



JUNE 7, 2018

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DOMINIQUE EDWARDS

Presentation Overview

- Beach and Bay Monitoring Program Overview
- State Health Standards
- Advisories and Closures
- Tijuana River: Impacts to Local Beaches
- Future Testing Methods

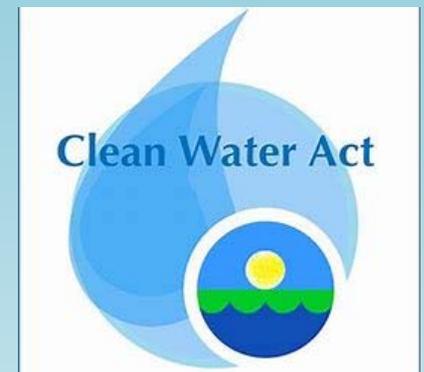
Program Goals

- Sample and evaluate beach water quality data
- Quickly and efficiently notify the public of poor water quality



Regulations

- Federal Requirements set in Clean Water Act – Beach Act 2000
- CA State legislation set in 1999 (AB 411)
 - Established *funding*
 - Provided guidance on *sampling locations*
 - Set beach water quality criteria and acceptable analysis methods
 - Mandated monitoring from **April 1st to October 31st**
 - Data reporting to the State (DEH & POTW)
- Regulations mandate monitoring at beaches which meet two criteria
 - >50,000 visitors a year
 - Receives surface water runoff between April - October



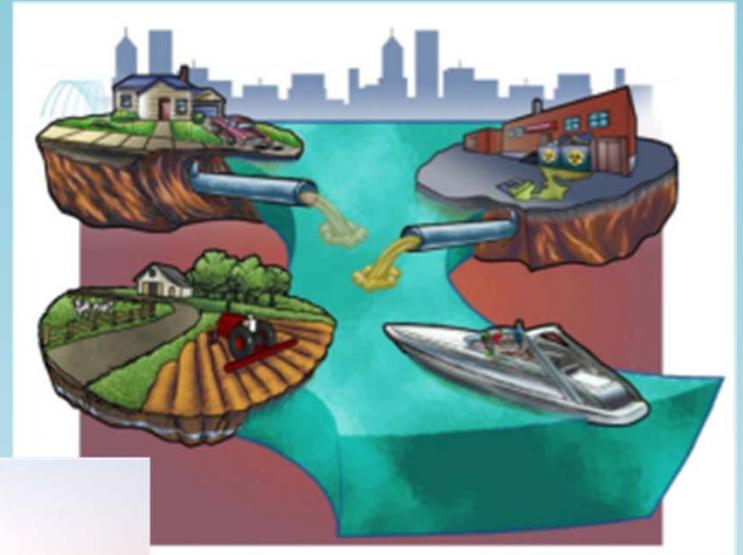
Fecal Indicator Bacteria (FIB)

- Groups of bacteria normally present in the intestinal tracts of humans, animals, and birds
 - Indicate the likelihood of presence of pathogenic microorganisms
 - Types of pathogenic microorganisms: bacteria, viruses, protozoa
 - Health risks associated with high FIB:
 - Stomach flu
 - Respiratory illness
 - Ear, nose, and throat infections
 - Skin rashes
- *Important to note at-risk populations that include children, older adults, and immuno-compromised individuals



Sources of Fecal Matter

- Leaking septic/sewer systems
- Storm drains carrying urban runoff
- Mammalian and avian populations
- Human encampments
- Boat/Illicit discharges



State Health Standards

(organisms per 100 mL)

Analyte	Single Sample Exceedance (CFU)	Geometric Mean Exceedance (CFU)*	Time to Final Results
Total Coliform	>10,000	>1,000	48 Hrs.
Fecal Coliform	>400	>200	48 Hrs.
Enterococcus	>104	>35	24 Hrs.

Fecal/Total Coliform Ratio – Ratio >0.1

GEOMEAN – Average of at least 5 samples (minimum) in a 30 day period

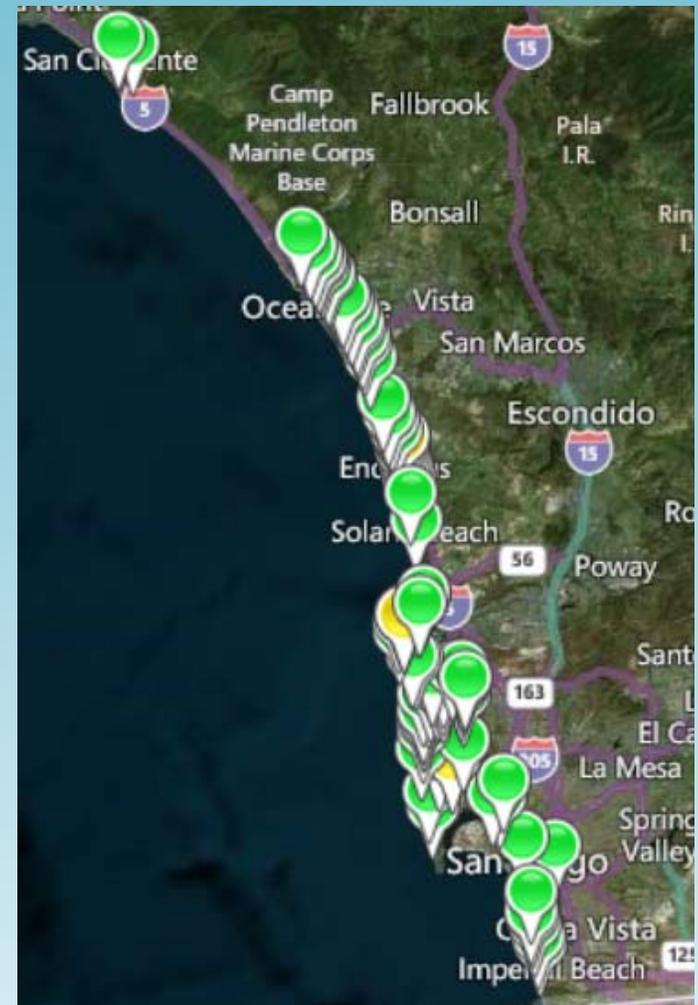
Active San Diego County Sampling Locations

Total Number of Weekly Beach
Water Quality Sample Locations

Agency	Summer	Winter
DEH	45	16
POTW*	41	41
Total	81	53

***There is some overlap in DEH/POTW sites.**

**Almost all sampling at edge of mixing zone of pipe or
waterway outlet (OM)**



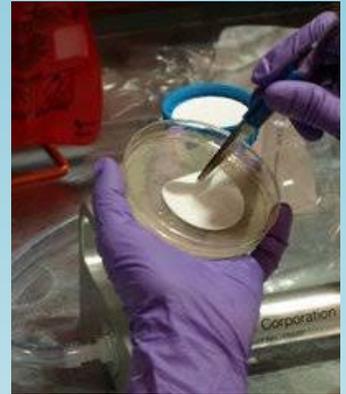
Sampling

- Sample below the water surface, in ankle-to-knee depth water (approximately 24 inches deep)
- PPE
 - boots, gloves
- Public Health Lab logistics:
 - Chain of Custody
 - Ice use during transport
 - One blank sample collected every 25 samples
 - One duplicate sample collected each sampling day



Processing Samples: Culture Methods

- Water quality analysis is currently conducted with culture-based methods
 - Total Coliform results in 48 hours
 - Fecal Coliform results in 48 hours
 - Enterococcus results in 24 hours



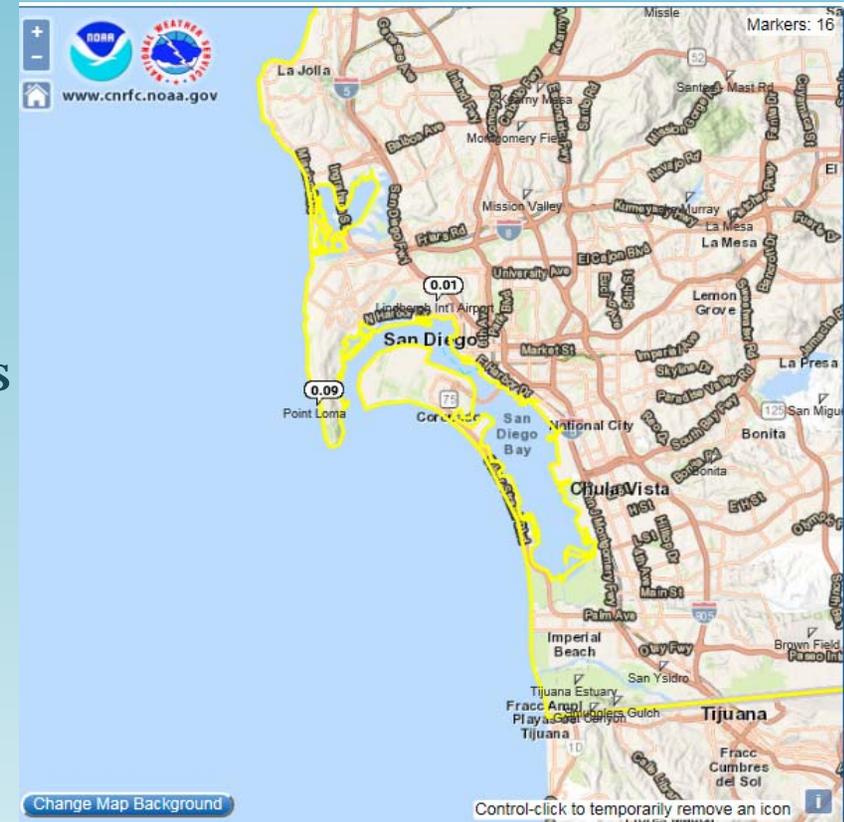
Advisories

- Bacterial Exceedance
 - Resampling required
- Precautionary
- General (Rain)



General Rain Advisories

- Greater than 0.20 inches of rain in 24 hours
- **Advisory in effect for 72 hours after rain stops**
- Urban runoff significantly degrades water quality
- ***NO*** routine sampling conducted during the GRA.



Closures

- Confirmed Sewer Spill
 - Reported by sewer agencies
- Confirmed Tijuana River Flow
 - Identified with SCCOOS
 - Reported by IBWC or public
- Usually Non-Routine Sites
 - Will use historic sample stations, when possible
 - Multiple sample locations per size of spill



Public Notification Methods

- **Beach Water Quality Mobile Web Application**
(Website – www.sdbeachinfo.com)
- Telephone Hotline
- Twitter
- Facebook
- Email
- Press Releases



**One thing dominates water quality
in South San Diego County:**

TIJUANA RIVER CONDITIONS

South County Beach Water Quality Project

- Efforts focused around the protection of public health at South San Diego County Beaches
 - Assess water quality impacts during dry weather (South → North conditions)
 - Evaluate reports of odors
- Monitoring conditions/telemetry
- Weekly sampling
 - Monday: North of the Border Fence, Tijuana Rivermouth, Cortez Avenue
 - Thursday: North of the Border Fence, Tijuana Rivermouth, Cortez Avenue, Imperial Beach Pier
- Strengthen communication with partners in water quality monitoring efforts



Tijuana River Impacts



TIJUANA RIVER STATUS

TIJUANA RIVER STATUS

South County Closures

- Tijuana River-related Closures are subdivided into four segments:
 - **Tijuana Slough Shoreline:** From the International Border to the south end of Seacoast Drive in Imperial Beach
 - **Imperial Beach Shoreline:** From the south end of Seacoast Drive (Imperial Beach) to Carnation Avenue (north end of Imperial Beach at Camp Surf)
 - **Silver Strand Shorelines:** From Carnation Avenue (north end of Imperial Beach) to Avenida del Sol (south end of Coronado Municipal Beach)
 - **Coronado Shoreline:** From Avenida del Sol (south end of Coronado Municipal Beach) to the north end of Coronado Municipal Beach

2016		
Area	Total #of Closures	Total #of Days
Tijuana Slough Shoreline	6	162
Imperial Beach Shoreline	7	30
Silver Strand Shoreline	4	16
Coronado Shoreline	1	3

2017		
Area	Total #of Closures	Total #of Days
Tijuana Slough Shoreline	2	167
Imperial Beach Shoreline	9	64
Silver Strand Shoreline	6	26
Coronado Shoreline	2	11

2018 <small>(as of 5/8/2018)</small>		
Area	Total #of Closures	Total #of Days
Tijuana Slough Shoreline	3	64
Imperial Beach Shoreline	3	10
Silver Strand Shoreline	2	7
Coronado Shoreline	1	2

Improving Monitoring Methods

- Culture based methods are slow
 - Best case scenario for public notification is 24-30 hours AFTER a sample is collected
- Need quicker ways to determine when beaches are unsafe for swimming and should be posted
 - PCR

