSTITUTE

Urban Water Efficiency

- Increase funding for water-efficiency and water-loss control programs to levels consistent with other water-supply investments.
- Continue expansion of targeted programs for underserved communities, including through partnerships with energy IOUs.
- Leverage recent drought EO to support a ban on non-functional turf and conversion to California Friendly gardens.
- Expand partnerships with private sector to co-fund efficiency programs.

PACIFIC INSTITUTE

Water Reuse and Stormwater Capture

- Prioritize multi-benefit recycled water and stormwater capture projects to galvanize support and leverage funding.
- Right-size investments by incorporating efficiency and demographic changes in local and regional recycled water assessments.
- Assess opportunities to support onsite reuse for residential and non-residential properties.

PACIFIC INSTITUTE

Heather Cooley
Director of Research, Pacific Institute

www.pacinst.org

@PacificInstitut