



What is the BRC?

The Beach Report Card (BRC) was first published in 1991 as a resource for beachgoers to better understand local water quality at their favorite ocean beaches.



The BRC is based on the routine monitoring of beaches conducted by local health agencies and dischargers.

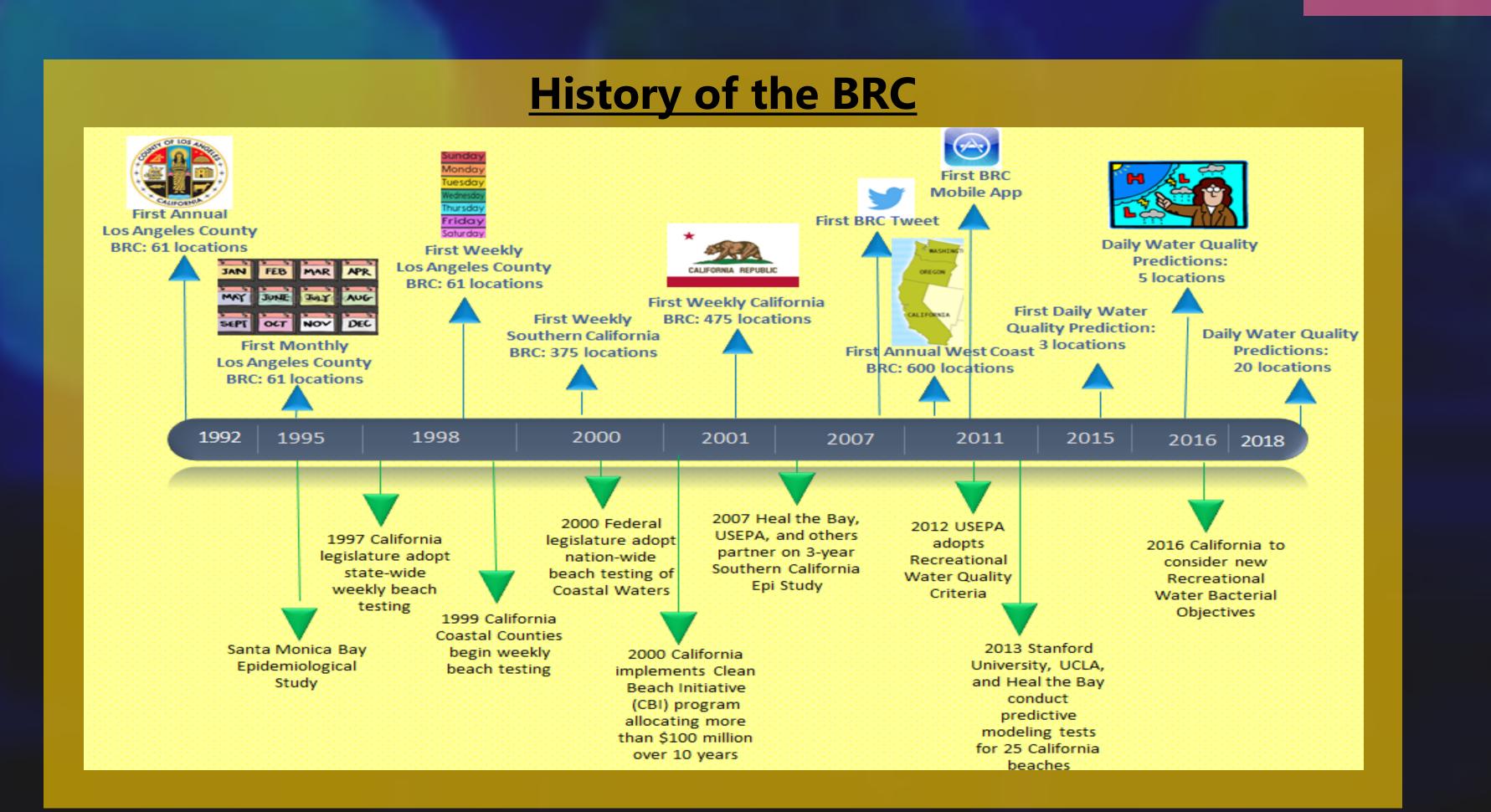


The Need for a BRC

istorically, shoreline water quality data was simply collected for regulatory compliance. When ambient monitoring and public notification was required, the data was used to merely determine sign posting.

Lost in this process was any effort to understand trends, source identification or abatement, or public notification efficacy.

