

Southern California Beach Valuation Study

Michael Hanemann

hanemann@are.berkeley.edu

Context

- Conducted in the aftermath of the American Trader case, involving an oil spill of 415,598 gallons of crude at Huntington beach on Feb 7, 1990.
- The case went to trial in Orange County in the fall of 1997. On December 8, 1997, the jury awarded damages to the state of \$18 million.

Major issues raised in the litigation

- How many people would have gone to the affected beaches if they had been open February 8 – March 15, 1990?
- Can you answer this reliably based on lifeguard estimates of beach attendance?
- Did people merely go to the many other beaches in the area that remained open?
- Did they merely go once the beaches re-opened.
- What is the relevant estimate of consumer's surplus per lost trip?

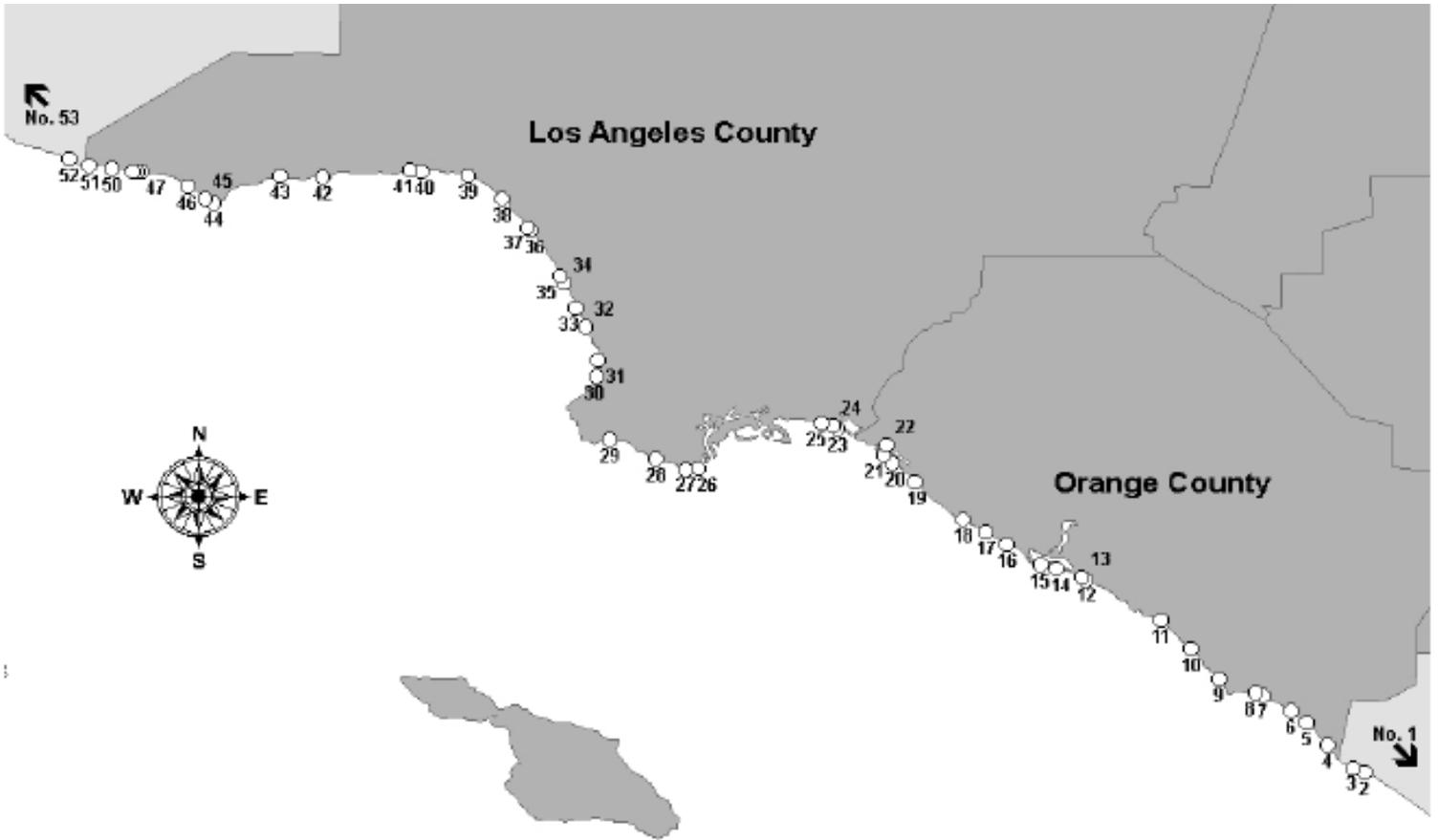


TABLE 1:
RECREATION ACTIVITIES IN THE OIL SPILL AREA

<u>AREA</u>	General Beach Recreation	Surfing	Shoreline Activities	Private Boating	Party / Charter Boating	Wildlife / Bird Viewing
Long Beach Marina / Alamitos Bay			✓	✓		
Seal Beach	✓	✓	✓		✓	
Anaheim Bay / Huntington Harbor	✓		✓	✓		✓
Sunset Beach	✓	✓	✓			
Bolsa Chica State Beach	✓	✓	✓			✓
Huntington City Beach	✓	✓	✓			
Huntington State Beach	✓	✓	✓			✓
Santa Ana River Mouth Beach	✓	✓				
Newport Beach	✓	✓	✓			
Newport Harbor	✓		✓	✓	✓	✓
Crystal Cove State Beach	✓	✓	✓			

Table 1 ESTIMATES OF THE LOSS OF BEACH RECREATION TRIPS

	RECORDED ATTENDANCE	ADJUSTED ATTENDANCE	PREDICTED ATTENDANCE	ESTIMATED LOSS
PLAINTIFF'S ANALYSIS*				
HANEMANN (1994)				
DURING THE CLOSURE PERIOD	225,915	75,984	530,265	454,281
OUTSIDE THE CLOSURE PERIOD	683,033	629,537	908,523	278,988
ADDITIONAL SURFING LOSS				30,485
TOTAL BEACH LOSS				763,752
TRIAL ESTIMATE*				
DURING THE CLOSURE PERIOD		119,135	585,154	448,019
OUTSIDE THE CLOSURE PERIOD		575,347	748,213	172,868
TOTAL BEACH LOSS				618,885
DEFENDANT'S ANALYSIS				
DUNFORD et al (1995)				
DURING THE CLOSURE PERIOD	225,915	116,822	297,992	181,370
OUTSIDE THE CLOSURE PERIOD				0
ADJUSTMENT FOR CHILDREN				-19,948
ADJUSTMENT FOR FOREIGNERS				-2,744
TOTAL BEACH LOSS				158,680
TRIAL ESTIMATE **				
DURING THE CLOSURE PERIOD	226,000	76,000	340,000	264,000
OUTSIDE THE CLOSURE PERIOD				0
TOTAL BEACH LOSS				264,000

TABLE 2: UNIT VALUES FOR GENERAL BEACH RECREATION

STUDY	BEACH AREA	METHOD	PER TRIP VALUE (\$ 1990)	BY WHOM THE STUDY IS CITED					
				Hanemann (1994)	Dunford et al. (1995)	Deacon & Kolstad (1995)	DOI French et al. (1996)	Hanemann (1997b)	Kolstad & Deacon (2000)
Bell & Leeworthy (1986)	Florida	TC	\$13.19	X		X	X	X	X
Bell & Leeworthy (1986)	Florida	CV	\$1.83			X			X
Brinkley & Hanemann (1978)	Boston	CV	\$4.88			X			X
Bockstael, McConnell & Strand (1988)	Maryland	TC	\$1.53-12.55			X			X
Curtis & Shows (1982)	Florida	CV	\$3.00			X	X	X	
Curtis & Shows (1984)	Florida	CV	\$5.73			X	X	X	
Dornbusch (1987)	So. California	TC	\$9.04-10.58			X	X	X	
Leeworthy & Wiley (1991)	New Jersey	TC	\$21.05				X	X	
Leeworthy, Schrufer and Wiley (1991)	San Diego	CV	\$1.00		X	X			
Leeworthy (1995)	San Diego	TC	\$80.79					X	
Leeworthy, Schrufer and Wiley (1990)	San Onofre	CV	\$4.33		X	X			
Leeworthy (1995)	San Onofre	TC	\$57.31					X	
Leeworthy, Schrufer and Wiley (1990)	Cabrillo-Long Beach	CV	\$1.95-2.17		X	X			
Leeworthy & Wiley (1993)	Cabrillo-Long Beach	TC	\$8.16					X	
Leeworthy, Schrufer and Wiley (1990)	Santa Monica	CV	\$1.15-2.33		X	X			
Leeworthy & Wiley (1993)	Santa Monica	TC	\$18.38					X	
Leeworthy, Schrufer and Wiley (1990)	Leo Carillo	CV	\$5.38		X	X			
Leeworthy & Wiley (1993)	Leo Carillo	TC	\$51.94					X	
Leeworthy (1995)	Pismo Beach	TC	\$26.20					X	
McConnell (1977)	Rhode Island	CV	\$0.95-4.30			X			X
McConnell (1992)	Massachusetts	TC	\$0.70-1.14			X			X
Meta Systems (1985)	Boston	TC	\$13.60				X		
Moncur (1975)	Hawaii	TC	\$1.07-4.18			X			X
Silberman and Klock (1988)	New Jersey	CV	\$4.25			X			
Tyrrell (1982)	Rhode Island	TC & CV	\$12.82				X		
US Army Corps of Engineers (1981)	Florida	TC	\$2.47			X			
US Army Corps of Engineers (1993)	Florida	TC	\$2.17			X			
RECOMMENDED UNIT VALUE (\$1990)				\$13.19	\$2.30	<\$5.00	\$11.00	\$15.00	\$1.00-4.00

