

Nutrient Management Workshop

City of Santa Barbara

May 19, 2026



Jared Voskuhl

Director of Regulatory Affairs

CASA Background



California Association of Sanitation Agencies

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CASA LEAD

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Legislation ▾

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~ 145 member agencies and municipalities across California that provide wastewater collection, treatment, recycling, and resource recovery services

CASA Background – Utility Member Coordination



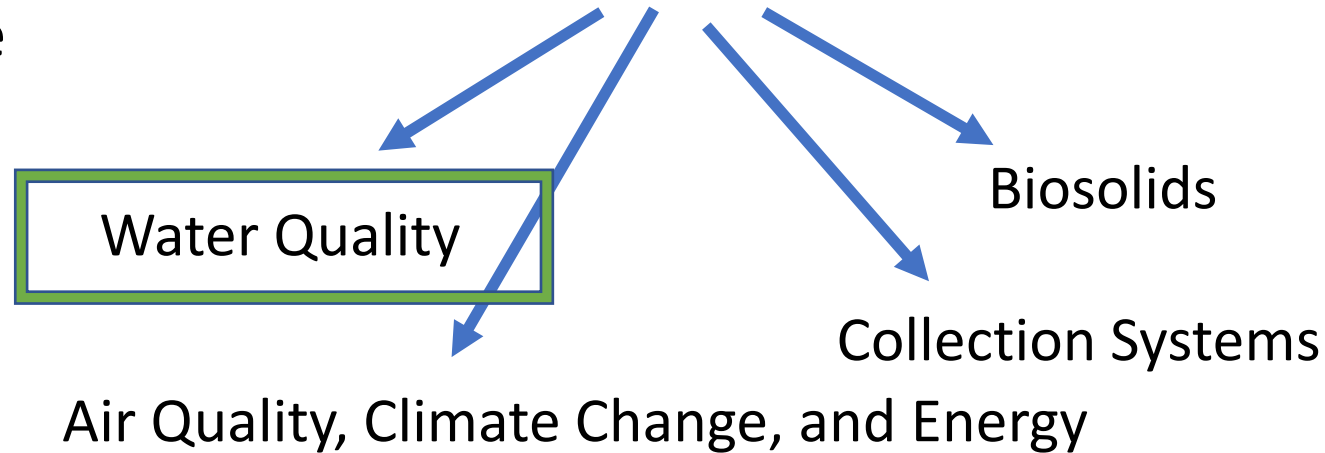
Legislative

State Legislative Committee

Federal Legislative Committee

Regulatory

Workgroups



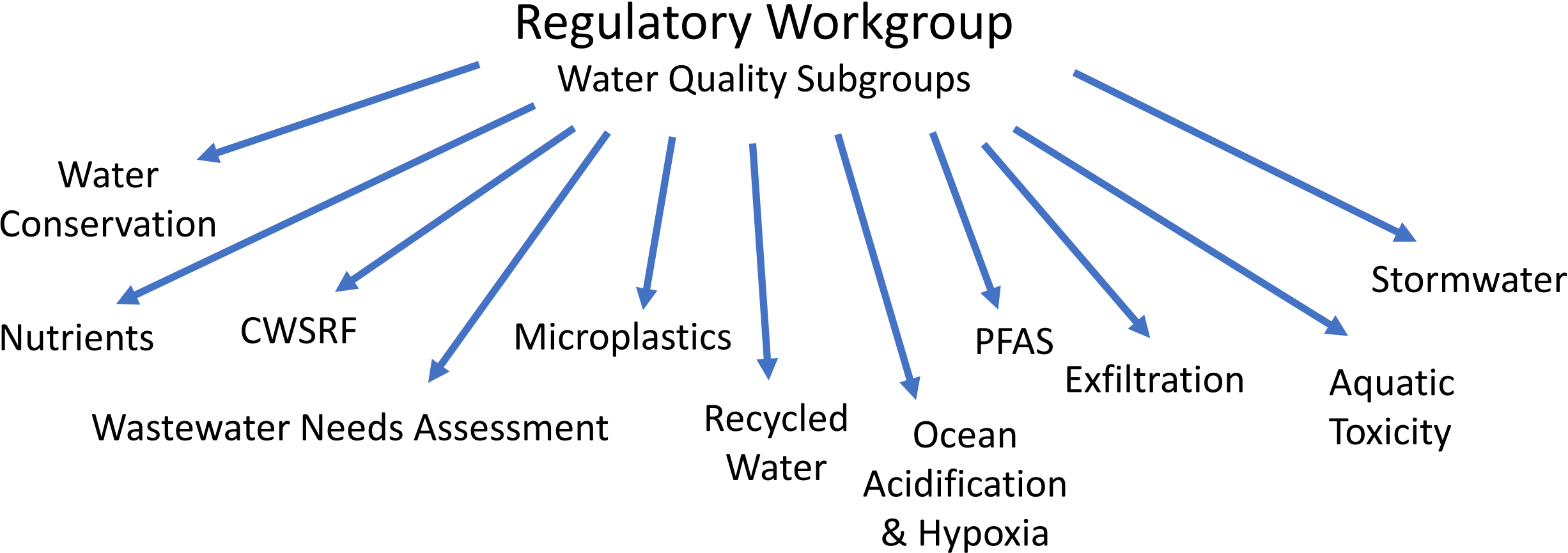
Legal

Attorneys Committee

<https://casaweb.org/about-us/workgroups/>

<https://casaweb.org/legislation/state-legislation/>

<https://casaweb.org/legal-and-regulatory/legal-advocacy/>



“What are the management capabilities with regulatory intervention?”



03 Watershed-Based Approach: Bay Area



BACWA
(wastewater utilities)



Regional Water Board
(regulatory)



San Francisco Estuarine Institute
(science)

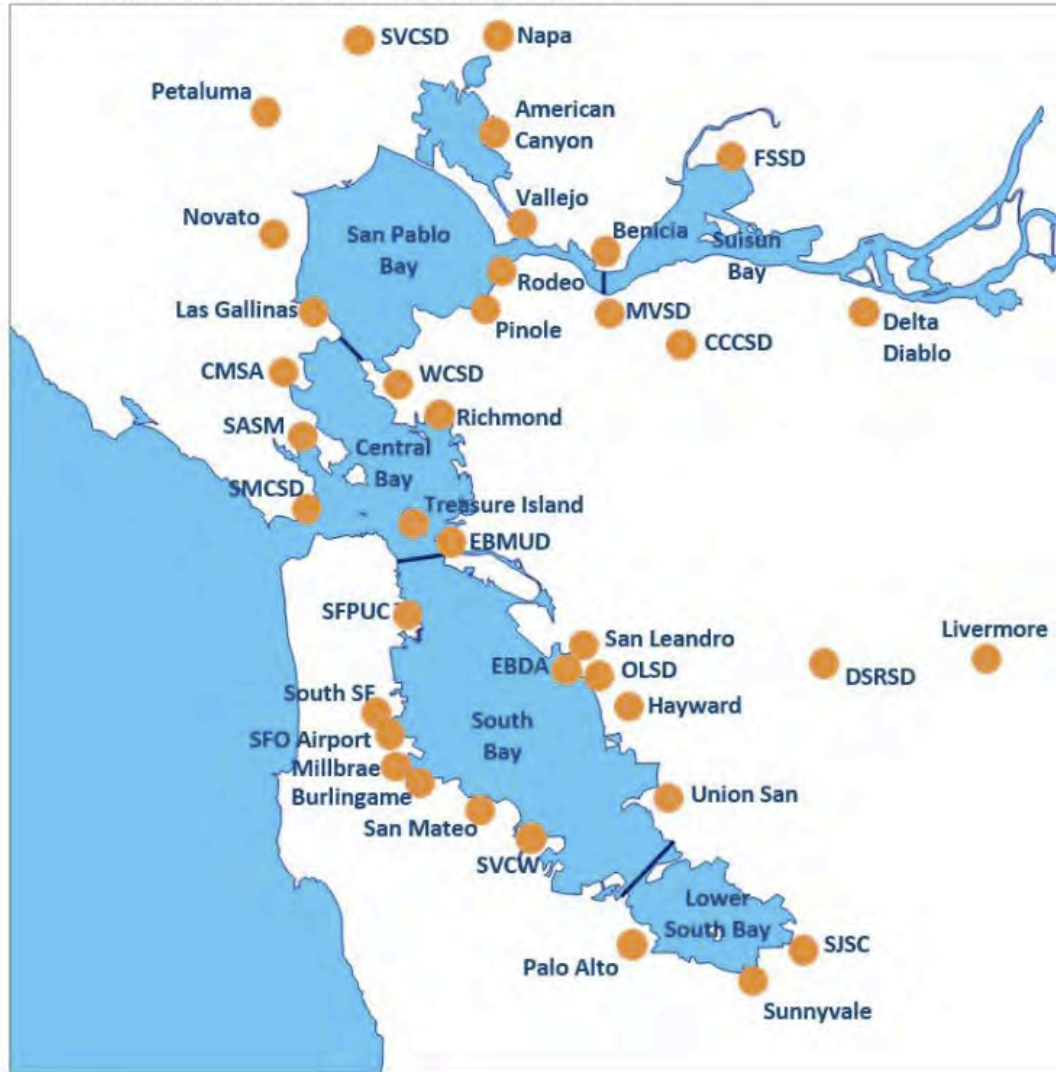


SAN FRANCISCO
BAYKEEPER.

Non-Govt Organizations
(NGOs)

40 POTWAs discharge 86% of dry season nitrogen to SF Bay

Figure 5. Participating Agencies and Major Dischargers to SF Bay



Bay Area Clean Water Agencies Nutrient Reduction Study

Potential Nutrient Reduction
by Treatment Optimization, Sidestream
Treatment, Treatment Upgrades, and Other
Means

Final Report
June 22, 2018



San Francisco Bay - Third Watershed Permit

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

1515 Clay Street, Suite 1400, Oakland, California 94612
waterboards.ca.gov/sanfranciscobay

**ORDER R2-2024-0013
NPDES PERMIT CA0038873**

The following dischargers (collectively, Dischargers and, individually, Discharger) are subject to waste discharge requirements (WDRs) set forth in this Order, for the purpose of regulating nutrient discharges to San Francisco Bay¹ and its contiguous bay segments:

Table 1. Discharger Information

Discharger	Facility Name	Facility Address	Minor/ Major
American Canyon, City of	Wastewater Treatment and Reclamation Facility	151 Mezzetta Court American Canyon, CA 94503	Major
Benicia, City of	Benicia Wastewater Treatment Plant	614 East Fifth Street Benicia, CA 94510	Major
Burlingame, City of	Burlingame Wastewater Treatment Plant	1103 Airport Boulevard Burlingame, CA 94010	Major
Central Contra Costa Sanitary District	Central Contra Costa Sanitary District Wastewater Treatment Plant	5019 Imhoff Place Martinez, CA 94553	Major
Central Marin Sanitation Agency	Central Marin Sanitation Agency Wastewater Treatment Plant	1301 Andersen Drive San Rafael, CA 94901	Major
Crockett Community Services District	Port Costa Wastewater Treatment Plant	End of Canyon Lake Drive Port Costa, CA 94569	Minor
Delta Diablo	Delta Diablo Wastewater Treatment Plant	2500 Pittsburg-Antioch Highway Antioch, CA 94509	Major
East Bay Dischargers Authority (EBDA); Cities of Hayward and San Leandro; Oro Loma Sanitary District; Castro Valley Sanitary District; Union Sanitary District; East Bay Regional Parks District; Livermore-Amador Valley Water	EBDA Common Outfall	EBDA Common Outfall 14150 Monarch Bay Drive San Leandro, CA 94577	Major
	Hayward Water Pollution Control Facility		
	San Leandro Water Pollution Control Plant		
	Oro Loma/Castro Valley Sanitary Districts Water Pollution Control Plant		
	Raymond A. Boege Alvarado Wastewater Treatment Plant		

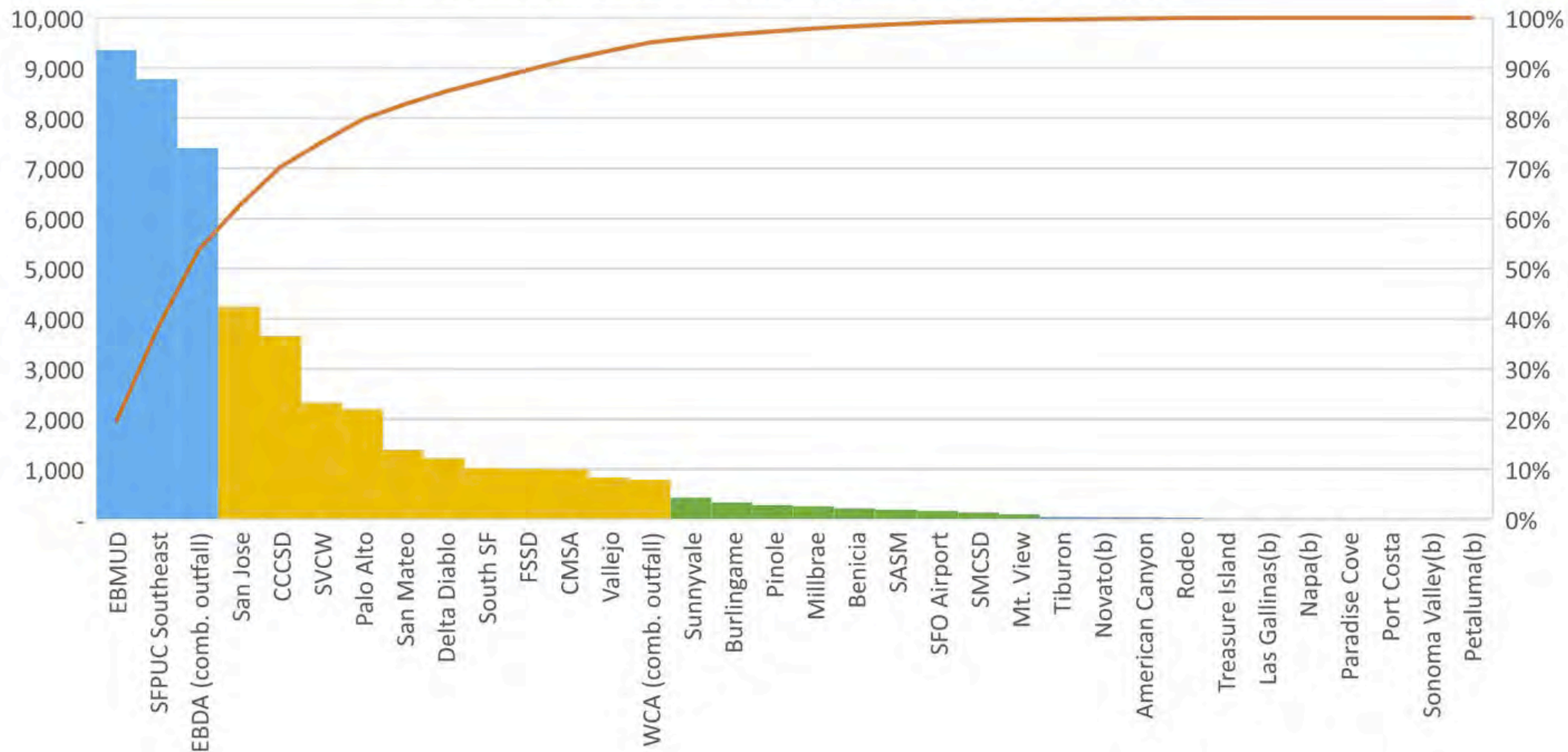
¹ San Francisco Bay consists of the Sacramento/San Joaquin River Delta, Suisun Bay, Carquinez Strait, San Pablo Bay, Central San Francisco Bay, Richardson Bay, Lower San Francisco Bay, and South San Francisco Bay.

