

Understanding the Water Situation in and around Channel Islands Harbor

February 2023

Channel Islands Neighborhood Council (CINC)

Marine Advisory Committee (MAC)

2/25/2023



Harbor water circulation was drastically impacted after 60 years of Mandalay Generating Station operations



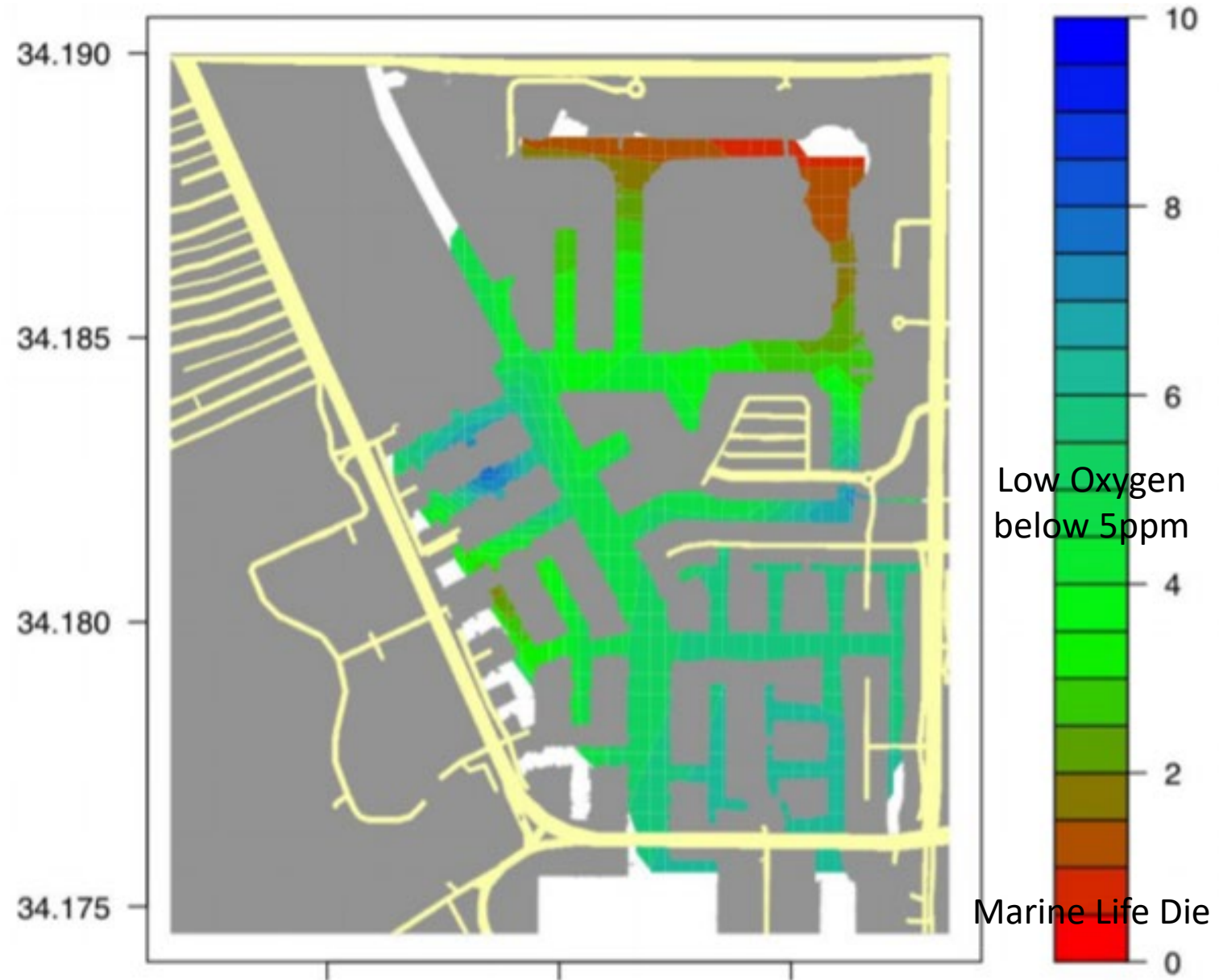
Ave. 1.5 billion gallons pumped out of canal per month stopped!