TABLE 3: ESTIMATES OF THE OVERALL RECREATION LOSS

	NO. OF TRIPS	PER TRIP LOSS (1990 \$)	TOTAL LOSS (1990 \$)
PLAINTIFF'S ANALYSIS			
HANEMANN (1994)			
(A) LOSS DURING BEACH CLOSURE PERIOD			
General beach recreation trips lost	454,280	\$13.19	\$5,991,953
Surfing trips lost	30,485	\$16.95	\$516,721
Private boating trips lost	22,074	\$34.00	\$750,516
Sport fishing trips lost	1,860	\$87.12	\$162,043
Whale watching and excursion trips lost	7,090	\$45.00	\$319,050
(B) OUTSIDE CLOSURE PERIOD			
General beach recreation trips lost	278,986	\$13.19	\$3,679,825
TOTAL LOSS			\$11,420,108
HANEMANN (1997b)			
(A) LOSS DURING BEACH CLOSURE PERIOD			
General beach recreation trips lost	389,580	\$15.00	\$5,843,700
Surfing trips lost	28,290	\$18.75	\$530,438
Surfing trips diverted to substitute sites	28,148	\$12.00	\$337,776
General beach recreation and surfing trips under adverse conditions	119,135	\$3.00	\$357,405
Private boating trips lost	13,074	\$40.00	\$522,960
Sport fishing trips lost	1,860	\$83.00	\$154,380
Whale watching and excursion trips diverted	7,090	\$12.00	\$85,080
(B) NET LOSS AFTER RE-OPENING, IN MARCH			
General beach recreation trips lost	147,064	\$15.00	\$2,205,960
Surfing trips lost	12,901	\$18.75	\$241,894
Surfing trips diverted to substitute sites	12,901	\$12.00	\$154,812
General beach recreation and surfing trips under adverse conditions	212,878	\$3.00	\$638,635
(C) NET LOSS IN APRIL			
General beach recreation and surfing trips under adverse conditions	370,000	\$3.00	\$1,110,000
TOTAL LOSS			\$12,183,040
DEFENDANT'S ANALYSIS			
DUNFORD et al. (1995)			
LOSS DURING BEACH CLOSURE PERIOD			
General beach recreation trips	158,680	\$2.30	\$365,403
Credit for rubbernecker trips	109,164	\$0.95	(\$103,257)
TOTAL LOSS			\$262,146
DUNFORD EXHIBIT 2224			
LOSS DURING BEACH CLOSURE PERIOD			
General beach recreation trips lost	264,000	\$2.30	\$607,200
TOTAL LOSS			\$607,200

WHY?

People use the Beach.

Pollution is on the rise.

Cleanup is costly.

How much is worth cleaning up?

Why the finite mixture model?

Different people have different tastes.