Date	Time	Source	T. COLI MPN/100 ml	E. COLI MPN/100ml	ENTERO MPN/100 m
03/28/16	0845	OCEAN	10	<10	
03/28/16	****	OCEAN	NO	SAMPLE	COLLECT
03/28/16	0908	OCEAN	<10	<10	
03/28/16	0921	OCEAN	10	10	
03/28/16	0930	OCEAN	10	<10	
03/28/16	0943	OCEAN	41	<10	
03/28/16	0953	OCEAN	10	<10	
03/28/16	1003	OCEAN	52	20	
03/28/16	1015	OCEAN	5,172	<10	
03/28/16	1041	OCEAN	2,481	<10	
03/28/16	1100	OCEAN	2,613	2,014	٤
03/28/16	1102	OCEAN	134	<10	
03/28/16	1106	OCEAN	880	<10	
03/28/16	1111	OCEAN	816	<10	
03/28/16	1148	OCEAN	388	<10	
03/28/16	1217	OCEAN	160	63	
03/28/16	1223	OCEAN	62	30	
03/28/16	1227	OCEAN	<10	<10	
03/28/16	1247	OCEAN	31	<10	
03/28/16	1300	OCEAN	<10	<10	



Program Sponsored by: Surf Industry Manufactures Association and Swain Barber Foundation

Heal the Bay's Beach Report Card® Communicating Complex Water Quality Issues and Improving Public Health Notification Leslie Griffin and James Alamillo



The BRC uses an 'A—F' grading system. Grades are solely based on fecal indicator bacteria sampling results. Grades consider the magnitude and frequency of exceedances, single sample and geometric mean results.

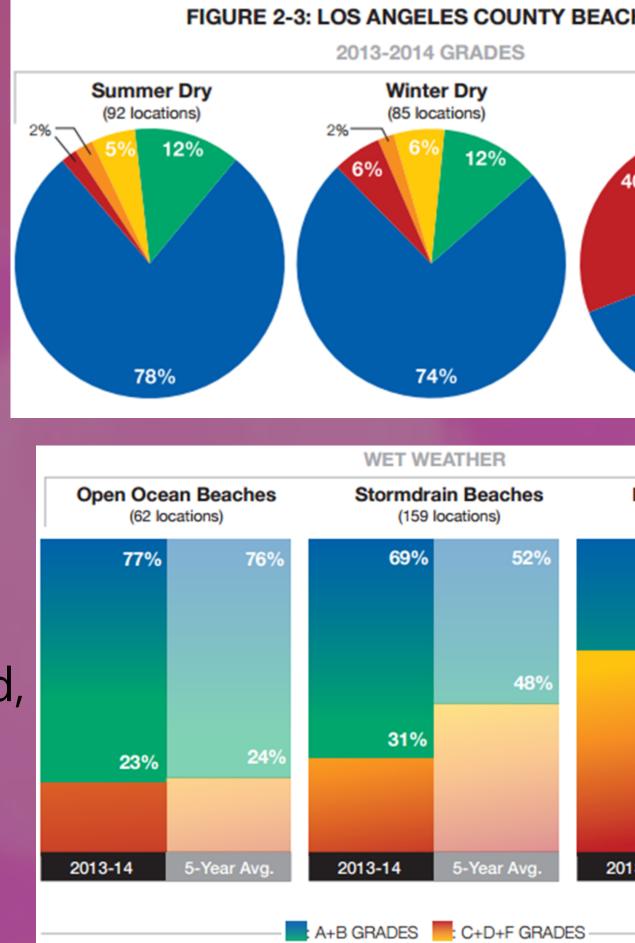
Our methodology has been approved by our partner agencies, SCCWRP, and CA SWRCB as an effective tool for public notification.

Public agency monitoring data is cleaned and classified by location type, rain influenced, and season.

Analysis of **Classifications**

Heal the Bay produces grades

- for monitored beaches by:
- Season (Summer Dry, Winter Dry, and Wet) . Weather (Dry vs. Wet)
- . Beach Type (Open, Enclosed,
 - and Storm Drain)
- . **Time** (Weekly or Annual)



Public Notification

Heal the Bay produces weekly, summer, and Annual grades for beach locations when data is available.

The grades are made available free to local press, partner organizations, and the general public via email, twitter, mobile app, and our web page.

For more information on the Beach Report Card Program, please visit:

www.brc.healthebay.org

Methodology and Data

TABLE 4-2: CALCULATING THE TOTAL POINTS LOST FOR THE GEOMETRIC MEAN COMPONENT							
Indicator Exceeded	Calif. Beach Bathing Water Standard	% of Total Ave Lost" Due to	Total Available Points				
nterococcus 35		80	80%				
Fecal Coliform	200	40%		50			
Total Coliform	1000	20	20%				
	100 milliliters of ocean water						
	NGLE SAMPLE GF		SHOLDS IN C	FU/100ML*			
		ADIENT THRE	SHOLDS IN C HIGH > T + 1 SD	FU/100ML* EXTREM Very High Ris			
TABLE 4-3: SI	NGLE SAMPLE GF	ADIENT THRE	HIGH	EXTREM			
TABLE 4-3: SII	NGLE SAMPLE GF SLIGHT T - 1 SD	MODERATE T + 1 SD	HIGH > T + 1 SD	EXTREM Very High Ris			
TABLE 4-3: SII Indicator Bacteria Total Coliform	NGLE SAMPLE GF SLIGHT T - 1 SD 6,711-9,999	ADIENT THRE MODERATE T + 1 SD 10,000-14,900	HIGH > T + 1 SD > 14,900	EXTREM Very High Ris N/			

HES			
	Weather ocations)		
40%	4% 6% 139	%	
	37%		
	d Beaches		
35%	29% 71%		
65% 13-14	5-Year Avg.		
	o rear Avg.		