Initial Concern: Eutrophication= low Dissolved Oxygen Level (DO)

- February 2018 - MGS turned off cooling pumps
- June 2018 - Algal Bloom in Channel Islands Harbor
- July 2018 - City of Oxnard hired Aquatic Bioassay Consulting (ABC) Labs
- Sept 2018 Plant Closure Granted by LA Regional Water Quality Control Board
- Oct/Nov 2018 ABC sampled water and sediment from 31 sites in CI Harbor and Edison Canal
- **March 2019 CINC forms Marine Advisory Committee MAC**
- March 2019 ABC (Aquatic Bioassay Consulting) published C.I. Harbor: Nutrients & Sinks Study
- **March 2019 Installation of 4 remote sensors for DOL & Chlorophyll (Now Two)**
- Installation of Aerators
- **Monthly water sampling starting January 2021**



Channel Islands Harbor



Findings from 2021

State Water Board paid for 12 months of laboratory processing in 2021 ~\$125,000

- A. The City obtained a \$1.3 million ARPA grant in June 2022 to continue testing and study remediation alternatives.
- B. The ***Clean Water Team*** volunteers resumed monthly testing for Bacteria, field measurements, Nutrient, Metals, Pesticides and Toxicity in December 2022
- C. Results show Bacteria, Metals and Pesticides exceed State Standards
- D. The Regional Water Board will review test results and recommend TMDLs



Sensors provide ongoing data

Aquatic Bioassay Consulting Labs (ABC) was contracted to perform the Nutrient & Sinks Study by the City in Fall 2018

Remote sensors were installed in 2019 to measure Dissolved Oxygen (DO) and Chlorophyll 24 hours per day from March through September

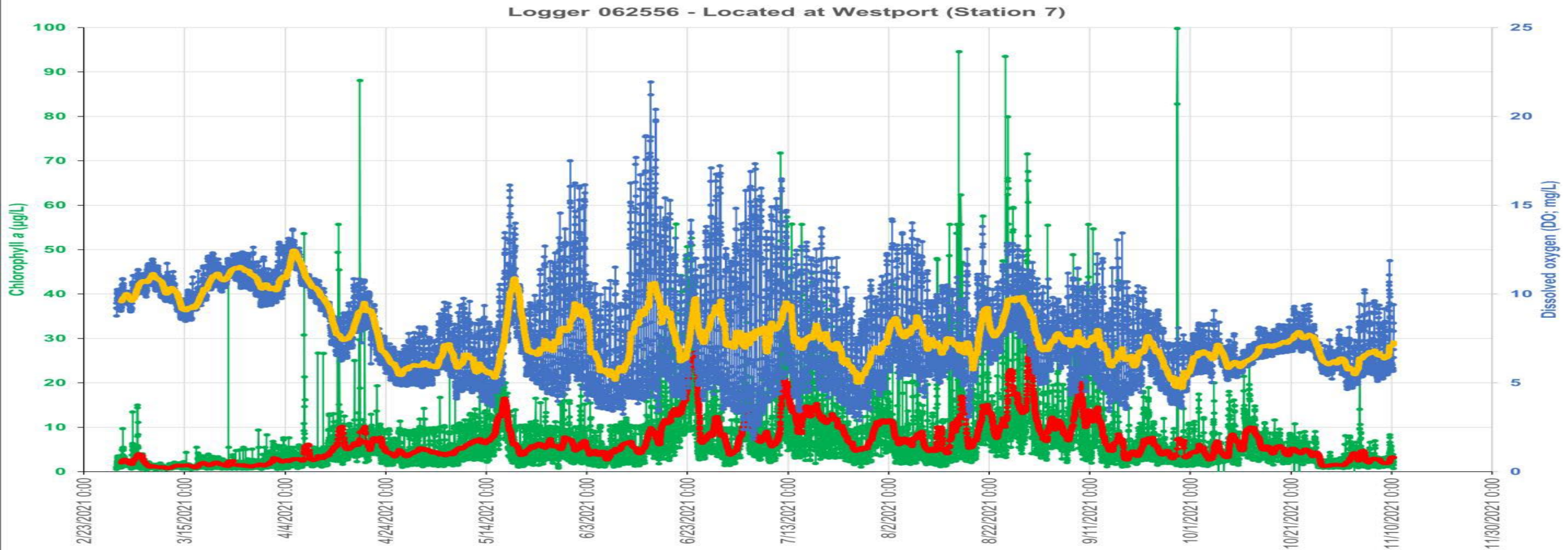
ABC monitors the results to detect potential Harmful Algal Blooms (HAB) or eutrophication