Strategy	Total N Load Reduction to the Bay	Total Present Value for Total N Load Reduction to the Bay (\$ Mil in 2023)
Optimization	7%	\$200 M
Sidestream Treatment	19%	\$870 M
Upgrade Level 2 (15 mg N/L)	57%	\$10.8 B
Upgrade Level 3 (6 mg N/L)	82%	\$13.0 B



Nutrient reduction will be a regional effort

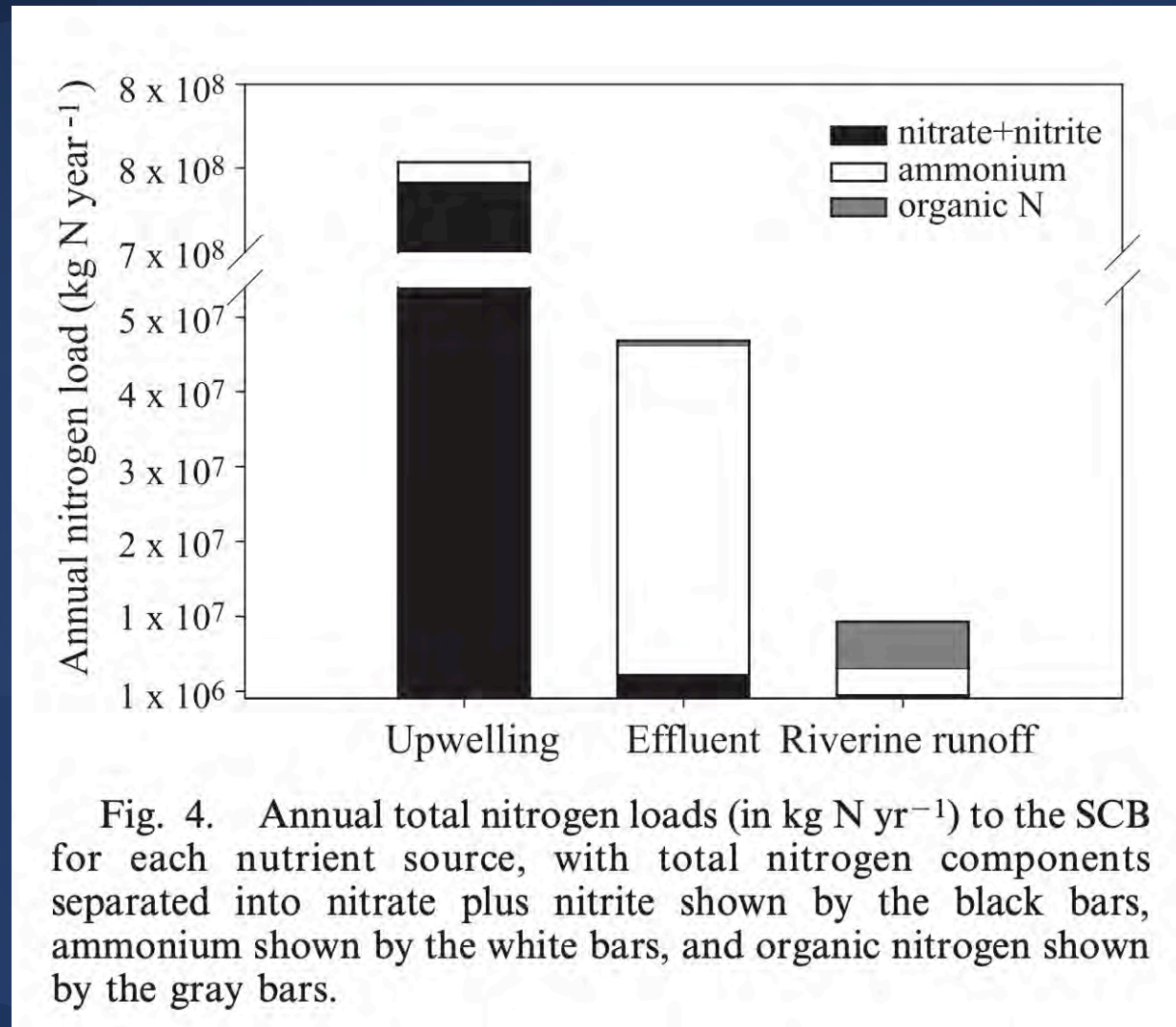
Cumulative Contribution of TIN Loading (Based on 2013-2022 Averages)



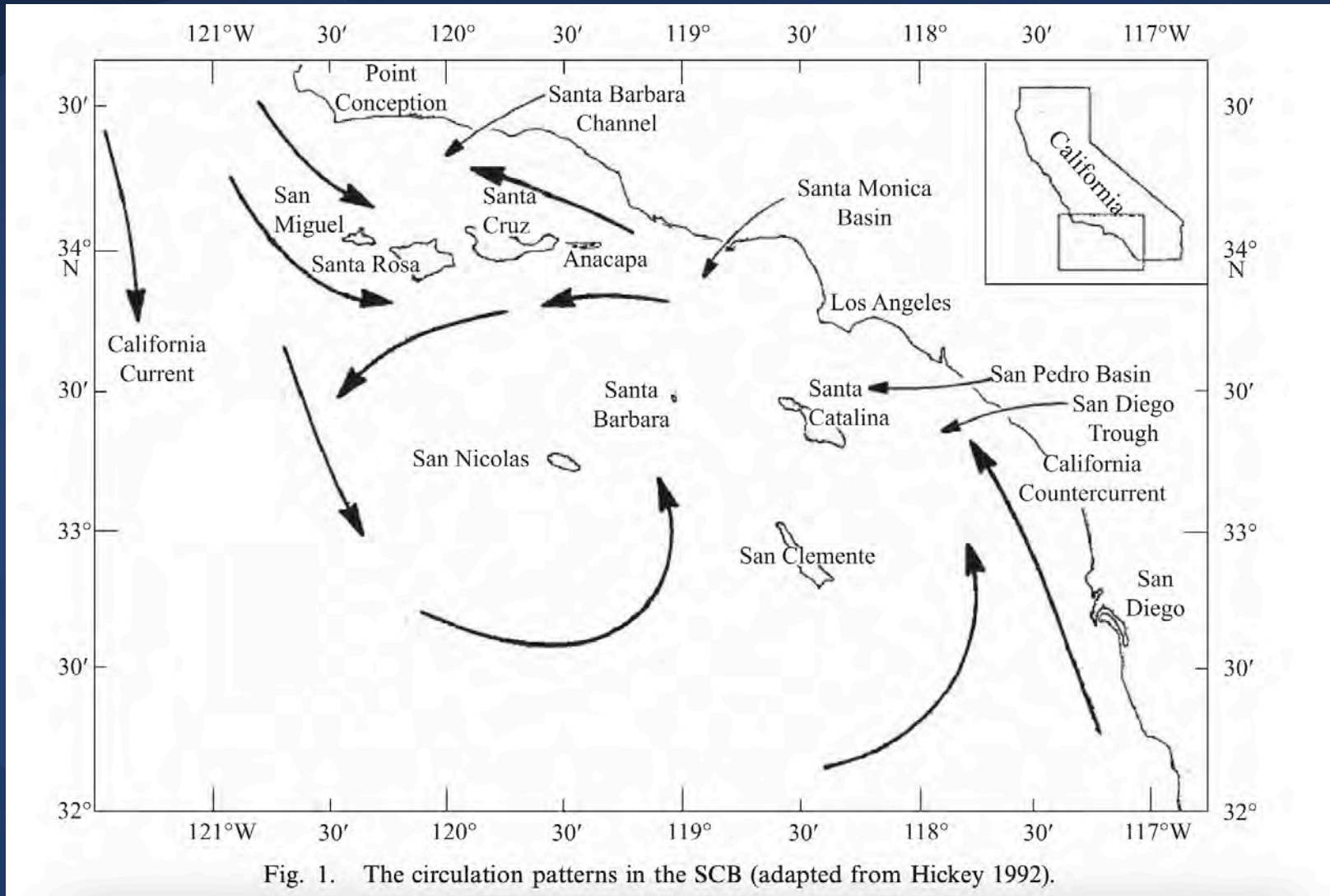
Southern California Bight - 28 WWTPs Discharging 830 MGD



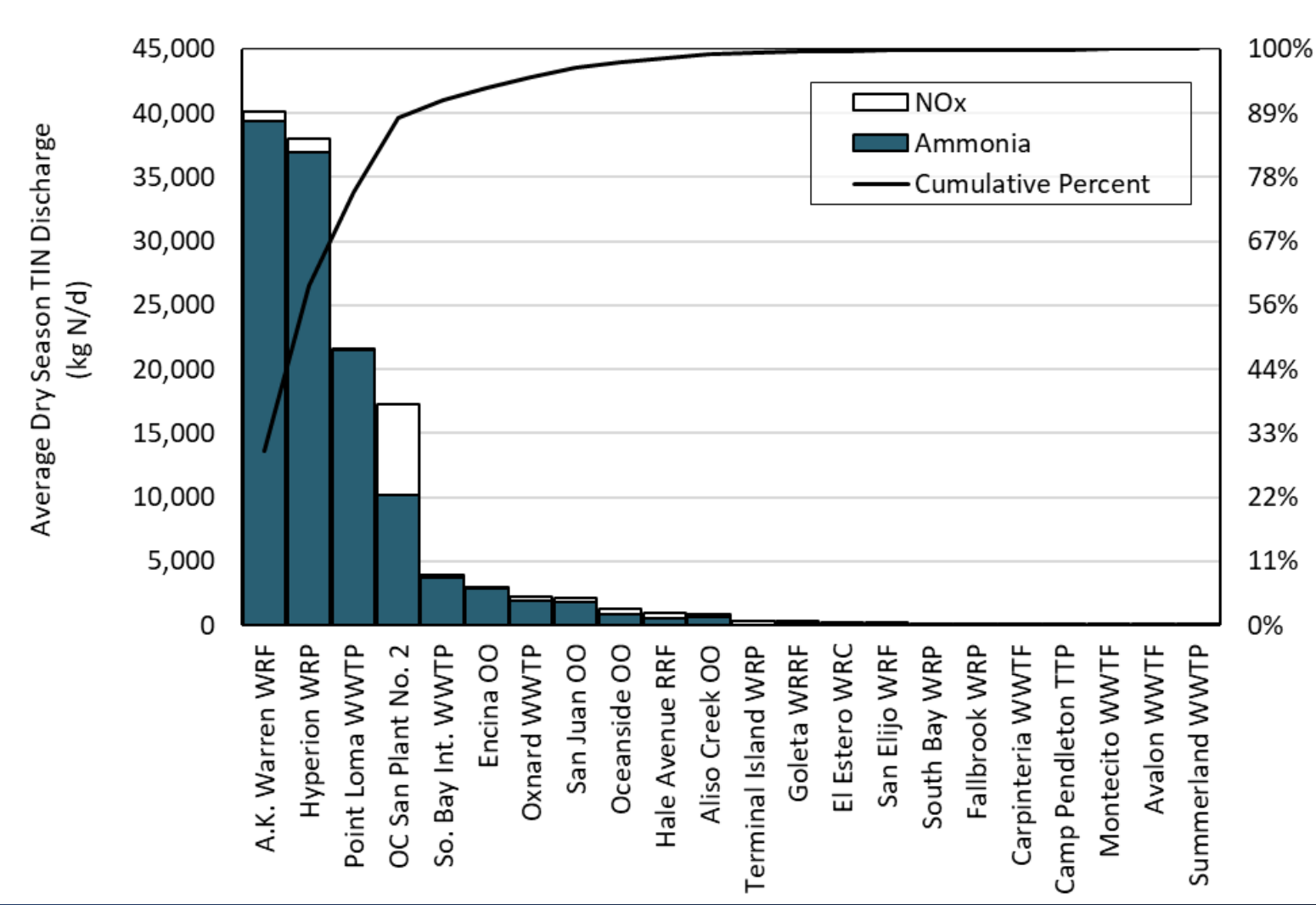
Southern California Bight - 28 WWTPs Contribute 6% of nitrogen loads