	Be	nef	its	<u>of t</u>	he l	BRC	
For	the	past	25 y	/ears	s, the	BRC	has

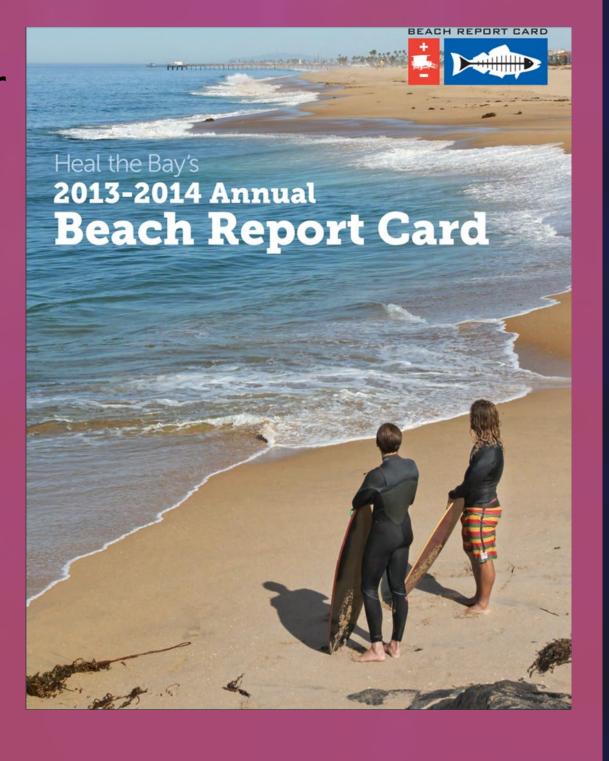
- Increased public notification and awareness
- . Identified water quality trends and problem locations
- . Led to 303(d) listings and policy elements like BMPs, Source ID, and special studies.
- Been utilized by public agencies for grant / funding opportunities
 - . Celebrated 'great' beaches.

Over the last three years, Heal the Bay, Stanford and UCLA determined the feasibility of implementing predictive models in California.*

Phase I: Proof of concept (2012 - 2014)Could models be developed for CA marine beaches?

Could a model be





- beaches during the summer months;
- **Develop** predictive models for 5 winter surf beaches;
- . Upgrade the mobile app to_allow for volunteer environmental monitoring, collection; and
- Upgrade the BRC Web page.

Partnerships: The BRC would not be possible without the cooperation of the various State and County public agencies that conduct beach water quality monitoring programs.



Predictive Modeling Phase I and II

Phase II: Pilot test at 3 beaches (2015)

Environme Science & Tech

Sunny with a Chance of Gastroenteritis: Predicting Swimmer Risk at **California Beaches**

W. Thoe,*^{,†} M. Gold,[‡] A. Griesbach,[§] M. Grimmer,[§] M. L. Taggart,[§] and A. B. Boehm[†] epartment of Civil and Environmental Engineering, Environmental and Water Studies, Stanford University, Stanford, Califor

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Supporting Information

f five different types of statistical, data-driven predictive gression model, partial least-squares regression mo artificial neural network, and classification tree, in predicting advisories due to FIB contamination at 25 beaches along the California coastline. Classification tree and the binary logist regression model with threshold tuning are consistently the best performing model types for California beaches. Beaches with good performing models usually have a rainfall/flow related dominating factor affecting beach water quality, while beaches having a deteriorating water quality trend or low FIB exceedance rates are less likely to have a good performing model. This study identifies circumstances when predictive models are the most effective, and suggests that using predictive models for public notification of unsafe swimming conditions may improve public health protection at California beaches relative to current practices.



readily integrated into an existing M&PN programs?

Promising Results:

1) Improved accuracy in public notification over current method;

2) Daily notification to beach-goers in the morning everyday

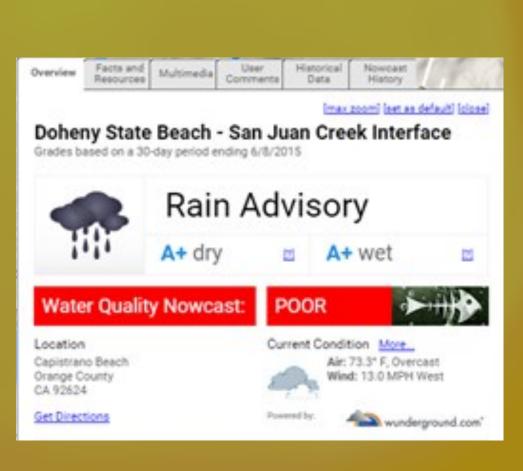
including weekends;

3) Improved understanding of FIB pollution at the beach and how to mitigate sources; and

4) Models can be successfully integrated into existing M&PN programs.

The Future of the BRC: Next Steps

- In the next three years, Heal the Bay, in partnership
- with Stanford University and UCLA, will:
- Expand the use of predictive models in California to 20



A predictive model is being tested at this beach. GOOD WATER QUALITY is predicted today based on observed conditions this morning. This means that bacteria levels are not likely to exceed the health standards for ocean water contact. Click here for more information.

Water Quality Nowcast: