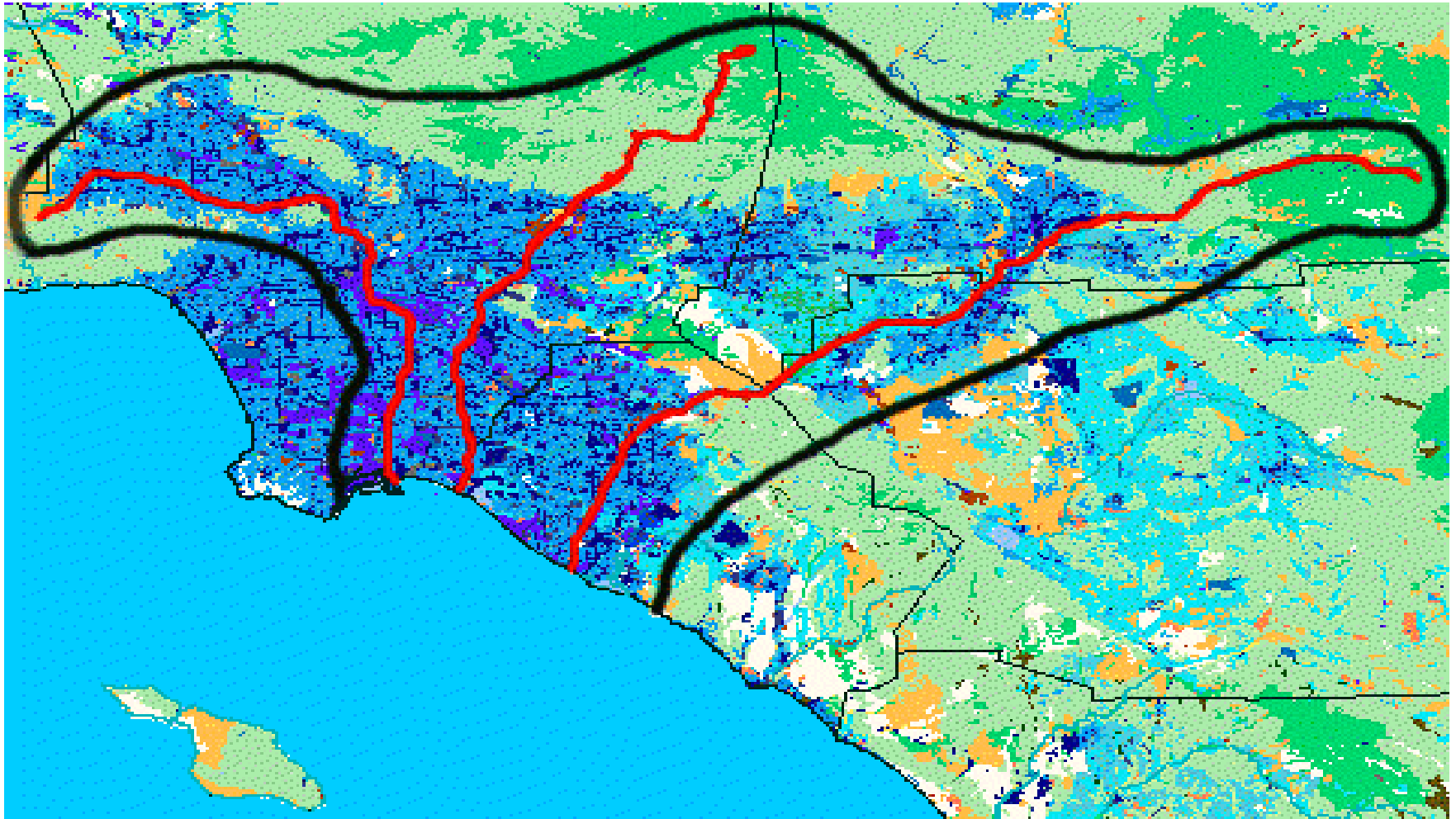


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***Estimated Health Costs For Illnesses Associated
with Recreational Contact with Marine Waters
Contaminated by Urban Runoff***

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Combined Watershed Areas for the Los Angeles, San Gabriel and Santa Ana Rivers



Pollution Plume from Santa Ana River





Why Value Health Effects?

- Economic valuation of recreational illnesses has not been done.
- To aid cost-benefit analysis when considering pollution abatement options.

Data

- 1998 & 1999 Epidemiological study in Huntington and Newport Beaches
- Surveyed 1,141 surfers
 - Illness type and symptoms
 - Illness duration
 - Required medical treatment
 - Demographics

Health Costs from Illnesses Associated with Surfing in Urban Runoff Contaminated Water

1998 El Nino Winter (January, February, March)						
N = 479	Reports	Mean Days Ill	Doctor Visits	Meds.	Lost Wages per illness	Total Costs per illness
Cold or Sinus	113	12.4	18	6	\$ 697	\$ 79,181
Flu	14	10.8	6	1	\$ 607	\$ 8,628
Gastroenteritis	50	3.7	4	3	\$ 208	\$ 10,510
Throat infection	53	6.4	4	2	-	\$ 100
Ear infection	53	8.3	13	5	-	\$ 310
Eye infection	22	4.8	1	0	-	\$ 20
Skin infection	45	15.6	9	0	-	\$ 180
Totals	350		55	17		\$ 98,929
1999 La Nina Winter (January, February, March)						
n = 662	Reports	Mean Days Ill	Doctor Visits	Meds.	Lost Wages	Total Costs per illness
Cold or Sinus	111	9.0	19	17	\$ 506	\$ 56,716
Flu	30	8.6	13	10	\$ 484	\$ 14,880
Gastroenteritis	19	7.6	3	2	\$ 427	\$ 8,193
Throat infection	18	5.1	3	4	-	\$ 100
Ear infection	38	8.8	15	6	-	\$ 360
Eye infection	8	7.5	2	0	-	\$ 40
Skin infection	27	7.6	4	0	-	\$ 80
Totals	251		59	39		\$ 80,369

Variables Generated

- Mean length of illness (8.3 days)
- Illnesses requiring medical attention (19.6%)
- Illnesses requiring prescription medications (10.2%)
- Lost wages calculated using mean income per year (\$20-\$40 thousand per year)

Cost of Illness Method

Total costs of illnesses =

(number of illnesses * lost wages) +
(number of doctor visits) * (\$20 co-pay) +
(number of prescriptions) * (\$10 co-pay)

Lost Wages =

(number of illnesses*0.57) * (Mean sick days*0.45)

Scale for Estimating Health Costs per 100,000 Swimmers in Recreational Marine Waters

Illness Rate	Number Ill per 100,000	Lost Work Days	Doctor 19.6% ²	Meds. 10.2% ³	Range for Estimated Health Costs	
					Low	High
1%	1,000	570	\$3,920	\$1,020	\$182,582	\$360,225
2%	2,000	1140	\$7,840	\$2,040	\$365,165	\$720,451
3%	3,000	1710	\$11,760	\$3,060	\$547,748	\$1,080,677
4%	4,000	2280	\$15,680	\$4,080	\$730,331	\$1,440,903
5%	5,000	2850	\$19,600	\$5,100	\$912,914	\$1,801,128
6%	6,000	3420	\$23,520	\$6,120	\$1,095,497	\$2,161,354
7%	7,000	3990	\$27,440	\$7,140	\$1,278,080	\$2,521,580
8%	8,000	4560	\$31,360	\$8,160	\$1,460,663	\$2,881,806
9%	9,000	5130	\$35,280	\$9,180	\$1,643,246	\$3,242,032
10%	10,000	5700	\$39,200	\$10,200	\$1,825,828	\$3,602,257
11%	11,000	6270	\$43,120	\$11,220	\$2,008,411	\$3,962,483
12%	12,000	6840	\$47,040	\$12,240	\$2,190,994	\$4,322,709
13%	13,000	7410	\$50,960	\$13,260	\$2,373,577	\$4,682,935
14%	14,000	7980	\$54,880	\$14,280	\$2,556,160	\$5,043,161
15%	15,000	8550	\$58,800	\$15,300	\$2,738,743	\$5,403,386

Conclusions

- Economic costs from illnesses associated with urban runoff are significant
- Small increase in illness rate results in large increase of economic costs
- Public health costs should be included in cost-benefit analysis