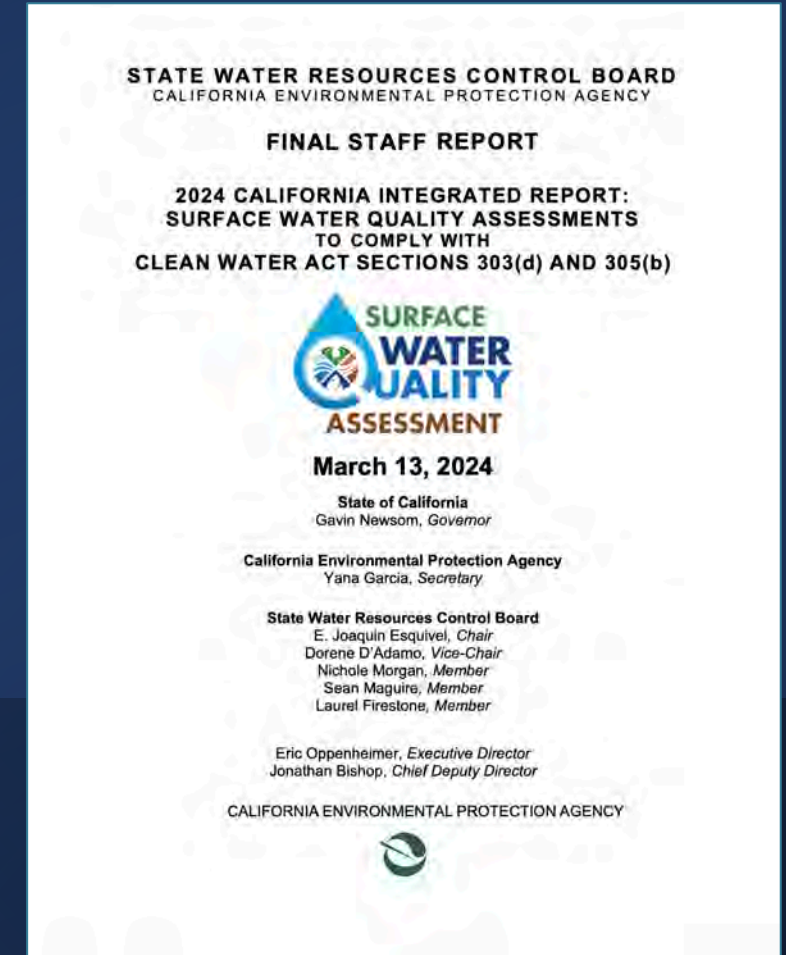
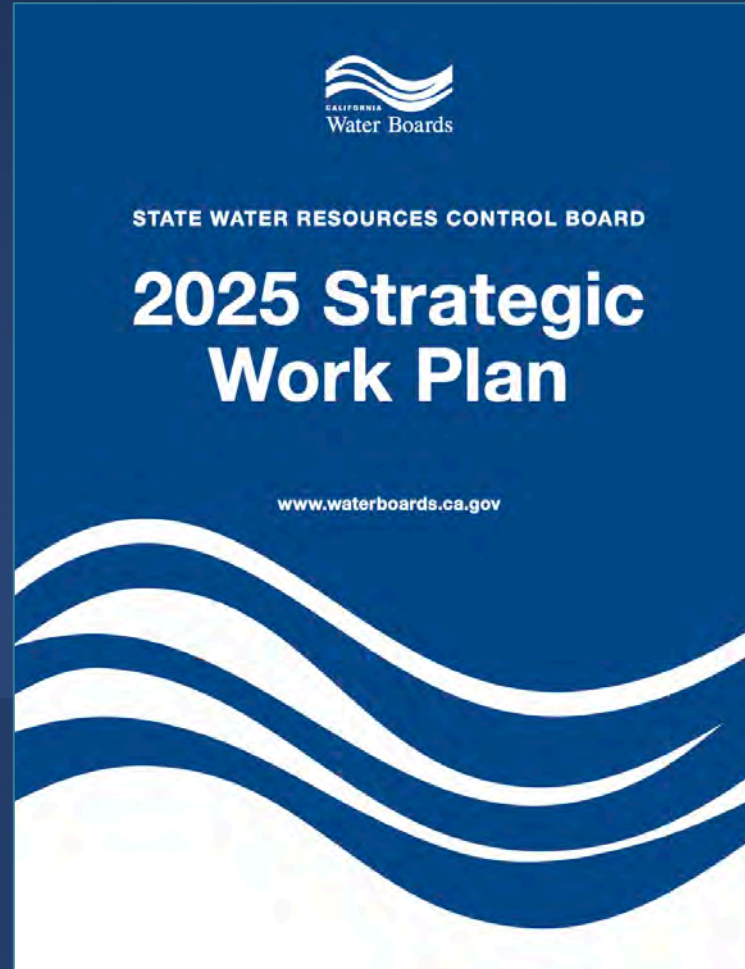
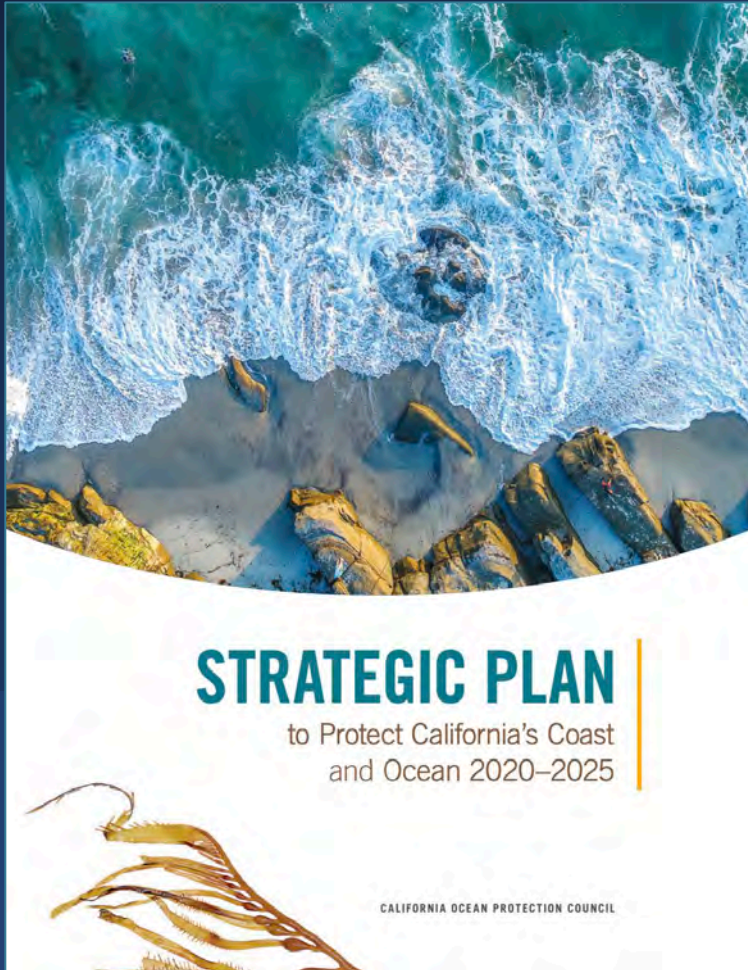
Complex Open Boundary System



2 Largest Dischargers Contribute 70% of the dry season load to the Pacific



CA Regulatory Plans for Coastal Nutrients



CA State Water Resources Control Board - Strategic Workplans

YEAR	Research & Initiate Development of a WQO	Scope an Ocean Plan WQO	Elimination of Coastal Discharge	Amend CWSRF to Incentivize Nutrient Removal	Investigate Feasibility of Nutrient Removal	Management Strategy	HABs Early Detection Monitoring
2020	X						
2021	X						

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2020	X						
2021	X						
2022		X					

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2020	X						
2021	X						
2022		X					
2023		X	X	X			

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2020	X						
2021	X						
2022		X					
2023		X	X	X			
2024		X			X		

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2020	X						
2021	X						
2022		X					
2023		X	X	X			
2024		X			X		
2025		X Ω		CWSRF Policy	X	X	X

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2020	X						
2021	X						
2022		X					
2023		X	X	X			
2024		X			X		
2025		X Ω		CWSRF Policy	X	X	X
2026		X			X	X	

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2020	X						
2021	X						
2022		X					
2023		X	X	X			
2024		X			X		
2025		X Ω		CWSRF Policy	X	X	X
2026		X			X	X	

OPC-funded Modeling of Central Coast (2024)



CALIFORNIA
**OCEAN
PROTECTION
COUNCIL**



Wade Crowfoot | Secretary for Natural Resources | Council Chair
Yana Garcia | Secretary for Environmental Protection
Malia Cohen | State Controller
Ben Allen | State Senator
Dawn Addis | State Assemblymember
Alexis Jackson | Public Member
Megan Rocha | Public Member

Staff Recommendation

February 29, 2024

Item 5

Action Item:

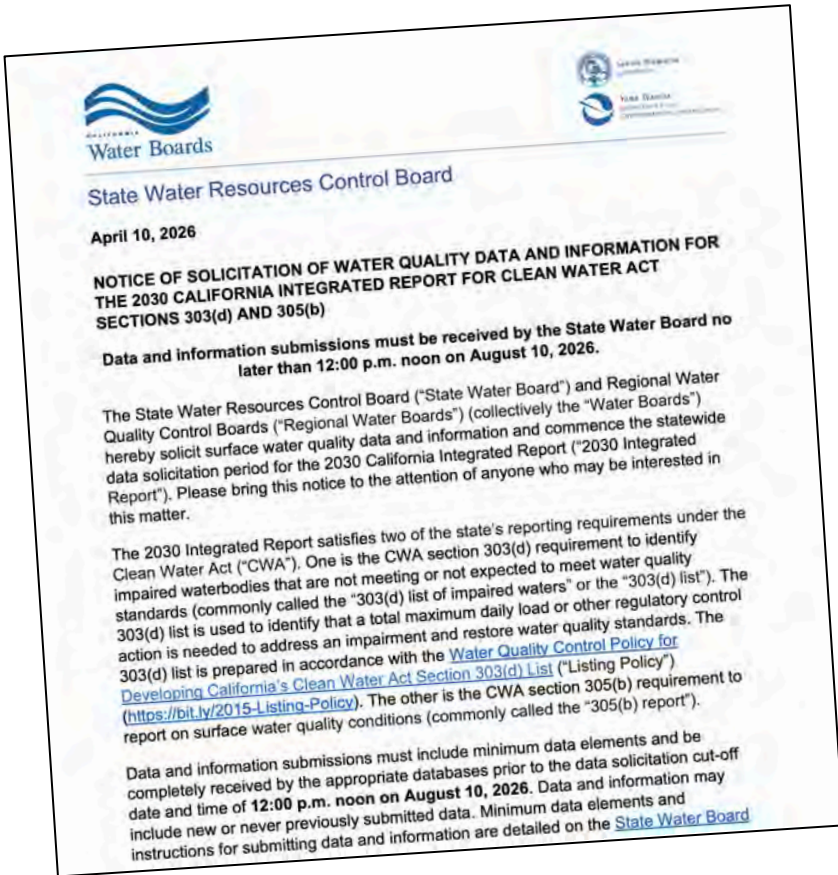
Consideration and Approval to Augment Funds to Advance Modeling of Ocean Acidification Drivers and Impacts on the Central Coast

Christine Sur, Water Quality Program Manager

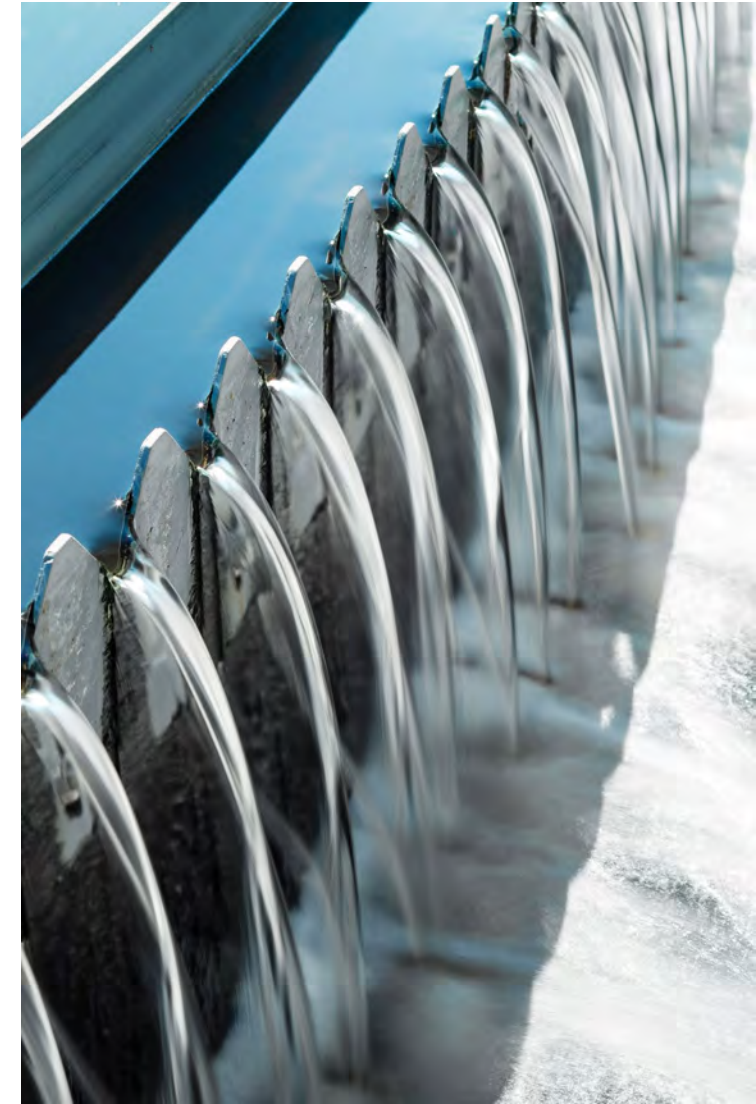
Recommended Action: Authorization to disburse up to \$561,072 to the Southern California Coastal Water Research Project (SCCWRP) to advance an integrated earth system model to assess the effects of anthropogenic nutrients on ocean acidification and hypoxia and the biological impacts of these conditions on the San Francisco and Monterey coasts. The authorization will provide a budget augmentation to an existing grant to SCCWRP previously approved by the Council on June 19, 2020.

Location: San Francisco and Monterey coast

CA Integrated Report and 303(d) List – 2030




1. Data solicitation deadline:
August 30, 2026



CA Integrated Report and 303(d) List – 2030

April 13, 2026



**CALIFORNIA
WATER BOARDS**
STATE WATER RESOURCES CONTROL BOARD

Notice of Consideration of Water Quality Data and Information to Inform Assessments on Ocean Acidification and Hypoxia in California for the 2030 Integrated Report for Clean Water Act Sections 303(d) and 305(b)

The State Water Resources Control Board (“State Water Board”) and Regional Water Quality Control Boards (“Regional Water Boards”) (collectively the “Water Boards”) are considering data to inform assessments of ocean acidification and hypoxia in the 2030 California Integrated Report for the following Regional Water Boards:

- San Francisco Bay
- Central Coast
- Los Angeles
- Santa Ana
- San Diego

State Water Board welcomes any data related to ocean acidification and hypoxia collected within three nautical miles from the coastline of the Regional Water Boards listed above. Data and information should be submitted consistently with the [Data Solicitation Public Notice](#) for the 2030 California Integrated Report.

The Water Boards are also considering data outputs from the Regional Oceanic Modeling System and the Biogeochemical Elemental Cycling, collectively known as “ROMS-BEC” model to inform assessments of ocean acidification and hypoxia in the Southern California Bight. Please bring this notice to the attention of anyone who may be interested in this matter.

CASA Engaged HDR to Replicate their Bay Area Work for SoCal



Report Sections

I. Influent

II. Effluent

III. Recycled Water

IV. Water Conservation

V. Energy & GHG Emissions

VI. Planned Projects

VII. Costs

CASA Engaged NWRI to Conduct an Independent Review of the Model in Collaboration with CalEPA, the Researchers, and NGO's



Consensus Findings and Recommendations for the ROMS-BEC Model

Independent Peer Review Panel Report

Prepared for
California Association of Sanitation Agencies

Prepared by
National Water Research Institute
Report No. 24-398-CASA-13

February 5, 2025

NWRI Independent Expert Review of ROMS-BEC (2023-2025)



- Initiated by SCCWRP CTAG
- Project Steering Committee
 - Karen Mogus, SWRCB
 - Dave Gibson, R9 San Diego RWQCB
 - Justine Kimball, OPC
 - Lan Wiborg, OC San
 - Steve Wagner, Goleta San
 - Lorien Fono, BACWA
 - Sean Bothwell, California Coastkeeper
 - Steve Weisberg, SCCWRP
 - Kristin Davis, Stanford
- Panel Charges
 - 1 - assess the Model's readiness
 - 2 - quantify uncertainty in its predictions
 - 3 - provide suggestions to improve the Model

NWRI Independent Report Executive Summary



Consensus Findings and Recommendations for the ROMS-BEC Model

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“The Panel members unanimously agree that the ROMS-BEC coupled modeling system is built on fundamental principles of physical and biogeochemical oceanography and has been evaluated using available observations.” (p. 4)

“It can be used to address basic management questions about whether nutrient loads from treated wastewater discharges in the region have impacted the marine environment and ecosystem in the Bight and what the large-scale and first-order impacts are. FN1” (p. 4)

“FN1 First-order impacts refer to ecosystem-level effects of discharging treated wastewater across the Bight region, rather than impacts on a specific marine species or parameter at a particular site.” (p. 15)

NWRI Independent Report Executive Summary



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“The Panel recommends exercising caution when using the Model to pinpoint exactly how and where discharges have affected the marine ecosystem. The Panel also provides recommendations for additional model analyses to address more detailed regulatory questions.” (p.5)

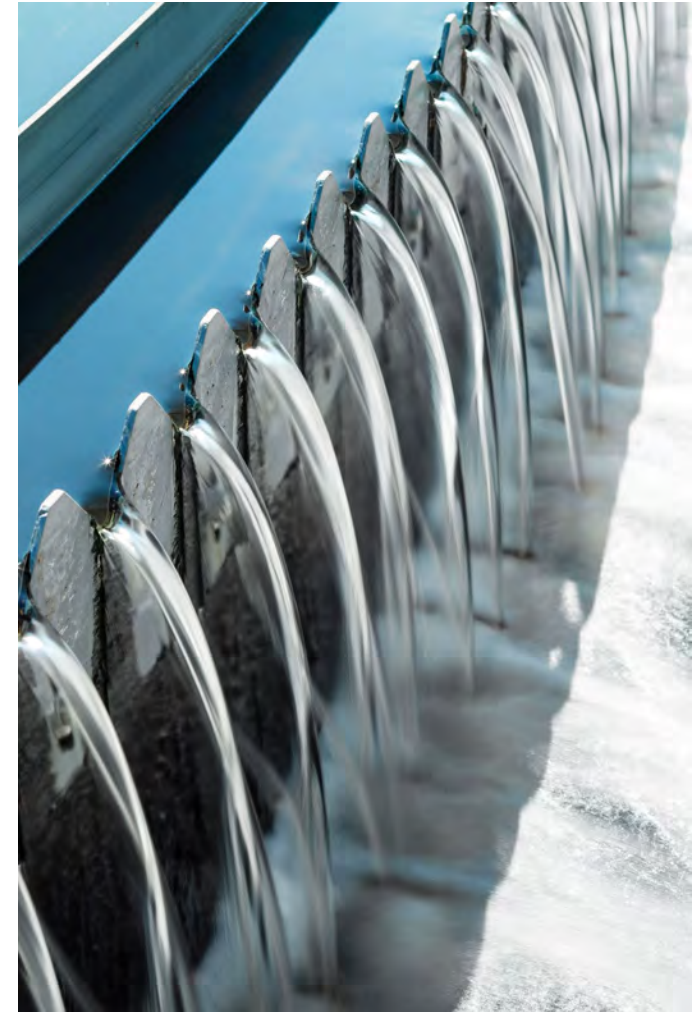
“The Panel recommends approaches to understanding and improving processes that may hinder the ROMS-BEC Model from accurately predicting the effects of treated wastewater outfalls on the marine ecosystem.” (p.5)

“The Panel also recommends several avenues for advancing the modeling system to more rigorously separate human-caused impacts from large-scale uncontrollable or natural variability of the marine environment.” (p.5)