Results are posted on the City's website

On-Going Concern: Fish Kill due to low Dissolved Oxygen Level (DO)

- City of Oxnard website Harbor Water Quality weekly reporting
- Remote sensors installed in 2019– Dissolved Oxygen & Chlorophyll
- Implemented surface algae removal: City Contract Harbor Offshore
- QAPP – first submitted August 2019 and approved March 2021

Quality Assurance Project Plan, Sponsored by State of CA Water Board



- Seabridge Memorandum of Understanding (MOU) 2002
- An environmental study (the Study) has been conducted for the County to determine the environmental effects of the cessation of operations at Mandalay Generating Station
- If water quality in ***Channel Islands Harbor*** is **degraded below State standards** of the California Water Board, then
- The County and Oxnard agree to have the Study updated
- The County and Oxnard further agree to implement the updated Study's Remediation Measures
- The County has earmarked \$1.3 million to match the City's \$1.3 million ARPA funds for Remediation Measures



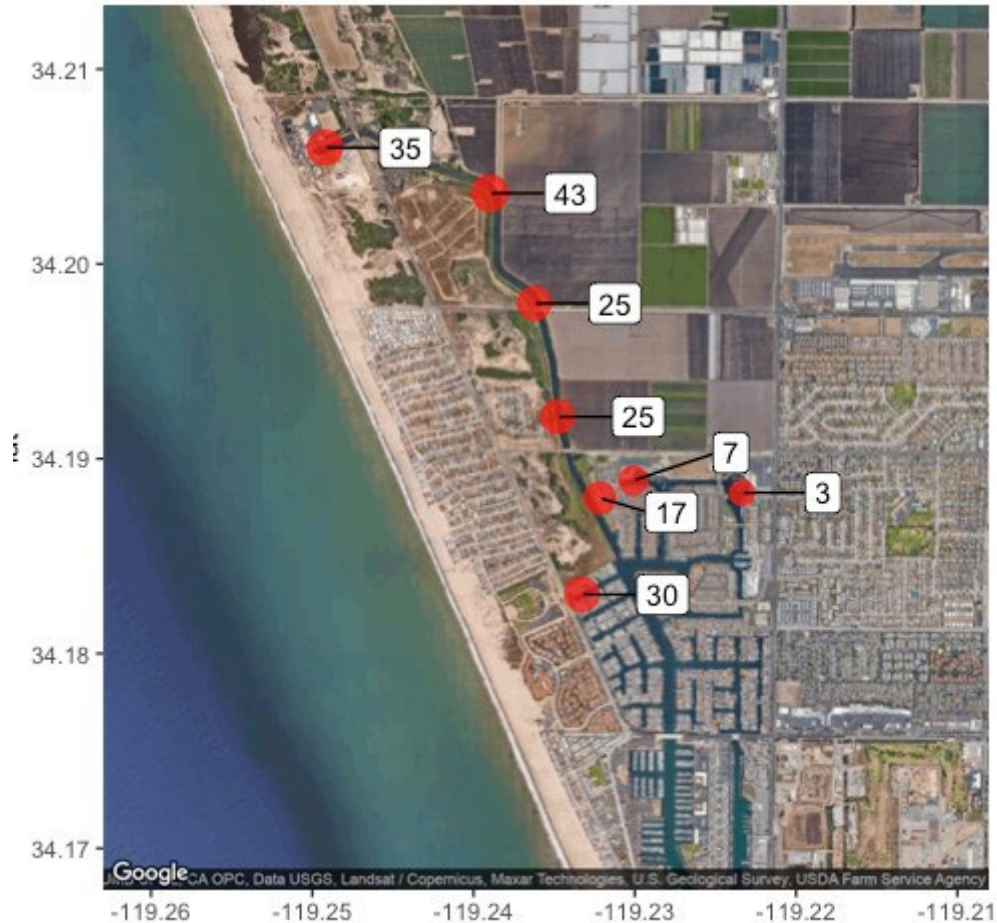
McGrath Lake

- McGrath Lake was classified by the EPA as “303(d) Impaired Water”
 - Exceeds Regional Board’s objectives for nitrates, metals, pesticides, PCBs and sediment toxicity as of June 2011
- McGrath Lake Pollution is a direct result of farm field runoff
- Same farm runoff are allowed to drain unfiltered and unmeasured into the Edison Canal and the Channel Islands Harbor



Pesticides and Bacteria exceed State Water Quality Standards

Bifenthrin is harmful to fish and aquatic species



The WQO is 0.6 ng/L. Edison Canal averaged 18ng/L, exceeding the State standard by 30 times.

2/25/2023

December 15, 2021 1.36 inches rain



Heavy rain caused extremely high bacteria levels in Edison Canal and adjacent to storm drains



Harbor Beaches of Ventura County Bacteria TMDL 2007

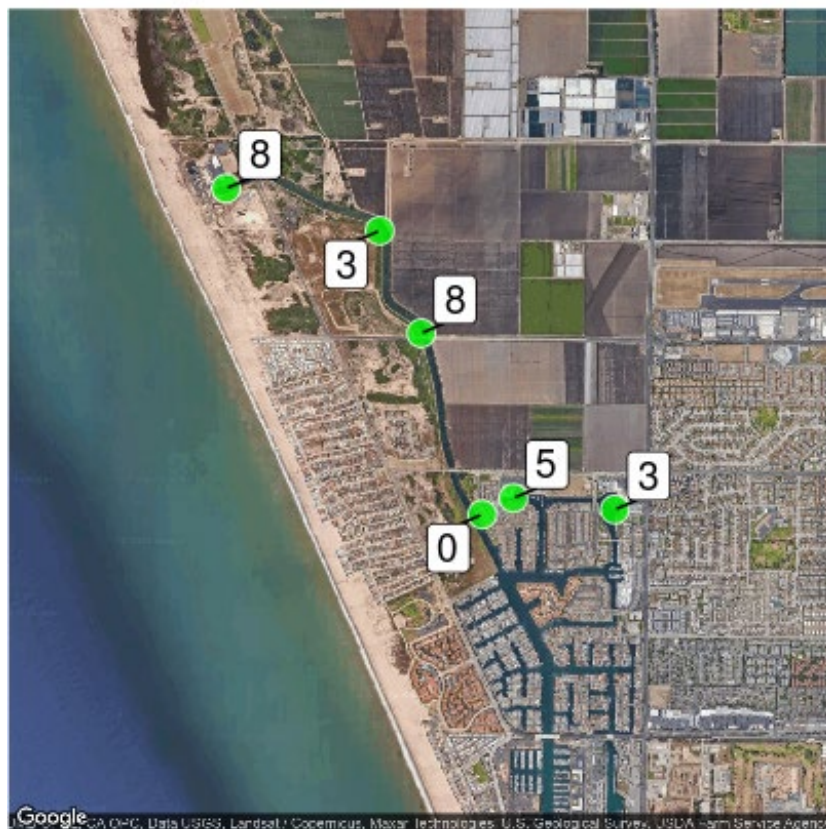
Toxicity

Ability of organisms to survive and reproduce

- One test measures the survival of small shrimp in water sample over time (one week)



% of shrimp that did not survive on Oct 26, 2021



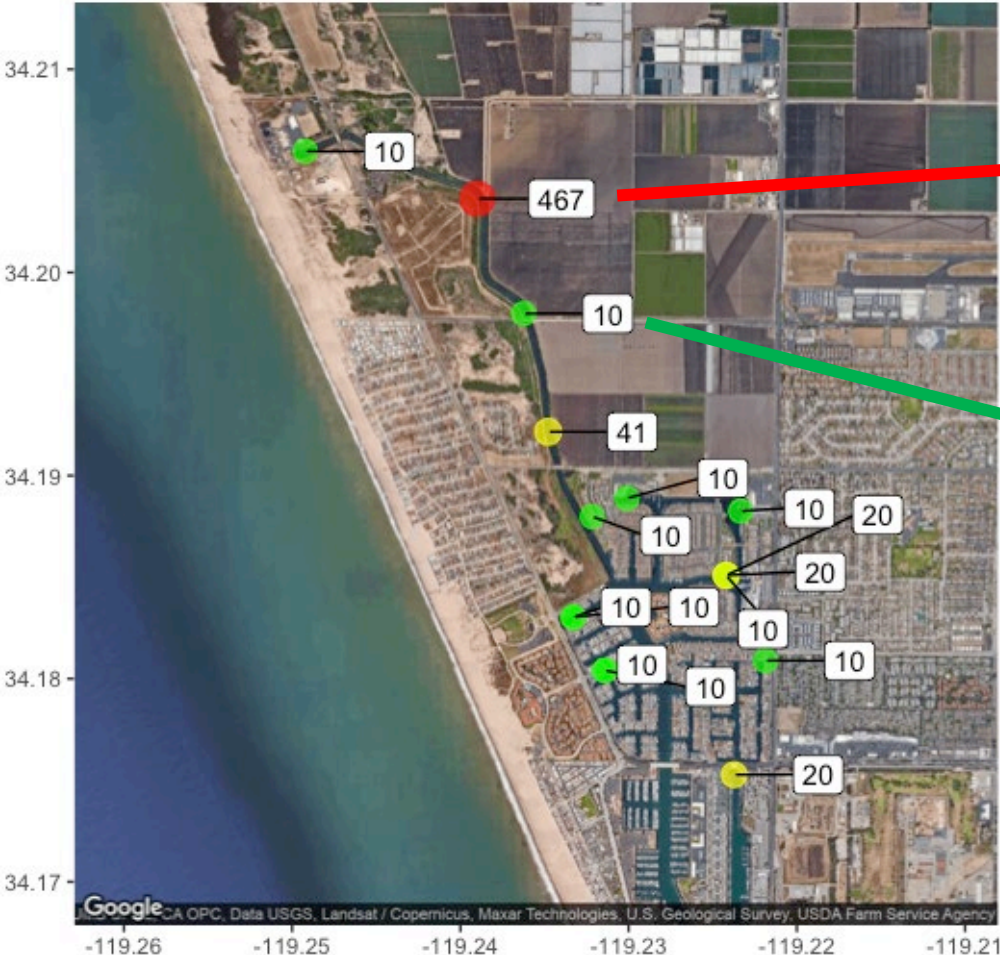
Moderate Rain (0.82")

% of shrimp that did not survive on Dec 15, 2021



Heavy Rain (1.36")

During Dry Weather High Bacteria Levels Only Measured Adjacent To Drains With Visible Runoff



Our data document numerous single measurements > 104 MPN/100mL indicating impaired water quality and risk for human contact (per water board basin plan).

Dry Weather Sampling
July 14, 2021

Values of 10 -20 are typical of dry weather



No inflow at Fifth Street Drain

Values of Enterococcus, MPN/100ml

Nitrate Measurements

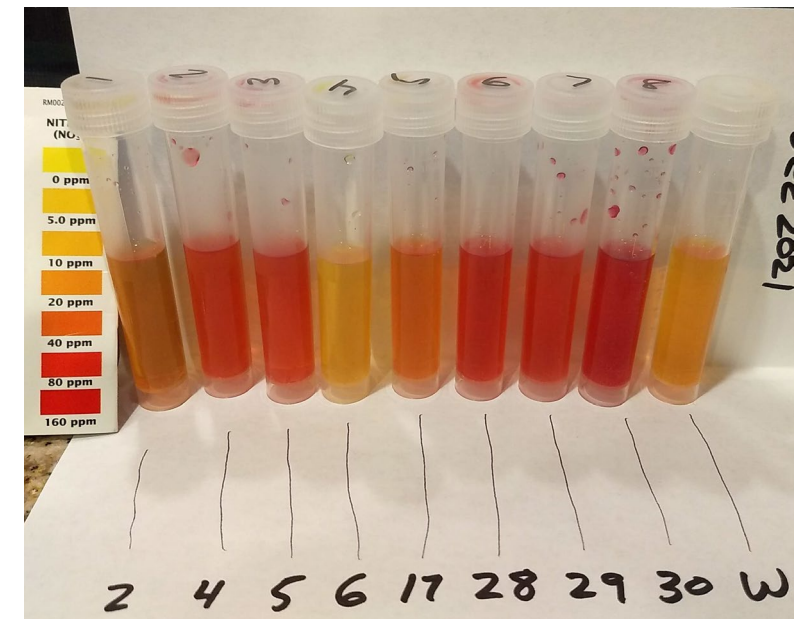
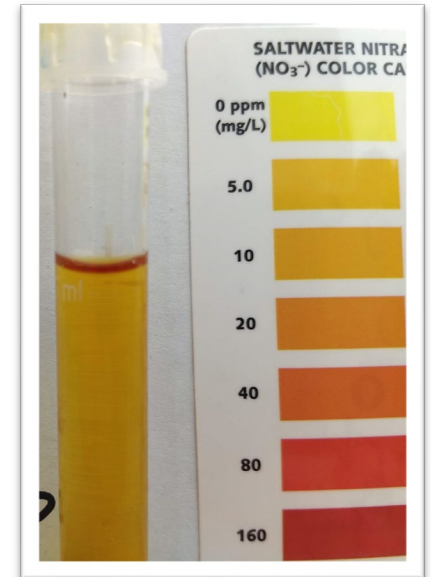
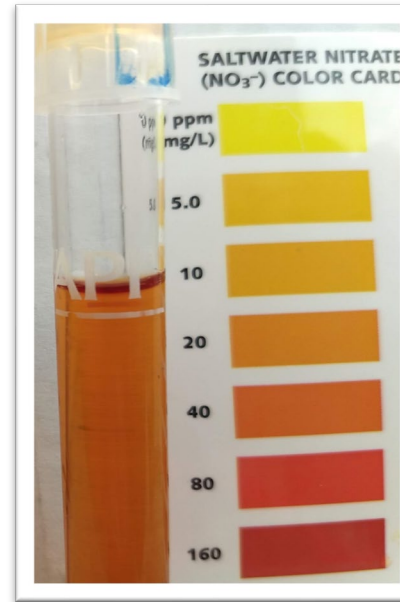
Nitrate is an essential plant nutrient and a major component of most fertilizers.

Excess nitrate in estuaries often leads to increased algal populations, impaired water quality and low oxygen conditions.

We visually estimated nitrate using a commonly available, inexpensive test kit.

While the measurements are not “laboratory quality,” they enabled us to determine major sources of nitrate, compare nitrate concentrations in different parts of CIH and the Edison Canal, and to track changes in nitrate concentration over time.

Our sampling revealed that, *particularly in the Edison Canal, nitrate tracked well with *Enterococcus* bacteria.*



Note that the nitrate color card is scaled for NO_3^- (ppm). Many publications, however, report nitrate as N (ppm). We converted our data to nitrate as N (ppm) for plotting vs bacteria but retained the original measurement of NO_3^- (ppm) to track changes over time in bar charts.

CHANNEL ISLANDS HARBOR WATER QUALITY TASK FORCE

- Quarterly meetings since 2021
- Representatives from City of Oxnard, Ventura County, Farm Bureau, NRCS, RCD, and MAC have initiated a **Harbor Water Quality Task Force** to engage key stakeholders work together to identify remediation alternatives
- Request for Proposal (RFP) will be sent to Environmental Consultants in Q2 2023
- Ventura County plans to match the City's \$1.3 million for remediation.

Chuck Carter - MAC	Sean Debley – County RMA	Jon Schwalbach - MAC
Dave Copper – MAC	David Fleisch – County PW	Glenn Shephard – County PW
Joel Berman - MAC	Alan Glen - MAC	Eric Storrie – Oxnard
Robert Bravo – County CEO office	Steve Howlett – Oxnard	Jodi Switzer – Farm Bureau
George Bregante - MAC	Maureen McGuire – Farm Bureau	Michael Tripp – County Harbor
Heather D'Anna- Nichols – Oxnard	Tom McNally - MAC	Michael Wolfe – Oxnard PW

Stakeholders & Influencers

Stakeholders Responsible for Harbor Water Quality

- **CenterPoint Energy** –Edison Canal owner
- **GenOn (NRG)** – Mandalay Power Plant owner
- **Water Quality Control Board** – regulates water quality
- **Ventura County** Channel Islands Harbor (WPA)
- **City of Oxnard** – Mandalay Bay/ Oxnard Waterways
- **City of Oxnard, Port Hueneme** – (MS4) storm drains that flow into CI Harbor
- **Farm Bureau of Ventura County** continues to implement BMPs (Best Management Practices) to reduce agricultural runoff that discharges nutrients & pollutants into CIH
- **National Resource Conservation Services (NRCS)** provide funding and BMPs guidance

Parties Impacted by Harbor Water Quality

- **Residents** who live in the CI Harbor
- **Businesses** that operate in the harbor
- **Marine life** whose survival is in jeopardy
- **All Harbor visitors & Tourists** who enjoy the harbor

Organizations That Can Help Oxnard Solve the Problem

- **LA Regional Water Quality Control Board (LARWQCB)**
- **Ventura County Public Works and Watershed Protection**
- **US Army Corp of Engineers** – built Harbor and Canal
- **CAL & Federal EPA** – assist in enforcing regulations
- **CA Coastal Commission**
- **Environmental Groups:** Heal the Bay, Santa Barbara Channelkeepers, Nature Conservancy, Wishtoyo/Ventura Coast Keepers, Ocean Protection Council, Surfrider



Possible Remediation Options

- Restore pumping out of the north end of Edison Canal
- Agricultural “Tailwater” Recovery Systems for reuse of water runoff
- Convert Edison Canal into a freshwater pond
- Engineered Wetlands, bioswales, settling ponds
- Flex mats – Idea from Natural Resources Conservation Services
- De-nitrification bio-reactor pilot – Resource Conservation District
- Filtration systems like Westport and Seabridge. Extend to all drains that contribute to the canal or directly to the harbor
- Dry Water Diversion –all water in the streets and storm drains is diverted to the sewer system when rainfall is less than 0.1”
- Other?



Questions?

