

# The Non-Market Value of Beach Recreation in California

By

Linwood Pendleton, Associate Professor  
*Environmental Health Sciences,  
University of California, Los Angeles  
and, Lead Non-Market Economist,  
The National Ocean Economics Program*

Judith Kildow, James W. Rote Distinguished Professor,  
*Division of Science and Environmental Policy,  
California State University at Monterey Bay  
and Director,  
The National Ocean Economics Program*

---

## ABSTRACT

Beach-going represents a major economic use of the California coast and ocean. Concession stands, paid parking lots, and waterfront restaurants reveal that beach-goers contribute to a thriving coastal market economy. We draw on estimates of beach non-market values and estimates of beach visitation in California to estimate the potential economic value of day-use beach-going in the state. A number of different sources estimate beach visitation days for California. These estimates of annual beach visitation range from 150 million visits to more than 378 million beach visits. Using a conservative estimate of 150 million beach visits, we estimate that market expenditures by beach-goers in California could substantially exceed \$3 billion each year. Less obvious, however, is the economic

magnitude of beach values that never enter the market. These non-market values represent the value that day users place on access to the beach beyond what they pay in terms of travel costs, parking fees and tolls. Beaches in California represent a recreational and open-space resource that provides a level of public access rarely matched elsewhere in the United States. Using a conservative estimate of 150 million beach visits, and a range of estimates for the non-market value of a California beach day, we estimate that non-market expenditures by beach-goers in California could substantially exceed \$2 billion each year.

*Article Received: 28 August 2005; Revised and Accepted: 8 February 2006.*

Two other studies examine beach-related expenditures by day visitors in California. A survey of beach-goers in southern California (Hanemann et al. 2002) found that per-person per-trip expenditures on beach related items and services were \$23.19 (\$25.18 in 2005 dollars) for beach-goers who took at least one trip in the summer of 2000. In another study by King (CDBW 2002), average beach-related expenditures (excluding gas and automobile costs) were \$29.66 (\$32.20 in 2005 dollars). While the study by Hanemann et al. (2002) estimates expenditures to only those visitors that actually “touch the sand” at least once during their trip, King (CDBW 2002) includes expenditures by visitors to piers, boardwalks, parks, and restaurants adjacent to beaches.

Visitors to beaches also place a value on beach visits above and beyond what they spend at the beach – the consumer surplus of beach visits. Unlike many marketed goods, access to the beach is largely free (aside from parking fees) in California. Because of the low cost of beach access and the importance of beach recreation to Californians, numerous studies have estimated the consumer surplus of beach-going in California to better measure the total economic value of beaches and beach management in the state. Yet, no study has attempted to compile these values to find an estimate for the total non-market value of beaches in California. As we show below, the value of non-market beach uses is substantial and may even be within an order of magnitude of the market expenditures associated with beach recreation in the state. Failure to fully account for non-market values of beaches in California could lead to explicit and implicit errors in the evaluation of beach projects.

## METHODOLOGY

We estimate the total non-market value of beaches in California using a two-step

---

## INTRODUCTION

Beach recreation is a cornerstone of the California coastal economy and even California culture. For at least four decades, Hollywood has carefully documented the California beach life. A more complete and accurate assessment of the number of actual beach users and the economic value of beach use, however, has only just begun. Nevertheless, the emerging picture of beach visitation and the potential value of market and non-market economic impacts of beach use in California corroborate the obvious importance of beach visitation for the California coastal economy.

The California Coastal Act protects access to public beaches throughout California. As a result, beaches are an important source of recreational open space for Californians with as many as 63.4 percent of all Californians making at least one visit to a California beach each year – 2.5 times the national average (California Department of Boating and Waterways [CDBW] 2002). A survey by the Public Policy Institute of California (PPIC 2003) finds that 72 percent of all Californians make at least one trip to the beach each year.

Day trips to beaches generate two distinct kinds of economic impact for the coastal and ocean economy: market expenditures and non-market consumer surplus values. The former represents 1) economic input for the local economy when visitors from out of the area spend money, and 2) a transfer of spending occurs from other activities to beach activities when visitors are local residents. While not technically a value from society’s perspective, expenditures are important because they allow the analyst to better understand what profits, employment, wages and taxes may be associated with beach spending. In California, day visitors to beaches spend money locally on food, beverages, parking and beach-related activities and rentals (e.g., body boards, umbrellas, etc.). In addition, beach-goers may purchase more durable goods to better enjoy beaches including surfboards, umbrellas and towels. To date, only the variable expenditures of beach goers in California have been estimated. King (1999) estimated the fiscal impact of beaches in California and reported that, in 1998, California’s combined day visitors and tourists spent \$14 billion dollars (\$16.4 billion in 2005 dollars) on beach-related expenditures (King 1999).<sup>1</sup>

process. First, we estimate the total beach visitation activity days (herein referred to as beach days) where a beach day represents a visit to one beach by one individual on one day. An estimate of total annual beach days represents the total number of person days spent on the beaches of California in one year. If a visitor goes to the same beach or different California beaches 10 times in one year then it is counted as 10 beach days. Second, we draw from the literature to find what we believe to be a representative range of estimates of value for one day of beach visitation to find the total non-market value of beach visitation for California. The people who visit a beach on a given day may engage in multiple outdoor recreation activities. They swim, sunbathe, walk, jog, view birds and wildlife, or just watch sunsets. Our estimates include beach visits for any recreational activity.

### **ESTIMATED TOTAL BEACH DAYS**

A number of different sources estimate beach days for California. King (CDBW 2002, Chapter 3) updates beach attendance figures originally based on a random telephone survey of California households by King and Potepan (1997). Adjusting for increases in state population, King estimates that as many as 378.5 million beach days were made to California beaches by Californians in 2001; these beach days include both day visits and multi-day visits (e.g., by tourists or out of town visitors) to beaches and piers, boardwalks, parks and restaurants adjacent to beaches. Leeworthy and Wiley (2001) use data from the National Survey on Recreation and the Environment, a national telephone survey, to estimate that 151.4 million beach days were taken at California beaches in 2000. In addition to telephone surveys, beach attendance records are kept by county and state agencies as well as private firms hired to provide lifeguard services at some southern California beaches. Using lifeguard estimates, the United States Life Saving Association estimates that as many as 146 million beach days were taken at southern California beaches alone (USLA 2002). In another study, Morton and Pendleton (2001) estimate that total beach attendance in Los Angeles and Orange County in 2000 exceeded 79 million beach days. Morton and Pendleton's estimates, detailed in a report to the State Water Resources Control Board, are taken directly from lifeguard records.

Kildow and Shivendu (2001) use data from the Environmental Protection Agency's BEACH Watch Program (EPA

BEACH) to estimate beach visitation in California. The authors estimate the attendance per mile of beach using EPA BEACH attendance estimates for four different regions of California: northern California, San Francisco Bay area, central California, and southern California, and then extrapolate to get the estimates of attendance for those beaches for which only length is known. The BEACH Watch program of EPA<sup>2</sup> covers only 224 beaches, but the authors supplement the data with other sources including guide books and the California Coastal Commission's *Coastal Access Guide*. In all, the authors identify at least 417 California beaches (see appendix for a complete list of beaches) and estimate the attendance at these beaches to be 153.1 million beach days.

The estimates of Kildow and Shivendu are in line with those of the NSRE (2000) estimates, the United States Lifeguard Agency (2002) data and the estimates for beach attendance given by Morton and Pendleton (2001), but are significantly lower than those of King's estimates for the California Department of Boating and Waterways (2001). It is not clear why the estimates from King diverge so greatly from other estimates. King's estimates represent and average of more than 10 beach day visits for every resident of the state. The Public Policy Institute of California found that 36 percent of California's 35.9 million (2004 Census estimate) residents who were surveyed went to the beach more than once per month, while 51 percent of the population went between once and several times each year. For the purposes of this study, we use a conservative estimate of 150 million beach days each year at California beaches with a clear understanding that the total number of beach days made statewide are likely to be larger.

### **ESTIMATING THE VALUE OF A BEACH DAY**

No attempt has been made to estimate the aggregate non-market value of beaches for large areas in general, and for California in particular. Aggregating non-market values studies can be complicated if the studies estimate the value of different types of uses (e.g., surfing, swimming or just sunbathing) and the value of uses during different seasons. Fortunately, most studies that have estimated non-market values for beach use in California have estimated the value of a general beach day, usually during the summer. Unfortunately, nearly all of the studies we cite estimate values for southern California beaches. As a result, the potential for extrapolation

error in our estimates lies in the degree to which non-market beach values for southern California beaches may not be representative of the values placed on beaches elsewhere in California. Nevertheless, because Kildow and Shivendu (2001) find that more than 85 percent of all beach visits in California are made to beaches in Los Angeles, Orange and San Diego counties, the sensitivity of our results to this geographical extrapolation error are likely to be relatively small.

Two primary methods have been used to value consumer surplus estimates: 1) travel cost methods that use market-based data on travel to beaches, and 2) contingent valuation methods that use survey approaches to elicit the value of beach recreation. Chapman and Hanemann (2001) argue that contingent valuation estimates of California beach visits to date have been flawed and generate unreliable estimates, largely because the contingent valuation surveys often are not site-specific and fail to account for varying travel costs to beaches around the state. We focus the discussion that follows on estimates from the many travel cost studies that have been undertaken to estimate the values of beach days in California.

Travel cost estimates of consumer surplus for beach visits have been employed to estimate the value of beach days, largely along the central and southern California coast. Table 1 provides estimates of consumer surplus values for visits to beaches in California. Consumer surplus estimates range from a low of \$10.98 (in 2001 dollars) for a beach day to Cabrillo Beach in Los Angeles County (Leeworthy and Wiley 1993) to a high of greater than \$70 (in 2005 dollars) day visits to San Diego beaches (Lew 2002). In 1997, Michael Hanemann estimated the value of the consumer surplus of beach days at Huntington Beach at \$15/day visit (in 1997 dollars; Hanemann 1997). Hanemann's estimate of beach related consumer surplus was later discounted by 10 percent and used as the basis for a jury award regarding lost beach recreation due to the *American Trader* oil spill (Chapman and Hanemann 2001).

The exact non-market value associated with a beach day depends importantly on the quality of the beach, the season, the geographic location and even water temperature. Similar, the consumer surplus value of a beach day depends on characteristics of the beach-goer, including their age, income and the activities they undertake while at the beach. Detailed data on beach specific non-market values and detailed data about beach-specific at-

Consumer Surplus/Beach Day	US\$ (1990)	Adjusted US\$ (2005)
Cabrillo-Long Beach <sup>1</sup>	\$8.16	\$12.16
Santa Monica <sup>1</sup>	\$18.36	\$27.36
Pismo State Beach <sup>2</sup>	\$26.20	\$39.04
Leo Carillo State Beach <sup>1</sup>	\$51.94	\$77.39
San Onofre State Beach <sup>2</sup>	\$57.31	\$85.39
San Diego <sup>2</sup>	\$60.79	\$90.58

Source: "Environmental Damages in Court: The American Trader Case," published in *The Law and Economics of the Environment*, 2001, Anthony Heyes, editor, pp. 319-367. The data are extracted from 1) Leeworthy and Wiley (1993) and 2) Leeworthy (1995).

  

Consumer Surplus/Beach Day	Adjusted US\$ (2005)			
Individual Surplus/Day	Carpinteria	Ercinitas	San Clemente	Solana Beach
Method 1	\$22.53	\$20.72	\$28.27	\$16.04
Method 2	\$26.87	\$24.39	\$33.64	\$19.09

Source: Philip King, "The Economic Analysis of Beach Spending and the Recreational Benefits of Beaches in the City of San Clemente," 2001. Note: Method 1 - dependent variable is a discrete random variable, CS calculated as the sum of a series of rectangles, each one day wide, touching the demand curve at its upper right corner. Method 2 - CS calculated as the sum of a rectangle for the area under the curve between zero and one, and the definite integral for the area between one and the average number of trips.

  

Statistic	Total Value of Beach Day (San Diego) Adjusted US\$ (2005)			
	Two-step Heckman	Two-step HFS	Joint Heckman	Joint HFS (cited by authors as preferred)
Mean	\$77.86	\$81.60	\$47.93	\$36.73
Median	\$80.69	\$84.29	\$50.48	\$39.38
Standard Deviation	\$11.52	\$11.76	\$10.57	\$10.65

Source: Dissertation by Daniel Kevin Lew, University of California Davis, "Valuing Recreation, Time, and Water Quality Improvements Using Non-Market Valuation: An Application to San Diego Beaches."

**Table 1. Travel cost estimates of the nonmarket value of beach days in California.**

tendance and the characteristics of beach-goers at all 471 beaches in the state are not available. Nevertheless, we can begin to better understand the order of magnitude of the non-market value of beaches in California by examining the likely value of beaches using a range of estimates for the economic non-market value for beach days and extrapolating this over the state.

We use both low and high estimates of \$15/beach day and \$50/beach visit day respectively to estimate a range of potential economic non-market values that may be associated with beach recreation in California. The low estimate for the value of a beach day is based on the court-appointed value of a beach day from the *American Trader* case (Chapman and Hanemann

2001); the upper limit represents a midpoint between the median beach value found by 1) Leeworthy and Wiley (1993) and Leeworthy (1995), and 2) the median value of the preferred estimates from Lew (2002). (All values are adjusted to dollars in 2005.) Based on a conservative estimate of beach attendance of 150 million beach days annually, we estimate the non-market value of beach visits in California to range from \$2.25 billion dollars to \$7.5 billion annually.

### CONCLUSION

Beach-going is more than just an idle past time in California. Beach-going represents a major economic use of the California coast and ocean and a major contribu-

tor to California's economy. The market value of beach going is widely recognized. Concession stands, paid parking lots, and waterfront restaurants reveal that beach goers contribute to a thriving coastal market economy. Less obvious, however, is the economic magnitude of beach values that never enter the market. Beaches in California represent a recreational and open space resource that provides a level of public access rarely matched elsewhere in the United States. We estimate that beaches in California continue to produce non-market economic benefits that are likely to be significantly greater than \$2 billion annually.

Despite the potentially large economic value of beach recreation in California and the fact that 72 percent of all Californians will visit the beach each year (PPIC 2003), the state does not collect any standardized, consistently estimated data on beach use or beach values. An authoritative record of annual beach visitation does not exist, and the attendance data that are available are estimated based on a variety of methods (Morton and Pendleton 2001), few of which have been rigorously tested for accuracy. Similarly, a statewide non-market valuation of beach recreation has not been undertaken for use values at California beaches. To date, beach valuation studies in the state have been conducted on an ad hoc basis, with only the Southern California Beach Valuation Project (Hanemann et al. 2002; 2003; 2004) attempting a valuation study using standard methods across beaches within an entire region<sup>3</sup>. Without standardized, regularly collected data on beach visitation and non-market beach values, county beach agencies, California Department of Parks and Recreation and coastal municipalities are mostly ignorant regarding the economic health of the beaches and beach-goers within their charge, and have little information about the value of the assets they are managing.

### ACKNOWLEDGEMENTS

The authors would like to thank the reviewers for helpful comments. Additionally, we thank Bonnie Lockwood for help in preparation of the manuscript.

## REFERENCES

- California Department of Boating and Waterways and State Coastal Conservancy, 2002. "California Beach Restoration Study," Sacramento California.
- Chapman, D. and Hanemann, W. M., 2001. "Environmental damages in court: the *American Trader* case," *The Law and Economics of the Environment*, Anthony Heyes, editor, 319-367.
- Hanemann, W. M., 1997. "Final conclusions of Professor Michael Hanemann regarding lost recreational damages resulting from the *American Trader* Oil Spill." Report submitted to the State of California Attorney General's Office.
- Hanemann, M., L. Pendleton, J. Hilger, and D. Layton, 2002. "Expenditure Report for the Southern California Beach Valuation Project," Prepared for the National Ocean and Atmospheric Administration, Minerals Management Service (Department of the Interior), the California State Water Resources Control Board and the California Department of Fish and Game.
- Hanemann, M., Pendleton, L., Mohn, C., Hilger, J., Kurisawa, K., Layton, D. and Vasquez, F., 2003. "Interim Report on the Southern California Beach Valuation Project." Prepared for the National Ocean and Atmospheric Administration, Minerals Management Service (Department of the Interior), the California State Water Resources Control Board and the California Department of Fish and Game.
- Hanemann, M., Pendleton, L., Mohn, C., Hilger, J., Kurisawa, K., Layton, D. and Vasquez, F., 2004. "*Using revealed preference models to estimate the affect of coastal water quality on beach choice in Southern California.*" Prepared for the National Ocean and Atmospheric Administration, Minerals Management Service (Department of the Interior), the California State Water Resources Control Board and the California Department of Fish and Game.
- Kildow, J. and S. Shivendu, 2001. "Valuing California Beaches." Presented at the Beach Economics Workshop, University of Southern California.
- King, P., 1999. "The Fiscal Impact of Beaches in California," *Public Research Institute*, San Francisco University, report commissioned by California Department of Boating and Waterways.
- King, P., 2001. "The Economic Analysis of Beach Spending and the Recreational Benefits of Beaches in the City of San Clemente," mimeo, San Francisco State University.
- King, P. G. and Potepan, M., 1997. *The Economic Value of California's Beaches*, San Francisco State University: Public Research Institute.
- Leeworthy, V. R. and Wiley, P. C., 1993. "Recreational Use Value for Three Southern California Beaches," *Strategic Environmental Assessments Division*, Office of Ocean Resource Conservation and Assessment, National Oceanic and Atmospheric Administration, Rockville Maryland.
- Leeworthy, V. R., 1995. "Transferability of Bell and Leeworthy Beach study to Southern California Beaches," Memo to David Chapman, June 22 (Exhibited 939) reported in Chapman, D. and M. Hanemann, 2001. "Environmental damages in court: the *American Trader* case." *The Law and Economics of the Environment*, Anthony Heyes, editor, pp. 319-367.
- Leeworthy, V. R. and P. C. Wiley, 2001. "Current Participation Patterns in Marine Recreation," National Oceanic and Atmospheric Administration.
- Lew, D. K., 2002. "Valuing recreation, time, and water quality improvements using non-market valuation: an application to San Diego beaches," Doctoral dissertation. University of California Davis.
- Morton, J. and L. Pendleton, 2001. "A Database of Beach Closures and Historical Water Quality," Prepared for the State Water Resources Control Board. Sacramento, California.
- PPIC, 2003. "Special Survey on Californians and the Environment," Public Policy Institute of California. San Francisco, California.
- United States Lifesaving Association, 2002, (USLA) <http://www.usla.org/PublicInfo/>.