KEEP OUT

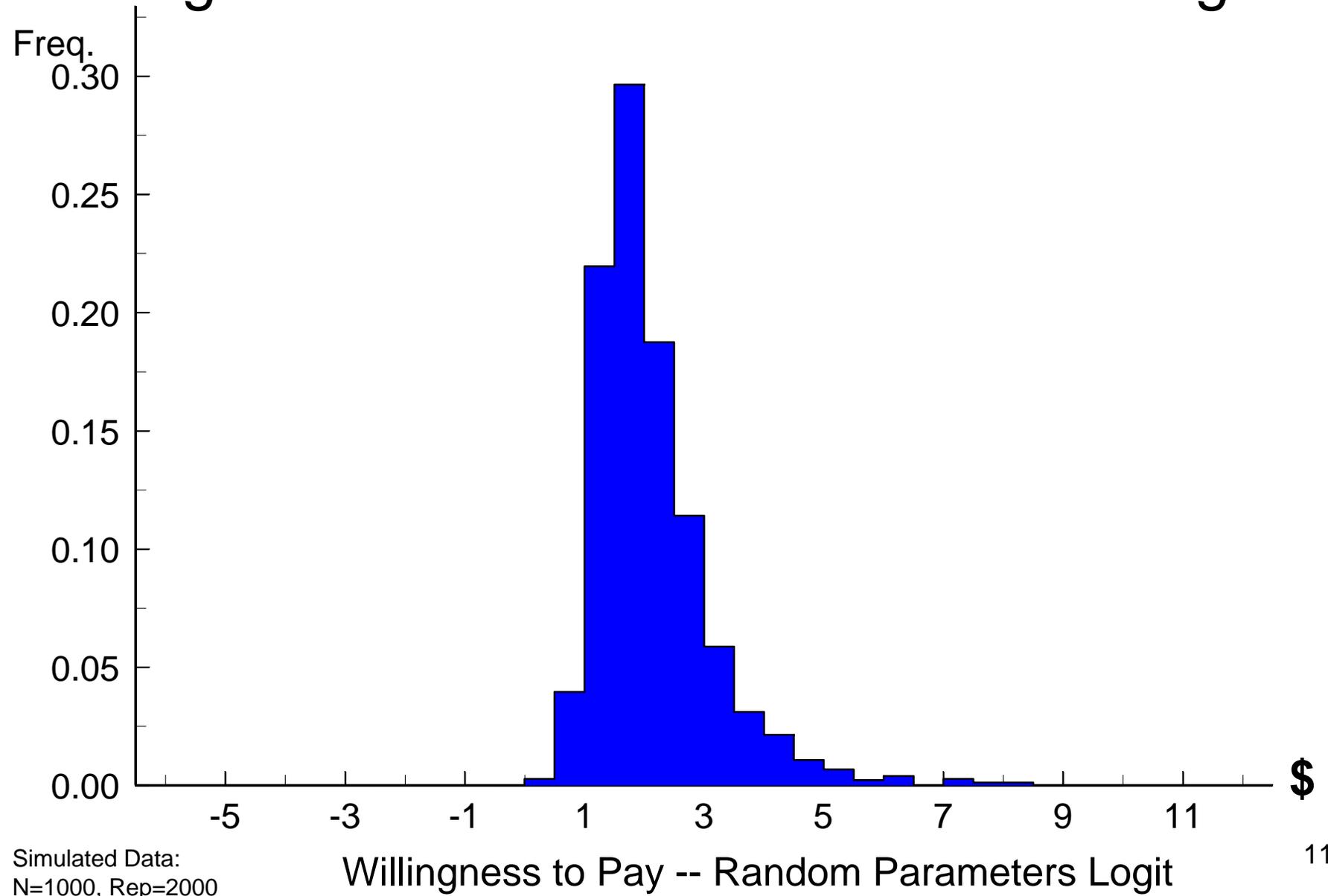


**SEWAGE CONTAMINATED
WATER**

OCEAN WATER MAY CAUSE ILLNESS

- 1496 postings in LA county in 2004.
- 45% of beach goers that do not go in the