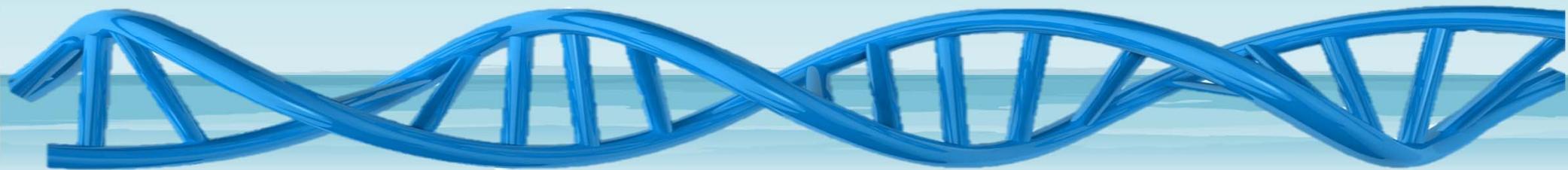


Polymerase Chain Reaction (PCR)

- **What exactly is PCR?**

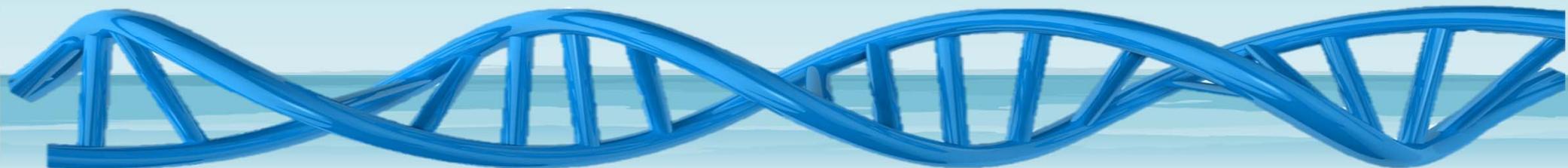
- Cutting edge technology for water quality monitoring
- Molecular method (counting DNA strands, not cells)
- Identifies *Enterococcus* sp.
- Very precise - requires specialized training & equipment
- Not currently approved in California

Provides final results in about 4 hours



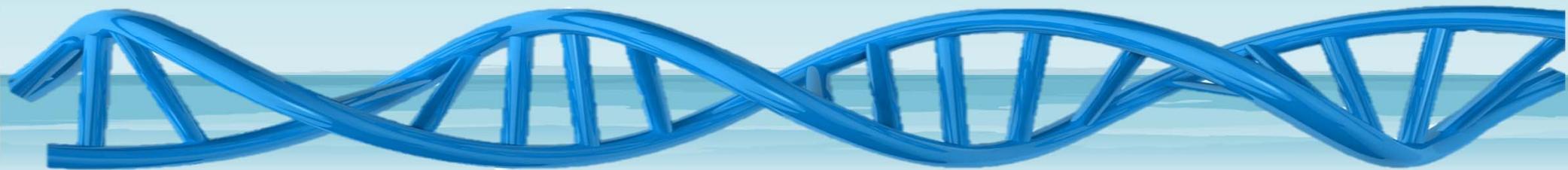
EPA's PCR Method

- Released in 2012 – known as qPCR
- 2013 study with 320 samples at 30 beaches
- Determined to be ineffective
 - *Inhibition rate too high (10%)*
 - *High detection limits*
 - *Variability too high (standards)*
 - *Overestimation of results*



New PCR Method

- Currently under development – known as ddPCR
- Likely address most of the EPA Method's issues
- Current study underway (~2,400 samples/all beaches)
- Collaboration with PHL, DEH, CDPH and SCCWRP
 - Finished collecting samples in May
 - Lab analysis complete in the Fall
 - Preliminary results available in early 2019
 - Regulation and other updates later in 2019



New PCR Method

- Hopeful this method will be successful
- Won't work at every location
- Limitations and challenges for South County beaches
 - Different environment due to sewage flows
 - Unsure what how south swell conditions will react
 - Will need special focused evaluation (could take longer)







Contact Information



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References

- <https://www.epa.gov/beach-tech/measure-beach-water-learn-how-clean-it>
- https://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/
- https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basin_plan/web/bp_ch2.html
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- <http://thankyouocean.org/threats/water-pollution/>
- <https://www.epa.gov/beach-tech/about-beach-act>
- <https://mi.water.usgs.gov/h2oqual/BactHOWeb.html>