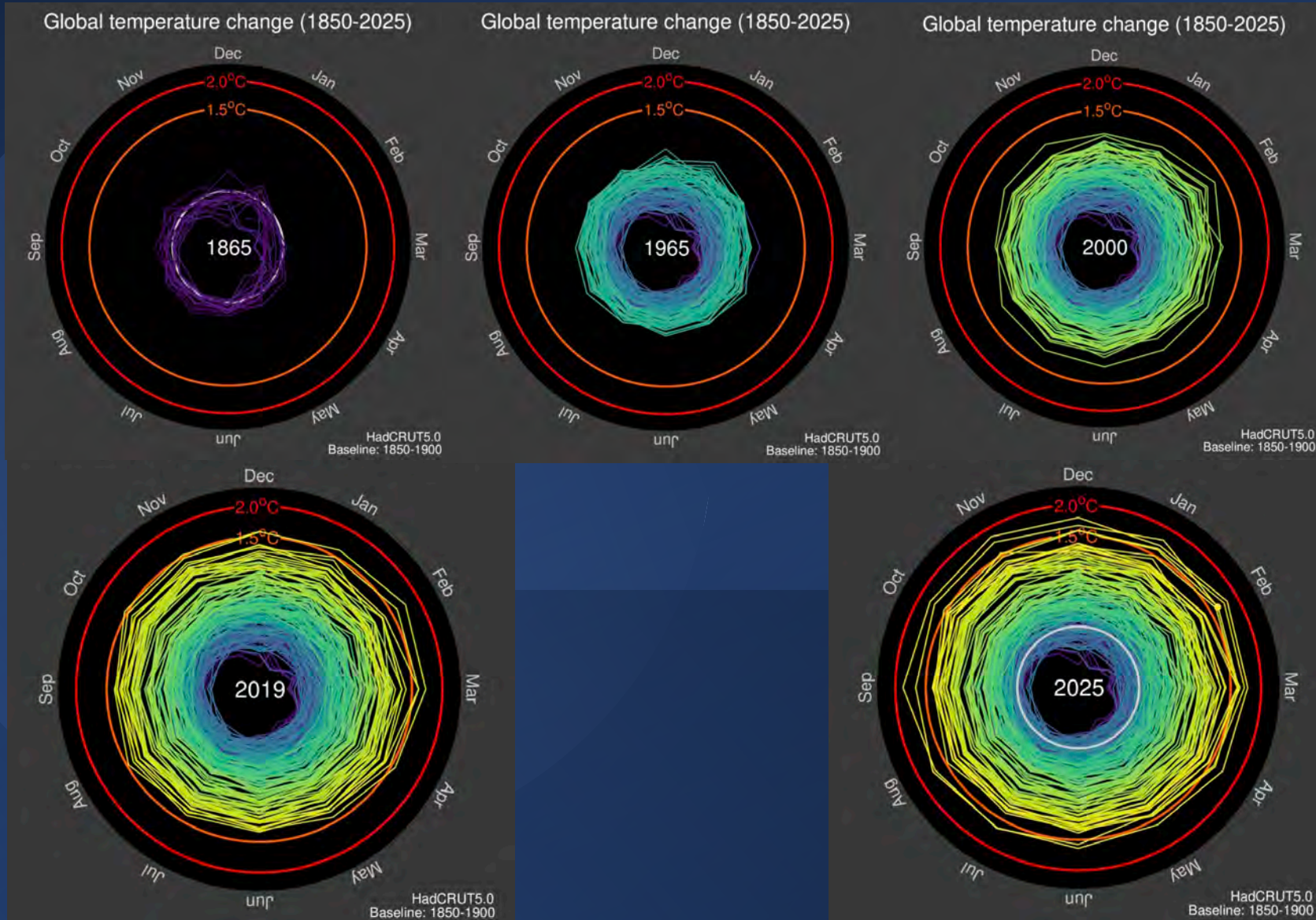
How to Help



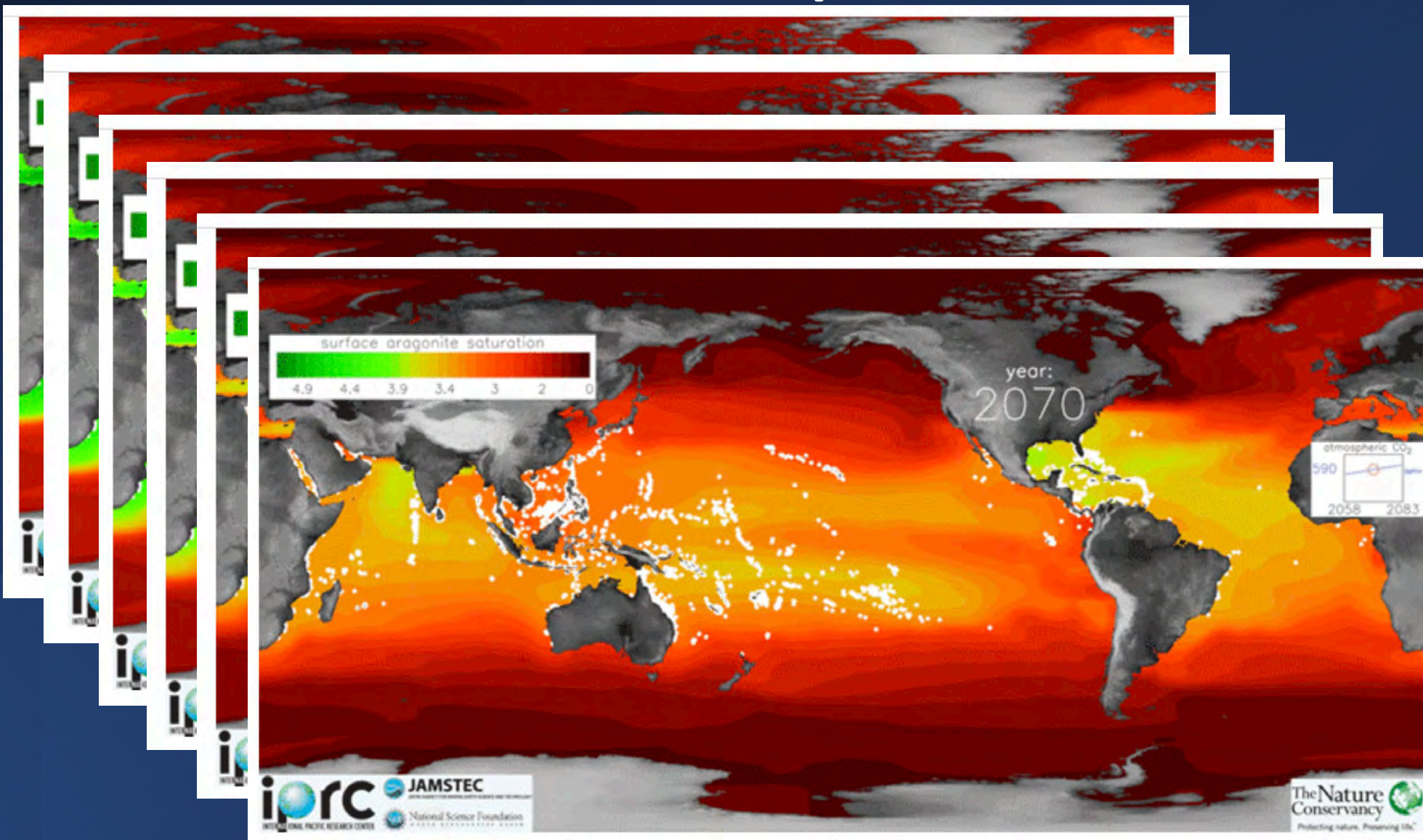
1. Connect with HDR on RFI Nutrient Data
2. Connect with SCCWRP on Data for OPC Research
3. Connect with other peer-Agencies in the region who aren't here today



2026 Temperature Check



2026 Temperature Check



Questions



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(916) 694-9269