water say pollution keeps them out.

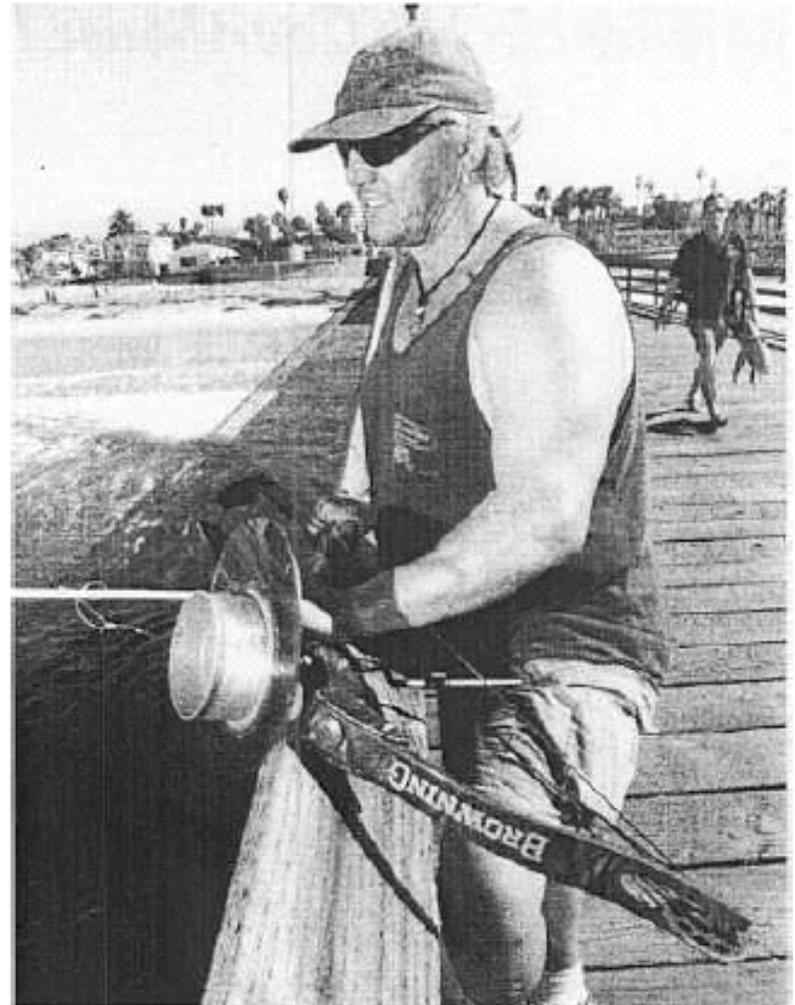
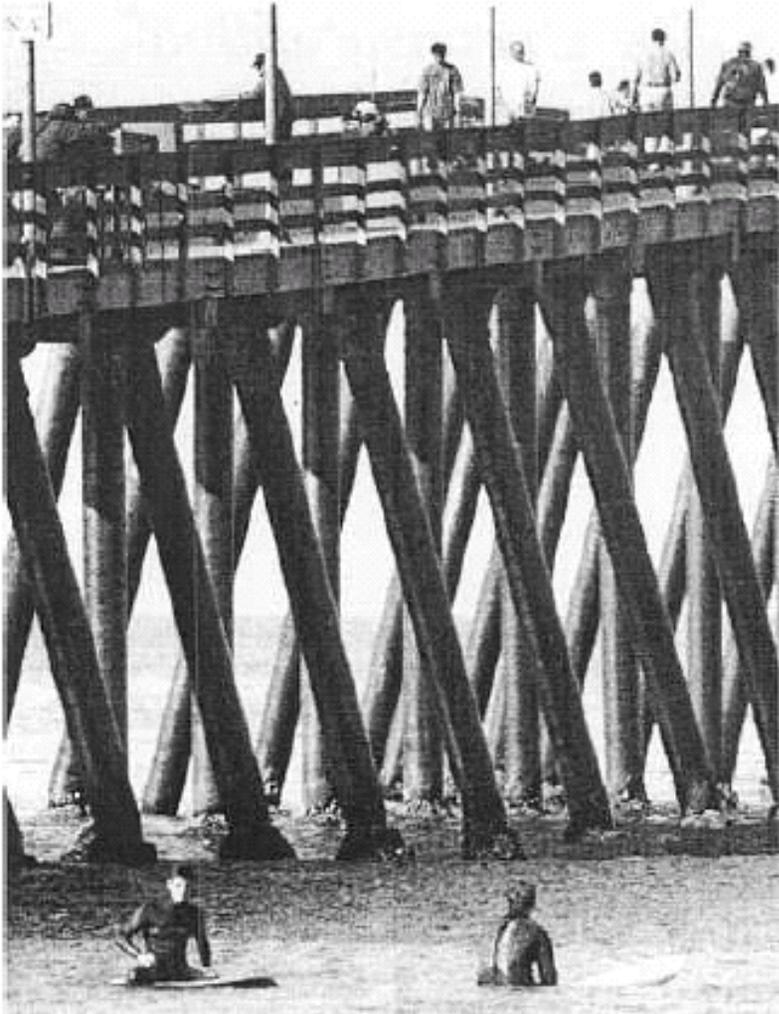
Willingness to Pay Distribution: Single Distribution Model Masks Heterogeneity



Similar Preferences?

A26 YNE

THE NEW YORK TIMES **NATIONAL** TUESDAY, NOVEMBER 19th, 2003

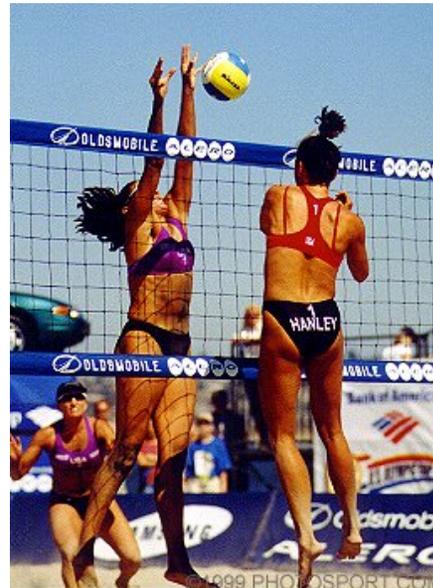


Photographs by Dave Godey for The New York Times

Surfers and bow fishermen like Blake Jacobson co-exist uneasily in Imperial Beach, site of the only pier in California where bow fishing is allowed.

As Bowmen Hunt From Pier, Surfers Feel Like Targets

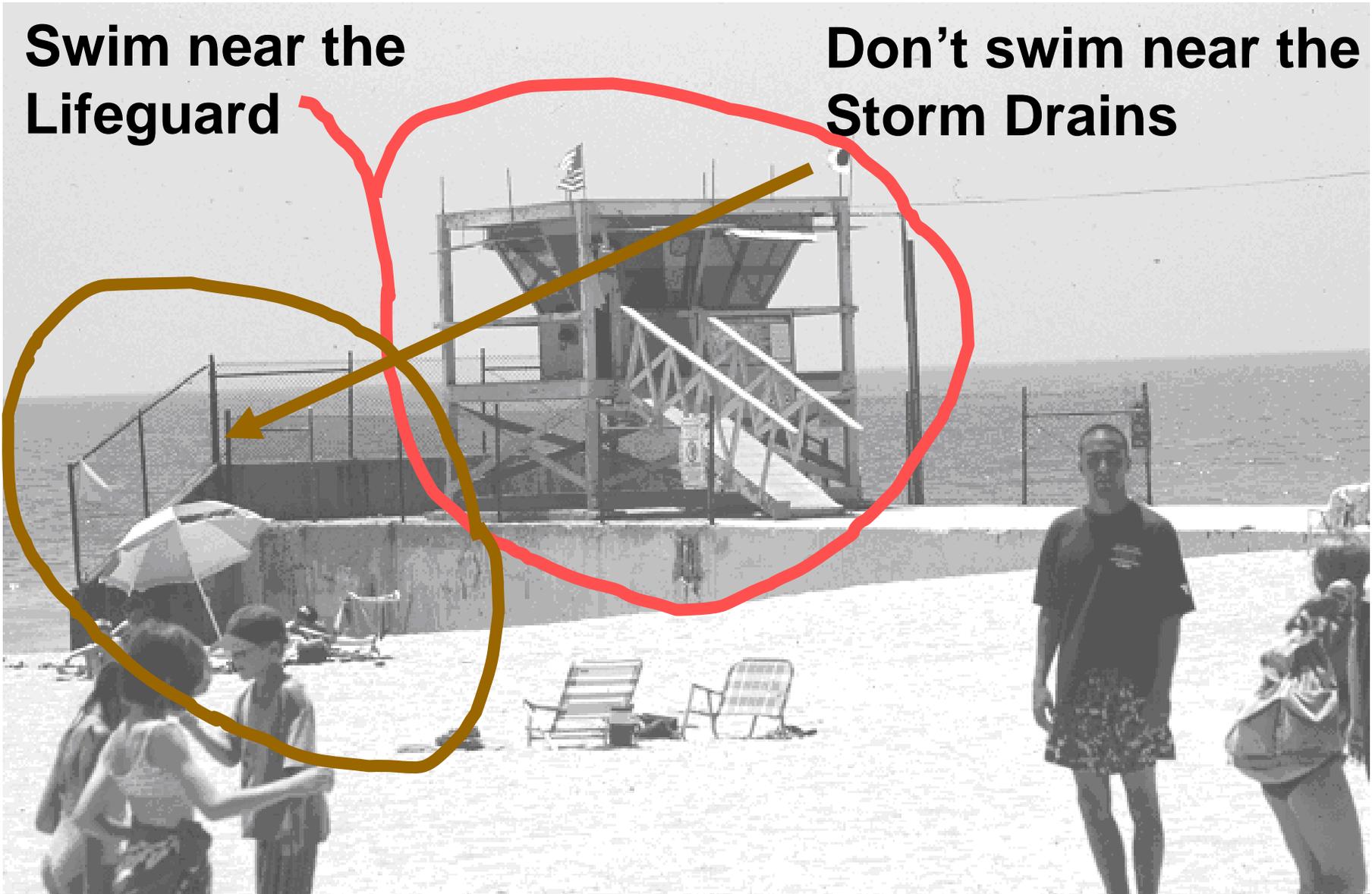
Beaches are characterized by diverse preferences and people



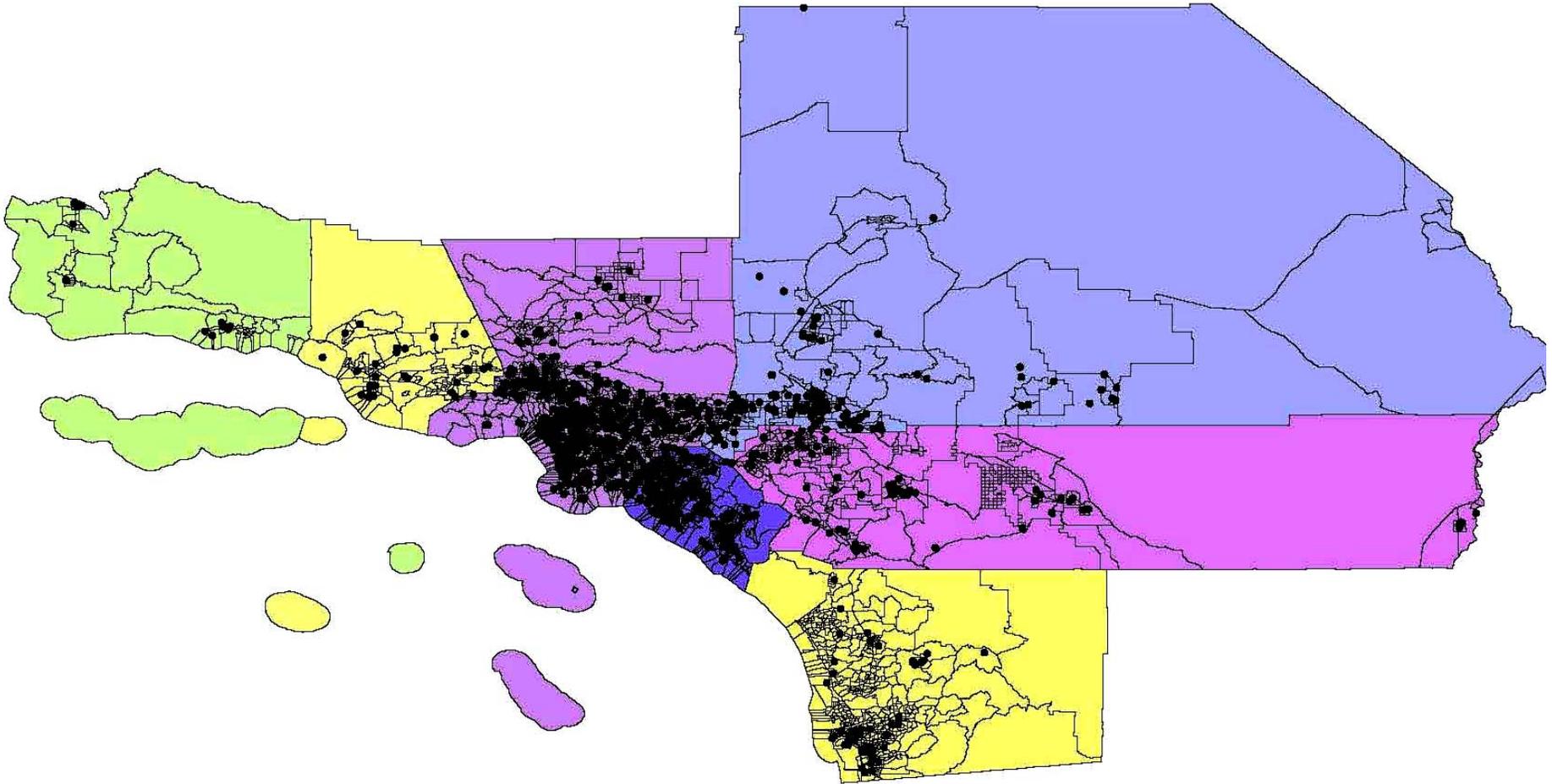
Choosing the 'right' beach can be difficult!

**Swim near the
Lifeguard**

**Don't swim near the
Storm Drains**



Survey Respondent Residence Location



Public Information on Water Quality

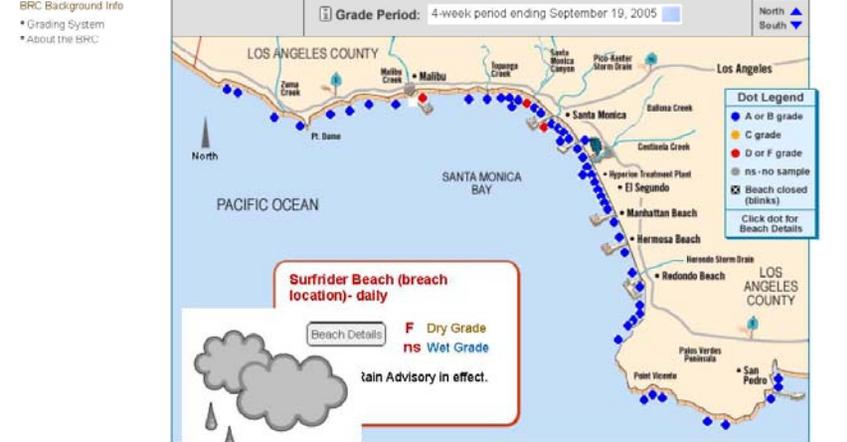
- Web Based
- Newspaper
- Signage
- Visual Observations



Heal the Bay | Beach Report Card | Weekly - Grade Map for Los Angeles County, CA (except Long Beach)

In This Section **Beach Report Card**SM

The Beach Report Card is made possible by a grant from **Weekly Report Card - Grade Map**
[CA State Map](#)



BEACH ADVISORIES

Beach Advisories were last updated at: 09/22/2005 1:05 PM

<p>Rain Advisory</p> <p>A rain advisory is issued anytime there is significant rainfall that may affect bacteria levels in ocean waters. Levels of bacteria can rise significantly in ocean waters especially adjacent to storm drains, creeks and rivers during and after rainstorms. Elevated levels of bacteria may continue for a period of up to 3 days depending upon the intensity of the rain and the volume of runoff. Elevated bacteria levels in ocean water may cause someone to become ill. The Department of Health Services recommends that beach users avoid contact with ocean water, especially near flowing storm drains, creeks and rivers for a period of 3 days after rainfall ends.</p>	<p>Rain advisory for all Los Angeles County beaches. This advisory will be in effect until 12:00 p.m. Friday September 23. This advisory may be extended depending on further rainfall.</p>
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<p>Beach Closures</p> <p>A beach is closed anytime there is a known sewage or chemical spill impacting ocean waters. Water contact may cause someone to become ill. When a beach is closed, the Department of Health Services advises beach users to avoid all contact with ocean water in the closure area and where closure signs are posted.</p>	
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Warnings

While every effort has been made to update ocean water monitoring information in a timely manner, information can be as much as a week old. This information [cannot](#) and [should not](#) be relied upon as a guarantee to the safety of current ocean water quality conditions.

A warning sign is posted anytime State ocean water bacteriological standards are exceeded. Elevated bacteria levels in ocean water may cause someone to become ill. The Department of Health Services advises beach users to avoid contact with ocean water where warning signs are posted. Warning signs are usually posted 50 - 100 yards either side of a sampling site where bacteria levels have exceeded State standards. Greater distances may be posted depending upon levels of bacteria.

"30 Day Grade" Indicates a 30 day average grade, "A - F," for each sampling site. The grade indicates the trend of bacteriological levels at each sampling site over the past 30 days. [See Methodology](#). An "ID" in the grade column indicates insufficient data to post a grade.

"Latest Testing" Indicates if the monitoring site meets, or does not meet State ocean water bacteria standards the last time it was tested. (Note: some sites are tested weekly and information may be as much as one week old)

Latest testing: meets standards does not meet standards

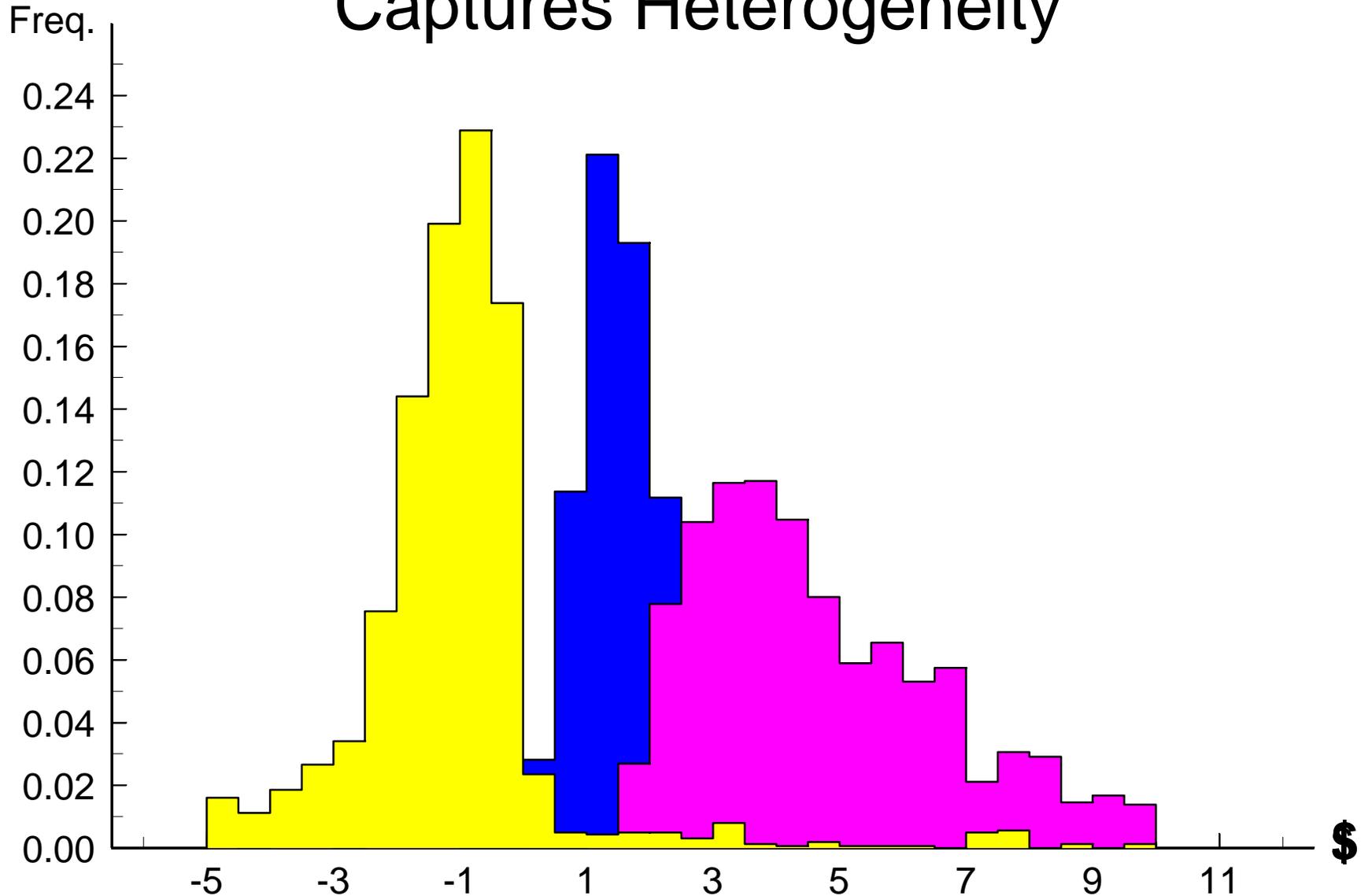
To see a description of areas posted with warning signs, place cursor over the slash symbol.

Click on a beach name below to see a map or click [here](#) to go to main map.

What water quality grades actually mean:

- Biological Pollutants: total & fecal coliform & enterococcus.
- Stomach flu, ear infection, upper respiratory infection and skin rash
- No Measures for Toxins, Human Debris, Natural Debris

WTP Distribution for Multimodal Model: Captures Heterogeneity



Simulated Data:
N=1000, Rep=2000

Willingness to Pay -- Finite Mixture Logit

